



Master Plan

Tuolumne River Regional Park

December 2001



Master Plan

Tudumne River Regional Park

***Prepared for the Joint Powers Authority:
City of Modesto, City of Ceres, Stanislaus County***



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Legion Park

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Black-crowned night heron

UC Berkeley, Digital Library Project, Gerald and Bluff Coors



Chapter 1: Introduction

The Tuolumne River is one of the most significant natural resources in California's Great Central Valley. From its headwaters in the Sierras in Yosemite National Park to the San Joaquin River, the Tuolumne is the largest tributary of the San Joaquin River. It is almost impossible to express the significance of the Tuolumne in every aspect of life in Stanislaus County. The river brings water and power to homes and businesses and, along with other rivers in the San Joaquin-Sacramento system, supports an agricultural region of significant wealth and productivity. The river is a defining feature of the landscape: a sinuous watery ribbon meandering its way across the valley floor; an oasis of green in an arid environment. The river supports a diverse biological community, including resident and migratory birds and wildlife as well as the largest naturally reproducing population of chinook salmon remaining in the San Joaquin Valley. The river is also an awesome force of nature. In 1997, heavy rains and snowmelt caused catastrophic flooding of the Lower Tuolumne in the vicinity of Modesto. The 1997 flood has initiated multi-year studies, by the U.S. Army Corps of Engineers and others, that address the flood conditions on the Tuolumne and the larger San Joaquin River system.

Despite its significant presence within the region, the Tuolumne River is not a resource that can be easily enjoyed by the public. The river is often inaccessible in rural areas, bounded by agricultural fields that are cultivated up to the riverbank. Its presence is also hidden within the urban landscape. Glimpses of the river can be gained while travelling over vehicular bridges, but access points to the water are limited. Rather than building upon the river corridor to define a unique regional identity, the mighty Tuolumne has become more of an incidental element.

As long as 40 years ago civic leaders in Stanislaus County began acquiring land along the Tuolumne with a vision that the river could become an important focus for life in the region. This land has been set aside as the Tuolumne River Regional Park (TRRP). Today, the TRRP consists of over 500 acres of land along a seven-mile stretch of the river generally bounded

Tuolumne River Regional Park Master Plan

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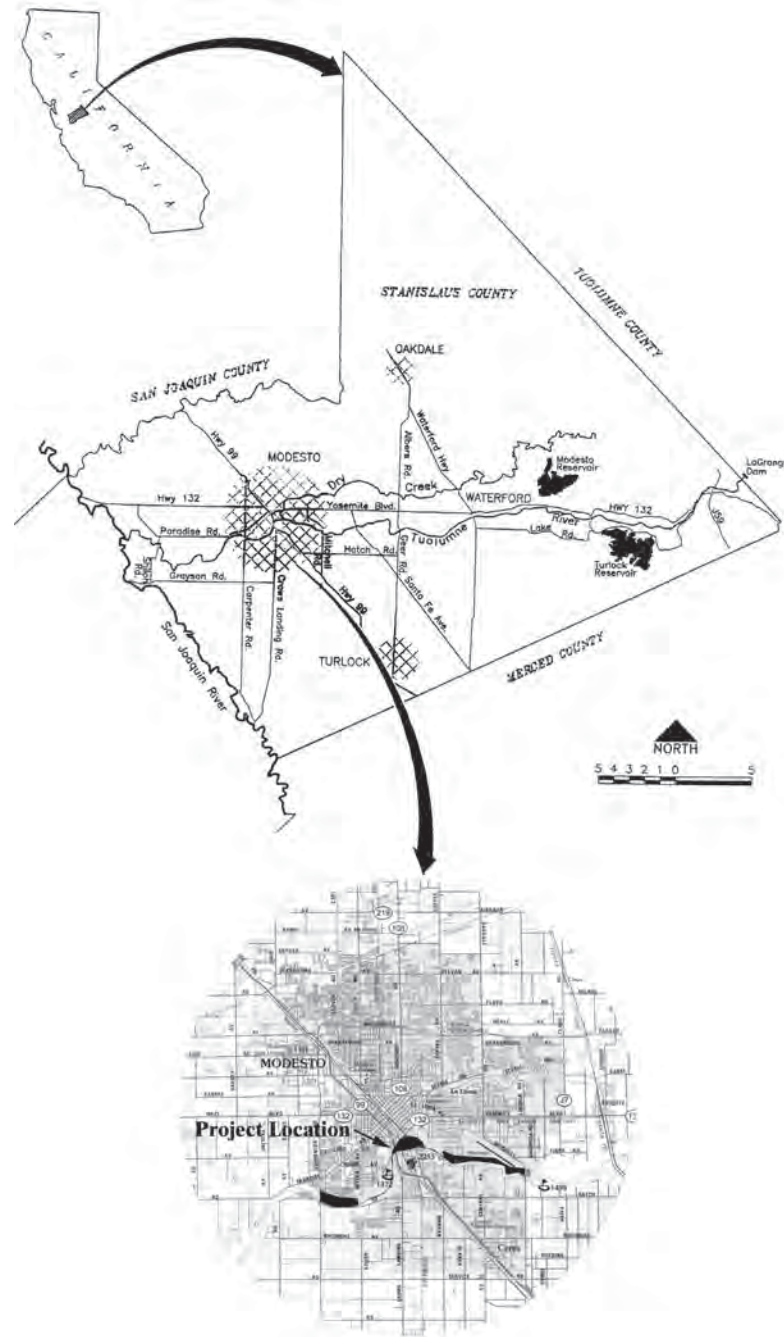


Figure 1: Tuolumne River Regional Park - Location

by Mitchell Road to the east and Carpenter Road to the west. Of the land acquired by the TRRP Joint Powers Authority (comprised of Stanislaus County and the Cities of Ceres and Modesto), only approximately 180 acres have been developed for recreational purposes. In 1995, the TRRP Joint Powers Authority acquired a pivotal property along the park corridor. This remnant walnut orchard at the foot of 10th Street, referred to as the “Gateway Parcel,” completed the missing link in the chain of park land along the Tuolumne and provided significant focus to the regional park.

Purpose of the Tuolumne River Regional Park Master Plan

This Master Plan represents a comprehensive update to the master plan that was prepared in 1968 for the Tuolumne River Regional Park. The new Master Plan builds on many of the ideas set forth in the 1968 plan, with respect to environmental awareness, while also responding to contemporary environmental practices, recreational preferences, and issues of regulatory compliance. The new Tuolumne River Regional Park Master Plan will provide a long-range vision for the park and will guide the Tuolumne River Regional Park Commission in undertaking projects that will enhance the recreational amenities, environmental values, and educational and interpretative programs of the park. This Master Plan is intended to provide the overall guidance for the conservation and improvement of the park; however, a more refined design of each of the park’s planning areas will be undertaken in the future.

TRRP Master Planning Process

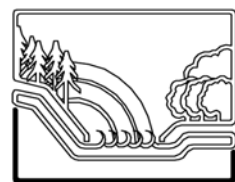
This Master Plan was prepared through an interactive process that involved the public as well as representatives of local, regional, state, and federal agencies. Over an approximate 12-month period, day-long workshops were held at key junctures in the plan development process to gather input and suggestions for the Master Plan. A series of working papers, covering a range of topics, were prepared to set the foundation for the Master Plan concepts. Paper topics included an evaluation of the 1968 Master Plan and associated documents, an examination of existing conditions, a preliminary identification of goals for the park, and a compilation of appropriate recreational and educational elements.

Public workshops were held to gather ideas and suggestions from the community and to present plans for the park. Members of the public were asked to brainstorm ideas, comment on preliminary concepts, and refine elements related to the conservation, recreation, and educational aspects of the park. Similarly, members of local, state, and federal agencies were asked to provide input into the development of the plan.



Public workshops allowed local residents to participate in the TRRP planning process.

City of Modesto



Tudumne River Regional Park Illustrative Plan

TRRP Joint Powers Authority and EDAW, Inc.

in association with McBain & Trush, Stillwater Sciences, and HDR Engineering Inc.

Figure 2



The TRRP Master Plan includes river overlooks that will provide visual access to the water while protecting the sensitive banks from foot traffic.

Preliminary Goals and Objectives

Preliminary goals and objectives for the TRRP Master Plan were prepared at the outset of the planning process to provide overall guidance for the design and management of the park. These goals are summarized below.

Overall Goals

- Create a park where the recreational experience is oriented towards and compatible with the Tuolumne River, its water, natural resources, and processes.
- Provide a park that is a source of pride for the citizens of Stanislaus County and reflects and accommodates the County's diverse peoples and cultures.

Land Use and Recreation

- Design areas within the park to accommodate multiple purposes and changes in recreational preferences over time, wherever possible.
- Expand the park and its trail system to the east and west, and within its current reach, as land becomes available.
 - Develop priorities for the acquisition of new park land and trail easements.

- Create active and passive areas within the park.
 - Focus the passive activities on the linear and more natural portions of the park, east and west of the Gateway Parcel.
 - Focus the more active, people-intensive activities on the Gateway Parcel, where vehicular access is good and the noise and intensity of these uses will not be disruptive to the passive areas of the park.
- Provide universal access to the variety of recreational experiences and natural resources located within the park.
 - Design all facilities to ADA standards.
- Develop adequate support facilities for activities within the park, including restrooms, drinking fountains, barbecues, picnic tables, garbage cans, lighting, signage, and parking.
- Consider the natural forces influencing the site, including potential flooding, prevailing winds, sun orientation, and topography.
 - Avoid locating permanent structures in the floodplain, when possible.
 - Investigate flood-tolerant building types and materials that may be used for structures to be located in the floodplain.
 - Incorporate energy conservation measures and alternative energy production techniques into structures wherever possible.

Circulation and Parking

- Create identifiable park entrances.
- Provide adequate circulation, free of modal conflicts, throughout the park in order to accommodate pedestrians, bicyclists, and vehicles, as well as equestrians and boaters, if appropriate.
- Provide opportunities for park access via public transportation.
- Provide a continuous trail linkage throughout the park that includes a range of experiences.
- Provide vehicular and pedestrian connections to the park that are direct and user-friendly.
 - Identify potential access points to the park from the City of Ceres
 - Provide connections to downtown Modesto.
- Provide adequate parking for park activities.

Vegetation

- Protect and enhance sensitive habitats and natural areas, including wetlands and riparian corridors.
 - Restore native riparian vegetation along the river's edge in areas of the park where it is degraded or missing.
 - Preserve and enhance stands of existing mature trees.
 - Emphasize native vegetation in park landscaping.
 - Eradicate non-native, invasive species where possible.

Wildlife

- Preserve and enhance existing wildlife habitat areas.
 - Protect and preserve important wildlife habitat features such as mature trees with cavities, downed trees, and snags where they do not conflict with public health and safety issues.
 - Maintain and enhance wildlife corridors.

Aquatic Resources

- Protect and enhance aquatic species and habitat.
 - Promote healthy, diverse riparian and wetland vegetation that provides shade, cover, and nutrients necessary for support of the aquatic community, including salmon spawning, rearing, and feeding.

Hydrology and Water Quality

- Promote a flood management program that provides protection from catastrophic flooding and contributes to the ecological values of the river corridor.
- Improve water quality to protect public health and ensure a healthy aquatic community.
 - Minimize or eliminate the use of pesticides and fertilizers that may run off into the river.
 - Maintain or restore streambanks to minimize erosion and siltation of the river.
 - Treat stormwater runoff onsite using constructed wetlands and vegetated swales where possible.



Snowy egret in flight

McBain and Trush



Coyote

California Dept. of Fish and Game



California poppy

Education and Interpretation

- Develop and support public information and educational programs that emphasize individual and community responsibility for resource protection and conservation, and foster an appreciation for the natural resources, history, and water quality of the park and the river.
 - Encourage scientific study of the river and its resources.
 - Develop natural resource education programs for school age children.
 - Develop an interpretive program highlighting the importance of the Tuolumne River in the overall Bay-Delta and San Joaquin Basin ecosystems.
 - Develop interpretive programs emphasizing the anadromous fish life cycle.
 - Organize community work days dedicated to park and river clean-ups, the planting of new vegetation, resource monitoring, and other enhancement and restoration projects.
 - Develop public information brochures and maps.
- Develop an identifiable and comprehensive program of park signage and graphics.

Historical and Archaeological Resources

- Preserve and protect historical and archaeological resources within the park.

Outreach and Coordination

- Establish and maintain cooperative and coordinated relationships with public agencies, applicable public interest groups, and local, neighborhood, and community groups.

Park Management

- Assure the safety and security of park visitors.
- Maintain appropriate staff levels and equipment for adequate park maintenance.
- Provide visitors with a clean and attractive park environment along its entire length.

Relationship to the California Environmental Quality Act

A Master Environmental Impact Report (EIR), pursuant to the requirements of California Environmental Quality Act (CEQA), is being prepared to analyze the potential impacts of this Master Plan and identify appropriate mitigation measures. The Master Plan and the environmental document have been prepared in close coordination with one another; thus, many aspects of the plan mitigate or improve environmental conditions of the Tuolumne River Regional Park.

The Master EIR will assess the implications of the TRRP Master Plan proposals. As this is a very long-range plan, there will be additional design work that will be completed before the park improvements are implemented. Some of these more specific designs will be within the scope of this EIR; others will not and will require additional, focused environmental studies. If the Joint Powers Authority determines, based on an Initial Study, that a proposed subsequent project will have no additional significant effect on the environment that was not identified in the Master EIR, then the JPA shall make a written finding based on the Initial Study that the subsequent project is within the scope of the project covered by the Master EIR. No new environmental documentation or findings shall be required in this case. Conversely, if a finding is made that the proposal may cause a significant environmental effect not studied in the Master EIR, subsequent focused environmental documentation will be prepared.

Background Reports

This Master Plan is based on data collected in a series of technical memoranda, prepared as background reports, including:

- *Technical Memorandum #1: Plan Summary and Critique*, EDAW, McBain and Trush, Stillwater Sciences and HDR Engineering, September 1999.
- *Technical Memorandum #2: Findings and Impressions*, EDAW, September 1999.
- *Technical Memorandum #3: Preliminary Park Program*, EDAW, September 1999.
- *Technical Memorandum #4: Environmental Setting*, EDAW, McBain and Trush, Stillwater Sciences, and HDR Engineering, October 1999.
- *Technical Memorandum #5: Summary of Opportunities and Constraints*, EDAW, November 1999.



UC Berkeley, Digital Library Project, Gerald and Buff Corsi

A California ground squirrel forages in meadow grasses.

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Chapter 2 Issues and Opportunities

Existing conditions around the Tuolumne River Regional Park (TRRP) and the Gateway Parcel pose issues and opportunities that affect the park's development and have shaped the current master plan. A summary of these issues and opportunities is given below. For a more detailed assessment of existing conditions, please refer to TRRP *Technical Memorandum #4* and *Technical Memorandum #5*.

Context: Regional Open Space System

Tuolumne River Regional Park will be the crown jewel in the Stanislaus County regional park system. Comparable in scope to Frederick Law Olmsted's Emerald Necklace park system near Boston and other major regional parks across the country, the TRRP will unite the surrounding region through the natural landscape. The TRRP's restoration work and park enhancements will showcase the magnificent Tuolumne River and bring it into the hearts and minds of people throughout the region.

The TRRP is intended to serve residents of Stanislaus County. The park's development presents a significant opportunity to enhance the existing regional open space network and provide focus to the system. The seven-mile riverfront TRRP will connect many of the recreational areas in Stanislaus County. For example, the new TRRP Riverwalk, a paved pedestrian and bicycle path, presents exciting opportunities to link to the Dry Creek Parkway, the Hetch Hetchy right-of-way, and other greenways in the area, existing and planned. Such a system would create a network of Class I (off-street) bicycle and pedestrian paths that would be an attractive alternative means of transportation, while enhancing livability throughout the region. The Tuolumne River extends for many miles beyond the proposed park. Expanding the park boundaries to the east and west in the future would provide additional park access for residents throughout the county.



1888 bird's eye rendering of Stanislaus County

Land Use and Planning

Land use patterns in the areas surrounding the Tuolumne River have changed dramatically over the last few hundred years. Before European-Americans came to the Central Valley, the Yokut tribe and other Native American groups hunted in the woods, fished in the river, and collected foods and fibers that grew along the river's banks. By the 1830s and 1840s, large Spanish and Mexican missions and ranches were established in the Central Valley. Cattle grazed the land near the lower Tuolumne River. As Gold Rush miners arrived during the late 1840s, the Tuolumne was used more and more during the high water season for steamboat transportation. Mining operations upstream soon clogged the river with silt, inhibiting most commercial traffic. After the Civil War ended in the mid-1860s, land near the river was cleared of its native vegetation and converted to farmland to take advantage of the fertile soils created by the river. In the twentieth century, the practice of clearing the riparian forest accelerated, until very little tree cover remained next to the river (Dahlin, 1997).

Land use and planning responsibilities in the areas surrounding the TRRP are currently divided into a mosaic of three different jurisdictions: the City of Modesto, the City of Ceres, and Stanislaus County. Figure 3 illustrates the interconnected boundaries of these jurisdictions. The TRRP is within the jurisdiction of Stanislaus County and the City of Modesto, but development of the park is a collaborative undertaking shared by the three governing bodies. The TRRP is owned by all three agencies.

As Figure 2 (page 3) illustrates, the TRRP corridor varies in width along the river. The widest portions of the park are at either end and in the centrally located Gateway Parcel. The TRRP presents an opportunity to unite these core areas with a continuous trail along two narrow riparian corridors near Dryden Municipal Golf Course, Modesto Municipal Golf Course, and the Gallo Property.

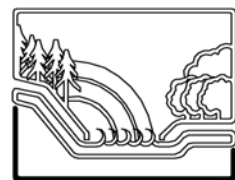
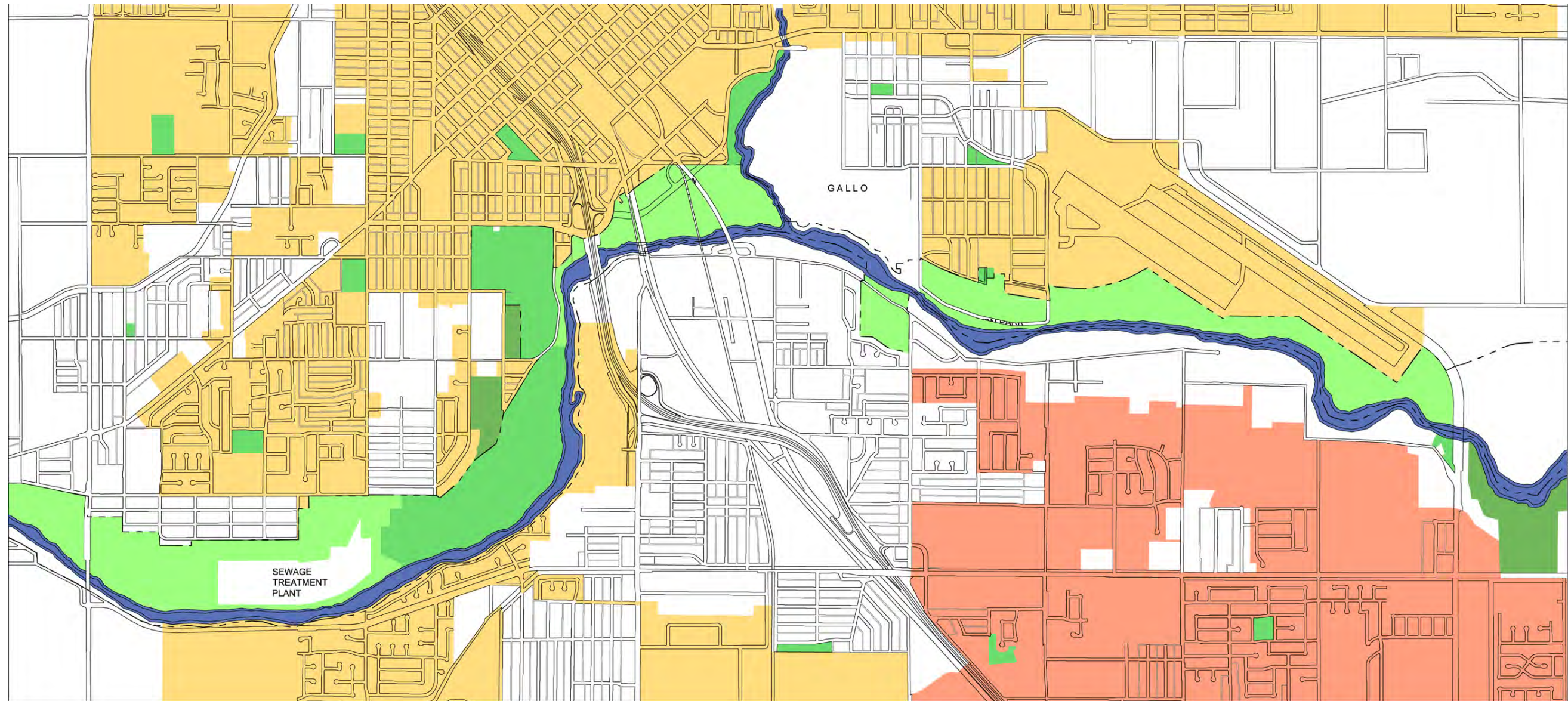
The Tuolumne River has been the County's "back door" in the past, historically serving both as a transportation backbone and waste disposal system for the region. A mix of residential,

commercial, industrial, and agricultural land uses now reach right up to the river banks in some places and surround the TRRP. The park will link all of these areas together and improve bicycle and pedestrian circulation between them. Over the long-term, there is the opportunity to reorient adjoining land uses to the river park corridor to reinforce its role within the urban fabric, heighten awareness of the river, and, in so doing, turn the Tuolumne River into the County's "grand entrance." Over time, this may involve redevelopment of commercial and industrial uses adjacent to the park.

