

## **Merced River Corridor Restoration Plan Baseline Studies**

# **Volume I: Identification of Social, Institutional, and Infrastructural Opportunities and Constraints**

April 30, 2001

**MERCED RIVER CORRIDOR RESTORATION PLAN  
BASELINE STUDIES**

**VOLUME I:  
IDENTIFICATION OF SOCIAL, INSTITUTIONAL, AND  
INFRASTRUCTURAL OPPORTUNITIES AND CONSTRAINTS**

**FINAL REPORT**

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## **PREFACE**

The purpose of this report is to provide the results of the Phase II baseline studies to identify social, institutional, and infrastructural opportunities and constraints for restoration that were conducted for the Merced River Corridor Restoration Plan. Previous drafts of this report were reviewed by Ted Selb (Merced Irrigation District), Rhonda Reed (California Department of Fish and Game), Desmond Johnson (Merced County Planning and Community Development Department), Scott Spaulding (U.S. Fish and Wildlife Service), and Randy Mager (California Department of Water Resources). The draft report was also presented to the Merced River Stakeholder Group (on June 15, 2000) and was subsequently revised. The revised draft was redistributed to the Stakeholder Group (on March 5, 2001). Many stakeholders provided valuable comments, which are reflected in this final report.

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## 1 INTRODUCTION

The Merced River drains a 1,276-square-mile watershed on the western slope of the Sierra Nevada range in the southern portion of California's Central Valley and joins the San Joaquin River about 87 miles south of Sacramento (Figure 1). Elevations in the basin range from 13,000 feet NGVD<sup>1</sup> at its crest in Yosemite National Park to 49 feet NGVD at the San Joaquin River confluence. The climate is typically Mediterranean, with wet winters and dry summers. Similar to other rivers originating from the west side of the Sierra Nevada mountains, flow in the Merced River is typified by late spring and early summer snowmelt, fall and winter rainstorm peaks and low summer baseflows. Annual water yield from the Merced River averages 996,500 acre-feet (for the period 1903–1999).

The Merced River Corridor Restoration Planning project was initiated to develop a publicly supported, technically sound, and implementable plan to improve geomorphic and ecological function in the Merced River corridor from Crocker-Huffman Dam (River Mile<sup>2</sup> [RM] 52) downstream to the San Joaquin River (RM 0). The project is a joint venture being led by the Merced County Planning and Community Development Department (the County) and Stillwater Sciences. In addition, the California Department of Fish and Game (CDFG) and the Merced Irrigation District (Merced ID) actively participate on the Project Team.

The project is being implemented in three phases. In Phase I, Stillwater Sciences and the County established a Merced River Stakeholder Group and Merced River Technical Advisory Committee (TAC). This phase was funded by the U.S. Fish and Wildlife Service Anadromous Fish Restoration Program (AFRP) and began in November 1998. In Phase II, the Project Team conducted baseline geomorphic and ecological analyses and identified social, infrastructural, and institutional issues and concerns that will define opportunities and constraints for restoration in the Merced River corridor. This phase was funded by CALFED and began in April 1999 and was completed in Winter 2001. In Phase III, which was also funded by CALFED and which began in Fall 2000, the Project Team will complete field and modeling efforts to develop design guidelines for geomorphically functional channel and floodplain dimensions<sup>3</sup>, and in collaboration with the Stakeholder Group and TAC, develop the Merced River Corridor Restoration Plan.

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<sup>1</sup> National Geodetic Vertical Datum, a standard vertical datum used throughout the United States.

<sup>2</sup> River miles represent the distance along the river channel upstream from the San Joaquin River.

<sup>3</sup> This task was originally included in Phase II. Phase II, however, was only partially funded in the 1999 CALFED cycle. This task was shifted to Phase III due to funding constraints.

## **2 SCOPE AND STRUCTURE OF THIS REPORT**

To be successful, the restoration plan must work within the ecological as well as the social, institutional, and infrastructural context of the river. This social, institutional, and infrastructural context includes property ownership, land use and zoning, water resource development, water supply reliability, flood control requirements, physical structures (such as bridges), and environmental, flood control, and other regulations. Understanding this social, institutional, and infrastructural context of the river provides necessary insight into potential opportunities and constraints for river restoration. Recognizing these opportunities and constraints, the plan and the restoration projects contained within the plan can be designed to be implementable and functional within the current and foreseeable social, institutional, and infrastructural framework of the river.

This report identifies social, institutional and infrastructural factors affecting future restoration opportunities within the Merced River corridor, including existing zoning and land use, land ownership patterns, existing and planned aggregate mining activities to provide a reliable aggregate supply, Merced ID operations, and other factors. This report focuses on lands within a 3-mile-wide corridor along the river (Figure 2). The area shown is the area of analysis used to describe the context of the river. It is NOT necessarily the area where potential restoration projects would occur. Restoration projects would focus on the river channel and its immediate adjacent floodplain.

This report is meant to be a source document providing information to guide future studies, develop appropriate restoration strategies, and assess the feasibility of specific restoration projects. This report will be used in conjunction with the geomorphic and riparian technical evaluations reported by Stillwater Sciences (2001) to work with the Stakeholder Group and TAC to identify feasible restoration projects in Phase III of this project.

## **3 LAND OWNERSHIP, LAND USE, AND INFRASTRUCTURE**

### **3.1 Property Ownership**

The analysis area includes 1,991 parcels covering 79,662 acres. Of this area, 1,931 parcels (97% by area) are in private ownership (Figure 3). A comprehensive restoration program, therefore, will require restoration projects to occur on private property in partnership with private property owners. In addition, restoration projects implemented on publicly owned lands could potentially affect nearby private property owners and would thus require coordination with these owners. Throughout the corridor, the largest landowners include: Merced ID, La Grange Gold Dredging Company, Gold River Ranch Partnership, Sunup Land & Cattle Partnership, N. Ellinwood, Robinson Cattle Company Partnership, United Packaging Partnership, Gallo Vineyards, Bettencourt Property Partnership, Ulkje Hilarides Trustee, P&H Dairy, Henry J & Adrienne M TeVelde Trustees, Joseph P & Cherry Vierra Company Trustees, the City of Livingston, J.O. Rocha, James J. Stevinson Corporation, and California Department of Fish and Game.

Privately owned parcels range in size from 0.1 acres to 970 acres, with the smallest parcels occurring in urban areas such as Snelling and Cressey. The average parcel size is 82 acres. Based on parcel maps provided by the Merced County Tax Assessor's Office, private property parcels are typically larger upstream of Cressey than downstream of Cressey (Figure 3). The large parcel ownership upstream of Cressey provides restoration opportunities in this reach. Fewer landowners and larger parcel sizes simplify restoration planning and project implementation and increase the likelihood of reaching a restoration agreement. In addition, public ownership of several large parcels upstream of Shaffer Bridge provides opportunities for restoration. Conversely, restoration downstream of Shaffer Bridge would be more complex due to numerous landowners and, smaller parcels.

Understanding the concerns of private property owners and working with private property owners to develop the restoration plan is crucial for developing implementable projects and ensuring that restoration projects do not adversely affect private property without appropriate, mutually acceptable compensation. Initial stakeholder comments indicate that the local property owners are concerned that a restoration plan would infringe upon their individual property and water rights, but that many landowners support improving natural resources and habitat in and along the river. In addition, landowners have expressed strong concerns regarding bank erosion, flooding and flood control, riparian water rights, mineral rights, trespassing, and vandalism. Lack of landowner support for restoration activities would be one of the greatest constraints to planning and implementing restoration actions.

Many of the agricultural and dairy operations along the river rely on water diverted from the river either by the Merced ID or by riparian diversions. For these operations, water from the Merced River is essential for irrigation supply and managing dairy byproducts. Several property owners along the river also operate aggregate mines on their land or may pursue future mining operations. Mineral rights are an important element of property rights. Recognition of aggregate resource values is expected to be a significant issue for riparian property owners. In addition, many landowners have experienced vandalism, littering, and other adverse effects of uncontrolled access to their properties and wish to limit and control access to the river corridor.

Sixty parcels, or approximately 3% of the analysis area, are publicly owned (Figure 3). These properties include land owned by the State (Department of Fish and Game and Department of Parks and Recreation), the County, Merced ID, the City of Livingston, Stevenson Water District, Turlock Irrigation District, Snelling School District, Snelling Community Services, Sacramento and San Joaquin Drainage District, Merced Falls School District, Hilmar Water District, and Delhi County Water District. Although these parcels are publicly owned, most do not offer public access.

### **3.2 Zoning, Planning Policies and Land Use in the Merced River Corridor**

Zoning and planning policies shape the land uses within the Merced River corridor. California Government Code (Section 65300-65307) requires city and county planning agencies to prepare and adopt a comprehensive, long-term General Plan for the development of the county or city and of any land outside its boundaries that is within the planning agency's jurisdiction. The General Plan outlines the goals concerning land use and is designed to serve as the basis for development-oriented decision making. General plans include a land use element that designates the proposed general distribution, location, and extent of the land uses for housing, business, industry, open space (including agriculture), natural resources, recreation, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private land uses.

The Merced County Year 2000 General Plan was adopted in 1990, and the Land Use Element was most recently revised in 1998. In the General Plan, all land in the unincorporated areas of Merced County is classified into land use designations for a variety of urban and rural uses. These designations are implemented through various zoning districts, such as Exclusive Agricultural (A-2), Single-Family Residential (R-1), or General Commercial (C-2). These districts are described in the Merced County Zoning Code. This code is intended to: (1) help implement the goals, objectives, and policies of the General Plan; (2) ensure compatibility between land uses; and (3) encourage development that protects and promotes the public health, safety, and general welfare of the unincorporated areas of the county. The Zoning Code describes the uses allowed and development standards for each zoning designation. Zoning districts within this report's area of analysis are shown in Figure 4 and Table 1. Some land uses (such as farming) are allowed by right, while other uses require a special permit. For example, mining/mineral extraction projects are allowed with a Conditional Use Permit in the A-1 and A-2 zones only. In addition to designating zoning, the County also tracks land use within the county area. Land uses in the Merced River corridor are shown in Figure 5 and Table 2.

**Table 1. Zoning Within the Merced River Corridor**

Zoning Type	Acres	% of Total Analysis Area
A-1 General Agricultural	41,987	53
A-2 Exclusive Agricultural	36,573	46
A-R Agricultural Residential	397	<1
C-2 General Commercial	58	<1
R-1 Single-Family Residential	118	<1
R-2 Multi-Family Residential	4	<1
M-1 Light Industrial	5	<1
M-2 Heavy Industrial	22	<1
<b>Total</b>	<b>79,164</b>	<b>100</b>

Source: Merced County Planning and Community Development Department.

**Table 2. Land Use within the Merced River Corridor**

Land Use Type	Acres	% of Total Analysis Area
Urban	1,030	1
Agriculture	24,433	31
Orchard	27,204	34
Grazing	12,688	16
Dairy	4,223	5
Poultry	2,430	3
Sand and Gravel (Aggregate)	1,331	2
Government	2,924	4
Vacant, Unclassified, Utility/Railroad, Misc.	3,399	4
<b>Total</b>	<b>79,662</b>	<b>100</b>

Source: Merced County Tax Assessor's Office.

### 3.2.1 Urban Zoning and Land Use

Three urban areas are situated within the Merced River corridor: Snelling, Cressey and Livingston (Figure 4). Snelling is located adjacent to the Merced River and has an estimated population of 453 for the year 2000, with a current average annual growth rate of 3%. The most recent population data for Cressey are from the 1990 U.S. Census Bureau, which lists the population of the Cressey voting district at 840. Livingston is one of the more populous cities in Merced County, with an estimated population of 10,183 for the year 2000 and a current annual growth rate of 4%.

Snelling, Livingston and Cressey are zoned for urban development along the river, and each has a Specific Urban Development Plan (SUDP). Land within an SUDP may include the following zoning designations: General Commercial (C-2), Light and Heavy Industrial (M-1 and M-2), Single Family Residential (R-1), and Multi-Family Residential (R-2), with some nearby lands zoned Agricultural Residential (A-R) (Merced County 1990). All land within an SUDP is planned for eventual development in a mixture of urban and urban-related uses, and whenever land is added to an SUDP, the decision is made that it will ultimately be converted to an urban use. The purpose of an SUDP is to direct urban development to designated urban centers in order to avoid the urbanization of rural areas (Merced County 1990). Public services, such as water and sewer, are typically available in these areas, making higher density development possible. SUDPs also provide an ultimate growth boundary for each community over the life of the Plan. SUDPs in Merced County are currently being revised.

Urban uses cover much less land area than agricultural uses along the river. Only 1,029 acres (1% of the analysis area) within the Merced River corridor are zoned for urban land use. Urban land uses within the vicinity of the Merced River tend to be located within SUDP areas or Rural Residential Centers (RRC). Urban land uses include residential, commercial, industrial and related institutional uses, and are described below (Merced County 1990). Large-scale restoration actions would not be appropriate on lands zoned for urban or residential uses. These areas have or potentially have intensive development and concentrated populations, factors which limit the effectiveness of restoration activities for ecological function but provide opportunities for public education and river-oriented recreation. Where appropriate, smaller-scale, urban-oriented restoration projects, such as parks and greenways, could be implemented in urban and residential areas.

Land use designations found in urban and residential areas are described below:

- Residential land use designations are applied to areas considered appropriate for the construction of single-family and multi-family dwellings. Single-family dwelling developments are further classified as Very Low and Low Density Residential. These lower density residential areas provide for the majority of unincorporated communities in Merced County and are generally located in regions that may lack public water or sewer systems. The multi-family dwelling developments are further classified as Medium and High Density Residential. These higher density residential units are found in the form of duplexes, triplexes, fourplexes and townhouses, and are predominantly located near the center of a community. Medium Density Residential areas typically have dwellings constructed at a density of up to 15 units per acre, while the buildings within High Density Residential areas may be constructed at a density of up to 33 units per acre.
- Commercial land use classifications are generally applied to areas within an urban district considered appropriate for general retail commercial activities. These areas are usually located near the center of a community to encourage the development of a central business district or core, possibly with other non-residential land uses. The mixture of businesses is important in these central business districts because the activities may complement each other and provide a certain level of convenience to customers. Typical uses that may locate in commercial areas include general retail commercial activities and personal and professional services. Recreational and institutional uses may also be appropriate in this land use designation.
- The Industrial land use designation is generally applied to areas within an urban district that are considered appropriate and necessary for manufacturing and wholesale activities. Industrial areas generally locate along major transportation routes and/or toward the fringes of the city. Typical uses that may locate in these areas are those involved in research, processing, distribution, storage, or the wholesale trade of various materials and products. Additional activities that may be considered appropriate in these areas include transportation facilities, maintenance facilities, and recreational or institutional activities.

### 3.2.2 Agricultural Zoning and Land Use

The majority of land within the analysis area is zoned for General or Exclusive Agricultural, with 41,987 acres (53% of the analysis area) zoned for General Agricultural and 36,573 acres (46% of the analysis area) zoned for Exclusive Agricultural. The General Agricultural zoning designation provides area for open space, agricultural, agricultural/commercial, and/or industrial uses dependent on proximity to urban areas or uses that require location in sparsely populated, low-traffic areas. Parcels with this zoning are 20 to 40 acres or greater in area, but can be reduced to a minimum of 20 acres if approved at a public

hearing and if the parcel reduction does not reduce the agricultural productivity of the property. Lands zoned for General Agricultural tend to rely on good soil quality, good water availability, and minimal slopes. Lands zoned for General Agricultural are located primarily downstream of Shaffer Bridge (Figure 4). The Exclusive Agricultural zoning designation area is primarily used as foothill pastureland and open space and allows for expanded agricultural enterprises since the minimum parcel size required for this zoning is 160 acres. Lands zoned for Exclusive Agricultural are located primarily upstream of Shaffer Bridge (Figure 4).

The crops grown within the Merced River corridor are typical of the types of crops grown throughout Merced County and include field crops such as oats, wheat and sorghum, fruits and nuts such as apricots, cherries, almonds, walnuts, figs, mandarin oranges, navel oranges, and prunes, and vegetables such as corn, lima beans and potatoes. Other agricultural land uses, such as dairies and poultry farms, are distributed throughout the corridor. Descriptions of the major agricultural land uses within the river corridor are provided below:

- Foothill pasture, or grazing, land is predominately located upstream of Shaffer Bridge (Figure 5). Characteristic features of grazing areas include: slopes greater than 4%, elevations greater than 200 feet above sea level, slow-to-very rapid water runoff potential, moderate-to-severe erosion potential, moderate-to-poor water availability, and thin topsoils and/or hardpan subsurfaces (i.e., poor for row crops). Within the Merced River corridor, 12,688 acres are used for pastureland, accounting for nearly 16% of the analysis area. In 1999, cattle was the sixth ranked farming commodity in Merced County, generating \$70,579,000 in revenue (Merced County Department of Agriculture 1999).
- Dairies are located throughout the Merced River corridor (Figure 5). According to the Merced County General Plan, a typical large size dairy consists of approximately 1,600 cows on a 60- to 70-acre site. Facilities include 25 to 30 acres of corrals (including free stall barns for shelter), a 4-acre water treatment lagoon, three acres of feed storage, and a 1/4-acre milk barn. In addition, up to another 1,000 to 1,500 acres of adjacent land may be controlled by the same owner and used to grow alfalfa and corn for feed that is irrigated with nutrient-rich dairy wastewater. Within the Merced River corridor, 4,222 acres are used for dairy production. Milk is the highest valued commodity produced in Merced County, generating \$519,743,000 in 1999 (Merced County Department of Agriculture 1999). Manure, a byproduct of dairy operations, is also an important agricultural commodity, generating \$7,998,000 in Merced County in 1999 (Merced County Department of Agriculture 1999). According to local dairy operations, modern dairy practices and mandated water quality regulations have greatly reduced the impact of dairy operations on the Merced River.
- Poultry ranches are predominately located upstream of Snelling Road, with a few located downstream State Route 99 (Figure 5). According to the General Plan, a typical poultry ranch requires a 70- to 80-acre parcel, including about 45 poultry sheds on 18 to 20 acres containing approximately one million birds. Additional facilities include three homes for employees, drainage detention basins covering two acres, and manure storage areas covering another two acres. Within the Merced River corridor, 2,430 acres are used for poultry production. Poultry is the second highest grossing commodity in Merced County, with a production value of \$165,507,000 in 1999.
- Orchards are located throughout the Merced River corridor, but they are more concentrated between Route 165 and Route 59 (Figure 5). Orchards include various nut and fruit crops such as almonds, walnuts, apricots, cherries, figs, mandarin oranges, navel oranges, and prunes. Within the Merced River corridor, 27,203 acres are used for orchards, accounting for approximately 34% of the total corridor area. A total of 77,461 acres of orchard crops were harvested in 1999 throughout Merced County. In 1999, almonds were by far the largest orchard crop grown in the County and were the

third highest grossing crop, valued at \$120,033,000 (Merced County Department of Agriculture 1999).