There are also several adjacent land uses that require special consideration. A closed landfill is present on the western end of the park near Carpenter Road. Before this portion of the park is developed for public access and recreational purposes, a closure plan must be prepared in compliance with California state law (Postclosure Land Use, CCR Title 27, Section 21190).

The Modesto City/County Airport lies at the eastern end of the park. Park planning should proceed in accordance with airport regulations regarding flight path considerations, as set forth in the Vegetation Management Plan for the Modesto City-County Airport and Adjacent Tuolumne River Interface. Consequently, large group gathering areas will not be constructed in this portion of the park. This area is more suitable for quiet, small group, nature appreciation activities due to the presence of an important gallery forest of mature valley oaks. It is also likely that tree canopy heights along the flight path will need to be monitored to keep them out of the airport's air space, over time.

Although most of the TRRP will be located on the Tuolumne River's north bank, several narrow strips of land along the south bank, as well as Mancini Park, will also be included as part of the park. In the future, these areas could be expanded to improve access to the TRRP from the south side, perhaps through an extension of the park's trail system. On this side of the river, available land is very scarce and park expansion will be somewhat difficult. Outside of the TRRP land, homeowners along the south bank should be encouraged to take part in the restoration work in their riverfront backyards. Such restoration could strengthen their often steep and eroding slopes and help to provide much-needed shade for the aquatic habitat below.



Tuolumne River Regional Park Planning Jurisdictions
TRRP Joint Powers Authority and EDAW, Inc.
in association with McBain & Trush, Sillwater Sciences and HDR Engineering Inc.



Planning Jurisdictions

- TUOLUMNE RIVER REGIONAL PARK (TRRP)
- CITY PARKS
- PRIVATE GOLF / ACTIVE RECREATION
- CITY OF MODESTO GREENWAY
- CITY OF MODESTO
- CITY OF CERES
- STANISLAUS COUNTY

Figure 3

Hydrology and Water Quality

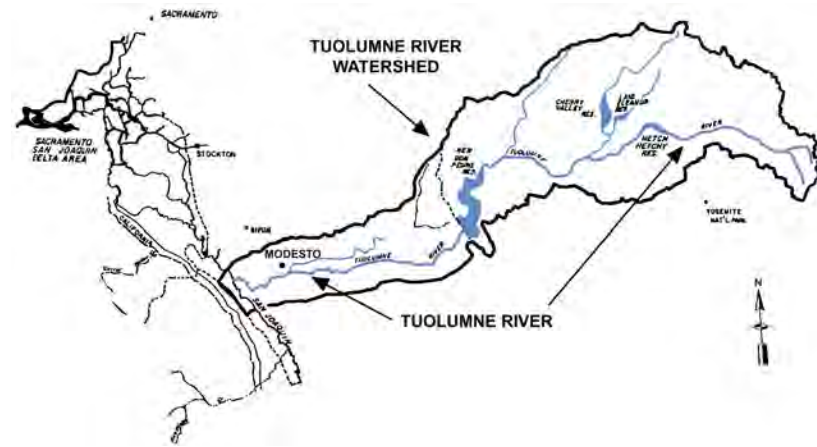


Figure 4 Tuolumne River Watershed

The Tuolumne River is one of the most important natural resources of California's Central Valley. The largest tributary of the San Joaquin River, the Tuolumne drains a 1,960 square-mile watershed that includes the northern half of Yosemite National Park. (Figure 4) The Tuolumne River watershed is located between the Stanislaus River Basin to the north and the Merced River Basin to the south. Stanislaus County contains most of the Lower Tuolumne River, a 52-mile reach, from La Grange Dam to its confluence with the San Joaquin River. As the Tuolumne River emerges from the Sierra Nevada foothills into the Central Valley, it carries precious agricultural, ranching, mining, and municipal water supplies to a highly developed and diversified regional economy (McBain and Trush, 2000). The river also supplies drinking water to 2.3 million people in four counties of the San Francisco Bay Area, via the 152-mile long Hetch Hetchy Aqueduct (FERC, 1996).

As is typical for rivers originating in the Sierra Nevada mountains, the peak annual flows of the Tuolumne River usually occur in the late spring and early summer months, fed by snowmelt runoff. Winter storms can also create high flows, generally of shorter duration. The unimpaired flow levels of the Tuolumne vary greatly from year to year.

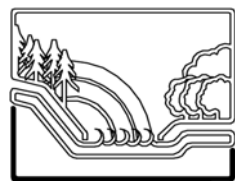
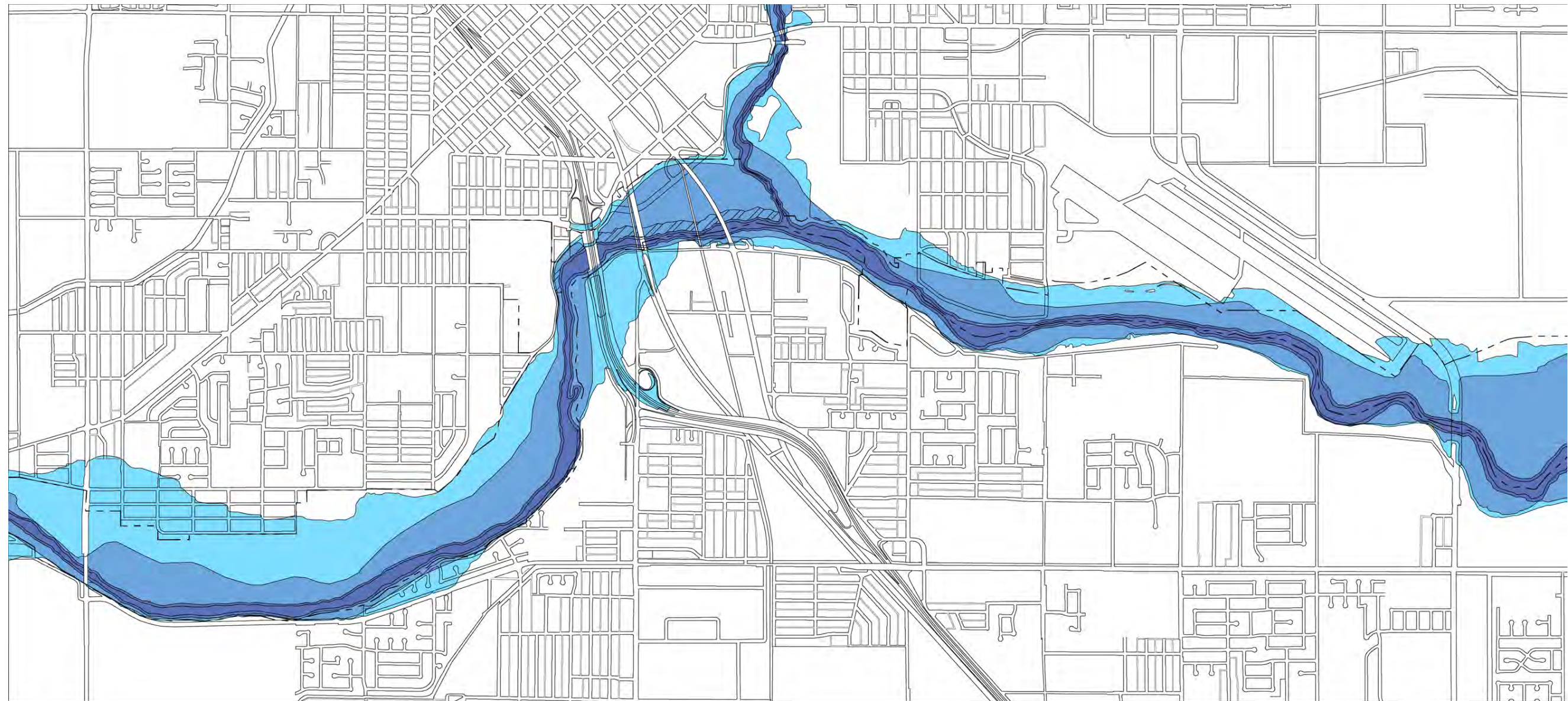
Prior to major human settlement and land development in the Central Valley, the lower Tuolumne River was a dynamic, meandering alluvial river, with broad floodplains and terraces, large gravel bar deposits, and extensive riparian wetlands and forests harboring a rich diversity of species. In its natural state, the Tuolumne River had the ability to frequently move its riverbed and banks, scour coarse sediments and transport them downstream, and replace them with comparable material transported from upstream. In this way, the shape of the river channel was maintained in a state of "dynamic equilibrium" by the force of running water. This condition provided the

physical foundation of the riverine ecosystem upon which native plant and animal communities depend for their survival (McBain and Trush, 2000).

The channel, floodplain, and flow levels of the Tuolumne River have changed substantially over the last two hundred years as the result of human activities. The operation of gold dredgers, the extensive gravel mining in the active channel and floodplain, and the encroachment of agriculture and urban development into the riparian zone have reshaped the riverbed, banks, and floodplain, turning many parts of the formerly active river into virtual lakes, alien environments for many of the native plant and wildlife species (FERC, 1996).

In addition to these urban and industrial impacts, the Tuolumne River also has a long history of streamflow regulation and diversion, dating from the mid-1800s. Presently, over half of the 1.9 million acre-feet of runoff in the Tuolumne River basin is diverted from the river for agricultural and municipal use each year (McBain and Trush, 1999). La Grange Dam, the first major dam on the Tuolumne River, was built in 1893 at river mile (RM) 52.2 in order to regulate the river for flood control and water supply purposes for the Turlock and Modesto Irrigation Districts (TID/MID). Most of the Tuolumne's dams, reservoirs, and water control structures are now located on the Upper Tuolumne River, above RM 52.2. Increased demands for water resulted in the construction of the Don Pedro Dam in 1923, which was replaced by the New Don Pedro Project in 1971. From 1970 to 1996, flow levels of the Lower Tuolumne River were managed by the New Don Pedro Dam at levels below "critically dry" so that most of the water could be used for agricultural and urban purposes. This has had disastrous consequences for the native salmon fishery and other wildlife.

This collection of water control structures has dramatically altered the historic flow levels and flood regimes, creating a much more regulated and (somewhat) more predictable flood pattern. On January 4, 1997, the flow of the Tuolumne River,



Tudumne River Regional Park Flooding and Hydrology

TRRP Joint Powers Authority and EDAW, Inc.

in association with McBain & Trush, Stillwater Sciences and HDR Engineering Inc.



Flooding and Hydrology

- TUOLUMNE RIVER CHANNEL
- 100 YEAR FLOODWAY (1999)
- 100 YEAR FLOODPLAIN (1999)

SOURCE: FLOOD HAZARD MITIGATION STUDY FEMA 1999

Figure 5



The January 1997 flood inundated portions of the TRRP and many surrounding streets. The image above, taken near the TRRP, and the aerial photograph below, centered on the Gateway Parcel, show the magnitude of the flooding.

combined with the volume of water already stored in the New Don Pedro Reservoir, surpassed the capacity of the reservoir and flooded Modesto with a 56,000 cfs flow at the 9th Street gauging station. Floodwaters filled the TRRP and some of the surrounding neighborhoods. With the exception of the 1997 flood, the New Don Pedro Reservoir has limited the maximum flood stage at the Modesto gauging station to a level 12 feet lower than the previous historical record. In so doing, it has altered the hydrologic processes that had been responsible for shaping the channel and maintaining its vital biological systems (McBain and Trush, 2000).

The Federal Energy Regulatory Commission (FERC), previously known as the Federal Power Commission, issued the original New Don Pedro Project (NDPP) license in 1964 (FERC Project No. 2299-024). This license required TID/MID to release minimum streamflows to protect the native chinook salmon populations. The NDPP license also required FERC to re-evaluate the project's minimum streamflow requirements after 20 years of operation. FERC initiated this evaluation in 1992 and prepared a Final Environmental Impact Statement in compliance with the National Environmental Policy Act (NEPA). The first ever FERC-initiated mediation process resulted in adoption of the 1995 FERC Settlement Agreement. The FERC Settlement Agreement participants included TID/MID, the City and County of San Francisco and other water suppliers, state and federal resource agencies, and several environmental groups. The Agreement revised streamflow requirements, required habitat restoration to improve conditions for chinook salmon, and ordered additional fishery studies to evaluate flow and non-flow measures.

Implications for the TRRP

The creation of a new TRRP master plan presents a variety of opportunities to restore some of the lost hydrological processes that are vital to the river and its biological communities. Such opportunities include: potential restoration of the flow levels released from the upstream dam (if required by the FERC Settlement Agreement or another authority); revegetation of the banks with native riparian forest vegetation to improve fish and wildlife habitat; and the use of the TRRP both as a recreational park and as a functioning river floodplain.

Since the Tuolumne River has a natural tendency to flood, particularly during wet winter and spring weather, land uses and facilities within the park must be able to withstand and accommodate this flood pattern. For all practical purposes, structures cannot be planned within the FEMA designated 100-year floodway, shown in Figure 5 on the previous page. New park uses must be consistent with the requirements of FEMA and the California Reclamation Board. This flood pattern also presents an opportunity for expanding the park in the future by incorporating additional adjacent land that is chronically flood-prone.

Dry Creek and the Tuolumne River (particularly below the confluence with Dry Creek) have persistent water quality problems generated by upstream land uses. An unregulated stream, Dry Creek is the main tributary of the Tuolumne River downstream of New Don Pedro Dam and Reservoir. It joins the Tuolumne from the north, along the eastern edge of the Gateway Parcel. Dry Creek drains a largely agricultural and urban watershed of approximately 192 square miles. Since this watershed contains large cattle grazing areas directly adjacent to the waterway, Dry Creek is a major contributor of fine sediment to the Tuolumne River. The water quality in the Tuolumne River is visibly impaired by Dry Creek's muddy effluent below the confluence (U.S. Army Corps of Engineers, 1998).



Water quality issues for the river also arise due to stormwater runoff from the adjacent urban and agricultural areas, bringing nonpoint source pollutants into contact with the river's ecosystems. The park design presents an opportunity to improve this situation through the inclusion of stormwater wetlands and vegetated swales that use native plants to partially purify the runoff before it enters the river.

Overall, the Tuolumne River is a tremendous local resource for hydrology-related interpretation and education, exploring both the natural river system and the impacts of man's developments on the river's natural processes. The TRRP presents an opportunity to celebrate the river and to use it as an asset for recreation as well as natural resource conservation.

Biological Resources

An enormous biological community depends on the Tuolumne River and its surrounding riparian environment. The term "riparian" describes the unique physical environment and associated plant communities along the banks of freshwater bodies, watercourses, estuaries, surface-emergent aquifers, and adjacent areas. Streamflow and groundwater in these areas provide greater soil moisture than is available from local rainfall and allow these special places to support water-loving vegetation.

Before the Gold Rush era of the late 1840s and early 1850s, lush riparian forests along the Tuolumne River were created and maintained by complex interactions between the river's physical processes and the individual tolerances of each plant species. The magnitude and timing of flows and floods, groundwater table fluctuations, changes in the shape and size of the channel, sediment deposition on floodplain terraces, and the transportation of woody debris all affected the growth of riparian plant species and the composition of the aquatic

community, and helped them to flourish. Vast forests of Fremont cottonwood, valley oak, western sycamore, and Oregon ash once protected the Tuolumne River's banks and floodplains, extending several miles wide in the lower San Joaquin Valley, and merging into the riparian forests of the neighboring Merced, Stanislaus, and San Joaquin rivers. Vines often stretched from the tree canopies above to the thick vegetation on the forest floor. Alder trees and a variety of willows blanketed the edges of the active river channel where the moving water constantly rearranged the landscape. These riparian woodlands provided foraging and breeding habitats for a diverse array of resident and migratory bird and wildlife populations, including tremendous populations of migratory waterfowl that often filled the sky (McBain and Trush, 2000).

As discussed above, industrial, urban, and agricultural land uses surrounding the river, as well as upstream dams and reservoirs, have applied great pressure to riparian forests over the last two hundred years. At present, less than 15% of the historical riparian forests remain along the Tuolumne River. In many places, the forest has been cleared almost all the way to the riverbanks. Dams now capture the majority of the large floods and their sediment loads and change the timing and quantity of water that is released for the vegetation, fish, and wildlife. These interrelated issues have substantially reduced plant growth and riparian biodiversity. For example, the new pattern favors willow species over other native trees such as cottonwoods, allowing them to dominate rather than share the river's edge. These hydrological changes and resulting loss of tree regeneration and diversity have reduced wildlife habitat in and along the river, causing wildlife populations to plummet (McBain and Trush, 2000).

The Airport Area of the TRRP holds the largest remaining contiguous stand of mature valley oak trees on the lower 24-mile stretch of the Tuolumne River (McBain and Trush, 2000). This beautiful, slow-growing gallery forest is one of the most precious resources in the TRRP, particularly because these trees have almost disappeared from the Tuolumne's banks



The Airport Area of the TRRP holds the largest remaining, contiguous stand of mature valley oak trees on the lower 24-mile stretch of the Tuolumne River. These majestic trees are one of the park's many assets.



California Department of Fish and Game

Great blue herons and many other birds make their home in and around the Tuolumne River.

outside the park. It is important to protect these trees during the project's construction and to keep summer irrigation away from their delicate, fungus-prone root systems. In addition to valley oaks, mature Fremont cottonwoods, Oregon ash, western sycamore, and box elder trees should be preserved within the park, as they are also important components of riparian woodlands. To further enhance the park's biological integrity, non-native riparian vegetation could be removed within the TRRP and replaced with native riparian species throughout the park.

Despite the habitat losses along the river, the Tuolumne River still supports the largest naturally reproducing population of fall-run chinook salmon in the San Joaquin Valley (McBain and Trush, 2000). The life of a salmon begins in the gravel beds of rivers like the Tuolumne. In the late fall, salmon eggs are laid and fertilized in small patches of carefully groomed river-bottom gravel called "redds." Sixty to ninety days later, salmon "alevins" hatch from their eggs and remain in the gravel for several weeks as they grow and absorb their yolk sacs. The small fish "fry" then seek shelter in the river's water column and protective vegetation. In late winter and early spring, the juvenile fish start to migrate to the San Francisco Bay delta, leaving the Tuolumne River in April or May. They then generally spend two to five years living in the ocean and then return to the river they were born in to spawn and die, completing their life cycle (McBain and Trush, 2000).

Fall-run chinook salmon and other native fish are important components of the Tuolumne River ecosystem and part of the foundation of the Bay Area's ocean fishing industry. At least thirty-eight species of fish, fourteen of them native to the area, have been observed in the Tuolumne River since 1981 (Brown and Ford, 1992). The restoration components of the TRRP present a wonderful opportunity to enhance the river's aquatic habitat and increase the abundance of native fish. Salmon

and most other native fish prefer cool water, so the shade from overhanging vegetation is very important. Plants that grow along the edges of the river also provide places for fish to hide from predators.

Many wildlife species are currently present in and around the Tuolumne River. Riparian and floodplain habitats in the Central Valley support at least 50 amphibian and reptile species, 147 bird species, and 55 mammal species (Mayer and Landenslayer, 1988). The Tuolumne River corridor is home to animals such as mule deer, coyotes, opossums, river otters, muskrats, California ground squirrels, garter snakes, and skunks. California quail, great blue herons, snowy and great egrets, and black crowned night herons may also be found along the river (McBain and Trush, 2000). The TRRP presents an opportunity to expand the habitat needed by these majestic and beautiful creatures, while making them visible to park visitors.

The TRRP's natural environment provides an excellent opportunity for ecological education and interpretation. Signage and other amenities, in conjunction with educational and interpretive programs, could educate the public about natural river processes, migrating salmon and other wildlife, and the importance of healthy riparian corridors. The location of the TRRP also provides an opportunity to highlight the unique and important issues that arise where urban populations and natural resources coexist.



California Department of Fish and Game

Opossums are one of the many mammals that live in riparian and floodplain habitats in the Central Valley.

Utilities and Infrastructure

The TRRP is currently served by very small utility and infrastructure systems. There are few water lines for irrigation and plumbing, few electrical connections, and a very small wastewater system. As the park is expanded, it will be necessary to upgrade these utility systems to meet the needs of park users without compromising the ecological integrity or beauty of the park.

Utility systems and infrastructure from abutting land uses greatly affect the character and environmental quality of the park in some places. For example, in its current configuration, the wastewater treatment plant near the west end of the TRRP detracts from the surrounding park land. There is an opportunity to reconfigure the plant somewhat to make it more compatible with the park. Such a reconfiguration could potentially integrate state-of-the-art technology, public artwork, and education to create “waterworks gardens” and educational programs.

Numerous stormdrains throughout the area currently empty near the Tuolumne River. Urban stormdrains are a potential source of water pollution for the river because they frequently drain local streets, parking lots, and other developed areas where nonpoint source pollutant residues build up. New constructed wetlands could be established within the park to purify this stormwater runoff somewhat before it reaches the river. They will also beautify the landscape, attract wildlife, and serve as educational resources.

Circulation

Since the TRRP will be a regional destination, it is important that it be accessible to private vehicles, public transit, bicycles, and pedestrians. It is essential to link the park to existing and planned road and trail networks and to improve movement along the park corridor as well as across it. Currently, there are no direct, continuous east-west routes that serve this purpose. Existing land uses abutting the river block passage or make travel circuitous. It is also very difficult to access the park from the south side of the river. The creation of a continuous riverfront trail along the north side of the river would tremendously improve access through the park, and pedestrian/bicycle bridges across the river will enhance north-south connections. Future park development could also include a similar trail along the south side of the river, if land becomes available, to further enhance southern park access points. The TRRP trail system could also be expanded to the east or west along the river if land becomes available in the future.



A paved streamside pathway in Boulder Creek Park (Boulder, Colorado) allows pedestrians and bicyclists to enjoy the creek corridor.



Chapter 3: Conservation and Open Space

The TRRP Master Plan has been designed with a strong conservation-oriented approach in order to protect and enhance the Tuolumne River and the surrounding unique and beautiful natural resources. The key components of this approach are:

- design strategies consistent with natural hydrologic processes;
- riparian restoration along the Tuolumne River and Dry Creek;
- restoration of riparian terraces along the Gateway Parcel and Carpenter Road Area;
- protection of existing mature forests;
- creation of native plant meadows;
- enhancement of aquatic and terrestrial wildlife habitats;
- ecologically appropriate planting guidelines;
- purification of urban stormwater runoff using constructed wetlands;
- use of ecologically compatible construction materials; and
- adoption of ecologically appropriate maintenance practices.

In addition, the plan also encourages a future redesign of the existing wastewater treatment plant in the western portion of the park so that it will be more compatible with the surrounding river and park land uses.

Design Strategies Consistent with Natural Hydrologic Processes

The flow and flood cycles of the Tuolumne River and Dry Creek have historically shaped the landscape that surrounds them. Dams located upstream from the TRRP have diminished the Tuolumne River's land-moving power, but the park and surrounding neighborhoods are still subject to cycles of increased flows and periodic inundation.

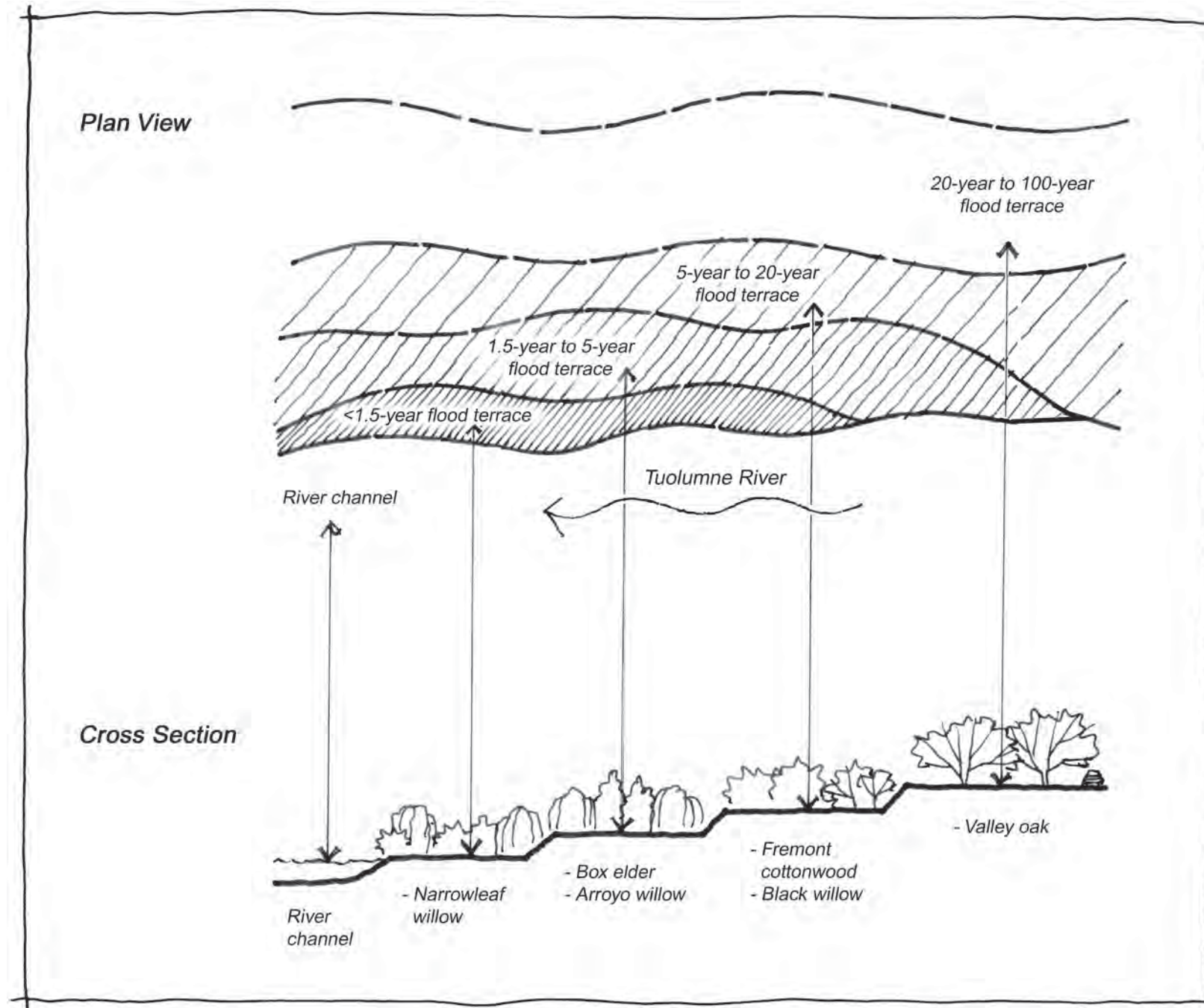


Figure 6 Riparian Floodplain Terraces

The TRRP Master Plan reflects these natural hydrologic cycles. The park is designed to withstand periodic floods and to gracefully handle regular increases in flow levels. The Gateway Parcel, for example, is designed with flood terraces (described in more detail below) that expand flood capacity on the site while enhancing the regeneration of riparian woodland habitats. These riparian forests also naturally serve to help control bank erosion. In addition, the Master Plan generally avoids the construction of permanent structures within the 100-year floodway in order to prevent the flood stage elevations from increasing and impacting the surrounding land uses.

Riparian Restoration

Riparian zones provide multiple benefits to aquatic and terrestrial ecosystems and are widely recognized as centers of biodiversity and dispersal corridors for plants and animals (Gregory et al. 1991). Riparian forests will be enhanced along the entire length of the park, with the exception of the Airport Area, which is already home to a large, mature valley oak forest. The Gateway Parcel will be the focus of the park's riparian restoration efforts and will include a riparian restoration zone at least 185 feet wide. Riparian restoration zones within the park have been designed to follow natural plant distribution patterns. As the plantings mature, the stands will be thinned by the river's normal flow and flood regimes. The goal of the park's riparian restoration zones is to restore the valuable, rich ecological corridor as well as the processes that help to create and maintain it over time.

Floodplain terraces (left) will be constructed along the riparian corridor in the Gateway Parcel and the Carpenter Road Area to restore hydrologic connectivity and create appropriate conditions for riparian vegetation and wildlife.

Restoration of Riparian Terraces

Historical land uses throughout the lower Tuolumne River have eliminated most of the functional floodplains and dramatically reduced riparian vegetation, restricting it to only one tree width in many locations. Fremont cottonwood forests are now generally missing along the lower Tuolumne River. The reduction in contiguous riparian vegetation and its further fragmentation by urban development has, in turn, caused the decline of many bird, animal, and fish species. The opportunity exists in the TRRP's Gateway Parcel to recreate lost habitat, benefiting numerous wildlife species and hydrologically reconnecting the river to its floodplain.

Riparian Vegetation Benefits

Many riparian plant species need specific substrates and hydrologic conditions in order to successfully regenerate on their own (Auble and Scott 1998, Mahoney and Rood 1998, Roe 1958, Scott et al. 1996). Fremont cottonwoods and many types of willows disperse their seeds during and shortly after the annual spring snowmelt runoff peaks (Scott et al. 1993). These species rely on the available substrate during this time to provide the conditions necessary for seed germination. Snowmelt flood recession rates affect groundwater elevations, and, consequently, soil moisture adjacent to the river channel. This is an important factor in determining seedling survival. Studies have shown that cottonwood seedlings cannot survive groundwater drawdown rates exceeding 0.10 feet a day (3-4cm/day) (Segelquist et al. 1993). Therefore, successful seedling recruitment requires not only exposed floodplain surfaces with moist substrate for germination, but also surfaces where seedlings can grow roots down to the summer groundwater and keep up with the snowmelt flood recession and correlated groundwater declines (McBain and Trush 1997, McBain and Trush 1998).

Floodplain terraces will be constructed where possible along the riparian corridor in the Gateway Parcel and the Carpenter Road Area to create places where cottonwoods and willows can naturally establish and develop self-maintaining stands, given adequate hydrologic conditions. These floodplains will provide surfaces that inundate more frequently, restore hydrologic connectivity, and create different hydrologic niches that meet many riparian plant species' initiation and establishment requirements (Table 1). Floodplain terrace construction will greatly increase riparian vegetation through natural regeneration and artificial propagation.

Hydrologic Conveyance Benefits

As riparian plant species naturally regenerate on the constructed floodplains, they could potentially begin to influence flood stage elevations. Current regulatory constraints prevent any change to the predicted 100-year and 500-year recurrence interval flood water surface elevations. Lowering the Gateway Parcel's surface within the 185-foot easement and constructing floodplains will increase the flow conveyance area along the Gateway Parcel. While young riparian vegetation will increase cross section roughness values, slowing the water down, the increased flow conveyance area would partially, or fully, mitigate this situation.

	Recurrence Interval Range	Post-NDPP Magnitudes (cfs) Above Dry Creek	Post-NDPP Magnitudes (cfs) Below Dry Creek	Related Geomorphic Surface	Ideal Gateway Parcel Location
<i>Narrowleaf willow</i>	Summer baseflow to 1.5-year flood	150 to 3,000	150 to 8,000	Pointbars, low water margin	This surface would not be constructed
<i>Box elder/ Arroyo willow</i>	1.5-year to 5-year flood	3,020 to 7,500	8,000 to 10,500	Bankfull floodplain margin	Streamside edge of constructed floodplain
<i>Fremont cottonwood/ Black willow</i>	5-year to 20-year flood	7,500 to 12,800	10,500 to 20,000	Floodplain, low terrace	Patches across constructed floodplain
<i>Valley oak</i>	20-year to 100-year flood	>13,000	>20,000	Low, medium and high terraces	Upland edge of constructed floodplain, and across most of the Gateway Parcel

Table 1: Riparian Terrace Configuration

Table 1 illustrates common plants found along the Tuolumne River, the associated range of discharges that the series falls within, and the recurrence intervals of the discharges pre- and post-New Don Pedro Dam (NDPP). Adapted from McBain and Trush 1998, FEMA 1999.

Cottonwood trees will be planted in patches across the park's floodplain and lower terraces. They are home to many wildlife species.



McBain and Trush



Mature vegetation will be protected near the confluence of the Tuolumne River and Dry Creek.

Protection of Mature Forests

The TRRP is home to the largest contiguous stand of mature valley oak trees in the lower 24 miles of the Tuolumne River (McBain and Trush 1998). This beautiful, slow-growing gallery forest along the river near the Modesto Airport is one of the most precious resources in the TRRP since valley oaks have almost disappeared from the Tuolumne's banks outside the park. Another smaller stand of mature oak trees can be found on the Gateway Parcel near the Tuolumne's confluence with Dry Creek. These trees will be protected from soil compaction and damage during the project's construction phase. In addition, irrigated lawn areas, which promote the growth of a fungus that can kill the trees, have been carefully sited away from the mature oak trees. If irrigation is necessary adjacent to resident oaks, an arborist would be consulted to ensure that impacts to the existing oaks would not occur. In addition to valley oaks, mature Fremont cottonwoods, Oregon ash, and box elder trees will be preserved within the park wherever possible. A variety of bird species already use the existing forests, including: the yellow-billed magpie, the Nuttall's woodpecker, the acorn woodpecker, the Swainson's hawk, and the oak titmouse.

Creation of Native Plant Meadows

Much of the open space within the TRRP will be planted with native wildflower meadow grasses typical of the Central Valley's Great Valley Grasslands. The feathery meadows of California bunch grasses, California poppies, and many other plants will enhance wildlife habitat and beautify the park with subtle colors and textures that wave in the breeze. After a period of initial establishment, the meadows will not be irrigated, allowing them to follow natural patterns of seasonal color change. There are many species of birds and mammals that will benefit from the food sources and cover offered by this enhanced habitat. Ground nesting birds such as quails, lazuli buntings, mourning doves, and burrowing owls will be particularly at home here. A network of small pathways will wind through the meadows, providing recreational access for park visitors.

In some areas of the park, the rich meadow habitats will also be sprinkled with patches of elderberry bushes. These "elderberry savannahs" will provide additional habitat cover and food sources for small mammals, such as ground squirrels, and a variety of birds including warblers and sparrows.



Multi-use meadows will be planted throughout the park.

Wildlife Habitat Enhancement

The TRRP is home to a wide variety of wildlife species, both in the water and on the land. The planned riparian restoration work and increased vegetation on the site will greatly enhance existing aquatic and terrestrial habitat, attracting more wildlife to the park. The canopy of riparian forests benefits fish and wildlife by providing leaf litter to in-stream food webs, large woody debris and shade for fish habitat, and cover and migratory corridors for terrestrial wildlife. Park trails and facilities have been designed to protect the fragile ecosystems while making these educational and recreational resources accessible to the public.

The river provides aquatic habitat for a variety of species, including anadromous fish. Thirty-eight fish species have been identified in the lower Tuolumne River (Brown and Ford, 1992). Of these, twenty-four species do not occur naturally in this area. Several of the non-native fish species, primarily largemouth and smallmouth bass, support recreational fisheries while at the same time posing a management concern because they prey on native species of fish and amphibians, including juvenile chinook salmon (McBain and Trush, 2000).

Chinook salmon are an important management species in the Tuolumne River. The Tuolumne supports the largest population of fall-run chinook salmon in the San Joaquin Basin. The salmon population abundance, however, has fluctuated widely in recent decades, declining severely during prolonged droughts (McBain and Trush, 2000). This has made habitat enhancement efforts even more important. The

riparian corridor restoration work in the TRRP will benefit the salmon and many other species. For example, Dennett Dam, an old concrete weir spanning the Tuolumne River under the 7th Street Bridge, currently poses an obstacle to migrating salmon and other fish and impedes small boat passage. The TRRP Master Plan calls for the removal of this structure in order to improve this situation.

In addition to fish and amphibians, the Tuolumne River and Dry Creek provide aquatic habitat used by bird and mammal species. Representative wildlife species that may forage in or around the Tuolumne River include river otters, ospreys, great egrets, belted kingfishers, wood ducks, cliff swallows, and bats.

In addition to the rich riparian zones, other areas of the park will enhance wildlife habitat. As mentioned above, wildflower meadows will be planted in much of the park's open space areas, attracting ground-nesting birds and mammals and providing seed and nectar food sources. The stormwater wetlands and vegetated swales will also be useful to many of the same species. The TRRP will also be planted with thousands of trees along its interior streets and pathways, and clusters of trees and shrubs will be grouped throughout the park's open spaces. These plantings will create nesting areas and cover for canopy dwelling species and provide rich food sources in the form of nuts and berries.



California Dept. of Fish and Game

Chinook salmon (above) and thirty-seven other fish species live in the Tuolumne River. Racoons (below) and other mammals thrive in healthy forests.



California Dept. of Fish and Game

McBain and Trush



Majestic valley oak trees already occur along the Airport Area of the TRRP. They will be planted throughout the Gateway Parcel and in other parts of the park.

Ecologically Appropriate Planting Guidelines

Plant Species Selection

Plants were selected for the park according to their place of origin, their habitat and hydrologic values, and their aesthetic appearance. Appendix A details the planting palette to be used in the TRRP. The list is divided into the following categories: trees, shrubs, grasses, wetland plants, annuals and perennials, and vines and groundcovers. All plants on the list are native to California, and most are native to the Central Valley, the Sierra mountains, or the foothills. Riparian plants that will be used for restoration or buffer strips are printed in bold lettering in the plant list.

A wide variety of tree species will be included in the park. Some plantings, along streets and pathways, will be somewhat formal while others will be arranged with a more naturalistic aesthetic, particularly within the park's restoration zones. Big leaf maples and western sycamores will have seasonally changing foliage with brilliant fall leaves that will delight park visitors. Evergreen trees, such as incense cedar, California bay laurel, and canyon live oak will present lush year-round greenery in the park. Pacific madrone, California buckeye, oak, and toyon trees are some of the species that will produce fruits and nuts for local wildlife.

Many of the shrubs and herbaceous plants will have attractive overall forms, foliage, and flowers. Western redbud, blue blossom wild lilac, golden sticky monkey flower, and other shrubs will be striking additions to the landscape, appreciated by park visitors as well as wildlife. California poppies, miniature lupines, Douglas violets, yarrow, and many other herbaceous plants will brighten the meadows with their colorful flowers throughout the year.

Plant Installation Specifications

Most of the new plants in the TRRP, including those in the riparian restoration areas, will require supplemental irrigation during their first year or two in the park. After this period of initial establishment, irrigation systems will not be needed in most places, with the exception of the few zones of irrigated turf in the Gateway Parcel's Loop Road, part of the Golf Course Area, and the Carpenter Road Area's sports complex. In general, it is best to install the majority of the park's plants in the late fall, right before the winter rainy season, to reduce the need for supplemental irrigation and to conserve water.

A variety of planting techniques and plant sizes will be used in the park. The TRRP Master Plan recommends that large specimen trees be planted along streets and in other special park zones such as the interior portion of the Loop Road on the Gateway Parcel. This is appropriate for the park environment and will allow these areas to look mature more quickly. Smaller trees and cuttings are the specified planting materials for the riparian restoration zones because they will adapt to the wet environment more quickly than larger specimens and have been shown to be more successful in these areas over time. The stormwater wetlands will be planted in a similar fashion using small container plants. The native plant meadows and the stormwater swales will be planted from seed using a hydroseed method.

Alfred Brousseau, St. Mary's Col. of Calif.