### 3.2.3 Mining

Aggregate (sand, gravel, and crushed stone) mining along the Merced River is an economically important industry and provides aggregate resources needed for current and future development in Merced County. Clinkenbeard (1999) identifies aggregate as the primary mineral commodity produced in Merced County. In 1998, approximately 1.7 million tons of construction aggregate, valued at more than \$9 million, were produced in Merced County. Mining activities do not require a separate land use designation within the General Plan; the operations are permitted on land within the General or Exclusive Agricultural zoning districts (L. Martinez, pers. comm., 1999).

The Merced River and its floodplain have been historically mined for both gold and aggregate, and aggregate mining continues on the floodplain today. Large-scale aggregate mining began in the Merced River in the 1940s. Older mines excavated sand and gravel directly from the riverbed, leaving behind deep pits within the channel. More recent mines have been located on floodplains and terraces adjacent to the river. These mines are typically separated from the river by narrow berms. Many of the berms at older mines have been breached, resulting in direct connection of many of these floodplain mines to the river channel.

The California Department of Conservation Division of Mines and Geology (CDMG) recently completed a mineral land classification of Merced County, which evaluates the mineral resource potential of Merced County and describes the location, quantity, and quality of concrete aggregate resources in the county, as well as the projected demand for construction aggregate within the county for the next 50 years (Clinkenbeard 1999). California's Surface Mining and Reclamation Act (SMARA) requires the State Geologist to prepare mineral resource reports indicating the mineral deposits of statewide and regional significance for all counties. According to the CDMG, lands containing significant mineral deposits are identified solely on geologic factors and without consideration to present land use or ownership. The goal of mineral land classification is to recognize the mineral resource potential of lands and consider that potential in land use planning.

The CDMG has designated the majority of the valley floor from Merced Falls to Cressey as an Aggregate Resource Area and estimates that 1.18 billion tons of concrete aggregate resources are contained within the 38 square miles of Merced County that are classified for concrete aggregate production. From Snelling Road to Oakdale Road, the valley floor is classified as MRZ-2a, meaning areas underlain by mineral deposits where geologic data indicate that significant measured or indicated resources are present (Figure 6). A notable exception, the dredger tailings in the Snelling vicinity are not included in the Resource Area. The dredger tailings are classified as MRZ-3a, or areas containing known mineral occurrences of undetermined mineral resource significance. Several mines, however, are operating in the tailings, and the tailings potentially provide a valuable aggregate resource, though the lack of sand in those deposits may limit their end-use. The Upper Merced River Property Owners' Group, which represents several landowners in the Merced Falls area, is currently investigating the feasibility of increasing the level of aggregate mining in dredger tailings on their properties.

Currently, mining along and near the Merced River provides a majority of the County's aggregate resources (D. Johnston, pers. comm., 1999). Within the Merced River corridor, 1,331 acres, all of which are located upstream of Shaffer Bridge (Figure 5), are used for sand and gravel production. The operating mines include the following (permit numbers are in parentheses): Bettencourt Ranch (Santa Fe Aggregates, CUP 97018); La Grange (CUP 3075); Blasingame (CUP 2870); Merced River Mining and

Reclamation Company (CUP 3668); Doolittle Mine (Sante Fe Aggregates, CUP 99021); and Woolstenhulme Ranch (Calaveras Material, CUP 99012). The mines that have completed excavation and are in the final reclamation phase include: Silva (LEP 586), Carson (CUP 3554), and Triple C (LEP 529). The Robinson South (LEP 307) and Robinson North (LEP 597) mines captured the river channel in the January 1997 high flows. The landowner is currently working with the California Department of Water Resources (CDWR) and CDFG to complete an extensive restoration project in the reach affected by these mines. In addition to currently operating mines, a permit application has been submitted to the County for another mine in the corridor—Grossman Mine (CUA 00020).

The CDMG predicts that demand for concrete grade aggregate will continue to increase with the population growth projected for Merced County and the construction of the University of California–Merced (UC–Merced) campus. Based upon the projected 50-year aggregate demand, the aggregate sources in eastern Merced County (including the Merced River), before the addition of the Calaveras Materials Woolstenhume Ranch permit, are predicted to be depleted in 3 to 4 years unless new resources are permitted for mining or there is an increase in import of aggregate into the area (Clinkenbeard 1999). Clinkenbeard (1999), however, was unable to quantify the potential impact of UC–Merced. This demand will place strong pressure to increase mining in the Merced River corridor.

### 3.2.4 Parks and Recreation

At this time, recreational opportunities along the river are very limited. Most parks and recreation areas in the corridor are located within the agricultural and grazing land uses. Five parks and public access points are located along the river from Crocker-Huffman Dam downstream to the confluence with the San Joaquin River (Figure 7). From upstream to downstream, state and local parks that provide access to the river include the Cuneo Fishing Access, Henderson Park, McConnell State Recreation Area, Hagaman Park, and George Hatfield State Recreation Area. The Cuneo Fishing Access, which is owned and operated by Merced ID, is located approximately 1.5 miles downstream of Crocker-Huffman Dam and provides river access for fishing. Henderson Park is a 74-acre county regional park located approximately one mile east of Snelling; it provides river access for fishing, ball fields and play equipment, and picnicking facilities. McConnell State Recreation Area, located two miles north of Livingston, provides 75 acres of parkland for camping and picnicking. Hagaman Park is a county park located just upstream of the Route 165 bridge and provides playgrounds, river access, and facilities for picnicking. George Hatfield State Recreation Area is a 46-acre park located near the confluence with the San Joaquin River. This park provides camping, fishing, and boating opportunities and is the only park on the river that includes public education signage. Provisions for river access and recreation may become increasingly important with the projected increase in population of Merced County, following the completion of the UC–Merced campus. It is not within the scope of the Restoration Plan to develop a public recreation and river access plan. The Restoration Plan, however, will recognize current and potential future recreational uses in the river corridor and will seek to avoid conflicts between restoration and recreation.

The Merced County Parks and Recreation Division is currently planning to develop a brochure providing information on public recreational opportunities and public access available on the Merced River from McSwain Dam to the confluence with the San Joaquin River. This brochure will be researched and developed with the public stakeholders along the Merced River. Information in the brochure will include: the history of the Merced River; a review of riparian habitat restoration; plants and wildlife found along the river; fishing regulations; public parks and recreation areas (including California State Parks, Merced County Parks, commercially operated recreation areas, and Merced ID-owned areas); boating and water safety; and appropriate and lawful public access to the river.

### 3.2.5 Future Land Uses

#### *UNIVERSITY OF CALIFORNIA–MERCED*

An SUDP area has been designated for the development of the UC–Merced campus. The proposed campus site is located approximately eight miles from the Merced River. This land use designation recognizes the need for specific urban land use planning around the University site in the future (Merced County 1996). In October 1996, the Merced County Board of Supervisors amended the County General Plan to acknowledge the site for the future campus and to identify an SUDP boundary for the University Community as the planning area for development adjacent to the campus. The lands within this boundary are designated "University Community Urban Reserve." In April 1997, the City of Merced completed a comprehensive update of its General Plan. Through this update, the City included the University Community SUDP within its Sphere of Influence and agreed to cooperate with Merced County in planning the University Community. In February 1998, the Merced County Board of Supervisors approved a Guidance Package for University Community Planning that clarified the relationships and roles of the various participants and outlined the subsequent planning steps. The first step in the process was a Concept Planning phase to provide an overall vision and framework for development of the University Community. The University Community Concept Planning process was initiated in April 1998 and the report was published in May 1999. The Concept Planning Report forms the basis for two subsequent planning documents: (1) The University Community Plan, which is being produced by the County of Merced as an amendment to the County General Plan and will be approved by the Merced County Board of Supervisors, and (2) The UC–Merced Long Range Development Plan, which is being prepared by the University of California and will be approved by the UC Board of Regents. Under Governor Davis' directive, the UC–Merced Campus is presently scheduled to open in 2004. The main campus will cover approximately 2,000 acres.

UC–Merced will not be located within the Merced River corridor; however, construction of the university will likely require large amounts of aggregate that would presumably come from nearby mines, including mines along the Merced River. In addition, the opening and operation of the university and associated residential and commercial development will increase the demand for water within Merced County, potentially requiring transfer of water from agriculture to urban use. The water usage for the UC–Merced campus and community is not expected to be significant based on preliminary estimates (B. Badgly, pers. comm., 2001).

#### *CASTLE AIRPORT AVIATION AND DEVELOPMENT CENTER*

The General Plan specifies an SUDP area for the redevelopment of Castle Air Force Base, which closed in 1995. Castle Air Force Base is contiguous with the northeasterly limits of the City of Atwater, approximately 5.2 miles from the Merced River. A Reuse Plan has been developed and adopted to oversee and facilitate economic reuse of the former military installation. This redevelopment will lead to a mixed-use area. The reuse of the military property is not anticipated to substantially increase demand for aggregate from the river, due to the use of existing buildings and infrastructure. Presently, reuse of the property has not occurred on the scale projected under the Reuse Plan.

### 3.3 Water Resource Development

Water resource demands and flood control issues on the Merced River will largely determine the extent and types of restoration implemented in the corridor. The Merced River is heavily allocated for agricultural water use. The Merced ID holds pre-1914 appropriative water rights to divert flow from the river. In addition, riparian water users divert flows through seven diversion channels between Crocker-Huffman Dam and Shaffer Bridge and numerous riparian pumps throughout the river. Minimum instream flow requirements in the river are defined under Merced ID's current licenses and agreements and are intended to provide adequate flows for chinook salmon and for the Merced River Riparian Water Users Association diversions. In addition, under current U.S. Army Corps of Engineers flood control operations rules, the maximum allowable release to the Merced River from New Exchequer Dam is 6,000 cfs. Restoration projects contained within the plan must, therefore, be designed to function within the current minimum flow requirements and this 6,000 cfs flood control limitation. Project planners, however, should recognize that larger floods can occur (as experienced in 1997). Design flexibility should therefore be incorporated to include consideration of these larger flow events.

#### 3.3.1 Water Supply and Demand

Within the Merced ID boundaries, the average annual water demand for agricultural uses, urban uses, instream flows, and environmental uses totals approximately 560,000 acre-feet. This includes approximately 430,000 acre-feet for applied agricultural uses, 40,000 acre-feet for urban uses, and approximately 90,000 acre-feet for instream flows and environmental uses. An additional 460,000 acre-feet of pumped groundwater is used annually outside of Merced ID, bringing total water demand to over 1 million acre-feet annually. The Merced Water Supply Plan (which is currently being revised) projects water demands for 2030, based on a growing population, the operation of UC–Merced, the potential for increased fish flows, and additional water for refuges (T. Selb, pers. comm., 1999). By 2030, the combined demands for surface and groundwater for all uses in the study area are anticipated to increase to between 1,180,000 and 1,284,000 acre-feet annually depending on potential instream flow requirements (CH2M Hill 1995).

The Merced Water Supply Plan (CH2M Hill 1995) recognizes several trends that influence the projected demand (the data supporting these trends are currently being revised in the Update of the Merced Water Supply Plan):

- Applied agriculture water demands within Merced ID are projected to decrease, while agricultural demands outside Merced ID (largely groundwater supplied) are anticipated to remain stable.
- Urban water uses are estimated to increase nearly three-fold. The projected increase takes into account the additional water demand associated with the new University of California campus.
- Instream flows needed for fisheries on the Merced River and downstream could increase to more than 269,000 acre-feet depending on the final outcome of deliberations between Merced ID and state and federal resource agency representatives. (An example of a Merced ID instream flow commitment implemented after the 1995 Merced Water Supply Plan is in association with the Vernalis Adaptive Management Plan [VAMP], a Delta biological experiment focused on salmonids.) In December 1999, the State Water Resources Control Board (SWRCB) issued Water Right Decision 1641. Included in that decision is a provision for Merced ID to release up to 55,000 acre-feet, in addition to its existing instream fishery releases, for a period of 12 years in association with the VAMP. This provision provides for a reduction of this obligation in sequential dry-year periods.
- Environmental uses of water are increasing. Merced ID's current obligation is to provide up to 15,000 acre-feet to the Merced National Wildlife Refuge. Merced ID may desire to increase water sales as requested by state or federal fish and wildlife agencies.

### 3.3.2 Water Rights

California law establishes two kinds of water rights: riparian and appropriative. Riparian rights usually come with owning a parcel of land that is adjacent to a source of water and entitle the owner to use a share of the water flowing past the property. Appropriative water rights allow for the use or diversion of water from surface streams, other surface bodies of water, or from subterranean streams. Prior to 1872, appropriative rights could be acquired by simply taking and using water. In 1872, provisions were made for establishing a priority of right by posting a notice of appropriation at the proposed point of diversion and recording a copy of the notice with the respective County Recorder (sections 1410 through 1422 of the California Civil Code). Once acquired, an appropriative right can be maintained only by continuous use of water. Regardless of the amount claimed in the original notice of appropriation at the time diversion and use first began, the amount that can now be rightfully claimed under an appropriative right initiated prior to the enactment of the Water Commission Act of 1914 has, in general, become fixed by actual beneficial use as to both amount and season of diversion (SWRCB 1990).

The Water Commission Act of 1914 created the agency that later evolved into the SWRCB and granted it the authority to administer permits and licenses for California's surface water. The act was the predecessor to today's Water Code provisions governing water appropriation. Post-1914 appropriative rights rely on a hierarchy of priorities; in times of shortage the most recent (junior) right holder is the first to discontinue water use. The priority of each right is based on the time the permit application was filed with the State Board. Although pre- and post-1914 appropriative rights are similar, the State Board does not regulate the pre-1914 rights as closely (SWRCB 1999).

### 3.3.3 The Merced Irrigation District System

Merced ID holds the largest water right on the Merced River. The district's rights include pre-1914 and post-1914 appropriative water rights. The pre-1914 rights are summarized below:

- The Exchequer Mining Right permits Merced ID to divert up to 6,000 cubic feet per second (cfs) from the river when available as inflow.
- The Crocker Huffman Land and Cattle Company right is for direct diversion of 2,125 cfs and 300,000 acre-feet of storage each year from the Merced River.

The post-1914 water rights have been perfected in most cases as an insurance policy to the pre-1914 water rights. These post-1914 water rights for consumptive uses are summarized below:

- License #2685 permits direct diversion from the Merced River of up to a maximum of 1,500 cfs, and storage of 266,400 acre-feet.
- License #6047 permits direct diversion from the Merced River of up to a maximum of 257 cfs.
- License #11395 permits diversions to storage of 605,000 acre-feet and withdrawal from storage not to exceed 516,000 acre-feet (acre-feet) per year.

In addition, Merced ID holds post-1914 companion water rights that cover the storage and direct diversion of water for power use.

Merced ID supplies water to approximately 2,000 full-time agricultural customers and 300 smaller water users or "garden heads." In addition, 700 stand-by accounts do not currently receive water from Merced ID (T. Selb, pers. comm., 1999). The water supplied for agricultural and urban uses near the Merced River comes from surface water diversions and groundwater pumping. Merced ID diversions average

approximately 522,000 acre-feet annually. In addition, Merced ID currently owns and operates 230 deep wells, which it uses to satisfy water demand that is not met by the surface water supply. In 1976, Merced ID, which then operated 239 wells, experienced the highest groundwater demand in its history and pumped 182,900 acre-feet (T. Selb, pers. comm., 2000). In recent years, normal groundwater pumping has been reduced by Merced ID to approximately 10,000 acre-feet per year. Merced ID also provides water to the Stevinson Water District through an adjudicated settlement. However, this water is diverted into the Main Canal and delivered at the west side of the District, rather than flowing in the river channel.