Golden sticky monkey flower

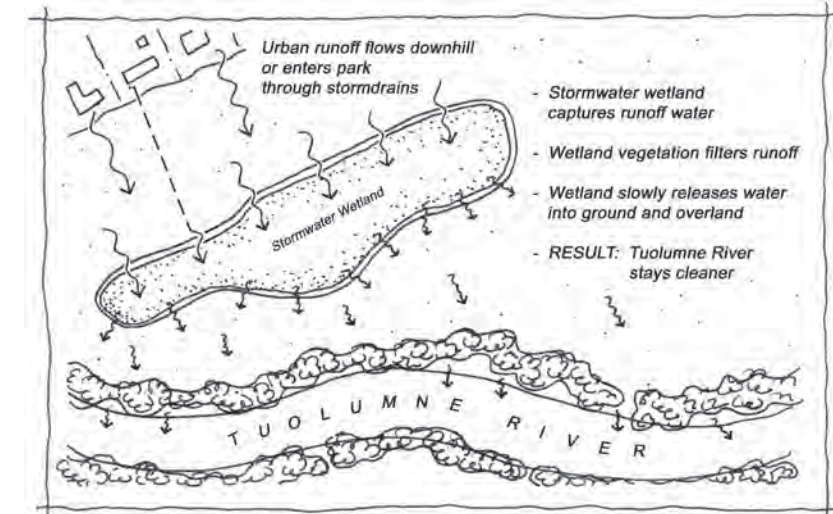
Constructed Wetlands and Vegetated Swales for Stormwater Purification

Stormwater wetlands and vegetated swales are shallow depressions in the landscape, filled with native plants such as tules, sedges, and cattails. They are designed to intercept some of the stormwater runoff from adjacent lands and partially purify it before it enters the nearby river. Rain water will naturally flow from the adjacent urban and agricultural lands, on a higher elevation, into the park, located at a lower elevation. Some of the runoff will be directed across the landscape and into the special stormwater wetlands and swales, where it will be slowed down by the tall marsh grasses planted there. The slowly moving water will then drop some of the sediment and pollutants it generally carries among the tall grasses, where the plants' roots and soil bacteria can break them down into less harmful substances. Water released by these special wetlands and swales will be cleaner than it was when it went in and will help to protect the overall water quality of the Tuolumne River. (Figure 7)

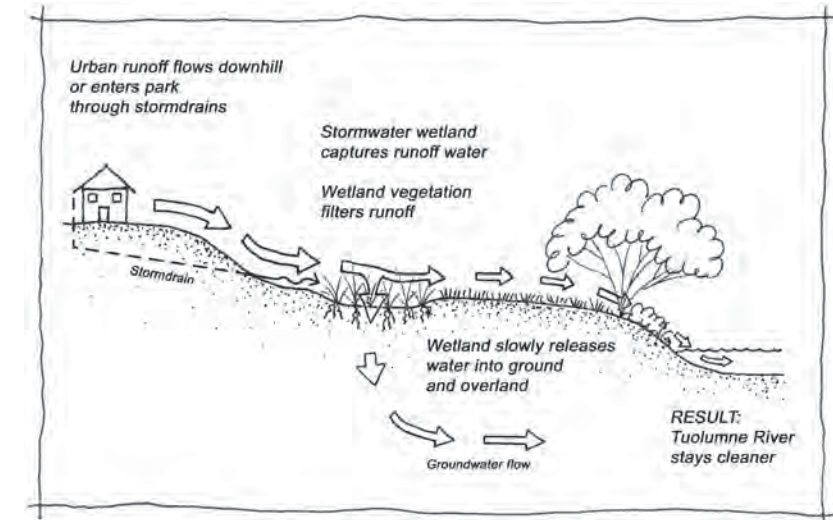
The TRRP Master Plan incorporates stormwater purification wetlands on the Gateway Parcel and in the Carpenter Road Area. Impervious surfaces have been minimized within the park landscape in order to reduce additional runoff-related problems. Where hard surfaces do exist, vegetated swales will edge all new parking lots and streets in the TRRP to help purify the new stormwater runoff. The stormwater wetlands and swales will also beautify the park landscape, attract wildlife, and serve as educational resources.

Ecologically Compatible Construction Materials

The park landscape will be constructed using materials that are compatible with the ecologically sensitive river environment. River overlooks, piers, and boardwalks will be constructed using materials that will not leach harmful chemicals into the surrounding environment. Paved areas have been kept to a minimum in the park, and permeable paving materials were chosen, where suitable. For example, the overflow parking area on the Gateway Parcel will be "paved" using "grass cells" that allow water to percolate through the surface and into the ground below. Although the main park trail will be paved to facilitate bicycle and wheelchair access, the majority of the secondary pathways through the park will be surfaced with natural materials such as compacted earth.



Plan View



Cross Section

Figure 7: Stormwater Wetlands

Stormwater wetlands will be constructed in the TRRP to help keep Tuolumne River water clean.



Constructed wetlands, like this one at Baylands Park in Sunnyvale, California, support a wide range of birds and other wildlife species. Ecologically appropriate maintenance practices help the wetland to look its best and also keep the wildlife healthy at the same time.

Ecologically Appropriate Maintenance Practices

It is important to follow maintenance guidelines that will promote the growth of the new vegetation and restoration work in the park, while also accommodating the seasonal needs of park visitors and the park's resident and migratory wildlife species.

In general, the TRRP landscape should be maintained without the use of chemical pesticides or herbicides in order to prevent water pollution and harm to wildlife and visitors. In rare circumstances, it may be necessary to use spot applications of these chemicals. This practice should be kept to a minimum, excluded from the riparian zone near the water's edge, accomplished with products that biodegrade quickly, and done with respect for the needs of nesting wildlife. Since the majority of the plants are native to the area and are adapted to the local soil types, use of any type of fertilizer or soil amendment is not recommended, except perhaps in irrigated turf zones (applied only as needed).

The majority of the park landscape is designed with a natural aesthetic in mind and will require minimal maintenance. After a period of initial establishment, most of the vegetation in the riparian zones, floodplain forest areas, native plant meadows, elderberry savannahs, and stormwater wetlands and swales should be left to grow naturally, without pruning, irrigation, disking, or mowing. None of these areas will require annual care to maintain their aesthetic appearance, as they will all be composed of native plants that are adjusted to the growing conditions present in this climate and are intended to have a natural look. The stormwater wetlands and swales, while generally maintenance free, should be evaluated every ten

years, or as required by applicable standards, to make sure that they are not filling up with sediment carried by the stormwater runoff they are designed to purify. Trees in the Airport Area of the park should be periodically evaluated to see if their canopy heights comply with airport regulations governing clear flight paths and airspace. A vegetation management plan has been adopted by the airport and the TRRP which provides specific guidelines for balancing the need to protect riparian resources with the need for airport flight safety.

If fire hazard reduction becomes a concern in the meadow areas, controlled burns are the best tool to use to reduce plant biomass in these zones. Controlled burns should be planned for the period of time between the first rainstorm (generally in November) and April 1st, when the ground and vegetation are moist. This window of time also respects the nesting season of ground nesting wildlife (April – August). Controlled burns should occur no more than once every few years.

If controlled burns are not an option, another potential fire hazard reduction strategy is to mow the meadow plants a maximum of once per year, again avoiding the nesting season. Mowing, however, will damage the soil, plants, and nesting wildlife communities if done improperly. Care should be taken during mowing to avoid soil compaction that might harm wildlife burrows and plant root systems. It is important to schedule annual mowing according to the nesting seasons of the wildlife species that may be present. This timing will also maximize native plant cover and minimize the spread of exotic plant species in these areas. The use of goats or other grazing animals to remove fire hazard potential is not recommended, unless the grazing is very light, because they can disturb the delicate ground surface, harm the meadow plants, and have negative impacts on ground nesting wildlife.

A few areas of the park are designed somewhat more formally than the naturalistic zones and have typical park maintenance needs. The paved pedestrian and bicycle trail, which extends the entire length of the park, will act as an access route for the small maintenance vehicles used for routine park maintenance tasks such as garbage collection. If vegetation encroaches on the trail, it should be carefully trimmed so that it will not obstruct the path. Formally planted street trees can be pruned occasionally to maintain balanced proportions and remove any limbs that may obstruct transportation corridors. Portions of the Gateway Parcel and other small areas of the park have irrigated turf, which may be mowed, as needed, on a weekly or monthly schedule. It would be best to time these mowing needs to reflect peaks of park visitor use and the timing of occasional large events. The turf portions of the Carpenter Road Area sports complex should be maintained in a manner consistent with the typical needs of sports fields. Use of fertilizers, pesticides, and herbicides should be avoided in irrigated turf zones, if possible, to prevent the contamination of adjacent natural areas and protect park visitors.

Wastewater Treatment Plant: Future Redesign Option

The Master Plan encourages a future redesign of the existing wastewater treatment plant in the Carpenter Road Area of the park so that it will be more compatible with the surrounding river and park land uses. Over time, it might be possible to remove some of the concrete-lined water treatment ponds and convert the land to additional park space.



Many of the pathways in the TRRP will be informal, compacted earth trails that provide access to the park while minimizing the disturbance to the surrounding ecosystems.

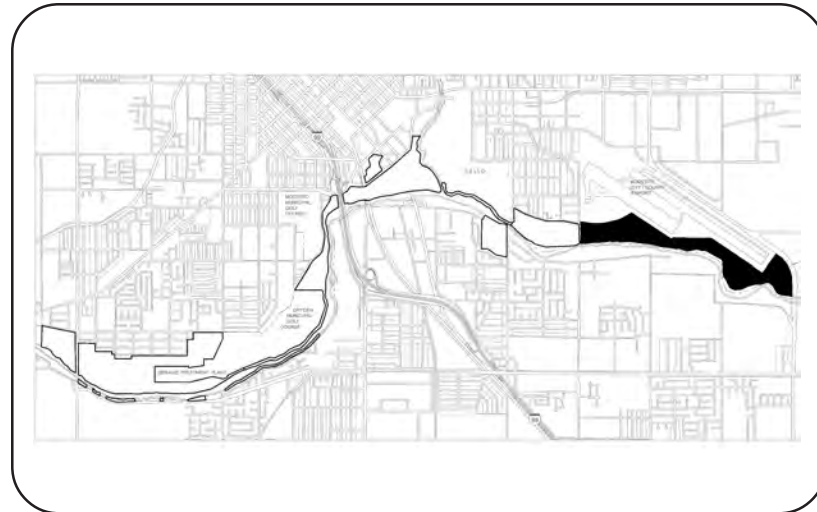


Chapter 4: Land Use and Recreation

Tuolumne River Regional Park (TRRP) will provide many opportunities for recreation, nature observation, and public education. It will contain a mixture of: active and passive recreational zones, from soccer fields to picnic areas; public gathering areas, large and small; formal and informal plantings, from street trees to forests; mature and restored riparian habitats, from tree-lined river banks to grassy meadows; and educational opportunities, from interpretive signage to outdoor classroom space. The following section will describe each of the seven major planning areas of the park in greater detail, touching on each of these themes.

As shown in the TRRP Illustrative Plan (Figure 2), the major park planning areas include: the Airport Area, Legion Park, the Gallo/Mancini Area, the Gateway Parcel, the Golf Course Area, and the Carpenter Road Area. In this seven-mile regional park, four of these planning areas are considered large “core” areas of the park, and two are vital riparian trail linkages. The trail linkages are the Gallo/Mancini Area and the Golf Course Area. Without these two important segments, the larger, remaining core areas would simply be a series of smaller parks. A seventh, smaller planning area, referred to as the South Side Parcels, will also be discussed. The South Side Parcels are located in the Carpenter Road Area and the Golf Course Area, on the Tuolumne River’s south bank.

The master plan for the TRRP has been developed according to a conceptual framework that divides the park into active and passive recreation areas, zones for intensive restoration work, and areas intended for nature study and interpretation. Each of these themes will be discussed in the sections below in greater detail. In general, the centrally located Gateway Parcel will be the primary public gathering area and home to informal, active recreational activities. The Carpenter Road Area’s sports complex will be the other active recreation zone, complete with sports fields located far from the river corridor. The rest of the TRRP is oriented towards quieter, passive recreation, focused around trail networks and picnic areas. The Tuolumne River banks and floodplain throughout the park have been designed to encourage riparian restoration, nature study, and interpretation.



TRRP Airport Area: Location

Airport Area

The Airport Area is located between Tioga Drive and Mitchell Road on the north bank of the Tuolumne River. The Modesto City/County Airport is adjacent to the site and influences the park in terms of appropriate uses and activities.

Overall, this 140-acre portion of the TRRP will be a low use area focused on the study and enjoyment of the natural environment. Emphasis will be placed on the beauty and habitat value of the mature riparian corridor. Trails and interpretive signage will provide opportunities to explore this area and learn more about it.

The Airport Area of the TRRP is already developed as a park and has existing park-related amenities and mature vegetation. A magnificent gallery forest of slow-growing valley oak trees and other associated plants lines the riverbanks and other places within the park. This forest is the largest of its kind in the lower 24 miles of the Tuolumne River. Valley oaks have almost disappeared from the Tuolumne's banks outside the park, so this forest is particularly important to preserve, protect, study, and enjoy.

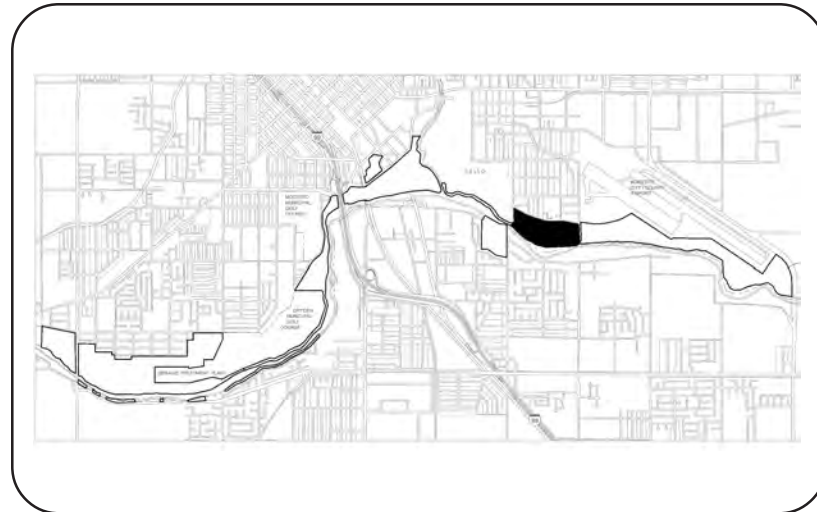
Since this part of the TRRP is already developed, its trails, amenities, and vegetation will generally be left as they are now. The existing main trail in the park will become part of the TRRP's paved 7-mile Riverwalk, appropriate for pedestrians and bicycle use. If the TRRP expands to the east in the future, the existing park trail may be extended to facilitate this connection.

Interpretive signage, park benches, and bicycle racks will be added to the Airport Area to allow the character of this site to match the other parts of the TRRP. A river overlook will be added to the park near Tioga Drive. It will be a particularly nice place to get an elevated view of the river and gaze upstream.

The adjacent airport also presents some management issues for this portion of the park. Trees in the Airport Area should be periodically evaluated to see if their canopy heights comply with airport regulations governing clear flight paths and airspace. A vegetation management plan has been adopted by the airport and the TRRP, which provides specific guidelines for balancing the need to protect riparian resources with the need for airport flight safety.



Figure 8 Airport Area - Illustrative Plan



TRRP Legion Park: Location

Legion Park

Legion Park is located between South Santa Cruz Avenue and Tioga Drive on the north bank of the Tuolumne River. Legion Park Drive, an existing street, runs parallel to the river and connects South Santa Cruz Avenue and Tioga Drive through the park. Legion Park is an ideal place for outdoor education and nature study due to its status as an existing park with well-established vegetation.

The 50-acre park is home to a mature riparian forest with graceful oak trees hung with lush trailing vines. The northern portion of the park site includes a recessed ancient river channel, once used by the Tuolumne River before natural forces changed its course to the present location. A forest has grown in this older river bed since it was abandoned by the moving water, presenting a myriad of opportunities for educational instruction about river processes. Two low wooden bridges will extend the trail network over the ancient channel and provide wheelchair access into this unique environment. Interpretive signage near the abandoned channel will explain its significance and evolution over time.

A large, inviting wildflower meadow fills the central portion of the park. This area is suitable for informal, small group recreation, family and group picnics, and other similar activities. This part of the park already includes a trail network, play areas, some picnic and barbecue sites, and bathrooms. The Master Plan will add a small covered picnic shelter to facilitate small group activities and additional benches, picnic areas, and barbecue grills in appropriate places. Bicycle racks will also be added to the park to encourage this type of transportation and to increase the use of the TRRP's overall trail network.

The portion of the site south of Legion Park Drive has an existing riparian forest with beautiful oak trees lining the riverbank. A wooden overlook will be built in this area to provide elevated views from the top of the river bank while protecting the fragile slope below. This view point will be an outstanding place to see the river from above. Since this portion of the river is particularly wide and suitable for boating, two types of simple facilities will be provided for launching non-motorized watercraft. A wooden boat pier will be placed at the water level for launching rafts in one location. An additional canoe and kayak "beach" will make it easier to put other types of small boats into the water nearby.

Since this part of the TRRP is well suited to nature study, the riverfront portion of Legion Park will also be the site of a rustic, small group public event space suitable for visiting classes of students from the region, day camp groups, and other community gatherings. This gathering place will be created using a collection of log benches, grouped as a small amphitheater along the riverbank. If possible, logs will be gathered to create the benches from other places along the TRRP that need to be cleared to build the park.



Figure 9 Legion Park - Illustrative Plan

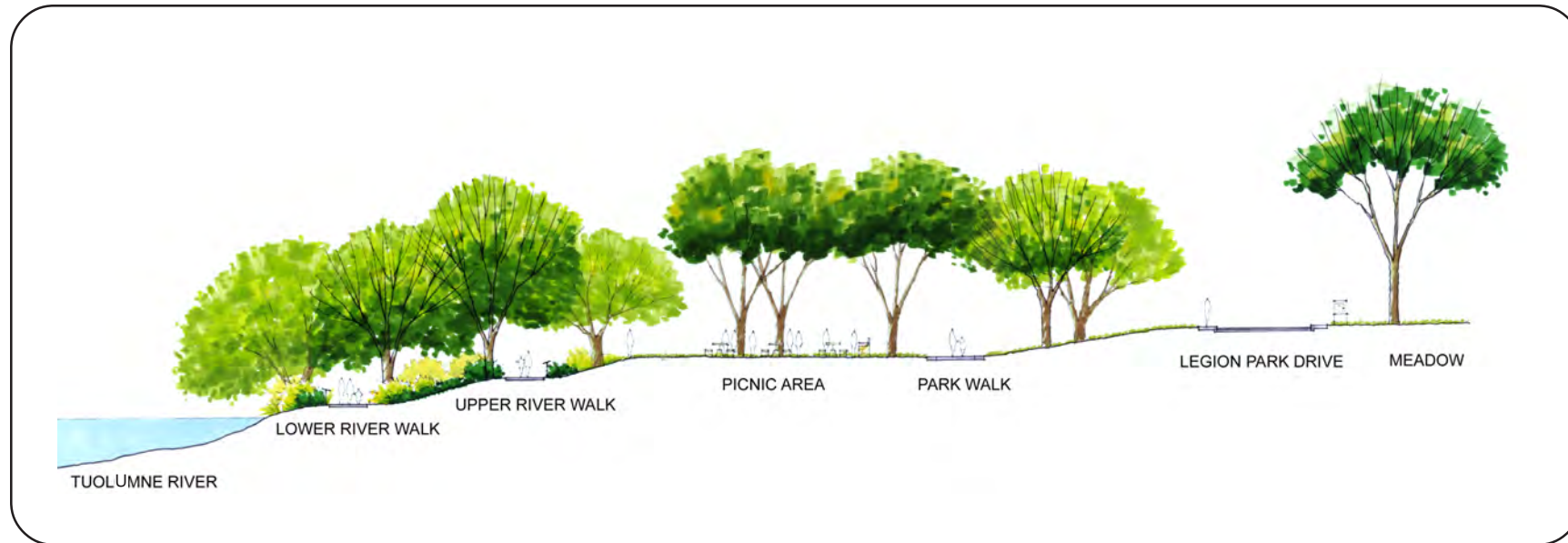


Figure 10 Legion Park - Illustrative Cross Section A

Legion Park Landscape

Legion Park will be an ideal place for outdoor education, nature study, and passive forms of recreation. The two cross section diagrams (left) and the sketch (right) illustrate the aspects of the park that contribute to this overall character.

Illustrative Cross Section A

Figure 10 shows the Riverwalk and other informal pathways near the Tuolumne River that allow park visitors to enjoy views of the water and the riverbank's mature trees without damaging the fragile slope. Picnic areas, interpretive signage, meadows, and additional trees will be located farther away from the river.

Illustrative Cross Section B

Figure 11 highlights the ancient river channel that runs through the upper portion of the site. Pedestrian bridges will span this channel in two places so that park visitors may easily cross this zone. The bridges and associated interpretive signs will also help visitors to enjoy and understand this part of the park.

Sketch

Figure 12 illustrates the overall ambiance of Legion Park. The canopies of mature oak trees already shade much of the riverbank in this area. A simple, riverfront outdoor classroom, nestled under the trees, will allow local teachers to bring their students to the park for formal and informal lessons. The outdoor classroom space will also be useful for community group meetings and other small gatherings. The nearby kayak beach will be an ideal place for launching small, non-motorized boats. River overlooks and the Riverwalk trail will provide wonderful views of the river.

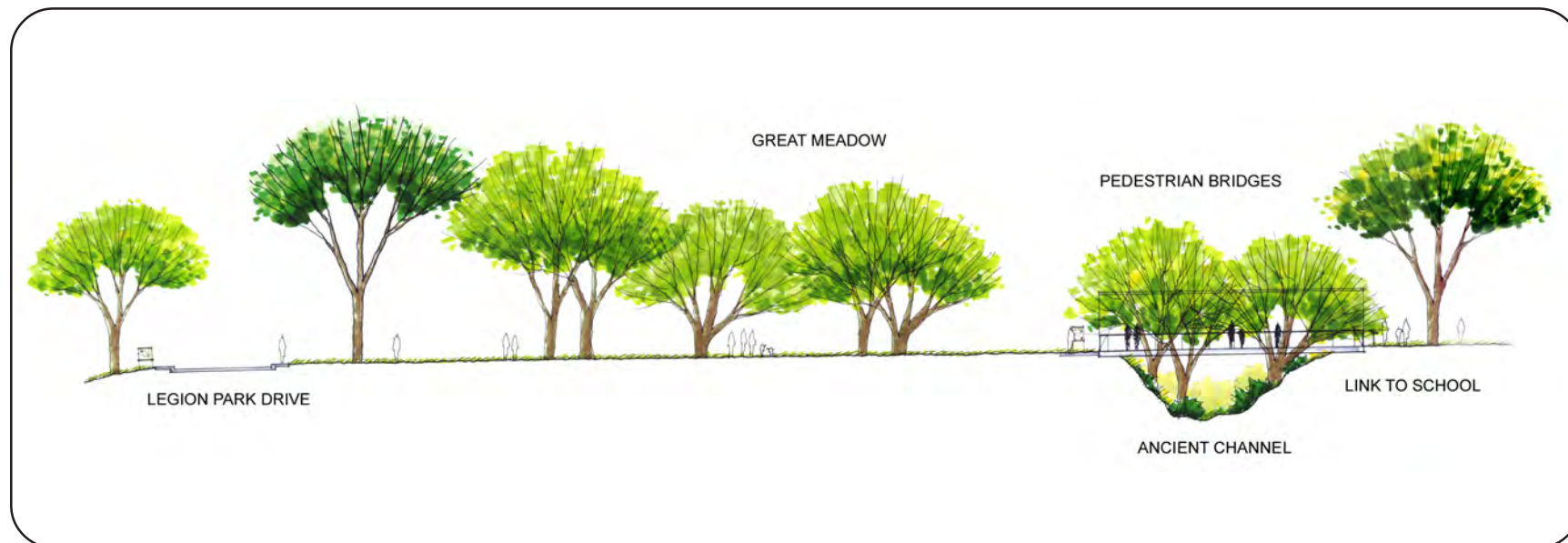
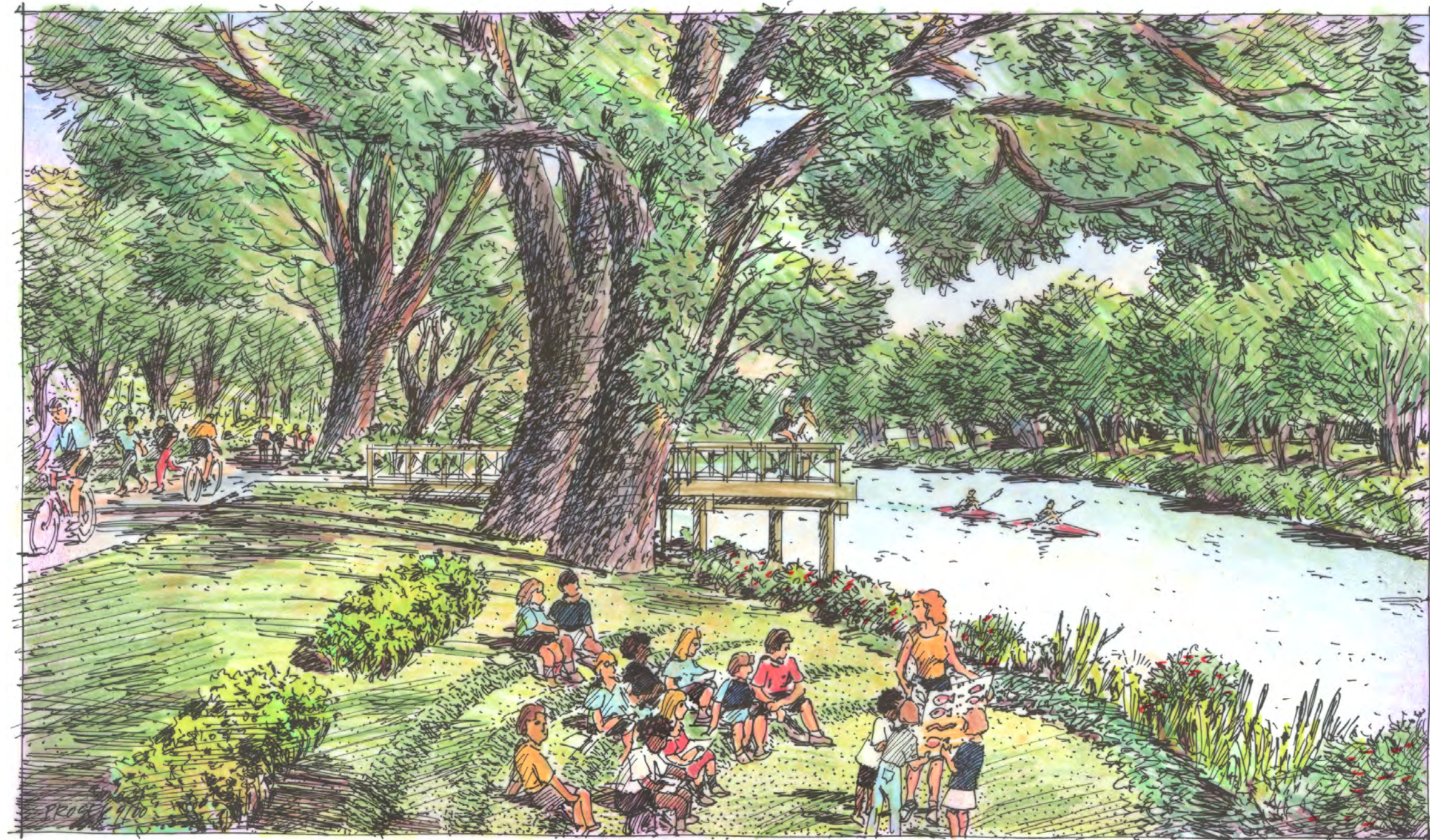
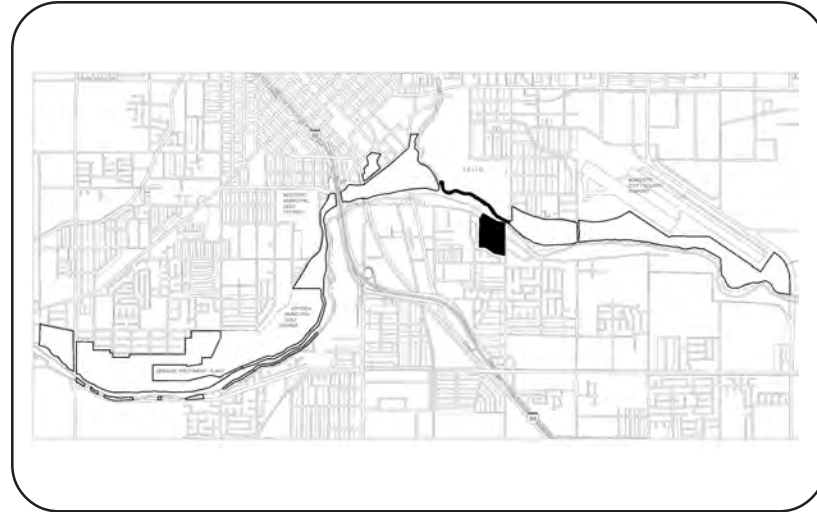


Figure 11: Legion Park - Illustrative Cross Section B



Thomas Prosek

Figure 12 Legion Park - Sketch



TRRP Gallo/Mancini Area: Location

Gallo/Mancini Area

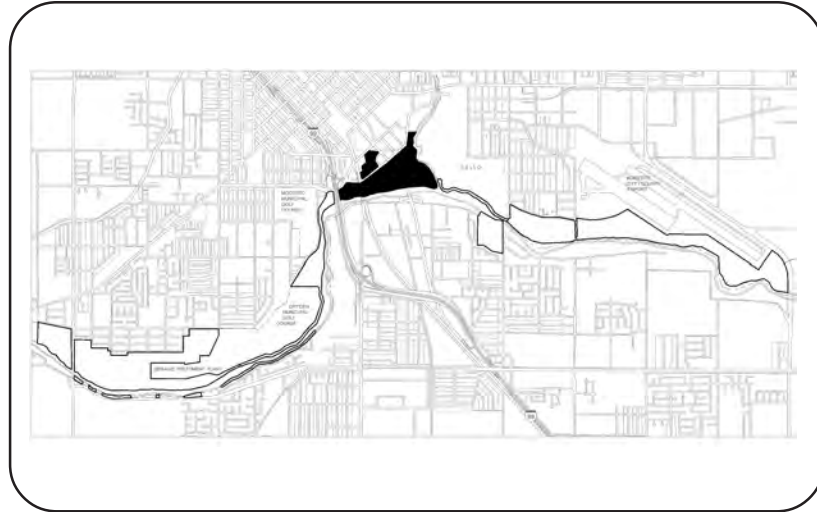
The Gallo/Mancini Area, located to the west of Legion Park, between the Tuolumne River's confluence with Dry Creek and Herndon Road, is an essential link in the overall park system. This part of the TRRP includes a narrow, half-mile riparian trail corridor along the Tuolumne's north bank and an existing 25-acre park on its south bank. A new pedestrian and bicycle bridge spanning the river near Herndon Road will unite these two elements.

Since the trail in this area will be located adjacent to the Tuolumne River along the Gallo property, the corridor will be enhanced with riparian restoration to improve wildlife habitat, beautify the pathway, and increase park visitors' enjoyment of the trail. The restoration work will also provide additional educational opportunities in the form of interpretive signage to be placed in a few selected locations along the trail.

A circular river overlook near the Tuolumne's confluence with Dry Creek will be a beautiful place to rest along the trail. Another overlook will be added to the riverbank portion of Mancini Park. A pedestrian bridge at Herndon Road, near the edge of Legion Park, will allow pedestrians and bicycles to cross the river at this point for the first time. The bridge will also bring Mancini Park into the TRRP system and encourage TRRP access from the south side of the river. TRRP signage, benches, and other standard amenities will be added to the existing facilities in Mancini Park to make its character similar to the other areas of the TRRP.



Figure 13 Gallo/Mancini Area - Illustrative Plan



TRRP Gateway Parcel: Location

Gateway Parcel

The Gateway Parcel is located roughly in the center of the TRRP, between State Highway 99 and the Tuolumne River's confluence with Dry Creek. This 87-acre area is the crown jewel of the TRRP system. It is envisioned as a high-profile public gathering place, close to the commercial centers of Modesto and Ceres, and accessible to the rest of the region along major arterial streets and Highway 99. In addition to several large public gathering areas, the park will include a substantial trail network, a pedestrian bridge across Dry Creek, river access points, active and passive recreational zones, extensive riparian restoration work, stormwater purification wetlands, and educational interpretive areas.

Recreation Elements

The Gateway Parcel will have a wide range of recreational opportunities and public access amenities. The Riverwalk, a paved river promenade trail, will wind through the park providing pedestrian and bicycle access from east to west. An additional paved trail along Dry Creek will connect Beard Brook Park (to the north) with the Riverwalk. An unpaved, internal trail network will provide additional access through the parcel's meadow lands, forests, and stormwater wetlands. A pedestrian bridge at the east end of the Gateway Parcel will create a link to the portions of the TRRP across Dry Creek and allow pedestrian and bicycle passage in this area for the first time. A new Loop Road, off of Tuolumne Boulevard between 7th and 10th Streets, will provide limited vehicular access to the center of the park in order to assist those who might have trouble walking the full distance to the river's edge.

There will be many group gathering areas within the Gateway Parcel. The largest, formal gathering area will be the "amphimeadow," a grassy, outdoor amphitheater near Dry Creek on the eastern edge of the parcel. The amphimeadow will be able to accommodate up to 3,000 people for regional and community events. In addition, two open-air, covered

tents (one large and one small) will be located near Tuolumne Boulevard and convenient parking areas. These seasonal, removable tents may be used to host regional fairs, such as farmers' markets and craft shows, to shade summer camp picnic outings, or to shelter rainy day outdoor group activities of many different types.

The Gateway Parcel will also include several different types of informal group gathering areas. A twelve-acre portion of the park, within the Loop Road, will be planted with an irrigated lawn, perfect for informal gatherings. Clusters of picnic tables and barbecue grills will be sprinkled throughout this zone, making it an ideal place for family and community picnics, large and small, and other types of informal recreational activities. A children's play area will also be included in the park near Tuolumne Boulevard and the Loop Road. The play area will include a variety of play apparatuses, appropriate for children in a wide age range.

The Gateway Parcel will also include special vista points, river overlooks, and river access piers. Confluence Point, located on the tip of the Gateway Parcel where Dry Creek meets the Tuolumne River, will be the site of a new informal gathering place. Low seating walls will provide places for small groups to sit to enjoy the natural beauty of the river and the charm and shade of a mature oak forest canopy. Other special vista points will be created within the park to highlight exceptional views of the waterways and open space areas. Two such places will be slightly elevated earthen mounds located near Dry Creek. Two other, quite different elevated view points will be created above the Gateway Parcel. One will be built along B Street to take advantage of the substantial grade change between this urban area of Modesto and the lower park zone. It will be possible to see most of the Gateway Parcel from this vantage point. The second elevated vista point will be built into the new 9th Street bridge structure, suspended above the Tuolumne River. This significant elevation will allow park visitors to gaze up and downstream quite a distance.



Figure 14 Gateway Parcel - Illustrative Plan



The remnants of Dennett Dam, located under the 9th Street Bridge, currently pose an obstacle to fish migration and impede boat passage. The TRRP Master Plan recommends that it be removed to improve these conditions.

In addition to these special vista points, a series of wooden deck overlooks and riverfront piers will be distributed throughout the park. Three such overlooks will be sited at the ends of formal pathways to accentuate view corridors within the park. One wooden overlook and two fishing piers will be placed near the water to facilitate fishing and visual access to the Tuolumne River while protecting the fragile riverbanks.

Conservation Elements

In addition to its emphasis on recreation and public access, the Gateway Parcel will be a showcase of riparian restoration and conservation-oriented efforts. The park plan includes a riparian restoration corridor at least 185-feet wide along the entire northern riverbank (almost three quarters of a mile long). The riverbank will be recontoured to establish riparian terraces and reconnect the river with its floodplain. These terraces will enhance the survival and natural recruitment of riparian vegetation stands and increase the flood capacity of the parcel. They will also be rich habitat areas for the local wildlife that will be attracted to the enhanced shelter, food sources, and places to nest.

The new riverfront vegetation will be accompanied by new wildflower meadows and enhanced by large, new groves of native trees. Special care will be taken to preserve mature, slow-growing oak trees on the site, particularly near Confluence Point.

The Tuolumne River channel will also be improved in this reach. The remnants of Dennett Dam, an old concrete weir spanning the Tuolumne River under the 9th Street Bridge, currently pose an obstacle to fish migration and impede small boat passage. The TRRP Master Plan calls for the removal of this structure in order to improve this situation.

Stormwater wetlands will be created on the Gateway Parcel to help purify some of the stormwater runoff from the adjacent urban areas. Wetland plants, such as tules, sedges, and cattails, and their associated soil microorganisms will act as filters to remove nonpoint source pollutants from the runoff water before it reaches the river. Vegetated swales will be used instead of traditional curb and gutter systems wherever large areas of new pavement are added. For example, runoff created by the new parking lots and the Loop Road will be cleansed by vegetated swales along their edges.

Educational Elements

The Gateway Parcel will be a useful educational site for schools in the region that wish to bring students to study river processes, native plants, and local wildlife species. The covered, open air tents and plentiful picnic areas in this park will be useful as large and small group meeting places for educational groups as well as others. The park will also be filled with helpful interpretive signs, useful for formal and informal educational purposes, that will describe all of the significant restoration zones in the area.



Thomas Prosek

Figure 15 Gateway Parcel - Birds Eye View

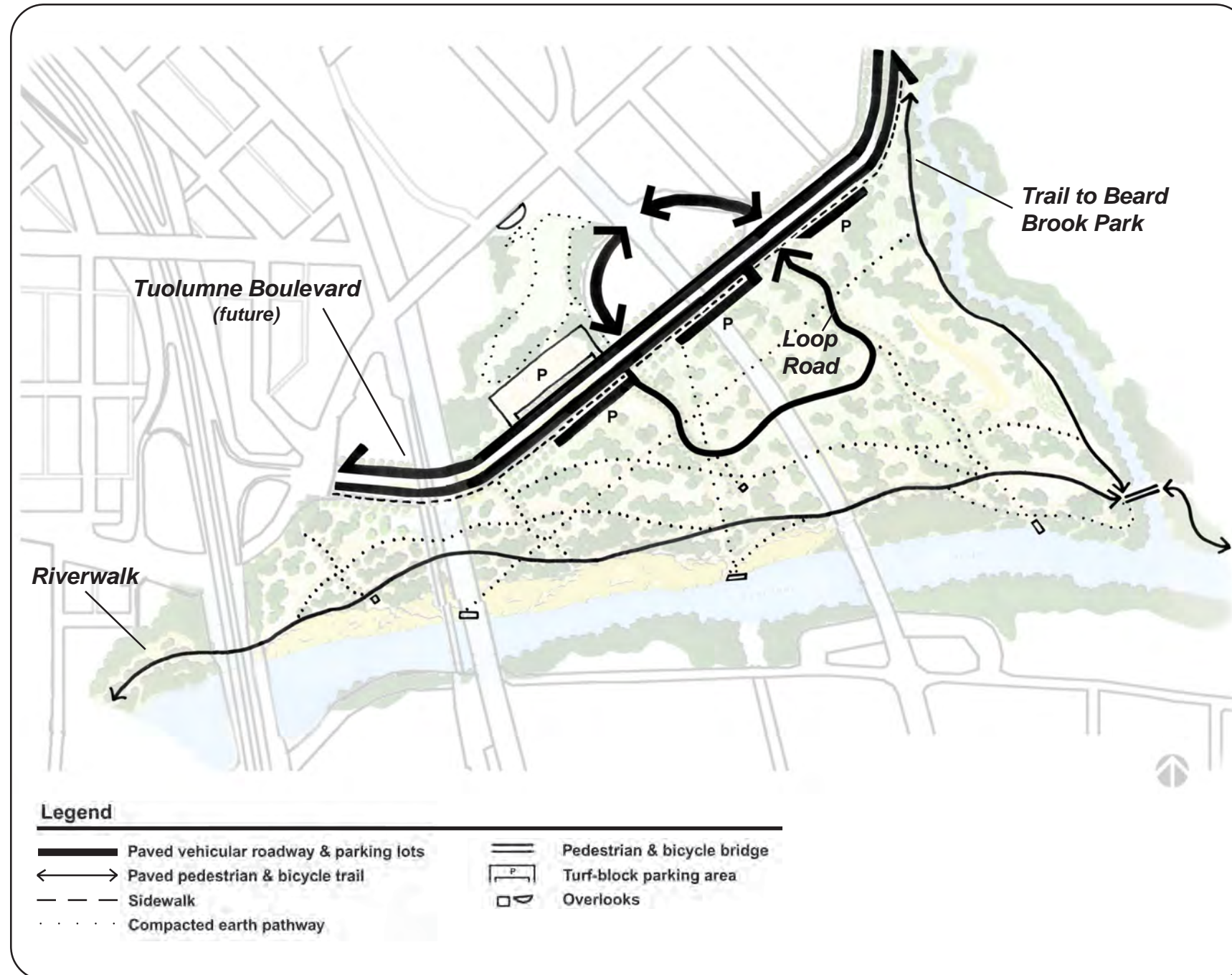


Figure 16 Gateway Parcel - Circulation Diagram

Circulation Patterns

Circulation patterns on the Gateway Parcel will be predominantly oriented towards pedestrian and bicycle travel. The paved Riverwalk trail, extending the entire seven-mile length of the TRRP, will cross the southern portion of the Gateway Parcel above the riparian terraces. A new pedestrian and bicycle bridge will allow the Riverwalk to continue across Dry Creek. Another paved trail will connect nearby Beard Brook Park, to the north, with the Riverwalk, significantly increasing pedestrian and bicycle access.

The Gateway Parcel will also be served by a network of unpaved earth trails that connect the park's amenities to the Riverwalk and parking areas. Some of the trails have been designed to provide access to the overlooks along the banks of the Tuolumne River. Other trails will allow leisurely, meandering walks through the park's meadows and along its riparian terraces and wetlands.