Merced ID's infrastructure includes the New Exchequer Dam, McSwain Dam, Crocker Huffman Dam, and the Northside and Main canals (Figure 1). Merced Falls Dam, located downstream of McSwain Dam, is owned by Pacific Gas and Electric Company. The New Exchequer Dam is the largest dam on the river. It was originally constructed in 1926 and was enlarged to a capacity of 1.024 million acre-feet in 1967. This is the main storage reservoir in the Merced ID system. Downstream, McSwain Dam serves as the New Exchequer Dam's afterbay and re-regulates releases from New Exchequer Dam. Like the New Exchequer Dam, power is generated at this dam (although a much smaller amount) and water is released from the bottom of the pool. Merced Falls Dam and Crocker-Huffman Dam are the locations of the Merced ID diversions. Merced Falls Dam diverts flow into the Northside Canal, which has a capacity of 90 cfs and provides irrigation water for approximately 10,000 acres (T. Selb, pers. comm., 1999). Power is also generated at Merced Falls Dam. A fish ladder is present at this dam. Crocker-Huffman Dam diverts flow into the Main Canal diversion, which is 20 miles long and has a capacity of 2,100 cfs. No hydroelectric power is generated at this dam. Although a fish ladder is present, it has been blocked off by CDFG, and there is no fish passage over this dam. The Main Canal is a designated floodway of the California Reclamation Board, thus its capacity must be maintained for local runoff events during the rainfall season.

In addition to these dams and diversions, Merced ID operates three operational spills that discharge to the Merced River: the Northside Canal, the Livingston Canal, and the Garibaldi Lateral. The Northside Canal Spill discharges approximately five river miles upstream of Cressey, the Livingston Canal Spill discharges approximately one river mile upstream of State Route 99, and the Garibaldi Lateral Spill discharges approximately three miles downstream of State Route 99.

Minimum instream flow requirements in the river are defined under Merced ID's current licenses and agreements and are intended to provide adequate flows for chinook salmon and for the Merced River Riparian Water Users Association diversions. The required minimum flows vary, depending on month and the inflow to the reservoir. Merced ID provides flows consistent with the requirements of the Federal Energy Regulatory Commission (FERC), the Davis-Grunsky contract<sup>4</sup> with the State of California, and riparian water user rights. Releases from the New Exchequer Dam are summarized in Table 3.

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<sup>4</sup> The Davis-Grunsky Act is legislation that provides financial assistance to public agencies for water development, recreation, and fish and wildlife enhancement.

**Table 3. Required Monthly Releases from the New Exchequer Dam (cfs)**

Month	FERC (D) <sup>1</sup>	Davis-Grunsky <sup>2</sup>	Cowell Agreement Flows <sup>2,3</sup>	Approximate Range
January	75 (60)	180-220	50	230-270
February	75 (60)	180-220	50	230-270
March	75 (60)	180-220	100	280-320
April	75 (60)	---	175	235-250
May	75 (60)	---	225	285-300
June	25 (15)	---	250	265-275
July	25 (15)	---	225	240-250
August	25 (15)	---	175	190-200
September	25 (15)	---	150	165-175
October 1-15	25 (15)	---	50	65-75
October 16-31	75 (60)	---	50	110-125
November	100 (75)	180-220	50	230-270
December	100 (75)	180-220	50	230-270

<sup>1</sup> Flows are during normal years. During dry years the flows provided are the values in parentheses. The Davis-Grunsky Contract requires minimum flows of 180 to 220 cfs for November 1 to March 31, measured at Shaffer Bridge.

<sup>2</sup> Measured at Crocker-Huffman Dam. 50 cfs shall be maintained only when that amount is available from the natural flow of the river (inflow to reservoir).

<sup>3</sup> Flow of 250 cfs for the month of June until the natural flow of the river falls below 1,200 cfs, at which time flows are reduced to: 225 cfs for next 31 days, 175 cfs for next 31 days, and 150 cfs for next 30 days.

Source: Ted Selb, pers. comm., 1999.

### 3.3.4 Riparian/Adjudicated Water Use

Riparian water rights usually come with owning a parcel of land that is adjacent to a source of water, and entitle the owner to use a share of the water flowing past his or her property. No permits, licenses, or government approval are required for this use, but the rights apply only to the water that would naturally flow in the stream. Return flows derived from groundwater use and water seasonally stored and later released are not included. Riparian rights do not entitle a water user to divert water to a storage reservoir for use in the dry season or to use water on land outside of the watershed. Riparian rights are tied to parcels, not owners, and cannot be transferred for use on another parcel of land but remain with the property when it changes hands. Furthermore, parcels severed from the adjacent water source generally lose their right to the water (for example, if the riparian strip is sold).

Between Crocker-Huffman Dam and Shaffer Bridge, Cowell Agreement and riparian water users divert up to approximately 94,000 acre-feet annually and have maintained seven main channel diversions since the 1840s-50s (Figure 8). These diversions are small wing dams consisting of rock and gravel. High winter river flows can carry this rock and gravel downstream, improving spawning areas. In addition to these diversions, CDFG has identified a large number of diversions, primarily pumps, in the 52 river miles between the Crocker-Huffman Dam and the San Joaquin confluence. During field surveys, CDFG recorded 244 diversions, which are predominantly used to supply water for agricultural use (206 diversions).

## 3.4 Flood Control

Flood control operation of New Exchequer Dam and Reservoir (Lake McClure) by Merced ID is regulated by the U. S. Army Corps of Engineers (USACE) and defined in a document entitled: “New Exchequer Dam and Reservoir, Merced River, California – WATER CONTROL MANUAL”, dated October, 1981, and amended in June, 2000 (USACE 2000). The Water Control Manual is Appendix VII to the Master Water Control Manual for the San Joaquin River Basin, California. Section 7-05, entitled: “Flood Control”, states, in part:

“...Generally, water stored within the rain flood space (a maximum of 350,000 acre-feet) will be released as rapidly as possible without exceeding 6,000 cubic feet per second (cfs) in the Merced River at Stevinson (confluence with the San Joaquin River). During the snowmelt season, when inflow is predictable, flood releases will be made so as to minimize damages. A maximum of 400,000 acre feet of space is dedicated to flood control during the snowmelt season, and when any part of this space is not required for flood control, it may be used for other purposes.”

The rain flood space period is between November 1 and March 15. By November 1, Lake McClure storage must be reduced to 675,000 acre-feet by Merced ID. Depending on forecasted snowmelt runoff, Merced ID may begin storing water above 675,000 acre-feet as early as March 15. The maximum release of 6,000 cfs, as measured at Stevinson, includes releases from the New Exchequer Dam, local runoff, and inflow from Dry Creek. There could be some flooding or minimal property damage associated with this flow. During extreme runoff in January 1997, the USACE concurred with Merced ID’s emergency deviation from established operation rules in its decision to increase release from 6,000 cfs to 8,000 cfs. During this release, flow in the Merced River peaked at 8,080 cfs (measured at Snelling). In the upstream reaches of the analysis area, the channel accommodated this flow, although the Route 59 bridge had to be closed due to the danger of bridge failure from an undermined spread footing. In the lower reaches of the river, however, private levees were breached at several locations and agricultural and dairy lands were flooded (Figure 9). It has been pointed out at Stakeholder Group

meetings that the City of Livingston's sewage treatment plant is vulnerable to flooding when flows exceed 6,000 cfs (G. Davis, pers. comm., 1999).

### **3.5 Bridges and Other Infrastructure**

In addition to the dams and diversion described in previous sections, infrastructure along the Merced River includes roadways, bridges, levees, sewage and wastewater treatment plants, and buildings associated with urban, commercial, or agricultural uses. This section provides an overview of the existing infrastructure near the Merced River, between the Crocker-Huffman Dam and the confluence with the San Joaquin River.

#### ***LEVEES***

No state or federal levee system has been constructed on the Merced River and existing levees are limited to privately owned structures. The levee system is, however, extensive, especially downstream of the State Route 99 bridge (RM 20.5). Private landowners have constructed and maintain these levees, which protect their agricultural lands, operations, and structures (including homes) from flooding. Levees are mapped and discussed in volume II of this report (Stillwater Sciences 2001). These levees confine river and floodplain width and isolate the river from portions of its former floodplain. They do, however, provide necessary flood protection to numerous landowners and businesses. Opportunities for modifying levee alignment to reduce channel confinement may be available but would need to be carefully coordinated with landowners and regulatory agencies.

#### ***DISCHARGE POINTS***

Turlock Irrigation District operates two spills that discharge into the Merced River: the High Line Spill and the Lower Stevinson Spill. The High Line Spill near Griffith Road discharges excess irrigation water diverted from the Tuolumne River and storm flows from the Mustang Creek watershed that are intercepted by the spill canal. The Lower Stevinson Spill discharges west of the Town of Hilmar and carries excess irrigation water diverted from the Tuolumne River and shallow ground water that has been pumped from the nearby region.

Currently, no permitted discharge points occur in the Merced River. The City of Livingston operates sewage treatment ponds on land adjacent to the river. Following the filling of its disposal ponds by floods in 1996, the City discharged (unpermitted) approximately 1,000,000 gallons/day to maintain levee integrity until it completed two new ponds on adjacent property in July 1999. Currently there are no unpermitted discharges by the City into the river (G. Petty, pers. comm., 2000).

#### ***BRIDGES***

Several highways and roads cross the Merced River between the Crocker-Huffman Dam and the confluence with the San Joaquin River. From upstream to downstream the bridges include: Snelling Road, State Route 59, Shaffer Bridge (at Oakdale Road), Santa Fe Drive, Burlington Northern Railroad, Southern Pacific Railroad, State Route 99, State Route 165, and River Road (Table 4). There are also several small, private bridges that cross the river. State highway bridges are maintained by Caltrans. Other roadway bridges are maintained by the County; railroad companies maintain their own bridges.

**Table 4. Merced River Bridge Information**

Bridge	Type	Owner	Repair/Reconstruction Plans
Snelling Road	auto	Merced County	reconstruction in planning
State Route 59	auto	Caltrans	reconstruction in planning
Shaffer Bridge (Oakdale Road)	auto	Merced County	reconstruction in planning
Santa Fe Drive	auto	Merced County	
Burlington Northern Railroad	railroad	Burlington Northern	
Southern Pacific Railroad	railroad	Southern Pacific	
State Route 99	auto	Caltrans	reconstructed in 2000
State Route 165	auto	Caltrans	reconstructed 1979
River Road	auto	Merced County	reconstructed 1982

The State Route 99 bridge crossing the Merced River was recently reconstructed. The planned bridge design primarily considered the existing flows and anticipated maximum flow (6,000 cfs) of the river at that location (G. Erickson, pers. comm., 1999). The State Route 59 bridge is planned to receive improvements within the next several years. Caltrans planners have considered both the maximum and future flows resulting from channel and riparian work by CDFG in the design of the bridge. Changes to the maximum flows or the surface elevation of the river could compromise the integrity of a bridge (G. Erickson, pers. comm., 1999).

Caltrans requires access to the bridges for maintenance work, which may include bridge footings. Because bridge maintenance activities may affect downstream areas, the areas immediately downstream of bridges should be avoided as areas for placement of spawning gravel. In addition, instream mining activities within one mile of a bridge are prohibited. Caltrans requires an encroachment permit for work within the right-of-way of a State maintained bridge.

Currently, the County is planning to build a new bridge just east of Oakdale Road (Shaffer Bridge). The current bridge at Oakdale Road would not be removed. Generally, the County defers to Caltrans for bridge construction and maintenance standards. County bridges are inspected biannually by Caltrans for structural integrity. The County requires an encroachment permit for work within the right-of-way of a County maintained bridge (K. Price, pers. comm., 1999).

## **4 Ongoing Restoration Projects on the Merced River**

### **4.1 Merced River Salmon Habitat Enhancement Project**

The CDFG is working with the CDWR and local property owners on a large-scale channel and floodplain restoration effort in the vicinity of the State Route 59 bridge (Figure 10). This project, which is called “The Merced River Salmon Habitat Enhancement Project” will reconstruct the river channel and floodplain through 4.3 miles of the Merced River that have been excavated for aggregate mining. The objectives of the project are to: (1) reduce predation on young salmon by non-native fish by isolating habitat in river-captured mining pits that serve as predator habitat, (2) restore or enhance salmon spawning habitat, (3) enhance passage of adult and juvenile salmon, (4) resize the channel and floodplain to restore some natural river processes, and (5) reestablish riparian vegetation. Phase I of this project, the Ratzlaff Reach, was constructed in 1999 by the CDFG and the CDWR, with funding from the Four Pumps Agreement, Proposition 70, CALFED, and the Anadromous Fish Restoration Program. Riparian vegetation was planted in 2000/2001. The next phase, the Robinson Reach, is currently being designed, with construction planned for the summers of 2001 and 2002. This project is being designed and implemented in cooperation with the Robinson Cattle Company.

### **4.2 Other California Department of Fish and Game and Department of Water Resources Habitat Restoration Projects**

The CDFG is leading several habitat restoration efforts in the Merced River that have already been completed or are occurring concurrently with the development of this restoration plan (Figure 10). Completed and ongoing projects include: (1) riffle reconstruction in the upper spawning reach, (2) providing spawnable gravel for construction of temporary local diversion dams, (3) acquisition of a floodplain parcel for future restoration, and (4) predator isolation.

In 1990, CDFG, working with the CDWR and with funding from the Four Pumps Agreement, reconstructed Riffle 1A, a spawning riffle at the Merced River Hatchery, and added gravel to a depleted riffle two miles downstream. Gravel was added to this site in 1996, 1997, and 1998. In 1998 and 1999, the CDFG worked with local riparian water users and Cowell Agreement diverters to introduce spawning gravel at several other locations in the river. These diverters construct temporary wing dams in the Merced River channel to divert flow during the irrigation season. These dams are typically constructed of gravel scraped from the channel bed. The CDFG, funded through Proposition 70, provided spawnable gravel to construct the dams so that when the dams wash out during high flows the gravel remaining at the site or transported downstream can be used by salmon for spawning.

In 1998, the CDFG obtained funding from CALFED to purchase the Merced River Ranch. This 318-acre parcel is located on the south bank of the river, approximately one mile downstream from Crocker-Huffman Dam. The site has been dredged for gold, and dredger tailings cover most of the property. The CDFG plans to use the site as a source of material (sand, gravel, and cobble) for future restoration projects and as a floodplain restoration site.

In 1996, the CDFG, working with the CDWR and with funding from the Four Pumps Agreement, completed the Magnuson Predator Isolation and Revegetation Project. This project rebuilt a failed berm around a gravel mining pit to protect young salmon in the river from non-native predatory fishes in the pond.

### **4.3 James J. Stevinson Corporation Easement**

The James J. Stevinson Corporation, which is owned and operated by the Kelley family, is in the process of placing conservation easements on nearly 9,000 acres of its landholdings at the confluence of the Merced and San Joaquin rivers in Merced and Stanislaus counties. The conservation easements are legal agreements in which the landowner is paid to preserve certain resources for a specified time. Easements exclude certain activities on the land, such as commercial development or residential subdivisions, to conserve the natural and agricultural resources of the land. The Stevinson Corporation landholdings proposed for conservation easements include approximately five miles of riparian habitat along the Merced River near its confluence with the San Joaquin River. By placing the land under easements, the Stevinson Corporation will retain rights to riparian and delivered water, create opportunities for habitat enhancement, and be eligible for tax benefits (Riviere 2000).

## **5 MULTI-STAKEHOLDER AGREEMENTS**

Cooperative management of large river ecosystems has been emerging in California as a part of ecological restoration programs. Multi-stakeholder cooperative management agreements present an opportunity to facilitate restoration planning and activities. Several stakeholder agreements, which are described below, are in place that affect the Merced River.

### **5.1 California Department of Fish and Game and Merced Irrigation District 10-Year Biological Study**

During the past six years, representatives of Merced ID and the CDFG (collectively, the "parties") have regularly consulted on potential actions to benefit fishery resources (primarily chinook salmon) in the Merced River. These consultations have focused on: (1) providing appropriate instream flows for salmon upstream migration, spawning, and egg incubation during the fall, (2) providing interim instream flow improvements for juvenile outmigration, and (3) completing studies on all freshwater life phases for salmon, including improved water temperature management for aquatic resources in the lower Merced River.

The parties have agreed, pending execution of a Memorandum of Understanding between the two agencies, upon an increase in flows during October to improve the timing and magnitude of instream flows to benefit chinook salmon upstream migration and spawning. The parties have also agreed, dependent on various factors, upon additional increases in instream flows, above the new minimum flows, during October on an interim and experimental basis to determine potential benefits for salmon. It is expected these increased instream flows will benefit salmon in the lower Merced River by providing improved habitats for the earliest migrating and spawning salmon.

The parties have also agreed on interim increased flows during a 30-day period in April and May, in association with the Vernalis Adaptive Management Plan, described below. This action is expected to benefit the downstream migration of juvenile salmon from the Merced River through improved habitat conditions and increased survival.

The MID and CDFG jointly developed and agreed upon a formal 10-year study program to determine the potential factors that may limit salmon production in the Merced River. This program is designed to evaluate the habitats necessary for increased salmon production by assessing the needs for each freshwater salmon life stage (i.e., upstream migration, spawning, egg incubation, fry and juvenile rearing, and outmigration). The joint study program defines the objectives, the basic experimental design, and the responsibilities for study implementation. The studies and instream flow scheduling will be coordinated with other studies throughout the San Joaquin basin and the Delta. Components of this program are presently underway. The completion of the 10-year program is intended to identify the long-term instream flow and other needs of salmon in the Merced River. To facilitate the studies, the parties have established the Merced Management and Technical Advisory Committees; the latter committee establishes and coordinates study protocols, study amendments, funding issues, and information sharing and exchange.