The proposed Tuolumne Boulevard extension will be the main vehicular access road for the park. A paved sidewalk will also be constructed along the southern edge of Tuolumne Boulevard to make this area more accessible to pedestrians. A narrow, arcing Loop Road will extend into the park, facilitating river access for those who cannot comfortably walk across the park's entire width. As illustrated in Figure 17, the Loop Road will be 20 feet wide, including one slow moving 12-foot travel lane, and one 8-foot parallel parking lane. The road will be designed with raised, textured crosswalks to slow traffic and provide pedestrians a safe crossing.

Vehicular traffic will be served by: three parking lots along Tuolumne Boulevard, with a total of 180 spaces; 150 parallel parking spaces along the Loop Road; and 200 additional parking spaces in an overflow parking lot north of Tuolumne Boulevard. The overflow lot will be paved with vegetated "grass-cells" that will give it a meadow-like appearance when it is not in use.

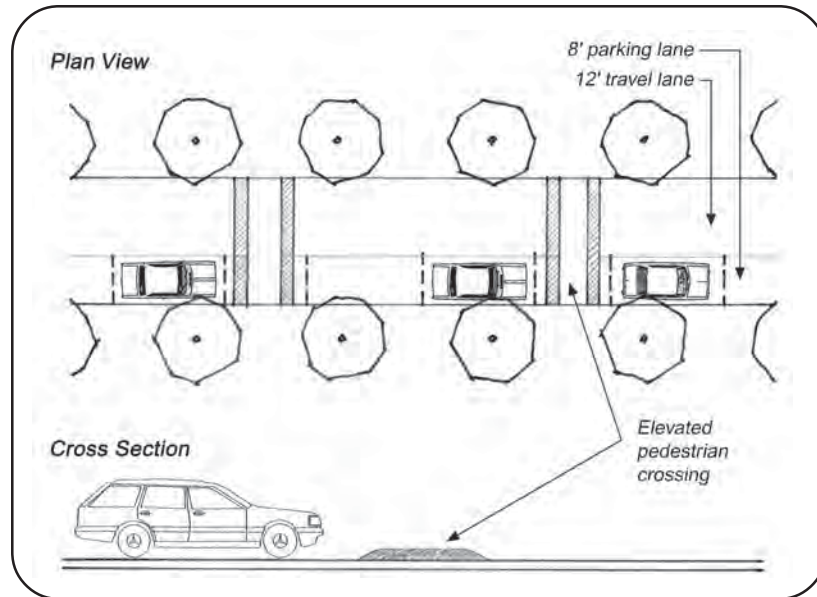


Figure 17: Gateway Parcel - Loop Road

Riparian Terraces

As illustrated in the cross section diagram below, the Gateway Parcel will be terraced to improve the Tuolumne River's connectivity to its floodplain and to revitalize its riparian vegetation. This configuration will also make the park's design more compatible with the river's natural flow patterns.

The lowest terrace, located along the river, will be planted with a narrow leaf willow plant community that is very well suited for wet conditions. This terrace will be expected to flood almost every year. A box elder and arroyo willow plant community will be located on the second terrace, in the 1.5-year to 5-year floodplain. Fremont cottonwoods, black willows, and other associated plants will be located on the third terrace in the 5-

year to 20-year floodplain. The highest terrace, expected to flood every 20 to 100 years, will be home to valley oaks and many other plant species that prefer drier conditions. Matching the plant communities to their preferred elevations in this manner will reduce park maintenance needs over time. The majority of the park's amenities will be located on the upper two terraces so that they will remain dry most of the time.

For more information about riparian terraces on the Gateway Parcel and elsewhere in the park, please see *Chapter 3: Conservation and Open Space*, pages 20-21.

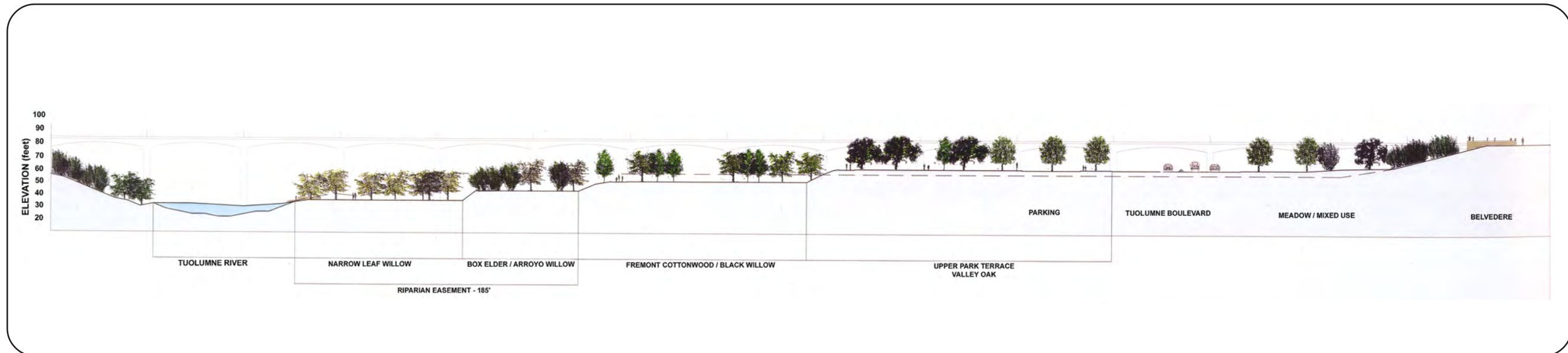
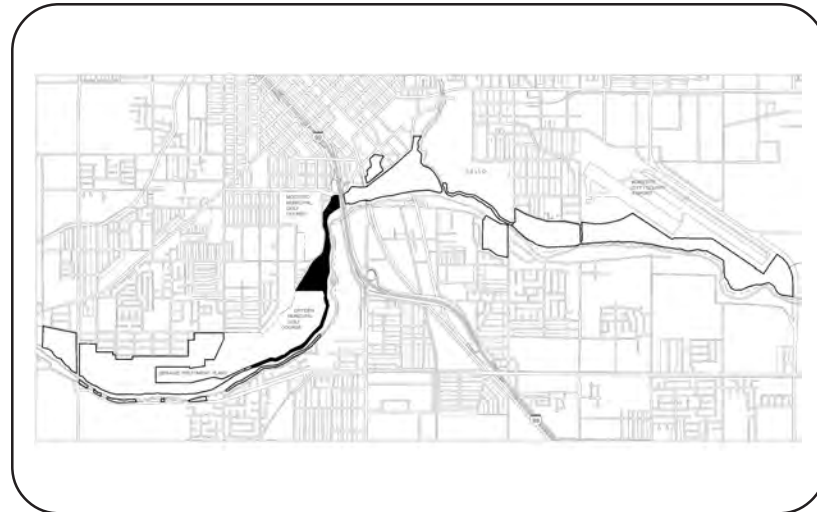


Figure 18 Gateway Parcel - Cross Section



TRRP Golf Course Area: Location

Golf Course Area

The Golf Course Area of the TRRP is a riparian trail corridor on the northern bank of the Tuolumne River between Leon Avenue and State Highway 99. This area is adjacent to Dryden Municipal Golf Course and portions of Modesto Municipal Golf Course. The Joint Powers Authority does not currently own the riparian corridor in this reach. For this reason, the TRRP Master Plan does not formally include this area. However, since this zone is a vital link in the TRRP's riparian trail system, it is hoped that a narrow easement along the river can be arranged in the future.

If a riparian trail easement can be obtained for this area, the site should include a paved pedestrian and bicycle trail along the one and a half mile riverbank in order to connect the Carpenter Road Area, to the west, with the Gateway Parcel, to the east. This trail segment would vastly improve the pedestrian and bicycle circulation through the park and create a continuous system that makes the entire trail network more useful to park visitors.

The Golf Course Area is also a perfect place to add a pedestrian bridge across the Tuolumne River. Such a bridge would facilitate access to the TRRP from the south side of the river, making the park accessible to these pedestrians and bikers for the first time. Dallas Street is the preferred location for such a bridge because it is an easily accessible street and because it is located near additional TRRP land on the south side of the river.

Since the trail in the Golf Course Area would be located near the river, the corridor would also be enhanced with native riparian restoration to improve wildlife habitat, beautify the corridor, and increase park visitors' enjoyment of the trail. The restoration work would also provide additional educational opportunities in the form of interpretive signage to be placed in a few selected locations along the trail.

A twenty-acre, triangular parcel of land along the southern end of Neece Drive in this area is currently part of the TRRP. The land is located between two large, adjacent golf courses. The program for this park includes a loop trail, connections to the main paved trail system, a canoe and kayak launch, and a separate fishing pier/river overlook. This portion of the Golf Course Area will also be planted with shade trees and have an irrigated lawn to allow informal recreation and activities such as picnicking and nature appreciation.

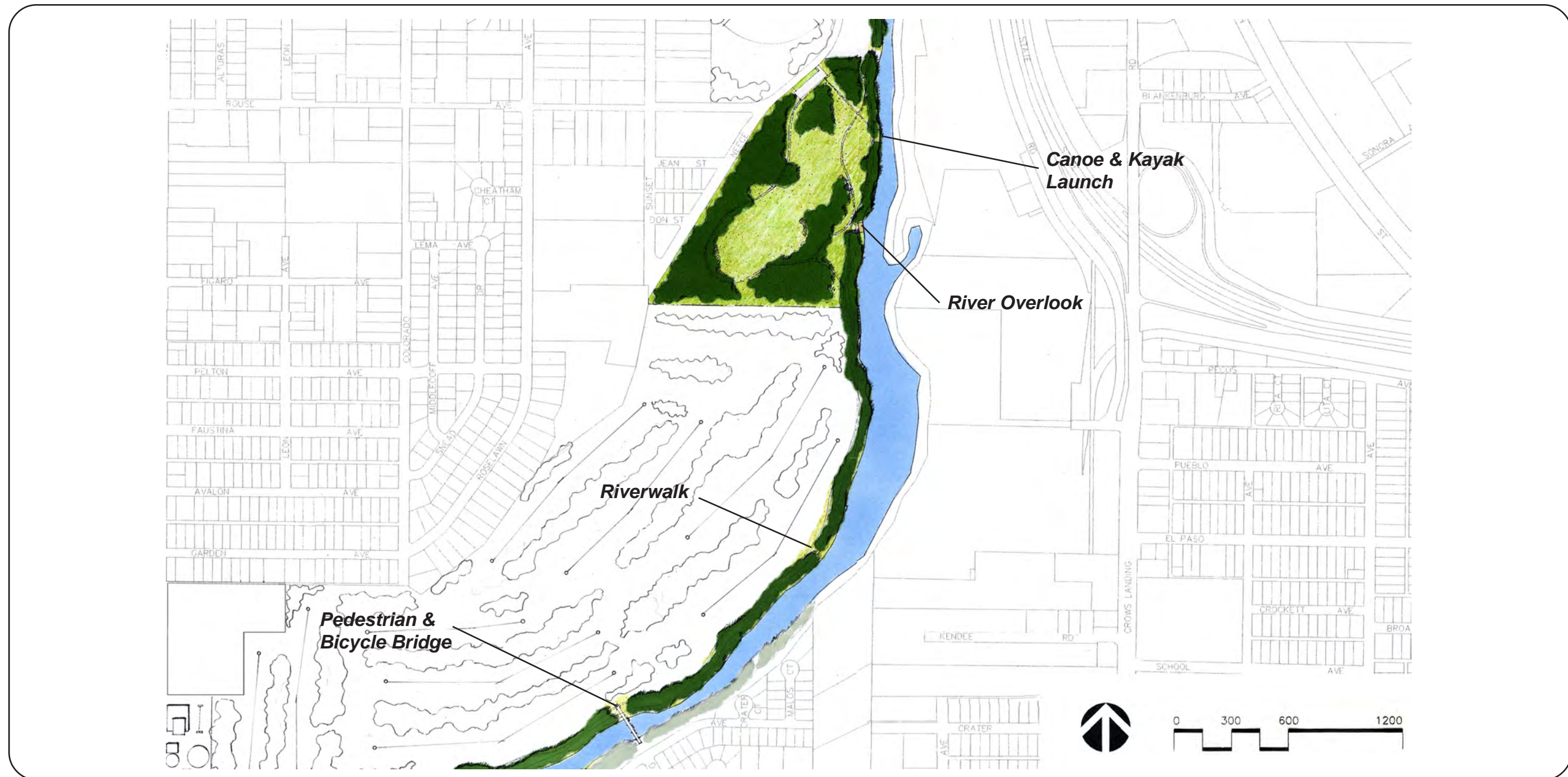
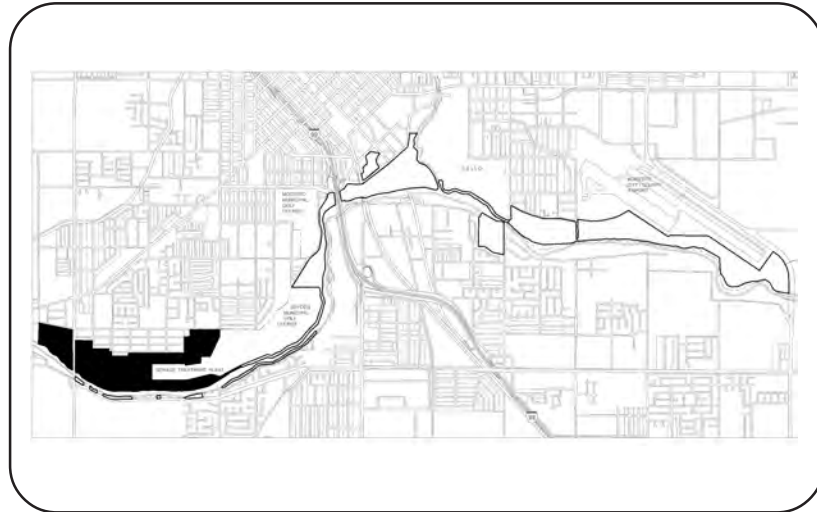


Figure 19 Golf Course Area - Illustrative Plan



TRRP Carpenter Road Area: Location

Carpenter Road Area

The Carpenter Road Area is located at the western end of the TRRP, roughly bounded by Ohio Avenue and Leon Avenue. The largest arterial street that crosses this part of the park is South Carpenter Road. The 185-acre Carpenter Road Area is adjacent to a large wastewater treatment plant and wraps around it to the north and south.

The Carpenter Road Area is envisioned as a regional sports destination, a place for land and water reclamation and restoration, and an exciting opportunity for educational interpretation. This large site will include a regional sports complex, a river promenade trail network, a mile and a half of riparian corridor restoration work, more than 100 acres of new forests and meadows, and new stormwater purification wetlands.

Much of the park land in the western portion of the Carpenter Road Area will be created on top of a former landfill site. Before this part of the park can be developed, a landfill closure plan must be prepared in order to comply with California state law (Postclosure Land Use, CCR Title 27, Section 21190). This section of the park will be devoted to informal recreational activities centered around a trail system that weaves its way through the new meadows and forests. Wooden overlooks will provide visual access to the river in three places along the trail network. An additional pier will offer physical access to the river and be suitable for recreational fishing as well as launching small, non-motorized boats.

The riverbank in the Carpenter Road Area will be enhanced through riparian restoration work. This will improve the wildlife habitat and educational value of the area while also decreasing potential riverbank erosion. Stormwater purification wetlands will be created in the southern third of the park between Carpenter Road and Hancock Street. These wetland zones will use plants, such as tules, sedges, and cattails, to purify stormwater runoff from the adjacent neighborhoods, reducing the amount of nonpoint source pollution that enters the Tuolumne River in this area. In

addition, vegetated swales, a type of stormwater wetland arranged in narrow bands along the edges of paved surfaces, will be used instead of traditional curb and gutter systems wherever large areas of new pavement are added. Swales will be installed along the park's new internal access road (connecting Hancock Street and Carpenter Road) and along the edges of any parking lots that are created.

The northeast portion of the Carpenter Road Area, north of the wastewater treatment plant, will become a regional sports complex with up to ten active play fields. The types of play fields, to be determined by regional needs, could include: soccer, baseball, football, or other sports. One field will be a tournament-level play field, with bleachers and night lighting. The sports complex will also include a regional sports center building with locker rooms, a ticket office, a meeting room, and limited office space for recreational administration. This sports complex will expand the public facilities offered through the county park system, and enhance organized recreational activities in the region.

A nature interpretive center will be located near the sports complex. The interpretive center building itself will be designed in an environmentally responsible manner. For example, the structure will incorporate energy conservation measures, energy production techniques (e.g., solar panels), and "green building materials" wherever possible.

The interpretive center will host exhibits about the riparian restoration in the park, the new forests and meadows, and the many wildlife species that live in and along the river. It will also provide information about the conversion of the former landfill to public park space and the water purification system used in the onsite stormwater wetlands. If a portion of the adjacent wastewater treatment facility is turned into park land in the future, this would also be an appropriate topic for an exhibit at the interpretive center. Interpretive signs, placed throughout the park along the paved main trail, will reinforce these educational themes.

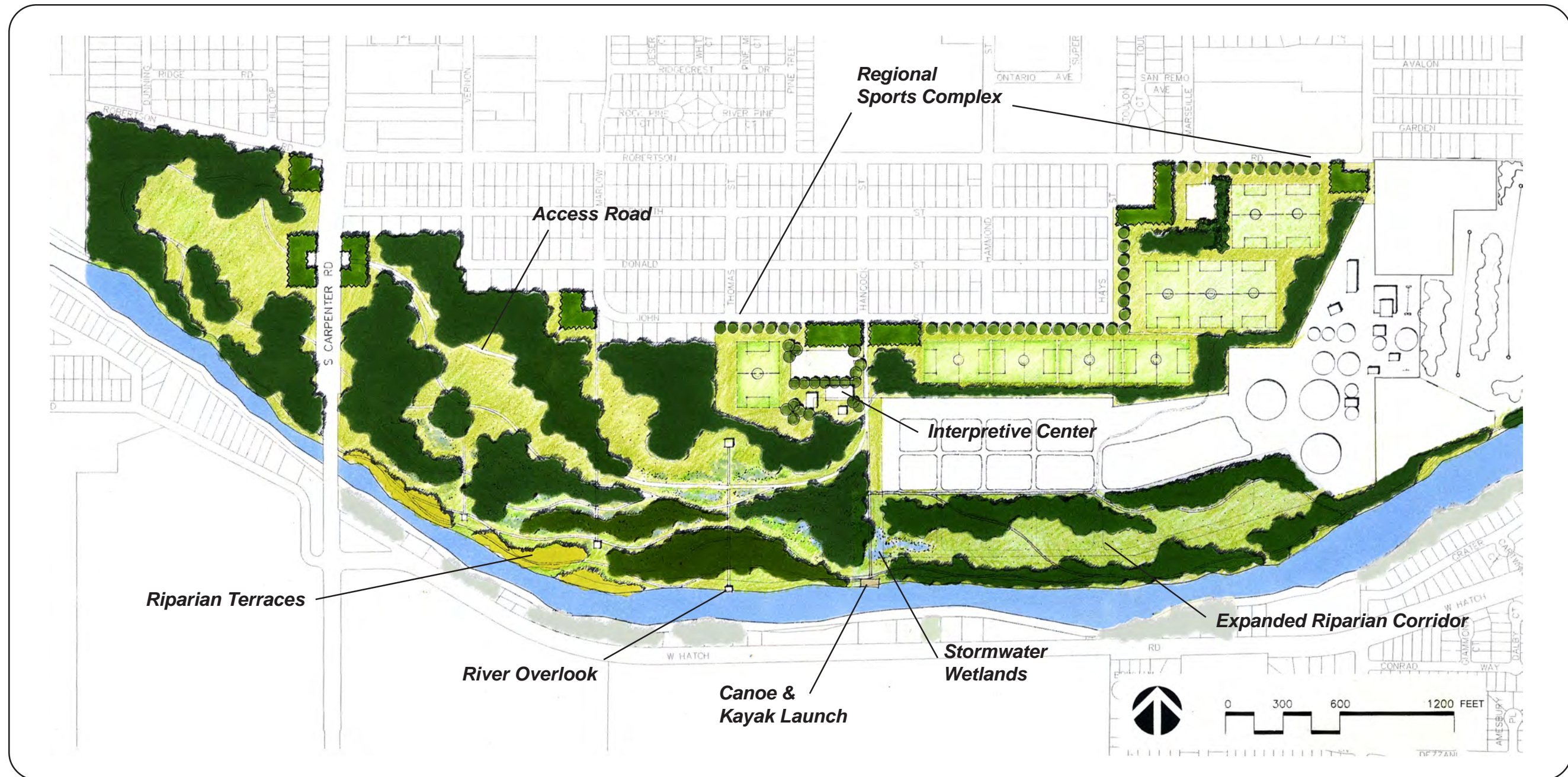


Figure 20 Carpenter Road Area - Illustrative Plan

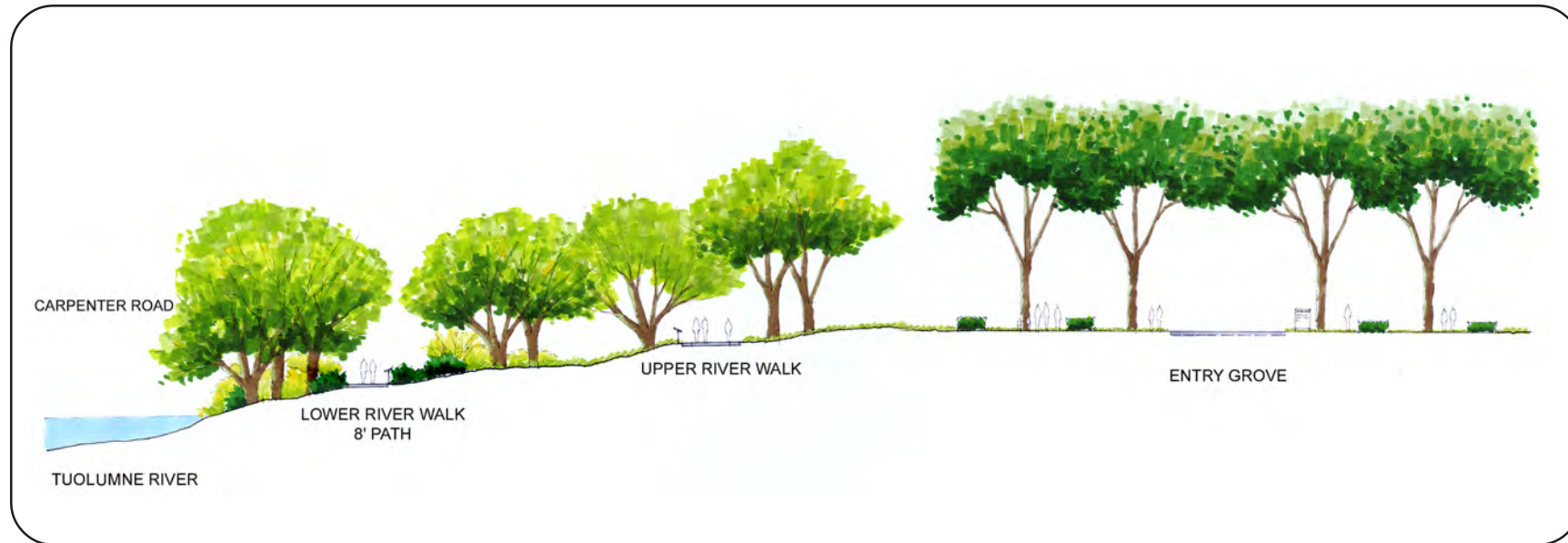


Figure 21: Carpenter Road Area - Illustrative Cross Section A

A small portion of the Carpenter Road Area will be used as a native plant nursery. The nursery will raise native and riparian vegetation to be used in the restoration of the park landscape as the park plan is implemented over time. When possible, the nursery should be encouraged to focus on local seed sources, such as acorns from the existing mature oak trees onsite, to preserve the genetic integrity of the local native plant populations. When the park is completed, the nursery area may be retained to supply replacement plant material, as needed, or converted into part of the park landscape. If desired, the plant nursery may be temporarily located on part of the park land that will be developed in one of the last implementation phases.

In the future, it may be possible to expand the Carpenter Road Area of the TRRP by upgrading the treatment plant and consolidating the treatment ponds, making more of the riverfront land available for park-oriented recreation and restoration. This configuration is reflected in the Figure 20 Illustrative Plan on page 47.



Figure 22: Carpenter Road Area - Illustrative Cross Section B

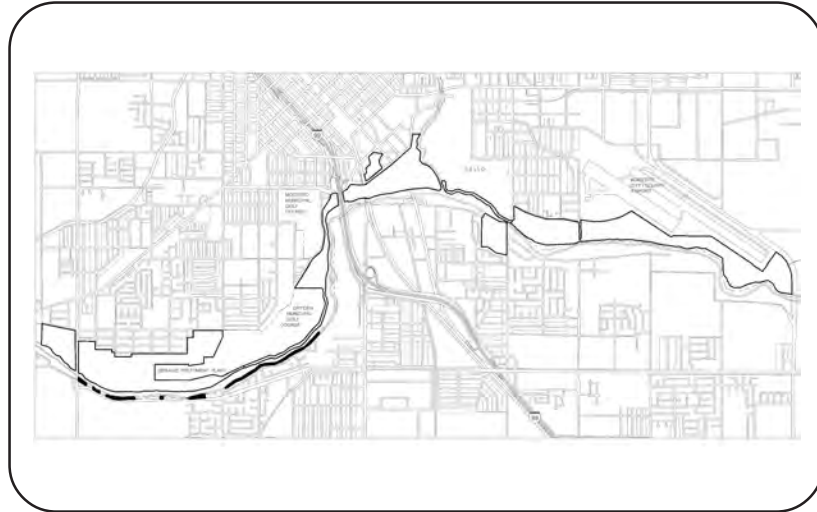
Carpenter Road Area Landscape

The Carpenter Road Area will be a regional sports destination, a place for land and water reclamation and restoration, and an ideal place for educational interpretation. The two cross section diagrams (left) and the sketch (right) illustrate the aspects of the park that contribute to this overall character.



Thomas Prosek

Figure 23 Carpenter Road Area - Sketch of the Park and Sports Complex



TRRP South Side Parcels: Location

South Side Parcels

In addition to the major planning zones discussed above, the TRRP also includes several riverfront parcels on the south side of the Tuolumne in the Carpenter Road and Golf Course Areas. Some of the parcels are located around the planned Dallas Street pedestrian bridge. In the future, it might be possible to create a riparian trail along the river's south bank using these parcels as the foundation. Such a trail would increase the usefulness of the pedestrian and bicycle bridge and make it more convenient for visitors to approach the park from the south.

The south side parcels are also quite important from a restoration perspective. The river ecosystem will be healthiest if it has a substantial amount of vegetative cover on both sides of the channel, providing habitat cover for aquatic species and keeping the water temperature cool during the hot summer months. The south bank is a particularly important part of the restoration process because it will produce far more shade than the north side, due to the direction that shadows are cast by the sun.

TRRP Amenities throughout the Park

Each section of the TRRP will have park amenities appropriate to its location. Larger elements, such as river overlooks and piers, pedestrian and bicycle bridges, group gathering areas, new parking lots, and special recreation zones, have been discussed in the context of the individual sites. The TRRP as a whole, however, will receive a consistent set of smaller-scale park amenities that will unite the various portions of the regional park and make park visitors more comfortable.

All of the entrances to the TRRP, from roadways and major bicycle and pedestrian paths, will be marked with TRRP

“welcome” signs. This will foster a sense of arrival for park visitors and will help to solidify the park's identity in the public eye.

A continuous paved trail will extend from one end of the TRRP to the other, allowing pedestrians and bicycles to travel through its entire seven-mile length. The trail will be accented by interpretive signs approximately every quarter mile that inform visitors about the landscape they are traveling through, the restoration work in the immediate vicinity, and the wildlife and native plants that are present in the surrounding riparian corridor and floodplain. It is envisioned that site specific, educational artwork be imbedded in the trail's pavement throughout its length to provide additional, playful nature interpretation. Small mileage posts will be placed at regular intervals along the path to inform trail users of their progress, and directional arrows will be placed at strategic locations so that visitors will be able to find their way easily in the park. The trail will also be outfitted with benches at particularly scenic locations and appropriate rest stops. Bicycle racks will be added to all of the core areas of the park near vehicular parking lots and other important stopping places to encourage use of the trail system.

Each of the core areas of the park will be outfitted with picnic clusters that include three to five picnic tables, a barbecue grill, and trash cans. Additional trash cans will be located throughout the park to help keep it clean. Larger trash collection facilities will be located in the Carpenter Road Area, the Gateway Parcel, and Legion Park. Park benches will be placed throughout the TRRP along trails, as mentioned above, and in other scenic locations. Drinking fountains will be added to selected locations within the TRRP's core areas. A limited number of restrooms will be included in the Carpenter Road Area and the Gateway Parcel. Appropriate restrooms already exist in Legion Park and the Airport Area.



Figure 24 South Side Parcels- Illustrative Plan

McBain and Trush



Chapter 5: Access and Circulation

Tuolumne River Regional Park (TRRP) will be a significant regional destination, accessible to pedestrians, bicycles, private vehicles, and public transit. The access and circulation systems in and around the park will substantially improve movement along the park corridor (east-west) as well as across it (north-south). The TRRP will also be a key link in the regional trail network, opening new travel possibilities for bicycles and pedestrians.

Trails

The TRRP's trail networks will make it possible, for the first time, to travel on foot and by bicycle through this scenic seven-mile corridor along the Tuolumne River. New pedestrian bridges will unite the north and south banks of the river, providing park access to those traveling to the TRRP from the south and making pedestrian and bicycle travel more convenient and viable throughout the region.

The seven-mile park corridor will be served by a 12-foot wide, paved bicycle and pedestrian Riverwalk that runs the length of the park and crosses Dry Creek near Confluence Point over a new bridge. An additional paved trail will connect Beard Brook Park with the Gateway Parcel's Riverwalk. In addition to the main Riverwalk, each section of the park will include smaller trails surfaced with compacted earth. In some cases, wooden boardwalks and concrete sidewalks will also be built. This new trail network includes more than seven miles of paved bicycle and pedestrian paths, a total of almost eight miles of compacted earth trails, one mile of wooden boardwalks, and two-thirds of a mile of new concrete sidewalks. Additional trails already exist in the Airport Area, Legion Park, and Mancini Park.



Big Dry Creek, Littleton, Colorado

The TRRP will be served by the Riverwalk, a 7-mile paved bicycle and pedestrian trail, as well as 8 miles of earth pathways, and a network of other trails, sidewalks, and boardwalks.

New pedestrian and bicycle bridges across the Tuolumne River are planned near Herndon Road and Dallas Street. The Herndon Road Bridge will link Mancini Park with Legion Park for the first time. The Dallas Street Bridge will unite the Golf Course Area neighborhoods to the south. Both bridges will encourage access to the TRRP from the south side of the river.

This substantial TRRP trail network will unite many of the existing and planned trail systems in Stanislaus County. For example, the new TRRP pedestrian and bike path presents exciting opportunities to link to the Dry Creek Parkway, the Hetch Hetchy right-of-way, and other greenways in the area. Such a system will create a network of Class I (off-street) bicycle and pedestrian paths that will be an attractive alternative means of transportation, while enhancing livability throughout the region. If the park boundaries are expanded along the Tuolumne River in the future, the trail network would be able to provide additional access to residents throughout the county.

Streets and Parking Areas

The park will be accessible to private vehicles from many of the arterial streets on the north side of the river and several on the south side. Carpenter Road, Tuolumne Boulevard, Mitchell Road, and Herndon Road are some of the more significant park access points for visitors arriving by car. Highway 99 will serve as a convenient travel corridor for park users from outside of the immediate area.

The TRRP includes several small internal streets that will facilitate private vehicle circulation within the park. The Airport Area and Legion Park already include such small vehicular access roads. The Gateway Parcel will include a new Loop Road that will allow private vehicle access into a portion of the park. The Carpenter Road Area will include a narrow road that will connect Hancock Street with South Carpenter Road through the park, removing some of the park's traffic from the adjacent neighborhood.

The TRRP will also provide approximately 1371 parking spaces for private vehicles. Parking lots already exist in the Airport Area (349 spaces), Legion Park (21 spaces), and Mancini Park (76 spaces). A total of 925 new spaces are planned throughout the TRRP to accommodate the anticipated increase in park visitation.

New parking lots are planned in the following locations:

- Legion Park: 115 spaces
- Mancini Park: 25 spaces
- Gateway Parcel:
 - 180 spaces in three parking lots
 - 150 parallel parking spaces along the Loop Road
 - 200 spaces in an additional overflow parking lot
- Golf Course Area: 30 spaces
- Carpenter Road Area: 225 spaces

Public Transit

Some public transit is already provided to areas near the TRRP. The Master Plan recommends that public transit routes and schedules be modified slightly to make it more convenient to reach the park. For example, new bus stops could be added along the new Tuolumne Boulevard extension in the Gateway Parcel to provide regular access to this major TRRP attraction. The Carpenter Road Area, with its substantial sports complex, will be another important location for future public transit stops. It will also be particularly important to coordinate the schedule for these stops with the timing of large public events. This will make such public gatherings more enjoyable for park visitors and relieve the parking burden onsite.



Figure 25 Access and Circulation Diagram



Chapter 6: Implementation

This chapter of the Master Plan presents capital costs associated with the proposed master plan facilities and improvements, potential revenue sources, a phasing plan, and a recommended implementation strategy for the Tuolumne River Regional Park.

Overall Park Capital Improvement Costs

The proposed conservation, recreation, and educational facilities described in this Master Plan will result in one-time capital costs associated with construction and improvements that total approximately \$80 million dollars.¹ As shown in Table 2, the majority of these costs, approximately \$50 million, are associated with improvement of the Carpenter Road area. This estimate for Carpenter Road does not include the cost of preparing a landfill closure plan and remediating the site. To put these costs in perspective, Guadalupe River Park in San Jose, approximately 100 acres, cost approximately \$100 million, and Crissy Field, a 150-acre park, cost approximately \$30 million.

The following section summarizes the major cost elements by type of improvement:

Trails

Approximately 17 miles of trails are proposed in the Master Plan, including asphalt bicycle and pedestrian trails, decomposed granite and compacted earth trails, wooden deck paths in wet areas, and bicycle and pedestrian bridges. Overall, the cost of trails through the 500-acre park totals approximately \$4 million. The trails, as well as the pedestrian bridges, provide an efficient non-motorized circulation system which links to important routes on both sides of the river. As such, these facilities appear to be excellent candidates for TEA-21 funding.

Cost Estimate Summary by Park

Airport Area:	\$ 190,000
Legion Park:	\$ 5,050,000
Mancini Park: (south of the river)	\$ 1,250,000
Gallo Riparian Area: (north of the river)	\$ 500,000
Gateway Parcel:	\$ 19,400,000
Golf Course Area:	\$ 5,850,000
Carpenter Road Area:	\$ 49,900,000
South Side Parcels:	\$ 610,000
TOTAL:	\$ 82,750,000

Table 2 Cost Estimate Summary by Park

Cost Estimate Summary by Item

Trails:	\$ 4,250,000
Restoration:	\$ 17,180,000
Landscaping:	\$ 35,060,000
Site Furnishings:	\$ 2,740,000
Streets / Parking:	\$ 2,020,000
Utilities:	\$ 750,000
Special Features:	\$ 20,750,000
TOTAL:	\$ 82,750,000

Table 3 Cost Estimate Summary by Item

Riparian Restoration

The Master Plan provides for restoration of riparian planting along the seven-mile river corridor. Significant costs in this category include the cost of earthmoving associated with the re-creation of riparian terraces. On the Gateway Parcel, there is additional cost associated with the protection of the mature oaks at Confluence Point. As described in the following section, there appear to be numerous sources of grant funding for riparian restoration projects. These funds should be pursued for river restoration projects.

Park Landscaping

This is the largest cost item in the Master Plan, at approximately \$35 million, and includes landscape enhancement throughout the 500-acre park. This cost is reflective of the sheer amount of acreage that currently is in an unnatural, poorly vegetated state. Overall, the approach to park landscaping is to revegetate the area with multiple-use meadows and oak savannas using a native planting palette. Areas of irrigated turf are limited in the park. As a whole, this landscaping approach is a cost effective one. Like the riparian work described above, much of the park landscaping can be viewed as habitat restoration. Once established, the restored park landscape will require lower levels of maintenance than a typical city park.

Special Features

This cost category incorporates all of the special park facilities, such as river overlooks, the amphimeadow, and the interpretive center, not including trails and landscaping, that are included in the Master Plan. These features total an estimated \$20 million. The most costly of these facilities include: the interpretive center/sports complex building (\$9.8 million); the conversion of three wastewater treatment ponds to riparian park corridor (\$6.2 million); and the three pedestrian

bridges over the Tuolumne and two pedestrian/bike bridges over the "ancient channel" in Legion Park (\$1.7 million).

Site Furnishings

The site furnishings category includes typical park facilities such as picnic tables and benches, drinking fountains, restroom buildings, trash receptacles, bicycle racks, and interpretive signage. Site furnishings for the park area are estimated to cost \$2.7 million.

Streets/Parking Areas

This category includes streets for circulation within the park as well as parking areas. These facilities are primarily located on the Gateway Parcel, within the Carpenter Road Area, and Legion Park, and total approximately \$2 million in capital costs.

Current and Potential Park Funding Sources

Current Sources of Revenue

Currently, there are three primary sources of funding for the TRRP: (1) contributions from Stanislaus County and the cities of Ceres and Modesto; (2) revenues generated by land leases and rental of picnic areas, buildings, etc.; and (3) grants. The budget currently totals \$600,000 annually. Approximately 70% of the revenue (or \$420,600) is attributable to contributions from the three member agencies and the remainder (\$70,900) is from grants and leases.² As a revenue source, grants vary on an annual basis. In terms of expenditures, the majority of the budget is currently dedicated to operations and maintenance (70%), with the remaining funds allocated to capital projects.

Potential Sources of Park Funding

It is estimated that the park will continue to be funded through these three primary sources of revenue. Grants appear to be a potential growth area because recommended park improvements fulfill multiple objectives of federal, state, regional, and nonprofit agencies, such as enhancement of environmental resources, provision of recreational opportunities, and provision of facilities for non-motorized transportation. There are numerous potential grant sources available to fund capital improvements in the TRRP. Some of the most relevant grants are summarized in the following section.

Government-Sponsored Grants

State Park Bond 2000 Funds (Proposition 12)

In March 2000, California voters approved the "Safe Neighborhood Parks, Clean Water, Clean Air and Coastal Protection Bond Act of 2000" (Proposition 12), which provided \$824 million for local assistance grants. Local grants included within the bill are disbursed on a per capita basis as well as a competitive basis. The Per Capita Grant Programs are intended to provide funds for projects that accomplish the following:

- A. Rehabilitate facilities at existing local parks that will provide for more efficient management and reduced operational costs.
- B. Develop facilities that promote positive alternatives for youth and that promote cooperation between local park and recreation service providers and youth-serving nonprofit organizations.
- C. Promote family-oriented recreation, including art activities.
- D. Provide for open, safe and accessible local park lands, facilities, and botanical gardens.





Wild lilac

Projects eligible for 2000 Bond Act funds include acquisition, development, improvement, rehabilitation, restoration, enhancement, and interpretation of local park and recreation lands and facilities. Funding will be available beginning in the 2001/2002 fiscal year.³

The preliminary estimates of the per capita grants disbursement are \$2,468,100 for Stanislaus County, \$396,600 for Ceres and \$2,261,350 for Modesto, for a total disbursement of \$5.1 million for the three member agencies.⁴ Each jurisdiction will decide on how to use these funds. However, it is assumed that some portion of the funds will be dedicated to the TRRP.

In addition to the per capita grants discussed above, the 2000 Bond Act provided for competitive grant programs in a number of areas that would be applicable to the TRRP. These are as follows:

- Roberti-Zberg-Harris Program—\$200 million statewide—for urban parks and open space.
- Riparian and Riverine Habitats Grant Program—\$10 million statewide—for river and stream trail projects.
- Non-Motorized Trails—\$10 million statewide—for recreational trails.

Applications for these competitive grants will be staggered throughout the 2001/02 fiscal year.⁵

Land and Water Conservation Fund Program

The Land and Water Conservation Fund Program is administered by the National Parks Service through California State Parks. The money is used for statewide planning and for acquiring and developing outdoor recreation areas and facilities. LWCF grants to local agencies require a dollar-for-dollar match.

Recreational Trails Program

The Recreational Trails Program provides funds for recreational trails and trail-related projects. The program is administered by the Federal Highway Administration (FHWA) through the California Department of Parks and Recreation. The Recreational Trails Program is a matching program that provides up to 80% of project costs.

Habitat Conservation Fund Program

The Habitat Conservation Fund Program is a competitive grant program that is administered through the California Department of Parks and Recreation. Currently, funds are targeted to habitat categories, including riparian habitat and rare, threatened, endangered and fully protected species. The Habitat Conservation Fund Program requires a dollar-for-dollar match from a non-state source.