### **5.2 San Joaquin River Agreement**

The San Joaquin River Agreement (SJRA) is a 12-year agreement among major water-right holders within the San Joaquin River Basin to implement a long-term experimental restoration plan. Under the agreement, the U.S. Department of Interior will acquire water from certain San Joaquin River Group

Authority (SJRGAs) members for use as a pulse flow at Vernalis during April and May. The SJRGAs members that will be providing water are Modesto Irrigation District (MID), Turlock Irrigation District (TID), Merced ID, South San Joaquin Irrigation District (SSJID), Oakdale Irrigation District (OID), and the San Joaquin River Exchange Contractors Water Authority (Exchange Contractors). The water provided by the SJRGAs will be provided by several potential means, including the increase of flows from tributary reservoirs, bypass of diversions, indirect substitution of groundwater, reduction of applied surface water, and increased system efficiency.

The basis for the SJRA is the Vernalis Adaptive Management Plan (VAMP), which is an experiment designed to assess the effects of San Joaquin River flow and Delta exports on the survival and passage of salmon smolts through the lower San Joaquin River and the Delta. The VAMP is comprised of an established set of flows and export pumping limits which, depending upon the water year type, is implemented each year. As part of the agreement, the CDWR will install and operate the Head of Old River Barrier as necessary to provide additional information about the migratory habits of salmon and to determine if increased smolt survival can be achieved by limiting their access to various Delta waterways.

## **6 REGULATORY FRAMEWORK**

The development and implementation of a restoration plan for the Merced River Corridor will require compliance with laws and regulations guiding land use and zoning and property and water rights, as described above. The process of applying for and adhering to the permits required to implement a restoration plan can present a constraint to the planning process. Depending on the size and scope of the project, the permitting process can be lengthy. Funding and schedules for restoration projects should include sufficient funding and time to obtain necessary permits. In addition, projects should be designed to be consistent with these regulations to facilitate timely issuance of required permits. State and Federal laws that could affect restoration implementation are described below.

### **6.1 Federal**

#### ***CLEAN WATER ACT***

Section 404 of the federal Clean Water Act (CWA) requires a permit to be obtained prior to any activity that involves discharge of dredged or fill material into “Waters of the United States,” including wetlands. Waters of the United States include navigable waters, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Pursuant to Section 404 of the CWA, the USACE regulates and issues permits for such activities. Any activity that adds material to or disturbs the bed of a water body or wetland usually requires a permit, even if the area is dry at the time the activity takes place. Many restoration actions that may be included in the plan may be covered under the USACE Nationwide Permit No. 27, Stream and Wetland Restoration Activities.

CWA Section 401 permits from the Regional Water Quality Control Board (RWQCB) are required for pollutant discharges (including sediment) to water bodies. This state permit is intended to protect and minimize impacts to the quality of the surface waters of the State. Anyone proposing to conduct activities resulting in a discharge to surface waters is required to obtain a RWQCB Certification or Waiver. Surface waters of the State include wetlands, riparian zones, streambeds, and lakes. Restoration projects that could cause discharges to the river (including discharge of sediment associated with project construction) would require 401 certification or waiver.

Under Section 303(d) of the CWA, the U.S. Environmental Protection Agency (EPA) can list a water body as impaired by non-point source pollution for wildlife and human uses. Once a water body is listed as impaired, the EPA, through the RWQCB, is responsible for developing a management plan to attain water quality standards and restore beneficial uses for the water body. The management plan is typically referred to as a Total Maximum Daily Load (TMDL), and it sets maximum limits on particular impacts, such as conventional pollutants or changes to temperature or sediment regimes. Once implemented, any action that could potentially contribute to the TMDL is eligible for review and potential re-design to make it compliant with the TMDL. The Merced River is listed as impaired for chlorpyrifos, diazinon, and Group A pesticides (CVRWQCB 1998). The TMDL is scheduled to be developed by 2005.

#### ***FEDERAL ENDANGERED SPECIES ACT***

Under the federal Endangered Species Act (ESA), the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) have authority over projects that may affect the continued existence of a federally listed species or may adversely affect their designated critical habitat. If project activities may affect a federally listed species, a take permit under Section 10(a) or a federal consultation

under Section 7 of the federal ESA is required. Under the federal ESA, the definition of take includes to kill, harm, or harass a protected species. The USFWS has interpreted the definition of harm to include significant habitat modification. For species listed as threatened, the USFWS and NMFS address take prohibitions differently. The USFWS automatically applies Section 9 take prohibitions to threatened species, giving threatened species the same level of protection as endangered species. NMFS does not automatically apply the Section 9 take prohibitions to threatened species. Rather, NMFS specifies take prohibitions in Section 4(d) rules. Several species protected under the Federal ESA potentially occur in the Merced River corridor. These species include (but are not limited to) valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), steelhead trout (*Oncorhynchus mykiss*), Sacramento splittail (*Pogonichthys macrolepidotus*), California red-legged frog (*Rana aurora draytonii*), giant garter snake (*Thamnophis gigas*), blunt-nosed leopard lizard (*Gambelia silus*), Aleutian Canada goose (*Branta canadensis leucopareia*), bald eagle (*Haliaeetus leucocephalus*), riparian woodrat (*Neotoma fuscipes riparia*) and San Joaquin kit fox (*Vulpes macrotis mutica*). In addition, the Merced River and its adjacent riparian habitat are included as designated critical habitat for Central Valley steelhead (*Oncorhynchus mykiss*). Restoration projects in the corridor would be required to identify the occurrence of listed and proposed species and their habitat at the project sites and to comply with the requirements of the ESA.

#### ***MIGRATORY BIRD TREATY ACT***

The federal Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess, or attempt to do the same, any migratory bird, or part, nest, or egg of such bird listed in wildlife protection treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former USSR. The current list of species covered by the MBTA can be found in Title 50, Code of Federal Regulations §10.13.

#### ***NATIONAL HISTORIC PRESERVATION ACT***

Under Section 106 of the National Historic Preservation Act, a federal agency sponsoring a proposed project or activity is required to have the project reviewed by the Advisory Council on Historic Preservation (ACHP). The ACHP is authorized to review and comment on all actions licensed by the federal government that will have an effect on properties listed in the National Register of Historic Places, or that are eligible for such listing. The listed properties (and properties eligible for listing) are not necessarily significant nationally; rather, most are significant primarily at the state or local level. Federal actions include, but are not limited to, construction, rehabilitation and repair projects, demolition, licenses, permits (e.g., Clean Water Act 404 permits), loans, loan guarantees, grants, and federal property transfers (National Historic Preservation Act [16 U.S.C. 470 §106]). Several homesteads and other potentially eligible properties occur in the Merced River corridor. Projects implemented under the plan would be required to identify historic resources at the project site and comply with the requirements of the National Historic Preservation Act.

#### ***FEDERAL POWER ACT***

The Federal Energy Regulatory Commission (FERC) regulates non-federal hydroelectric power projects that affect navigable waters, occupy U.S. lands, use water or water power at a government dam, or affect the interests of interstate commerce. FERC's jurisdiction includes issuing preliminary permits, issuing project licenses and exemptions from licensing, ensuring dam safety, performing project compliance activities, investigating and assessing payments for headwater benefits, and coordinating with other agencies. Operation licenses are issued for a term of between 30 to 50 years, and exemptions are granted in perpetuity. Merced ID's hydroelectric operations on the Merced River, license number 2179, will be subject to FERC relicensing in 2014.

### ***NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)***

The National Environmental Policy Act (NEPA) requires a federal agency to assess the effects on the "human environment" of granting permits, constructing projects, and undertaking other activities whenever it proposes such actions. The assessment includes an analysis of the activity's effect on a particular resource and possible mitigation measures available to reduce the significance of that effect. Federal agencies are also required to consider the cumulative effects of the planned action. Actions that would be subject to NEPA analysis include, but are not limited to, the issuance of federal permits and projects receiving federal funding. NEPA documentation (i.e., an Environmental Assessment or Environmental Impact Statement) would be required for Merced River restoration projects requiring federal permits or receiving federal funding.

## **6.2 State**

### ***STREAMBED ALTERATION PROGRAM***

Through Section 1603 of the Fish and Game Code, CDFG regulates any proposed project or activity that will substantially divert or obstruct the natural flow of water, or change the bed, channel or bank of any river, stream, or lake, or use any material from a streambed. The purpose of this program is to protect and conserve plants, fish and wildlife and the habitats upon which they depend. CDFG must be notified, on a standardized notification form, of any such activity that will take place in or in the general vicinity of a river, stream or lake, including rivers or streams that only flow periodically through a bed or channel. After CDFG receives the completed notification package it determines whether the project requires a Streambed Alteration Agreement. A Lake or Streambed Alteration Agreement is a written document that includes a description of the project or activity and project conditions necessary to protect fish or wildlife resources. The project or activity can commence as soon as a representative from CDFG signs and authorizes the Streambed Alteration Agreement. Restoration projects that affect the Merced River streambed, channel or banks would require CDFG 1603 agreements.

### ***SURFACE MINING AND RECLAMATION ACT***

The Surface Mining and Reclamation Act (SMARA) of 1975 was enacted in recognition of the need for a continuous supply of mineral resources while minimizing adverse impacts of surface mining to public health, property and the environment. The Act's requirements apply to anyone, including government agencies, engaged in surface mining operations in California (including those on federally managed lands). SMARA requires all mining operators to have an approved reclamation plan for lands disturbed by surface mining activities conducted after January 1, 1976. SMARA requirements apply to surface mining operations that disturb more than one acre or remove more than 1,000 cubic yards of material. This includes activities such as borrow pitting, dredging and quarrying, and stockpiling of mined materials. SMARA permits could potentially be required for restoration actions, particularly in the dredger tailings area.

### ***STATE LANDS COMMISSION AUTHORIZATION***

The State Lands Commission (SLC) has fee title to historic river channels and public trust jurisdiction over certain public lands, such as all ungranted tidelands and submerged lands and beds of navigable rivers, streams, lakes, bays, estuaries, inlets, and straits. The SLC manages these lands for the benefit of all the people of the state for water-related commerce, navigation, fisheries, recreation, open space, and other recognized public trust uses. Activities that would require the SLC authorization include, but are not limited to, implementation of habitat plans, installation of structures, sand and gravel extraction, and dredging or disposal of dredged material on the state's land (USFWS 1997). SLC authorization would take the form of a lease agreement or a nonjudicial determination for use of state lands.

### ***CALIFORNIA RECLAMATION BOARD ENCROACHMENT PERMIT***

The California Reclamation Board is required to enforce appropriate standards for construction, maintenance, and protection of adopted flood control plans that would protect the public from floods. The Reclamation Board may issue encroachment permits for proposed activities that might affect levees, floodways, or flood control plans. The Reclamation Board has jurisdiction within the 50-year flood zone along the Merced River. The applicant must demonstrate that project-specific actions would not jeopardize the integrity and safety of flood control levees and floodways and that the project would be consistent with flood control plans. Restoration project actions within the jurisdiction of the Reclamation Board, including the planting, excavation, or removal of vegetation within any area that has an adopted flood control plan, must be approved by the Reclamation Board and a permit must be obtained before work begins (USFWS 1997).

### ***CALIFORNIA ENDANGERED SPECIES ACT***

Although similar to the federal Endangered Species Act in its prohibition of take of listed endangered or threatened species, the California Endangered Species Act (CESA) has a separate process for authorizing incidental take. The process involves CDFG issuing an Incidental Take Permit, pursuant to Section 2081 of the Fish and Game Code, as amended in 1997. Regulations for CESA take permits were adopted in 1998 in the California Code of Regulations, Section 783 *et seq.* To obtain a take permit, the code requires that a project (including mitigation/compensation measures) must fully mitigate the impact of take of the species, among other requirements. In addition to species protected by the Federal ESA, species protected under the CESA that may occur in the Merced River corridor include (but are not limited to): San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), greater sandhill crane (*Grus canadensis tabida*), Swainson's hawk (*Buteo swainsoni*), peregrine falcon (*Falco peregrinus*), yellow-billed cuckoo (*Coccyzus americanus occidentalis*), little willow flycatcher (*Empidonax traillii brewsteri*), and bank swallow (*Riparia riparia*).

### ***CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)***

The California Environmental Quality Act (CEQA) requires California's state and local agencies to: (1) identify the significant environmental effects of their actions, independently, and with consideration of other reasonably foreseeable projects; and, (2) either avoid those significant environmental effects, where feasible, or mitigate those significant environmental effects, where feasible. Compliance with CEQA requires documentation of project activities and the associated environmental impacts. If the project may have a significant effect on the environment, an Environmental Impact Report (EIR) must be prepared by the agency. If an agency determines that no significant effect on the environment will occur, a Negative Declaration is prepared. If an agency determines that the environmental impacts of the proposed project could be mitigated to a less-than-significant level, then a Mitigated Negative Declaration is prepared. The purpose of an EIR is to provide state and local agencies and the general public with detailed information on the potentially significant environmental effects that a proposed project is likely to have, to identify measures to minimize those impacts and to indicate alternatives to the project. Restoration actions under the plan that would require state or local permits (such as CDFG 1603 Agreements or County Conditional Use Permits) would be required to comply with CEQA.

## **7 FUNDING OPPORTUNITIES**

Development and implementation of a restoration plan for the Merced River will require cooperation and funding from various federal, state, and local agencies. Following is a list of sources that may be available to provide funding to implement recommended restoration actions. Additional potential funding sources are listed in Appendix A.

### **7.1 CALFED Ecosystem Restoration Program Plan**

CALFED's Ecosystem Restoration Program Plan (ERPP) goal is to "improve and increase aquatic and terrestrial habitats and improve ecosystem functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species." The program objectives are to:

- improve and increase aquatic habitats so that they can support the sustainable production and survival of native and other desirable estuarine and anadromous fish in the estuary;
- improve and increase important wetland habitats so that they can support the sustainable production and survival of wildlife species; and
- increase population health and population size of Delta species to levels that ensure sustained survival.

The CALFED ERPP is based on the premise that restoration of ecological processes and functions is a fundamental tool for successful ecosystem restoration. These natural processes serve to create and maintain habitats needed by fish, wildlife and plant communities. Restoration efforts based on restoration of natural processes are likely to be more cost-effective in the long-term because they should be self-sustaining and require less human intervention. Restoration of processes such as hydrologic regime is also important if habitats such as tidal, perennial, and shaded riverine aquatic are to function.

Over the last three years the CALFED ERPP has funded 195 projects for a total of approximately \$228 million. Funded projects have included fish screens and ladders, land acquisition, habitat restoration, and focused research and monitoring. Funds are obtained from stakeholder contributions, state Proposition 204 funds, and the Federal Bay-Delta Act. The CALFED ERPP funded Phases II and III of the Merced River Corridor Restoration Plan.

### **7.2 Central Valley Project Improvement Act**

The Central Valley Project Improvement Act (CVPIA), passed by Congress in 1992, contains 40 separate titles providing for water resource projects throughout the West. The CVPIA mandates changes in management of the Central Valley Project (CVP), particularly for the protection, restoration, and enhancement of fish and wildlife, including providing 800,000 acre-feet of water dedicated to fish and wildlife annually. The Secretary of the Interior directed the U.S. Fish and Wildlife Service and the U.S. Bureau of Reclamation to jointly implement the CVPIA, and Section 3406(b)(1) in particular. The Anadromous Fish Restoration Program (AFRP) was developed in response to Section 3406(b)(1) of the CVPIA. This Section requires that the Department of the Interior "develop within three years of enactment and implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained during the period of 1967–1991..." Anadromous fish species addressed by the CVPIA are chinook salmon, steelhead, white and green sturgeon, striped bass and American shad. Further, sub-section 3406(b)(1)(A) requires that the program "give first priority to measures which protect and restore natural channel and riparian habitat values through habitat restoration actions, modifications to Central Valley Project operations, and implementation of the supporting measures mandated by this subsection."

The CVPIA provides for other reforms, including improving water flow in wildlife refuges, reducing current water use through water conservation, water transfer programs, water pricing and contracting reform, programs to eliminate or reduce fish losses due to flow fluctuations, replenishing spawning gravel, screening diversions, program monitoring and establishing programs for retiring agricultural land. It also provides incentives to encourage farmers to participate in a program to keep fields flooded during appropriate time periods for the purposes of waterfowl habitat creation and maintenance and for CVP water yield enhancement.

The CVPIA also established in the Treasury of the United States the "Central Valley Project Restoration Fund" and authorized the appropriation of up to \$50,000,000 per year to carry out programs, projects, plans, habitat restoration, improvement, and acquisition as required by the CVPIA. The Restoration Fund is replenished by fees on renewed water contracts, surcharges on water from certain CVP facilities, and other water use fees. Many of the specific habitat restoration and remedial actions of CVPIA require state-federal cost sharing. Potential recipients of the funding include the State of California or an agency or subdivision thereof, a Native American tribe, or a non-profit entity concerned with restoration, protection, or enhancement of fish, wildlife, habitat, or environmental values, which is able to assist in implementing any action authorized by this title in an efficient, timely, and cost effective manner.

### **7.3 CDWR Delta Pumping Plant Fish Protection Agreement (Four Pumps Agreement)**

The CDFG and CDWR entered into an agreement in late 1986 to offset direct losses of striped bass, chinook salmon, and steelhead caused by the diversion of water by the Harvey O. Banks Delta Pumping Plant. Direct losses were defined as losses of fish that occur from the time fish are drawn into Clifton Court Forebay until the surviving fish are returned to the Delta. These losses occur in spite of fish screens located at the pumping plant, due to enhanced predator efficiency in parts of the system, very poor screening efficiency for fish less than one inch in length, and mortality caused by handling fish during salvage operations. In addition to annual obligations for losses at the pumping plant, the CDWR also agreed to provide \$15 million to initiate a program to increase the probability of fish populations quickly recovering. Recently, another \$3.7 million became available after the cancellation of a project on the Tuolumne River. Since 1999, the CDWR has funded \$18.3 million in annual mitigation projects. Projects funded have ranged from hyacinth control projects on the Merced River to a major salmon spawning gravel restoration project. Through this agreement projects are developed by the CDFG, reviewed for funding by the Fish Advisory Committee, approved for funding by Directors of the CDFG and CDWR. Approved funds are administered by the CDWR. The Fish Advisory Committee includes representatives from the CDFG, CDWR, water contractors, fishery interests and environmental organizations (Mager, pers. comm., 2000). The funds in the account are derived from the State Water Project contractors (HRG 1999). On the Merced River, the Four Pumps Agreement has provided funds for implementation of the Merced River Salmon Habitat Enhancement Plan, two riffle reconstruction projects, and ongoing gravel augmentation projects.

## **7.4 Wetlands Reserve Program**

The Wetlands Reserve Program (WRP) is a voluntary program administered by the Natural Resources Conservation Service (NRCS) to restore wetlands. Participating landowners can establish conservation easements of either permanent or 30-year duration, or can enter into restoration cost-share agreements where no easement is involved. In exchange for establishing a permanent easement, the landowner receives payment of up to the agricultural value of the land and 100% of the restoration costs for restoring the wetlands. The 30-year easement payment is 75% of what would be provided for a permanent easement on the same site and 75% of the restoration cost. The restoration cost-share agreements are for a minimum 10-year duration and provide 75% of the cost of restoring the involved wetlands. Easements and restoration cost-share agreements establish wetland protection and restoration as the primary land use for the duration of the easement or agreement. In all instances, landowners continue to control access to their land.

## **7.5 Wildlife Habitat Incentives Program**

The Wildlife Habitat Incentives Program (WHIP) provides technical assistance and cost-share payments to help establish and improve fish and wildlife habitat on private lands. Participants work with Natural Resource Conservation Service (NRCS) to prepare a wildlife habitat development plan in consultation with the local conservation district. The plan describes the participant's goals for improving wildlife habitat, includes a list of practices and a schedule for installing them, and details the steps necessary to maintain the habitat for the life of the agreement. This plan may or may not be part of a larger conservation plan that addresses other resource needs such as water quality and soil erosion. NRCS and the participant enter into a cost-share agreement for wildlife habitat development. This agreement generally lasts from 5 to 10 years from the date the agreement is signed.

## **7.6 California Riparian Habitat Conservation Program**

The California Riparian Habitat Conservation Program was established in 1991 through the Wildlife Conservation Board (WCB) to protect, preserve, restore, and enhance riparian habitat throughout the California through acquisition of interest and rights in land and waters. The objectives of the program are to: (1) assess the current amount and status of riparian habitat throughout the state; (2) identify those areas that are critical to the maintenance of California's riparian ecosystem; (3) identify those areas that are in imminent danger of destruction or significant degradation; (4) prioritize protection needs based on the significance of the site and the potential loss or degradation of habitat; (5) develop project specific strategies to protect, enhance, or restore significant riparian habitat; (6) develop and administer a grants program for riparian habitat conservation; and (7) provide a focal point for riparian habitat conservation efforts statewide. The WCB may award grants to nonprofit organizations, federal or local agencies, resource conservation districts, and state departments for the purpose of riparian habitat conservation, restoration, or enhancement projects (HRG 1999).

## **8 SUMMARY OF OPPORTUNITIES AND CONSTRAINTS**

As discussed in the previous sections, property ownership, land use, zoning, water rights and water supply, flood control and flood hazards, and current funding availability define many opportunities and constraints for restoration in the Merced River corridor. These opportunities and constraints, as they currently occur, are summarized below. Many of these opportunities and constraints, however, may change over time. This summary, therefore, should be considered to be an initial starting point for identifying opportunities and constraints for restoration in the Merced River corridor.

### **Property Ownership, Zoning, and Land Use**

Ninety-seven percent (by area) of the land in the Merced River corridor study area is privately owned. The restoration plan, therefore, must rely heavily on voluntary participation by landowners and must address landowner concerns and embrace landowner values. The suggestion of restoration for the Merced River has raised concerns from many landowners that their property or water rights could be affected. The inclusion of landowners and other river stakeholders in the restoration planning process will help ensure that the plan addresses landowner and stakeholder interests on a broad scale. By adhering to the principle that restoration actions will be based on voluntary participation of landowners at project sites, the restoration plan can ensure that landowners' interests and rights are supported at the project-specific scale. To involve landowners in the restoration planning process, Stillwater Sciences and the Merced County Planning and Community Development Department with support from the AFRP have established the Merced River Stakeholder Group and Merced River Technical Advisory Committee (TAC). The Stakeholder Group represents a broad spectrum of interests in the watershed, including landowners, riparian water users, aggregate miners, dairy operators, ranchers, farmers, environmental groups, and local management and regulatory agencies. This group has been meeting approximately monthly to provide input to and review of baseline studies, define restoration goals and objectives, and identify potential restoration projects.

The land ownership, zoning, and land use patterns in the river corridor provide several opportunities for restoration. Outside of the towns of Cressey, Livingston, and Snelling, land parcels are large, are zoned almost exclusively for agriculture, and are currently in agricultural land uses. Large parcel ownership simplifies restoration design and implementation by reducing the number of people contributing to the design process, reducing the number of easements and access agreements required, and potentially simplifying the permit process. Land parcels are largest in the upper half of the project reach, upstream of Cressey.

There is some concern on the part of private landowners that they will be forced into a position of restoration in their section of the river corridor if such efforts are undertaken on neighboring parcels. It is important to note that the contractors working on the Merced River Corridor Restoration Plan have no legal right or mechanism to force such participation. Further, a commitment has been made to these landowners that no such pressure will be exerted in the foreseeable future; all participation in restoration activities is wholly voluntary. Another area of significant concern to the landowners is public access. Again, a commitment has been made that there will be no requirement for public access in order to participate in restoration activities; the use of public funds for restoration is unrelated to public access on privately-owned land.

Much of the property in the corridor has been in the families of the current landowners for several decades or generations. With their knowledge of and reliance on the river, landowners are ideal stewards of the river resource. Most landowners are currently involved in active river stewardship; many have expressed their desire to continue or to increase their stewardship of the river, and many have expressed willingness to have restoration projects on their properties. Ongoing landowner projects

include wetland enhancements, installing duck boxes along the river, innovative dairy management to avoid water quality impacts to the river, and extensive preservation of valley oak woodlands. In addition, several landowners in the vicinity of the Route 59 bridge are currently working with CDFG and CDWR to implement the Salmon Habitat Enhancement Project in that reach (described in Section 4.1).

### **Water Supply, Water Rights, and Riparian Water Users**

The Merced River is heavily allocated for agricultural water use. The Merced ID holds pre- and post-1914 appropriative water rights to divert flows from the river. Riparian water users divert flows through seven diversion channels between Crocker-Huffman Dam and Shaffer Bridge and numerous riparian pumps throughout the river; these uses are protected by the rights held by riparian users and are not negotiable. In addition, numerous farms and dairies rely on water from the Merced River for their operations. These agricultural operations provide significant economic benefits to Merced County, and preservation of agricultural land uses is a key concern of many stakeholders.

Minimum instream flow requirements in the river are defined under Merced ID's current licenses and agreements and are intended to provide adequate flows for chinook salmon and for the Merced River Riparian Water Users Association diversions. Merced ID's FERC license for the New Exchequer Project, which has a minimum flow requirement, expires in 2014, at which time license flow requirements may change. In addition, Merced ID is coordinating with CDFG to implement studies to assess the effects of flows on chinook salmon in the river.

Restoration actions in the river must be designed to function within the current license and agreement flow requirements and must recognize the value of agricultural and other water use. In addition, restoration actions cannot adversely affect appropriative or riparian water rights. This is one of the most important constraints of the restoration plan and restoration project design from several standpoints. From the physical and ecological standpoint, flows will be a significant factor governing project design and project prioritization. Further, projects that adversely impact appropriative or riparian water rights would not be supported by the Stakeholder Group, private landowners, or Merced ID and, therefore, would not be implementable. Lastly, the restoration program has no legal right or mechanism to alter flow requirements in the river or impact water rights on the river.

### **Flood Control**

As explained in Section 3.4, the USACE sets the standards for flood control-related operations of Merced ID's New Exchequer Dam. Current USACE flood control rules allow a maximum routine release from the Dam of 6,000 cfs. The current USACE regulations mandating specific storage capacity requirements control the amount of storage capacity which must be available to accommodate runoff from November 1 through March 31; currently 350,000 acre-feet must be maintained as a cushion except to the extent that the cushion is impinged upon by runoff caused by melting snow or extremely wet, monsoon-like tropical storms.

The U.S. Geological Survey determined in studies conducted in the 1960s that the Merced River channel can convey 6,000 cfs without overbank flooding (Blodgett and Bertoldi 1968). In January 1997, flows of up to 8,080 cfs (measured at Snelling) caused levee breaches and flooding of agricultural lands immediately above Shaffer Bridge; near the confluence of the San Joaquin River, the flooding was more pronounced and extended into dairies and agricultural land.

A cooperative comprehensive reevaluation of flood control operations throughout the Central Valley undertaken by USACE and CDWR has the potential to affect future flood control operations on the Merced River. These potential future changes would occur outside of the timeframe of this restoration plan; restoration projects contained within the plan therefore, must be designed to function within the

6,000 cfs flow limitation but must also recognize that larger floods do occur and should be provided for within the scope of the project.

### **Aggregate Mining**

As discussed in Section 3.2.3, the demand for aggregate resources in Merced County is increasing consistent with the demands of a growing population. The proposed UC–Merced campus, slated to be marginally operational in 2002, will contribute to the depletion of available aggregate materials in eastern Merced County. Issues related to virgin aggregate resources are important to the Merced River Corridor Restoration Plan because such resources typically occur contiguous to rivers and streams. The CDMG designates the area along the Merced River between Snelling Road and Oakdale Road as MRZ-21 SG-2, meaning that the mineral deposit contained therein is suitable as marketable commodity and the deposit meets the threshold value in size. The Merced River dredger tailings area is classified as MRZ-2a; the aggregate quality is uncertain due to the dredging process. CDMG does not automatically consider dredger tailings to be of similar quality to the non-dredged floodplain deposits from which they were derived. Limited data were available to CDMG to assess the aggregate quality of the Merced River dredger tailings at the time of the report. The Upper Merced Property Owners Group is currently conducting studies to assess aggregate quality and mining feasibility in the tailings area.

Considering the Department of Conservation’s recent mineral classification, pressure for aggregate mining will be greatest in the Merced River corridor. Depending on how mining is implemented, this increase in mining could result in conversion of extensive areas of floodplain (including farmland, grassland, oak woodland, and riparian areas) to mining pits. Innovative planning and mining approaches in these floodplain areas, however, could be used to minimize resource conflicts, and current reclamation and mitigation regulations present opportunities for the aggregate producers to interface with the Merced River Corridor Restoration Plan in providing habitat grassland, farmland, oak savannas, and riparian areas. In some instances, innovative mining approaches could be used to enhance river function and habitat values. In addition, mining in the dredger tailings could be combined with extensive floodplain and riparian habitat restoration.

### **Infrastructure**

Key infrastructure that affects restoration opportunities includes public and private bridges, the Livingston sewage treatment facility, and other development in the floodplain. The major constraint imposed by the bridges is the risk of increasing debris jams during high flow events downstream of riparian restoration projects. This risk is greatest at the Snelling Road bridge and at low private crossings. Risk of debris jams and impacts to flood conveyance at the bridges would need to be assessed as part of floodplain and riparian restoration efforts, especially in the Snelling vicinity.

The City of Livingston sewage treatment facility is vulnerable to flooding. Because the restoration plan would not increase flooding above currently allowable flood control releases, the plant does not pose constraints to restoration actions.

Lastly, several roads (both public and private), private levees, wastewater treatment plants, and other structures are located immediately adjacent to the river. Many of these structures are vulnerable to bank erosion, and many are currently protected by bank revetment or rubble placed on the banks to reduce erosion. Actions in the restoration plan cannot increase the vulnerability of these structures to damage from bank erosion.

### **Funding Opportunities and Easement Mechanisms**

Several large funding opportunities are currently available to design, permit, and implement restoration projects on the Merced River. The largest opportunities are available through CALFED, the AFRP, the

Four Pumps Agreement, and the NRCS wetlands programs. Through these and other sources, funding could be available for large-scale restoration projects, smaller demonstration projects, and easement purchases. These funding sources represent a significant opportunity to implement restoration actions on the river in the near future.

Conservation easements between a holding agency and landowners can achieve permanent land conservation and provide tax benefits to the landowner. A conservation easement is a legal agreement between the landowner and the holding agency in which the landowner is paid to preserve certain resources on portions of or all of a parcel. In addition, the landowner may receive property tax benefits in association with the easement. Both natural resource values (such as riparian vegetation buffers) and agricultural resources values can be protected under various easement programs.

### **Regulatory Issues and Opportunities**

Several regulations will affect restoration project design and implementation. Key regulations to consider include the California and Federal endangered species acts, the California Fish and Game Code, the California Environmental Quality Act, the National Environmental Policy Act, the Surface Mining and Reclamation Act, the Clean Water Act, and the Reclamation Board encroachment permit requirements. The opportunities provided and constraints imposed by these laws and regulations are outlined below. Restoration project funding and implementation schedules must contain sufficient funding and time to meet the reporting and public review requirements of these acts.

- The Merced River (including its riparian corridor) is currently designated critical habitat for Central Valley steelhead (NMFS 2000) and supports designated critical habitat for the valley elderberry longhorn beetle and other protected or sensitive species. Restoration projects would generally benefit these species in the long-term; however, construction and implementation may have short-term, adverse impacts to some species or their habitats. Such projects would require coordination with and authorization from agencies with jurisdiction over the affected species, including the CDFG, USFWS, and NMFS. This coordination should begin during the project design process and would continue through the project permitting process.
- The California Environmental Quality Act (CEQA) requires environmental evaluation and public review for projects receiving state permits or funding. The National Environmental Policy Act (NEPA) requires similar evaluation and review for projects receiving federal permits or funding. Under these acts, specific environmental evaluations could be required for implementation of some restoration projects, and almost certainly would be required for implementation of large projects. Under CEQA, the State lead agency would be required to complete an Initial Study and, possibly, an Environmental Impact Report. Under NEPA, the federal lead agency would be required to complete an Environmental Assessment and, possibly, an Environmental Impact Statement. Restoration project plans should include adequate funding and time to complete the NEPA and CEQA processes.

- Permits for many restoration projects would be required under the Clean Water Act, the California Fish and Game Code, and the Surface Mining and Reclamation Act. Also, lease agreements may be required from the State Lands Commission. Restoration projects should be consistent with the regulatory mandates of these programs to ensure that permits can be readily issued so long as projects provide sufficient supporting information (such as engineering designs, wetland delineations, species surveys, and impact assessments) to the regulatory agencies. These regulatory agencies should be included in project designs to the extent feasible to ensure that their concerns are met. In addition, project budgets and schedules must contain sufficient funding and time to obtain these permits. The Regional Water Quality Control Board may also require assessments of mercury contamination for projects in the dredger tailings.
- The California Reclamation Board must permit any project occurring within the 50-year flood zone. Projects within the floodplain must demonstrate that they will not decrease flood conveyance or increase flood stage elevation. On the Tuolumne River, the Reclamation Board has been hesitant to allow planting of elderberry bushes on the floodplain as part of restoration projects due to their concern that presence of critical habitat for a protected species would limit their options in a flood fight. The USFWS is currently coordinating with the Reclamation Board to develop an agreement that would allow planting of elderberries without limiting flood fight abilities. Depending on the outcome of these negotiations, planting elderberry bushes in the floodplain will also likely be an issue for implementing floodplain and riparian restoration projects on the Merced River.

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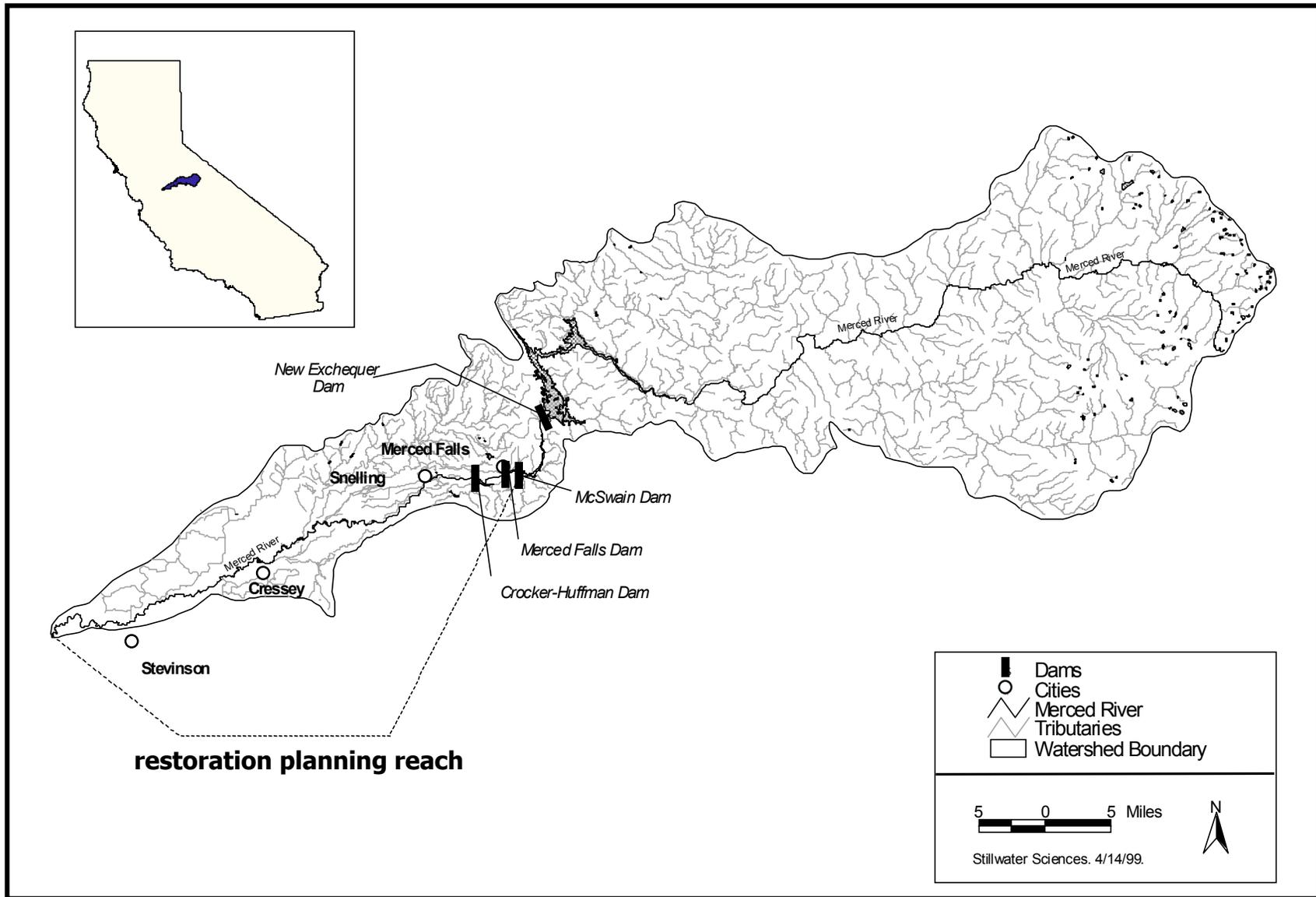
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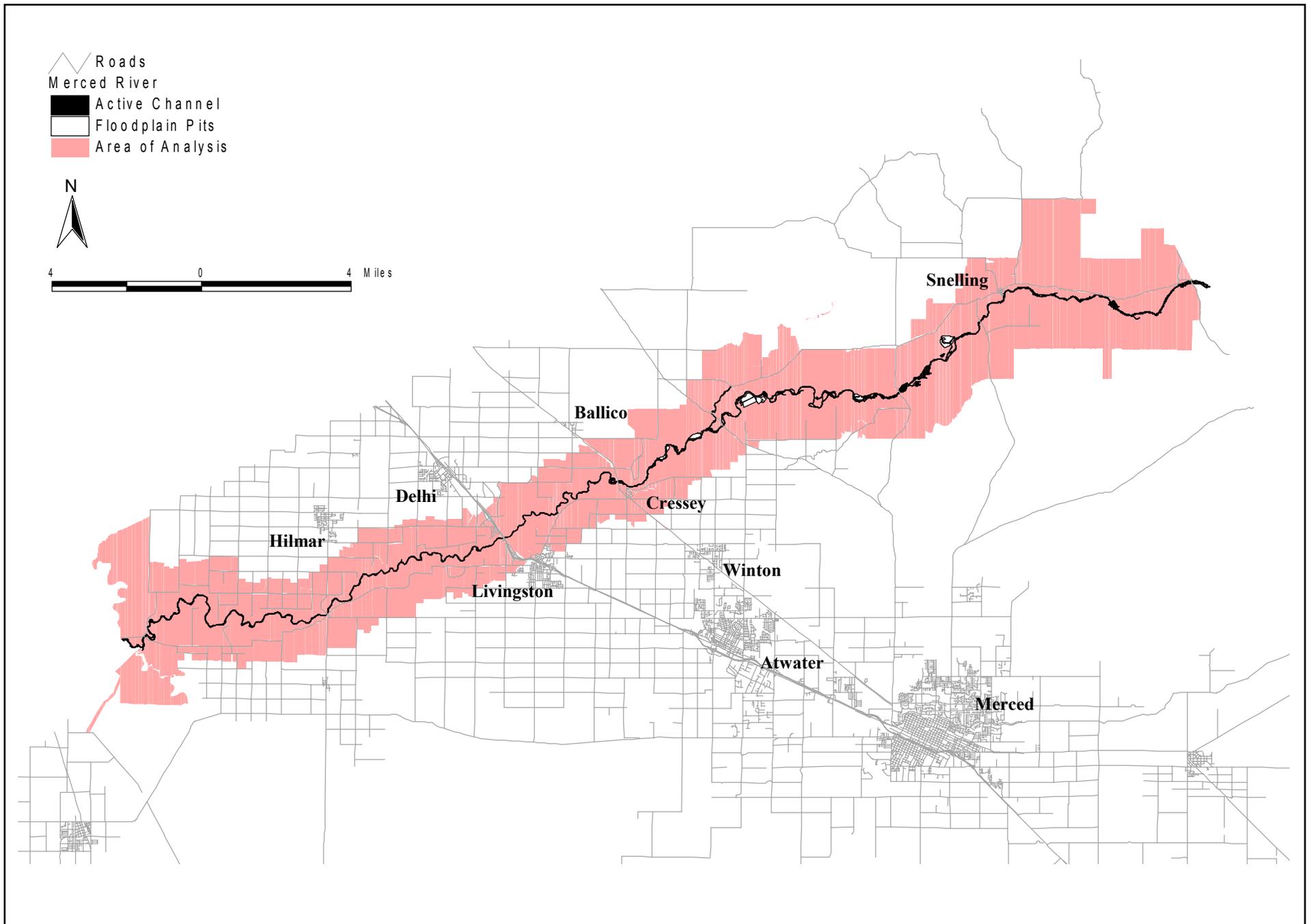
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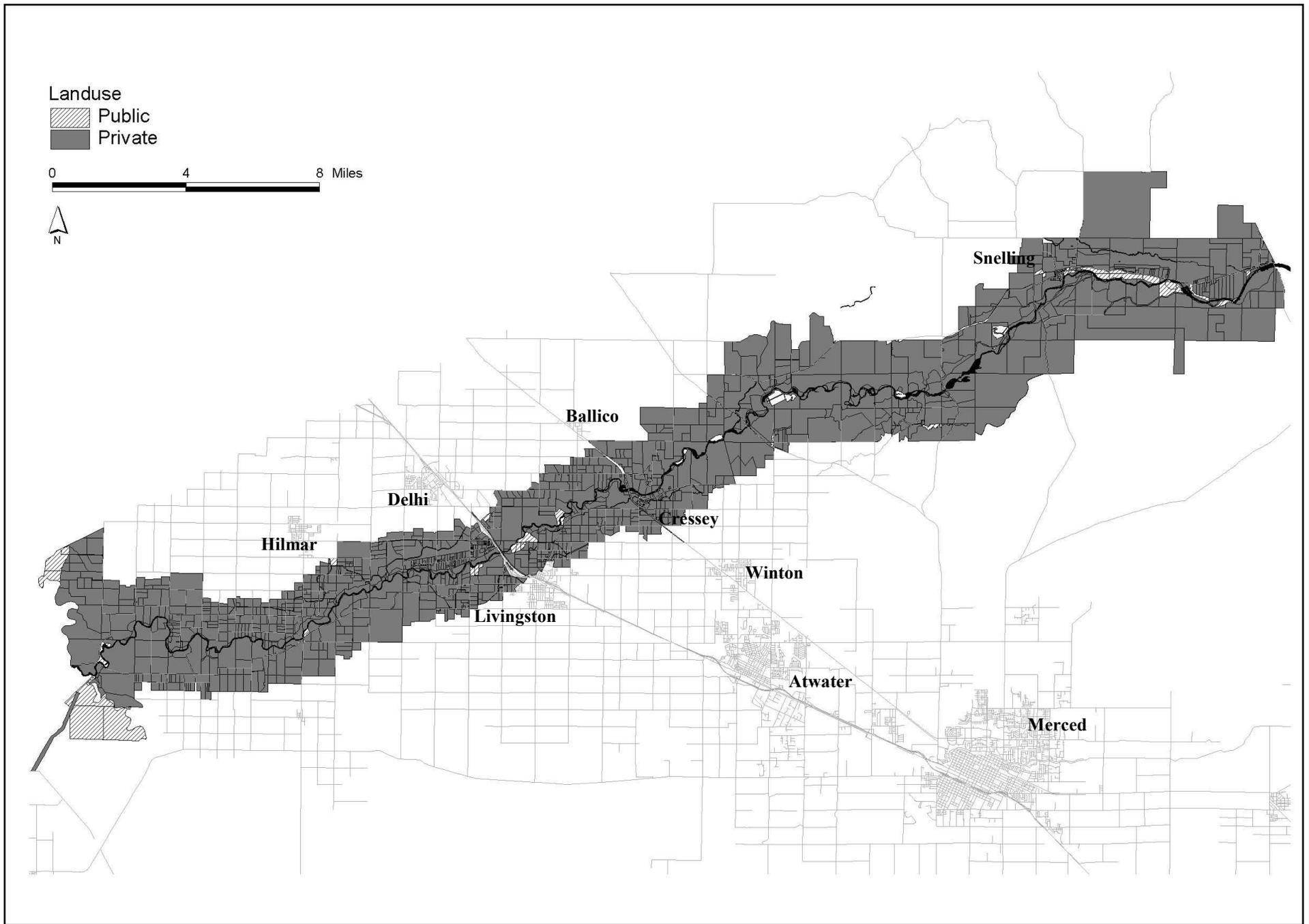
## **Figures**



**Figure 1. The Merced River watershed and the restoration planning reach.**

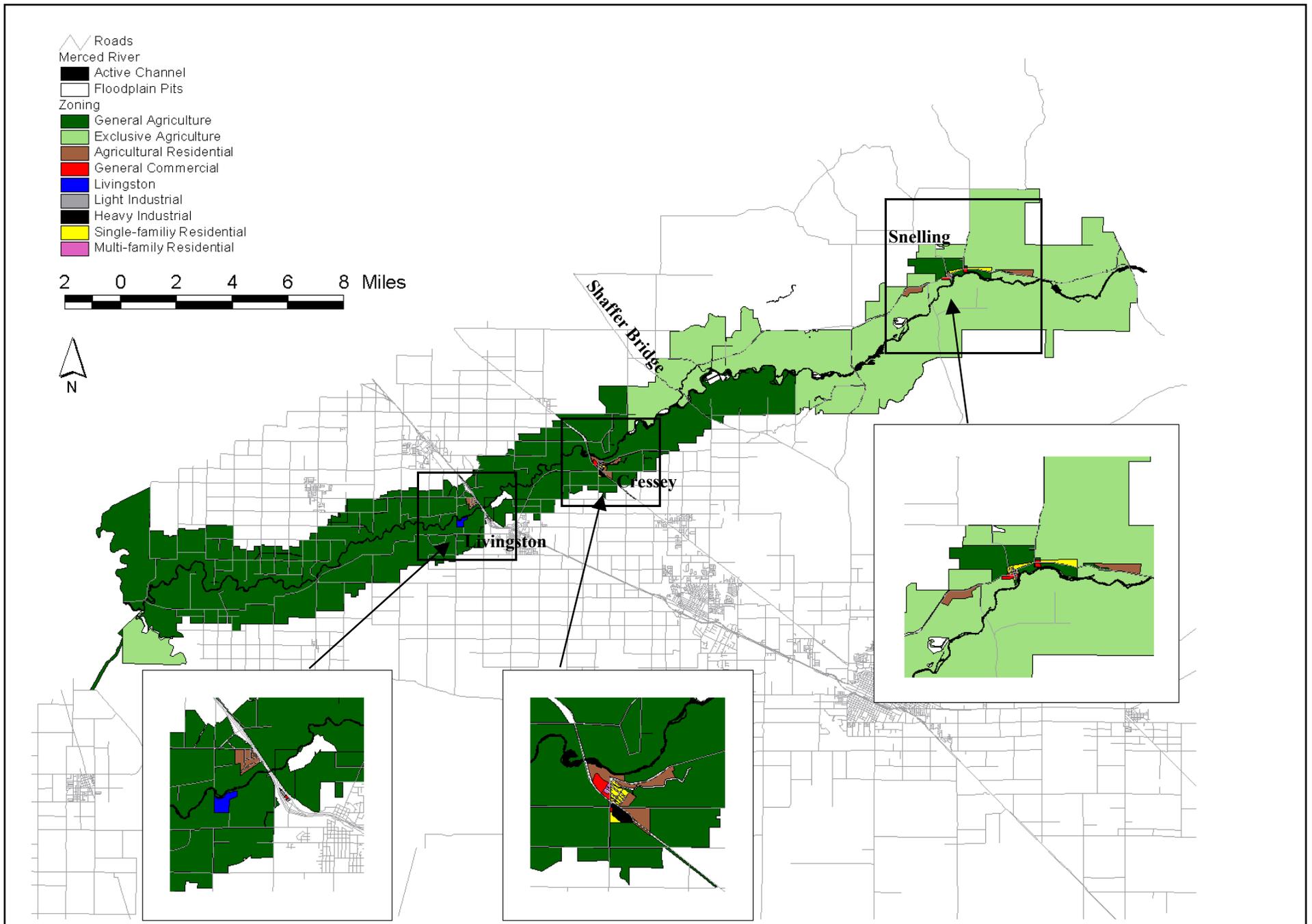


**Figure 2. Area of analysis.**



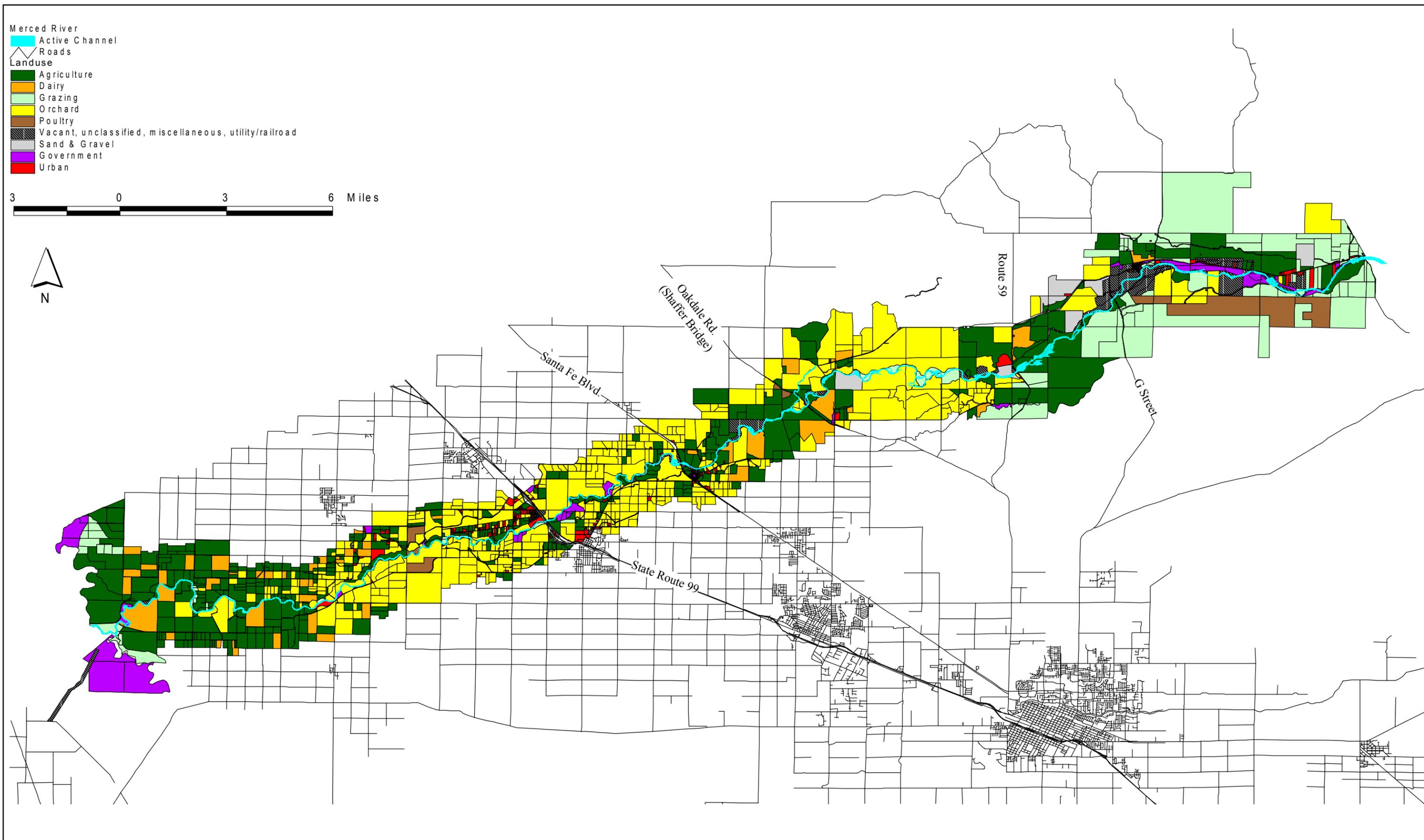
**Figure 3. Property ownership in the Merced River corridor.**

Source: Merced County Planning and Community Development Department



**Figure 4. Zoning districts in the Merced River corridor.**

Source: Merced County Planning and Community Development Department



**Figure 5. Land use in the Merced River corridor.**

Source: Merced County Tax Assessor's Office

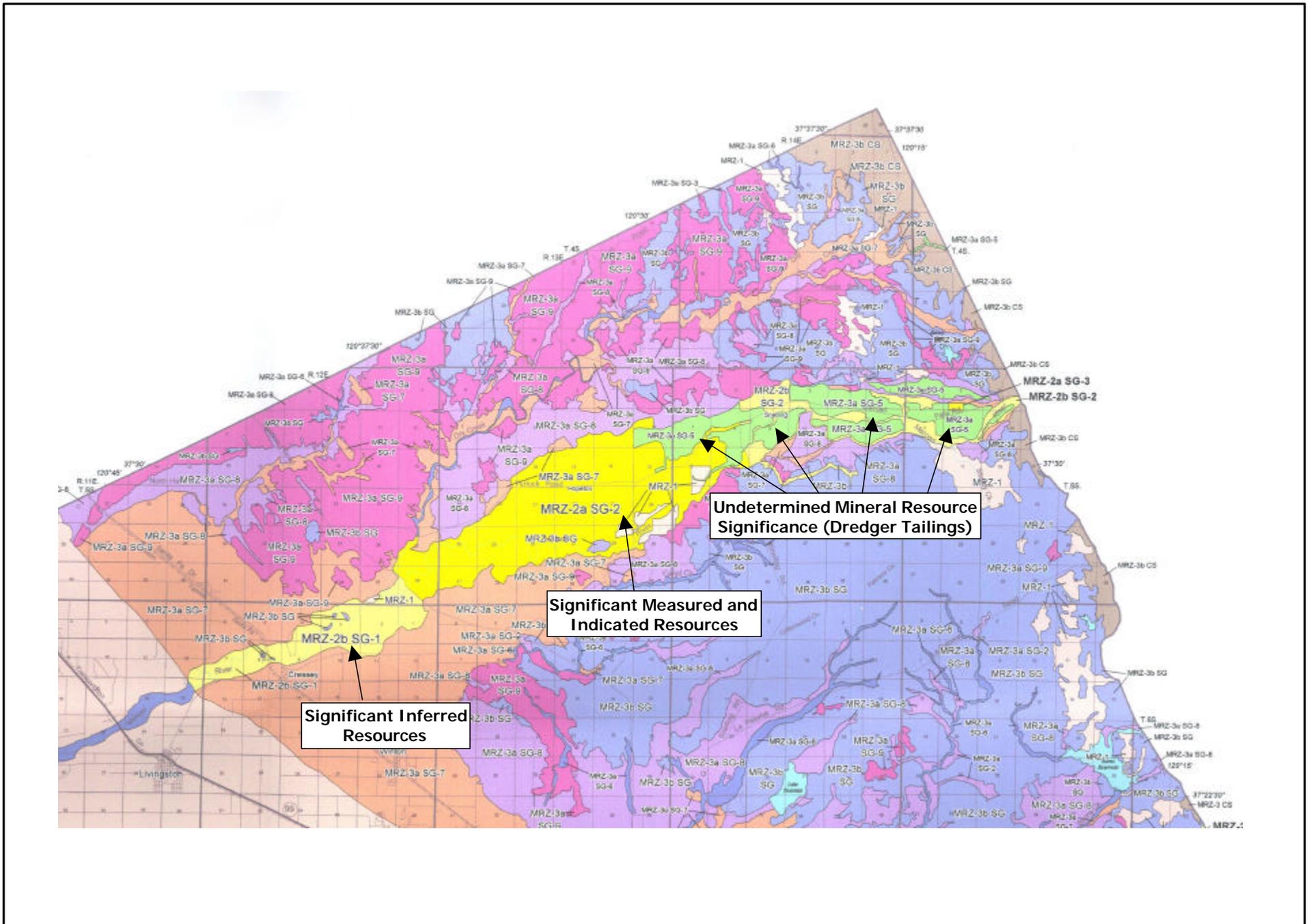
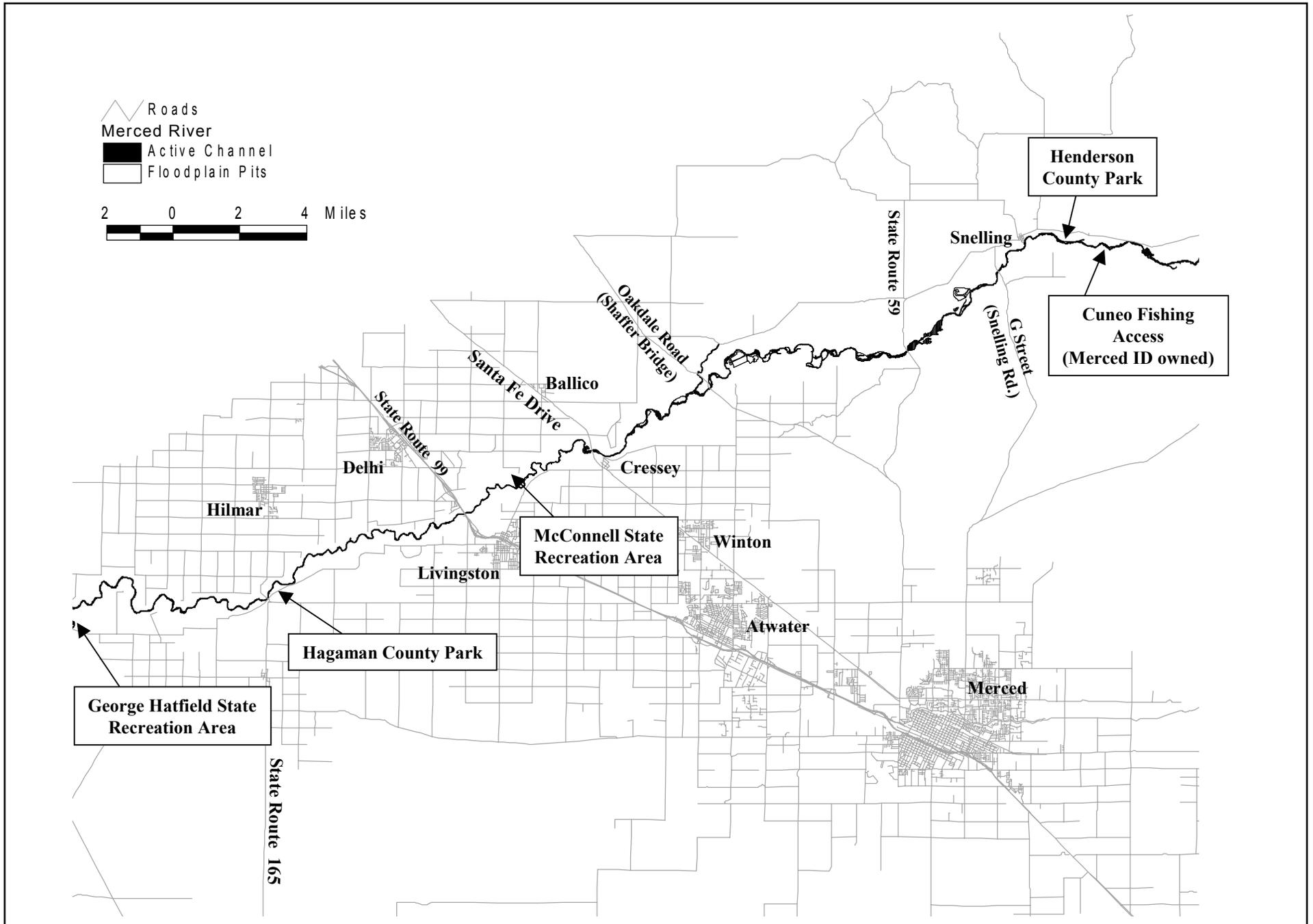
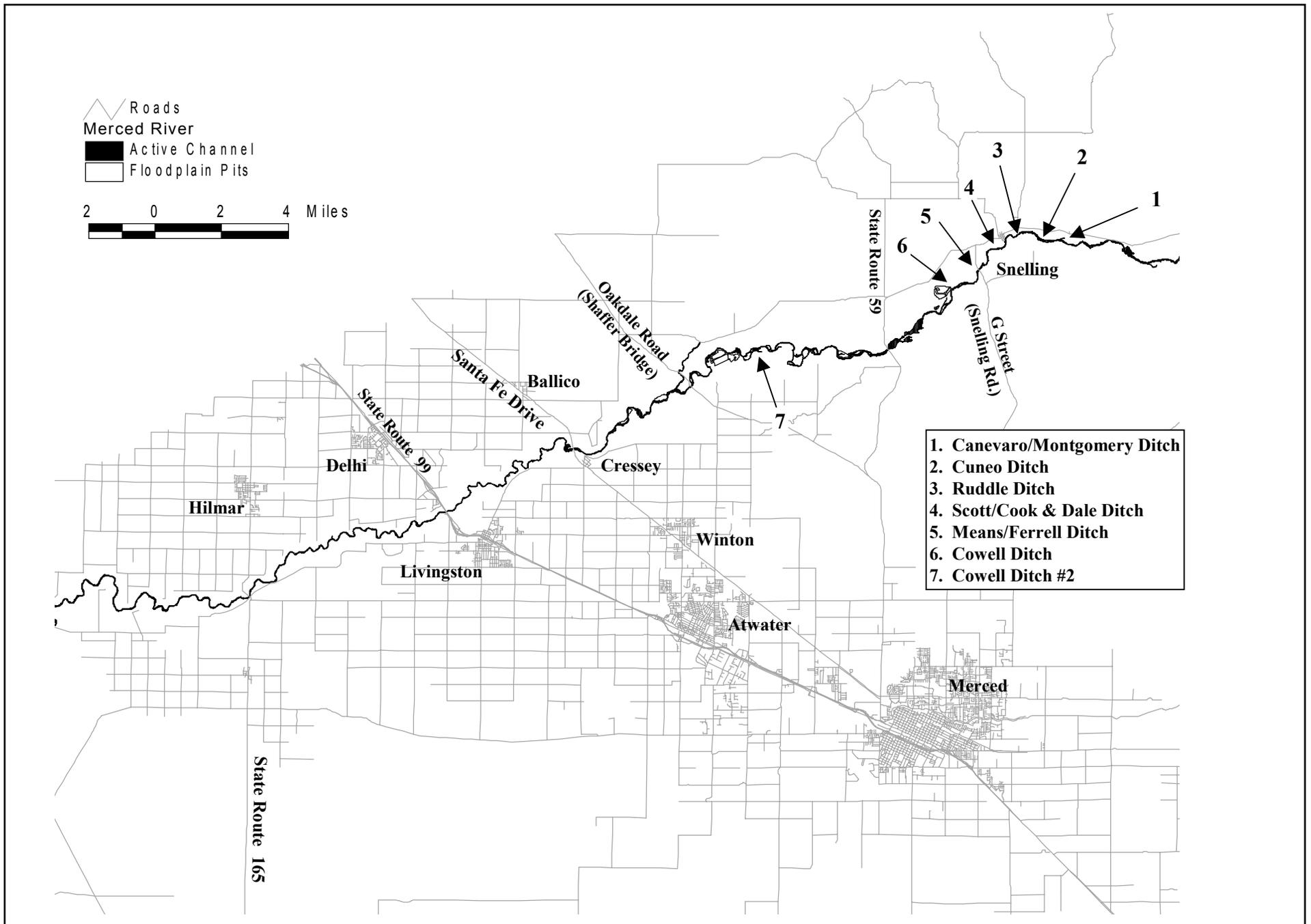


Figure 6. Mineral Resource Zones (MRZs) for concrete aggregate in Merced County.

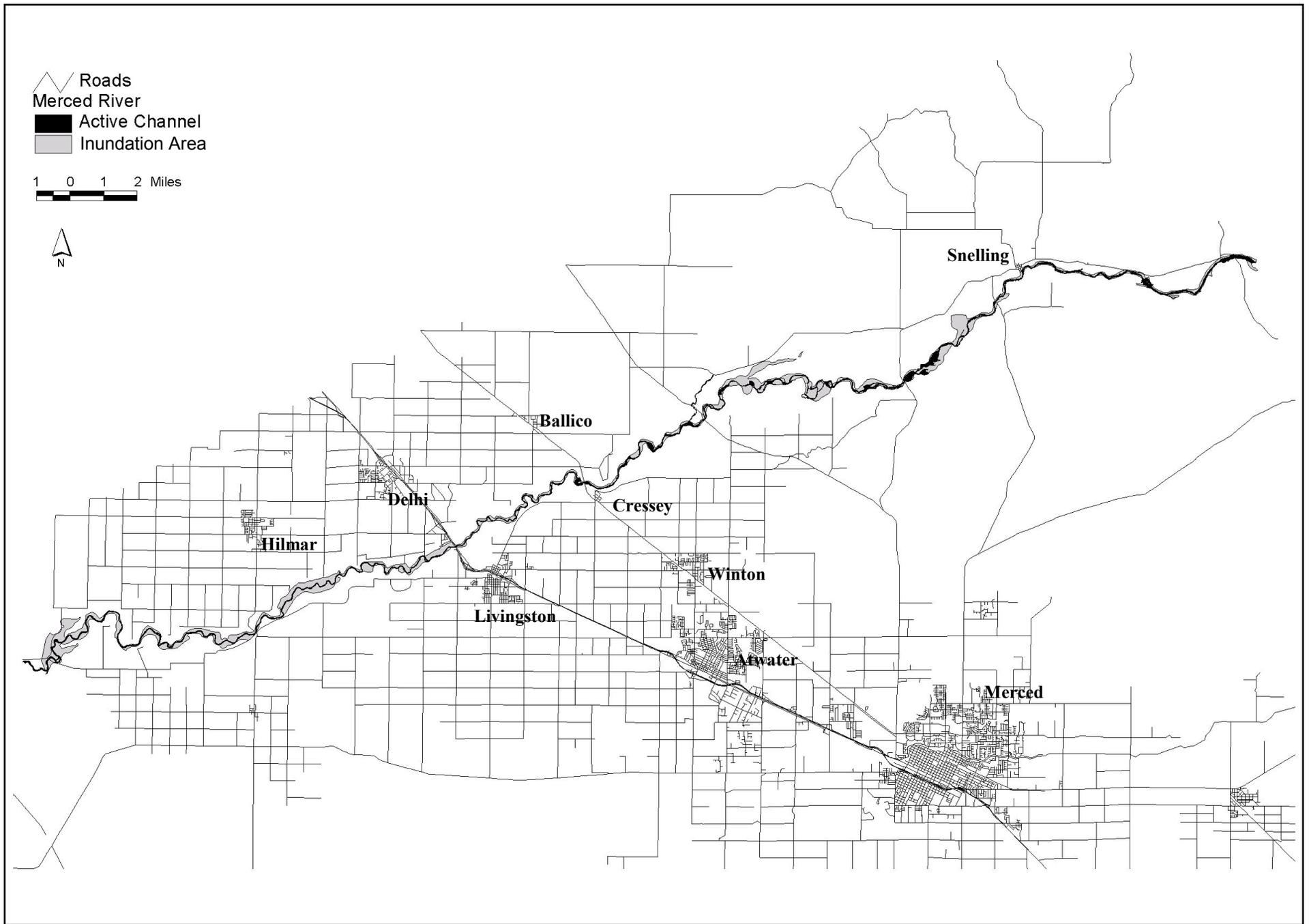
Source: Clinkenbeard 1999



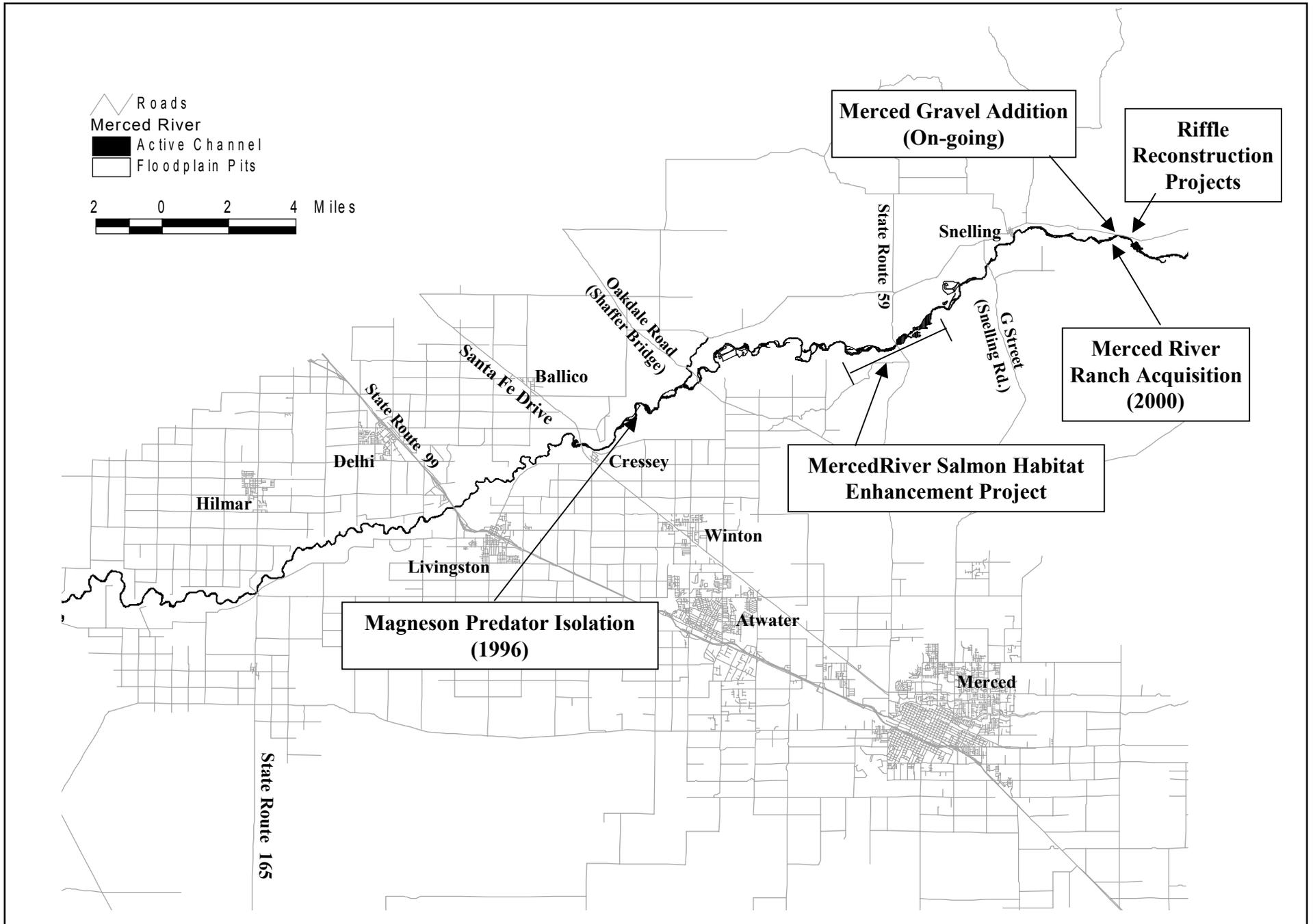
**Figure 7. Public access sites in the Merced River corridor.**



**Figure 8. Riparian water use diversion ditches.**



**Figure 9. Area inundated by January 1997 high flows.**  
Source: Corps of Engineers, unpublished data.



**Figure 10. CDFG restoration project sites.**

## **Appendix A: Additional Funding Sources**

## **Additional Funding Sources**

### **ABANDONED MINE LAND RECLAMATION PROGRAM**

The Abandoned Mine Land Reclamation (AMLR) Program is designed to protect the public and correct environmental damage caused by coal and, to a limited extent, non-coal mining practices that occurred prior to August 3, 1977. AMLR provides for the restoration of eligible lands and waters mined and abandoned or left inadequately restored. AMLR is divided into two programs: the State Indian Reclamation Program and the Federal Reclamation Program. Both programs address problems such as dangerous highwalls, slides, subsidence, dangerous portals, and polluted waters.

### **ADMINISTRATIVE GRANTS FOR FEDERAL AID IN SPORT FISH RESTORATION PROGRAM**

The Administrative Grants Program supports projects that assist with the administration and implementation of sport fish restoration programs. Funds may be used for administrative projects, including investigations, administration, and execution of the Sport Fish Restoration Act and for aiding in the formulation, adoption, or administration of any compact between two or more states for the conservation and management of migratory fishes in marine or freshwaters.

### **AGRICULTURAL LAND STEWARDSHIP PROGRAM**

The Agricultural Land Stewardship Program within the State Department of Conservation provides long-term protection of farmland through grants to local agencies and non-profits for the purchase of agricultural conservation easements.

### **BRING BACK THE NATIVES PROGRAM**

The Bring Back the Natives Program is a national effort by the Bureau of Land Management (BLM), the U.S. Forest Service (USFS), and the National Fish and Wildlife Foundation to improve the status of native aquatic species on public lands through riparian area rehabilitation, watershed restoration, and species reintroduction. Preserving the biodiversity and ecological integrity of unique areas is an essential component of the restoration strategy. The Fish and Wildlife Foundation contributes money to the program in the form of a challenge grant to USFS and BLM. To receive funding for individual projects, the project proponent must secure an equal amount of funds from non-federal sources (e.g., private, corporate, or state sources). Additionally, both BLM and USFS can contribute money to the projects.

### **BOSCO-KEENE RENEWABLE RESOURCES INVESTMENT FUND (RRIF)**

This fund, created by 1981 legislation, receives 30% of the revenue deposited into the Geothermal Resources Development Account. Under current law (Public Resources Code, Section 34000), salmon and steelhead hatchery expansion and fish habitat improvement appear as items in one of eight listed potential uses for these funds. The amount of funding made available to CDFG varies from year to year.

### **CONSERVATION RESERVE PROGRAM (CRP)**

The Conservation Reserve Program, administered by the U.S. Department of Agriculture's (USDA) Farm Service Agency, encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as native grasses, trees, filterstrips, or riparian buffers. The program is intended to reduce soil erosion and sedimentation in streams and improve water quality and wildlife habitat. Participation is voluntary, with a monetary incentive to participate. Farmers receive an annual rental payment for the term of a multi-year contract and can receive cost-sharing funds to establish vegetative cover.

## **COOPERATIVE ENDANGERED SPECIES CONSERVATION FUND GRANTS TO STATES**

The Cooperative Endangered Species Conservation Fund Grants to States is intended to provide federal financial assistance to any state to assist in the development of programs for the conservation of endangered and threatened species. Potential programs include animal, plant, and habitat surveys, research, planning, management, land acquisition, protection and public education.

## **ENVIRONMENTAL ENHANCEMENT AND MITIGATION PROGRAM**

The Environmental Enhancement and Mitigation Program was established by the enactment of the Transportation Blueprint Legislation of 1989 (AB 421). This program for mitigating negative effects of highways and vehicle operations is administered by the California Transportation Commission; however, the Resources Agency evaluates initial fund applications and makes recommendations to the California Transportation Commission. The enabling legislation (Section 164.56 of the Streets and Highways Code) provides a \$10 million annual appropriation through fiscal year 2000/2001 for several purposes, including grants for acquisition, restoration, or enhancement of resource lands to mitigate loss of, or detriment to, lands near rights-of-way. The program provides grants to local, state, and federal agencies and nonprofit entities to provide enhancement or additional mitigation for the environmental impact of modified or new public transportation facilities. Categories of environmental enhancement and mitigation projects eligible for funding include: highway landscaping and urban forestry; the acquisition, restoration, or enhancement of resource lands to mitigate the loss of resource lands lying within or near rights-of-way acquired for proposed transportation improvements; and acquisition and/or development of roadside recreation opportunities. Resource lands include natural areas, wetlands, forests, woodlands, meadows, streams, or other areas containing fish or wildlife habitat.

## **ENVIRONMENTAL LICENSE PLATE FUND**

The Environmental License Plate Fund, established in Section 21190 of the Public Resources Code, offers grants to state agencies, boards or commissions, city or county agencies, the University of California, or private non-profit research organizations to support projects that help preserve or protect California's environment. Eligible projects include acquisition, restoration or enhancement of resource lands and endangered species, and development of interpretive facilities. Projects are funded in one-year increments and each must be a separate, distinct project with a clearly defined benefit. Funds from this program are administered by the Resources Agency.

## **ENVIRONMENTAL WATER PROGRAM**

The Environmental Water Program was created by the Environmental Water Act of 1989 and provides funding for enhancement and restoration projects (not studies) that will contribute significant environmental benefits to the state. Grant monies must be matched by either an equal amount of cash, or a combination of cash and in-kind services. Eligible projects include fisheries habitat restoration and enhancement; riparian habitat acquisitions, restoration or enhancement; and wetland habitat acquisitions, restoration or enhancement. Funds for this program are administered by the California Department of Water Resources.

## **ENVIRONMENTAL QUALITY INCENTIVES PROGRAM (EQIP)**

The Environmental Quality Incentives Program (EQIP) is administered by USDA's Natural Resource Conservation Service (NRCS) and encourages environmental enhancement of private ranch and farmland. EQIP aims to address significant natural resource needs and objectives by providing a voluntary conservation program for farmers and ranchers. EQIP provides technical, financial, and educational assistance. Nationally, half of EQIP funds are targeted for livestock-related natural resource problems, while the other half is appropriated to more general conservation priorities. EQIP participants implement activities based on a conservation plan. EQIP offers 5- to 10-year contracts that provide incentive payments and cost sharing for conservation practices needed at the site. Cost sharing may pay up to 75% of the costs of certain conservation practices, such as grassed waterways, filter strips, manure management facilities, capping of abandoned wells, and other practices important to improving and maintaining the health of natural resources in the area.

## **FEDERAL AID IN SPORT FISH RESTORATION ACT**

The federal government levies an excise tax, paid by manufacturers, on fishing tackle and on pleasure boat and motorboat fuel. The revenues are made available to the states on a matching basis (generally three federal dollars for each state dollar) through the Federal Aid in Sport Fish Restoration Act for funding fish restoration and enhancement activities, wetlands restoration, and acquisition of motorboat access to the nation's waterways. Additionally, the act provides part of the funding for Central Valley anadromous fish habitat restoration crews, as well as their equipment and facilities. Funds from this program are administered by the California Department of Fish and Game (CDFG).

## **FISH AND GAME PRESERVATION FUND**

This fund, administered by CDFG, receives revenues generated from the sales of licenses, stamps, and permits issued by CDFG for hunting, sport, and commercial fishing privileges, and other resource-related activities over which CDFG has purview. Functionally, the fund is divided into two parts: the non-dedicated portion and the dedicated portion. Expenditures from dedicated accounts within the fund are constrained to specific activities defined by their enabling legislation. In general, non-dedicated monies are available for expenditure at the discretion of CDFG for support of programs beneficial to fish, wildlife, and native plants. Dedicated Fish and Game Preservation Fund accounts that have the potential to assist in anadromous fish recovery efforts are described under separate subheadings. Funding for anadromous fish habitat restoration from the non-dedicated portion of the fund is very limited.

## **FISH AND WILDLIFE ENHANCEMENT BOND ACT OF 1984 (PROPOSITION 19)**

The 1984 Fish and Wildlife Enhancement Bond Act (Proposition 19) provides funds through the Wildlife Conservation Board (WCB) to correct the more severe deficiencies in fish and wildlife habitat in California. Funds may be used only by public agencies to enhance, develop or restore flowing waterways for the management of fish outside the coastal zone. Individuals or groups must affiliate with or act as the agent of a public agency to be eligible for these funds. Funds for this program are administered by WCB.

## **FISHERIES DEVELOPMENT AND UTILIZATION RESEARCH AND DEVELOPMENT GRANTS AND COOPERATIVE AGREEMENTS PROGRAM**

This program is intended to increase the nation's wealth and quality of life through sustainable fisheries that support fishing industry jobs, safe and wholesome seafood, and recreational opportunities. Special emphasis is given to funding projects that respond to priorities identified in the annual solicitation. Applicants should demonstrate awareness of the fisheries resources in their region, as well as the issues

and problems involving such fisheries. Issues and problems addressed by the project should be supported by industry experience.

### **FLOOD MITIGATION ASSISTANCE**

The Flood Mitigation Assistance (FMA) program helps states and communities identify and implement measures to reduce or eliminate the long-term risk of flood damage to homes and other structures insurable under the National Flood Insurance Program (NFIP). Projects may include (1) elevation, relocation, or demolition of insured structures; (2) acquisition of insured structures and property; (3) dry floodproofing of insured structures; (4) minor, localized structural projects that are not fundable by State or other federal programs (e.g., erosion control and drainage improvements), and (5) beach nourishment activities, such as planting of dune grass.

### **HABITAT CONSERVATION FUND**

The California Wildlife Protection Act of 1990 created the Habitat Conservation Fund and provided for an annual appropriation to it of \$30 million from the General Fund. The General Fund obligation can be reduced on a dollar-for-dollar basis by transfers to the Habitat Conservation Fund from other specified funding sources, including, among others, the Public Resources Account, the Cigarette and Tobacco Products Surtax Fund, and the California Environmental License Plate Fund. The WCB is responsible for administering annual appropriations to the Habitat Conservation Fund of up to \$11.5 million for acquisition, restoration, or enhancement of aquatic habitat for that spawning and rearing of anadromous salmonids and trout.

### **HABITAT CONSERVATION FUND/LOCAL AGENCY GRANTS**

The Local Agency Grant Program within the Habitat Conservation Fund provides funds for the acquisition, restoration, and enhancement of wildlife habitat and natural areas. Eligible projects include acquisition and restoration of: deer and mountain lion habitat; rare, threatened and endangered species habitat; wetlands, riparian, and anadromous fish and trout habitat; and urban trail and wildlife corridor projects. Each year, \$2 million is available for four of the six project types on a revolving basis. Only local public agencies are eligible to apply, although non-profits are encouraged to participate as partners. A 50/50 local match is required.

### **LAND AND WATER CONSERVATION FUND**

The Land And Water Conservation Fund is composed primarily of revenue from outer-continental shelf leases and royalties. Although the authorized level of funding annually is \$900 million, Congress appropriates approximately \$225 million for the acquisition of land for conservation by the U.S. Forest Service, Bureau of Land Management, National Park Service, and the U.S. Fish and Wildlife Service.

### **NATIONAL FISH AND WILDLIFE FOUNDATION**

National Fish And Wildlife Foundation funds are available for acquiring significant resource lands for the protection and restoration of sensitive fish, wildlife and plant species within the Wetlands and Private Lands and Wildlife and Habitat Initiatives. Other programs eligible for funding include Conservation Education, Fisheries Conservation and Management, and Neotropical Migratory Bird Conservation. Federal, state, and local agencies and non-profits may apply.

### **NORTH AMERICAN WETLANDS CONSERVATION ACT**

The North American Wetlands Conservation Act (NAWCA) provides federal funds specifically to “conserve North American wetland ecosystems and waterfowl and the other migratory birds and fish and wildlife that depend on such habitats.” Eligible projects include acquisition and restoration of wetlands, among other activities.

## **PARTNERS FOR WILDLIFE HABITAT RESTORATION PROGRAM**

The Partners for Wildlife Habitat Restoration Program provides technical and financial assistance to private landowners through voluntary cooperative agreements in order to restore formerly degraded wetlands, native grasslands, riparian areas, and other habitats to conditions as natural as feasible. Under cooperative agreements, private landowners agree to maintain restoration projects as specified in the agreement but otherwise retain full control of the land. To date, the Partners for Wildlife Habitat Restoration Program has restored over 360,000 acres of wetlands, 128,000 acres of prairie grassland, 930 miles of riparian habitat, and 90 miles of instream aquatic habitat.

## **PUBLIC RESOURCES ACCOUNT OF THE CIGARETTE AND TOBACCO PRODUCTS SURTAX FUND (PROPOSITION 99)**

Proposition 99 provides funds for fish habitat restoration. Through the initiative process in 1988, Californians levied a tax on tobacco products and created the Cigarette and Tobacco Products Surtax Fund. Because of legal constraints, Proposition 99 funds are not available for fish rearing activities. Proposition 99 funds are directed toward habitat restoration projects only, based on the wording of Revenue and Taxation Code Section 30122(b)(5)(A), which governs expenditure of these funds. Because of the current imperiled condition of coho salmon stocks, highest priority for proposition 99 funds allocated for each target drainage have been given to projects in the drainages for coho salmon habitat restoration.

## **RESOURCE CONSERVATION AND DEVELOPMENT PROGRAM**

The Resource Conservation and Development Program was initiated in 1962 to help people care for and protect their natural resources to improve an area's economy, environment, and living standards. The program provides a way for local residents to work together and plan how they can actively solve environmental, economic, and social problems facing their communities. Assistance is available for planning and installation of approved projects specified in Resource Conservation and Development area plans, for land conservation, water management, community development, and environmental enhancement.

## **SPORT FISH RESTORATION PROGRAM**

The Sport Fish Restoration Program supports projects that restore and manage sport fish populations for the preservation and improvement of sport fishing and related uses of these fisheries resources. Approvable activities may include land acquisition, development, research, coordination, and education.

## **TRANSPORTATION ENHANCEMENT ACTIVITIES PROGRAM**

The federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) requires that states spend a minimum of 10% of their Surface Transportation Program funds on "transportation enhancements" or conservation-related projects such as the acquisition of scenic lands, easements, and historic sites, construction of bicycle trails, and archeological/historic preservation. Eligible projects must relate to a transportation facility and be above and beyond normal transportation projects or mitigation. Non-federal matching funds are required. State, local, and federal agencies and non-profits are eligible to receive funding, although they are encouraged to submit joint applications.

## **WILDLIFE CONSERVATION AND APPRECIATION PROGRAM**

The Wildlife Conservation and Appreciation Program provides grants to fund projects that bring together USFWS, State agencies, and private organizations and individuals. Projects include; identification of significant problems that can adversely affect fish and wildlife and their habitats, actions to conserve species and their habitats, actions that will provide opportunities for the public to use and enjoy fish and wildlife through nonconsumptive activities, monitoring of species, and identification of significant habitats.