California Riparian Habitat Conservation Program

The Wildlife Conservation Board administers funds for the protection and restoration of the state's riparian ecosystems. The TRRP received one of these grants to assist in the purchase of the Gateway Parcel.

TEA 21 Grants

The Transportation Equity Act for the 21st Century (TEA 21) was enacted in 1998 and provides funds for surface transportation for the 6-year period 1998 to 2003. TEA 21 funds are applicable to a wide range of transportation-related projects, including bicycle and pedestrian paths and recreational trails. TEA 21 Grants typically require local matching funds.

Solid Waste Disposal and Codisposal Site Cleanup Program

Under the Solid Waste Disposal and Codisposal Site Cleanup Program, local governments can finance a wide range of remediation projects. The California Integrated Waste Management Board (CIWMB) may expend funds directly for

cleanup or emergency actions, provide loans to responsible parties who demonstrate the ability to repay state funds, or provide matching grants to local governments to assist in remediation of environmental problems at landfills. For this program, there is a continuous application period. Each grant is brought before the Permitting and Enforcement committee and the Board individually for award.

Nonprofit Foundation Sponsored Grants

The David and Lucille Packard Foundation

The Packard Foundation provides grants to nonprofit organizations in a number of areas including conservation. The Foundation's assets were approximately \$13 billion as of December 31, 1999. Grant awards totaled approximately \$411 million in 1999, and the Foundation expects to make grants of approximately \$500 million in 2000.

One of the grant programs supported by the Foundation is the Conserving California Landscapes Initiative. This is a five-year, \$175-million initiative aimed at preserving the natural ecosystems and agricultural resources in California. In 1999 the Packard Foundation granted approximately \$43 million in grants to nonprofits for conserving California landscapes. Funds are used for land acquisition, policy analysis, planning, capacity-building, and restoration and stewardship.

LEGACI Grants

Each year, the Great Valley Center awards over one-half million dollars in monetary grants to nonprofit groups, community organizations, and local governments that are working to improve the well-being of the Great Central Valley through initiatives in the areas of Land Use, the Environment, Growth, Agriculture, Conservation and Investment (LEGACI).

To be eligible for support, projects must have an area of focus within at least one of the Valley's 19 counties. Proposals that incorporate collaboration with other local groups are viewed favorably by the Center's Board of Directors.

Other Sources of Revenue

User Fees

Certain facilities within the park are currently subject to user fees. The TRRP presently generates approximately \$70,000 dollars each year from user fees associated with the lease of picnic areas, land, and Legion Hall. In the future, user fees will continue to be generated by the facilities in the TRRP, as well as picnic and meadow areas in the Gateway Parcel, the Amphimeadow at the Gateway Parcel and the Sports Complex in the Carpenter Road Area. Other user fees that may be considered include park entrance fees and parking fees.

Revenue-Generating Facilities

Another potential source of revenue would be associated with concessions. Concessions that are in keeping with the nature of the park, such as bicycle, canoe, and skate rental as well as limited food sales in association with the regional sports complex, could generate revenue for the park and serve its users. There may also be opportunities for entrepreneurial ventures, such as commercial land development in appropriate areas, to generate revenue for the park. Entrepreneurial ventures that enhance enjoyment of the park and generate revenue for the park should be pursued.

Development Impact Fees

As a rapidly growing area, the member agencies may consider levying a development impact fee for TRRP. However, such fees need to demonstrate that there is a clear relationship between the amount charged and the cost of the related improvement.

Private and Nonprofit Sponsors

Private sponsors, including philanthropic organizations and corporate sponsors, is a potential area that could be pursued for the TRRP. A growing area of funding for parks comes from corporate donations in exchange for some form of recognition



Cornerstone Park, Littleton, Colorado



Littleton, Colorado

within the park. This is a practice that is becoming more common as a mechanism to finance public facilities. Clearly, a vital and attractive park is a marketable asset that can attract private investment. Care should be taken, however, to ensure that recognition of corporate donors does not take over the identity of the park.

County-Wide Park Bonds or General Obligation Bonds

Another potential source of revenue for capital expenditures would involve the issuance of a General Obligation Bond. This is a mechanism that has been used successfully by other counties and park districts in California to finance land acquisition and capital expenditures for park facilities. A park bond measure would require approval by a two-thirds majority vote.

Phasing of Park Improvements

Recommended Park Improvement Phasing

The capital costs included in the Master Plan are assumed to be implemented over a 20-year period, from 2001 to 2021. In general, park improvements should be phased as funding permits, with early term projects focusing on trail linkages and riparian and landscape restoration. Priority should be placed on development of the Gateway Parcel, due to its high visibility, central location and proximity to existing trails and park facilities at Legion Park and the Airport Area.

Due to the additional planning and extraordinary costs associated with the Carpenter Road landfill, it is assumed that improvements in this area would occur in the long-term. A generalized schedule of park improvement phasing is summarized in Table 4.

Implementation Strategy

The implementation strategy for the Tuolumne River Regional Park is based on the following elements:

- Ongoing commitment of funds contributed by the three member agencies to fund operation and maintenance costs of the park and early term capital improvements.
- Commitment of additional funds from the three member agencies based on the availability of Park Bond 2000 (Proposition 12) Funds starting in 2001. If the TRRP could obtain 10% of the Park Bond 2000 Per Capita funds from the member agencies, there would be approximately \$500,000 to begin implementation projects.
- An aggressive approach to securing grants and private contributions for park improvements.
- Leveraging available funding for capital improvements (Park Bond Funds in early years) to maximize financial impact. In early years, priority should be placed on using available funds for capital improvements that can:
 - Attract additional funding (i.e. matching grants); or
 - Generate revenue through user fees or leases.
- In the long term, the county or the three member agencies should consider a General Obligation Bond to fund park and recreation capital improvements.

Table 4 Conceptual Phasing Schedule

Area / Item	Phase
AIRPORT AREA	
Trails	Completed
Riparian Restoration	2
Special Features:	
Overlook	3
Site Furnishings	3
LEGION PARK	
Trails	1
Riparian Restoration	2
Park Landscaping	3
Special Features:	
Small Pedestrian Bridges	3
Deck Overlooks	3
Boat Pier	3
Canoe & Kayak Beach	2
Small Group Event Space	3
Picnic Shelter	3
Site Furnishings	3
Streets/Parking	3
MANCINI PARK	
Trails	3
Riparian Restoration	3
Park Landscaping	3
Special Features:	
Pedestrian Bridge	3
Overlook	3
Site Furnishings	3
Parking	3

Area / Item	Phase
GALLO RIPARIAN AREA	
Trails	1
Riparian Restoration	2
Park Landscaping	3
Special Features:	
Overlook	3
Site Furnishings	3
GATEWAY PARCEL	
Trails	1-3
Riparian Restoration	1
Park Landscaping	1-3
Special Features:	
Pedestrian Bridge	1
Amphimeadow	3
Stormwater Wetlands	3
Overlooks	3
Fishing Piers	3
Children's Play Area	3
Vista Points	3
Site Furnishings	3
Utilities	3
Streets/Parking Areas	3

Area / Item	Phase
GOLF COURSE AREA	
Trails	2
Riparian Restoration	2
Park Landscaping	3
Special Features:	
Pedestrian Bridge	3
Overlook	3
Canoe & Kayak Launch	3
Site Furnishings	3
Streets/Parking Areas	3
CARPENTER ROAD AREA	
Trails	2-3
Riparian Restoration	2-3
Park Landscaping	3
Special Features:	
Overlooks	3
Canoe & Kayak Launch	3
Sports Complex	3
Interpretive Center/Sports Bldg.	3
Stormwater Wetlands	3
Treatment Plant Upgrade	3
Site Furnishings	3
Site Utilities	3
Streets/Parking	3
SOUTH SIDE PARCELS	
Trails	3
Riparian Restoration	3
Site Furnishings	3
Street Trees	3

Note: This phasing schedule has been developed for illustrative purposes only. Actual phasing will vary.



Native to woodland, grassland, and riparian areas of the Central Valley, California fuchsia will be planted in the TRRP.

TRRP Implementation Action Plan

Phase 1: Improve and Connect the Gateway Parcel into the Park System

Centrally located and highly visible, the Gateway Parcel represents the ideal first phase of park development. The site also contains a blend of public access, recreation, and environmental restoration programs that would address a broad cross section of public interest.

Specific Actions

1. Develop Schematic Design and Construction Documents for the Gateway Site. The next step in implementing the Gateway parcel is to develop detailed construction documents.
2. Pursue an Agreement with the City of Modesto to Use the Parking Area at Beard Brook Park as a Staging Area for Gateway. The Tuolumne Boulevard Extension will not occur for several years (estimated 2003-2004). In the meantime, access and parking for the TRRP could be obtained via Beard Brook Park, immediately north of the Gateway site. The TRRP should pursue an agreement with Modesto to use this area for access to Gateway.
3. Pursue an Agreement with Gallo Regarding a Trail Easement Between Dry Creek and Legion Park. Once completed, the half-mile trail linkage between Gateway and Legion will result in a continuous 3.5-mile linkage along the river from Highway 99 to Mitchell Road. The Gallo section of this trail is a critical linkage.
4. Implement the Dry Creek Trail Connection from Beard Brook Park to Legion Park. As described above, this would be the first priority park improvement.

5. Complete Earthwork Over the Gateway Site. Earthwork must be completed in order to implement any of the park improvements, including the riparian restoration.
6. Complete Riparian Restoration Planting and Trail. Once the earthwork is complete, including the re-created riparian terraces, the riparian zone can be replanted to improve the environmental quality of the site and the river. A trail along the river in this vicinity would be a significant amenity to the system.

Phase 2: Integrate the Remaining Riparian Areas into the Park System

The following phase of work should focus on implementing the riparian restoration and trail system along the length of the park. This phase of work will require a number of specific actions that should be pursued opportunistically. For example, further evaluation and refinement of the stormwater wetlands concept for the Carpenter Road area may be studied as part of a larger stormwater management study for the adjacent area. Similarly, the regional sports complex should be pursued in conjunction with other regional sports park planning efforts taking place in the County.

Specific Actions

1. Pursue Agreements for a Trail Easement and Riparian Restoration along the Modesto Municipal and Dryden Golf Courses. A trail linkage through this zone would add significantly to the overall system.
2. Complete a Closure Plan for the Carpenter Road Landfill. Improvement of the Carpenter Road area, including trails and roadways for access to facilities will depend on assessing the landfill and determining what actions are necessary to construct park facilities in this area.

Phase 3 Larger Park Improvements

The third phase of park improvement includes many of the park improvements aside from the river trail and riparian restoration. These should be developed as funding permits.

Operations and Maintenance

Throughout the development of the TRRP Master Plan, considerable concern has been expressed by the public and agencies regarding maintenance, safety and enforcement issues. In its current state, the park represents undeveloped land within an urban area, and as such, attracts inappropriate uses and activities. To a large extent, improving the park with trails and recreational activities as described in the Master Plan will begin to activate the park and bring in more "legitimate" users and activities. However, it will be critical to provide a higher level of enforcement and maintenance in order to provide users with a safe park experience and to protect the natural resources of the park.

Long-term Expansion of the TRRP

This Master Plan has addressed the land which is currently within the ownership of the Tuolumne River Regional Park Joint Powers Authority. Initially, the vision of the park was "from the mountains to the sea." Clearly, extending the park upstream and downstream and along both sides of the river should continue to be a priority. Toward this end, the TRRP JPA should look opportunistically for additions to the park, through a number of mechanisms, including land acquisition, dedication, or conservation easements. As new areas are added to the park, the overall approach taken in this Master Plan can continue to be implemented. Overall, these elements include:

- Restore a continuous riparian corridor.
- Provide a continuous river trail.
- Provide connections to the river.
- Provide a variety of experiences related to recreation, education, and conservation.
- Maintain a consistent set of park amenities, such as signage, to foster a unified sense of place and a coherent park identity.

Many specific elements of this Master Plan, such as the approach to the re-created riparian terraces, the planting palette, and the maintenance guidelines, will be directly applicable to new lands acquired by the TRRP.



The TRRP's existing tree canopy is a wonderful asset in places such as Legion Park.

¹ All cost estimates include a factor for design (10%), construction management (10%), a contingency (15%) and a labor surcharge (5%) reflecting the tight labor market.
² 1999/00 TRRP Budget.
³ California State Parks web site, 2000 Bond Act Description of Grant Programs, <www.parks.ca.gov/grants>.
⁴ California State Parks-Local Services Section, Prop 12 Estimates of Per Capita Grants Programs, 1999.
⁵ California State Parks web site, op. cit.



Bibliography

Background Reports

This Master Plan is based on data collected in a series of technical memoranda, prepared as background reports, including:

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- *Technical Memorandum #2: Findings and Impressions*, EDAW, September, 1999.
- *Technical Memorandum #3: Preliminary Park Program*, EDAW, September, 1999.
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Image Sources

All photographs, maps, diagrams, and illustrations were produced by EDAW, Inc. unless otherwise noted next to the image. These additional image sources include:

California Academy of Sciences

California Department of Fish and Game

City of Modesto

McBain and Trush

McHenry Museum and Historical Society

St. Mary's College of California

University of California, Berkeley - Digital Image Library



Native grape vines blanket some of the park's oak trees and provide additional wildlife habitat.



Willows and other water-loving plants grow along the edge of the Tuolumne River.

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Appendix A:

Proposed Planting Palette for Tuolumne River Regional Park

Appendix B

Conceptual Cost Estimates for Tuolumne River Regional Park

Appendices

Appendix A

Proposed Planting Palette for Tudumne River Regional Park

Note: Riparian plant species appropriate for restoration or buffer strips are indicated in bold. Common names and taxonomy are taken from:

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Blue oak (foreground) and foothill pine (background)

TREES					
	Scientific Name	Common Name	Fall Color	Native Region	Generally Found in These Vegetation Types
1	<i>Acer macrophyllum</i>	big-leaf maple	Yellow	Foothills	Riparian
2	<i>Acer negundo</i> var. <i>californicum</i>	box elder	Yellow	Central Valley	Riparian
3	<i>Aesculus californica</i>	California buckeye	Brown	Foothills	Riparian
4	<i>Alnus rhombifolia</i>	white alder	Yellow	Central Valley	Riparian
5	<i>Arbutus menziesii</i>	Pacific madrone	Evergreen	Foothills, Sierra	Mixed conifer
6	<i>Calocedrus decurrens</i>	incense cedar	Evergreen	Sierra	Mixed conifer
7	<i>Cornus nuttallii</i>	Pacific dogwood	Red	Sierra	Mixed Conifer
8	<i>Fraxinus dipetala</i>	ash	Yellow	Central Valley	Riparian
9	<i>Fraxinus latifolia</i>	Oregon ash	Yellow	Central Valley	Riparian
10	<i>Fremontodendron californicum</i>	California flannelbush	Evergreen	Foothills	Chaparral
11	<i>Heteromeles arbutifolia</i>	toyon	Evergreen	Foothills	Chaparral, woodland
12	<i>Juglans californica</i> var. <i>hindsii</i>	Northern California black walnut	Yellow	Central Valley	Riparian
13	<i>Pinus sabiniana</i>	grey pine, foothill pine	Evergreen	Foothills	Woodland
14	<i>Platanus racemosa</i>	western sycamore	Yellow	Central Valley	Riparian
15	<i>Populus fremontii</i>	Fremont cottonwood	Dormant	Central Valley	Riparian
16	<i>Pseudotsuga menziesii</i>	Douglas fir	Evergreen	Sierra	Mixed conifer
17	<i>Quercus chrysolepis</i>	canyon live oak	Evergreen	Foothills	Woodland, grassland
18	<i>Quercus douglasii</i>	blue oak	Brown	Central Valley	Woodland
19	<i>Quercus kelloggii</i>	black oak	Yellow	Foothills	Woodland
20	<i>Quercus lobata</i>	valley oak, roble oak	Brown	Central Valley	Riparian
21	<i>Quercus wislizenii</i> var. <i>wislizenii</i>	interior live oak (tree form)	Evergreen	Foothills	Woodland
22	<i>Salix gooddingii</i>	Goodding's black willow	Yellow	Central Valley	Riparian
23	<i>Salix laevigata</i>	red willow	Yellow	Central Valley	Riparian
24	<i>Salix lucida</i> ssp. <i>lasiandra</i>	pacific willow, shining willow	Yellow	Central Valley	Riparian
25	<i>Umbellularia californica</i>	California bay laurel	Evergreen	Foothills	Riparian

SHRUBS					
	Scientific Name	Common Name	Fall Color	Native Region	Generally Found in These Vegetation Types
1	<i>Amelanchier alnifolia</i> var. <i>pumila</i>	western serviceberry	Yellow	Foothills, Sierra	Woodland, mixed conifer
2	<i>Arctostaphylos manzanita</i> ssp. <i>manzanita</i>	manzanita	Evergreen	Foothills	Chaparral, woodland
3	<i>Arctostaphylos viscida</i>	whiteleaf manzanita	Evergreen	Foothills	Chaparral, woodland
4	<i>Baccharis pilularis</i>	coyote brush	Evergreen	Central Valley	Riparian
5	<i>Baccharis salicifolia</i>	mule fat, seep willow, water wally	Brown	Central Valley	Riparian
6	<i>Calycanthus occidentalis</i>	spice bush	Evergreen	Central Valley	Riparian
7	<i>Carpenteria californica</i>	tree anemone	Evergreen	Foothills	Riparian, woodland
8	<i>Ceanothus cordulatus</i>	mountain whitethorn	Evergreen	Sierra	Mixed conifer
9	<i>Ceanothus cuneatus</i>	buck brush	Evergreen	Foothills	Chaparral
10	<i>Ceanothus integerrimus</i>	deer brush	Yellow	Sierra	Chaparral
11	<i>Ceanothus thyrsiflorus</i>	blue blossom	Evergreen	Foothills	Chaparral, woodland
12	<i>Ceanothus velutinus</i>	tobacco brush, snow bush	Evergreen	Sierra	Woodland
13	<i>Cephalanthus occidentalis</i> var. <i>californicus</i>	buttonbush, buttonwillow	Yellow	Central Valley	Riparian, wetland
14	<i>Cercis occidentalis</i>	western redbud	Yellow	Foothills	Chaparral, grassland
15	<i>Cercocarpus betuloides</i>	mountain mahogany	Evergreen	Foothills	Chaparral, woodland
16	<i>Cornus sericea</i> ssp. <i>occidentalis</i>	American dogwood, redtwig dogwood	Red	Foothills, Sierra	Riparian
17	<i>Corylus cornuta</i> var. <i>californica</i>	western hazelnut	Yellow	Sierra	Mixed conifer
18	<i>Garrya fremontii</i>	Fremont silk tassel	Evergreen	Foothills	Woodland
19	<i>Garrya elliptica</i>	silk tassel	Evergreen	Foothills	Chaparral, woodland
20	<i>Holodiscus discolor</i>	oceanspray	Yellow	Central Valley	Riparian, woodland
21	<i>Lupinus albibifrons</i>	bush lupine	Evergreen	Foothills	Grassland
22	<i>Lupinus polyphyllus</i>	purple lupine	Evergreen	Central Valley	Riparian, wetland
23	<i>Mimulus aurantiacus</i>	golden sticky monkey flower	Evergreen	Foothills	Chaparral
24	<i>Philadelphus lewissii</i>	wild mock orange	Yellow	Sierra	Riparian, mixed conifer
25	<i>Prunus virginiana</i> var. <i>demissa</i>	western chokecherry	Yellow	Foothills	Woodland



Alfred Brousseau, St. Mary's College of California

Spice bush (above), generally found in the Central Valley's riparian zones, blooms in the spring or summer. Golden sticky monkey flower (below) is native to the chaparral plant community of the foothills.



Alfred Brousseau, St. Mary's College of California



Western azalea

Gladys Lucille Smith, California Academy of Sciences

SHRUBS (continued)					
26	<i>Rhamnus californica</i> ssp. <i>californica</i>	California coffeeberry	Evergreen	Foothills	Woodland, chaparral
27	<i>Rhododendron occidentale</i>	western azalea	Red	Foothills, Sierra	Riparian
28	<i>Ribes aureum</i> var. <i>aureum</i>	golden currant	Yellow	Central Valley	Riparian, woodland
29	<i>Ribes cereum</i>	wax currant	Yellow	Sierra	Mixed conifer
30	<i>Ribes menziesii</i>	canyon gooseberry	Yellow	Foothills	Chaparral
31	<i>Ribes roezlii</i>	Sierra gooseberry	Yellow	Foothills, Sierra	Chaparral, woodland
32	<i>Romneya coulteri</i>	Coulter's Matilija poppy	Evergreen	Central Valley	Riparian, woodland
33	<i>Rosa californicum</i>	wild rose	Red	Central Valley	Riparian, woodland
34	<i>Salix exigua</i>	narrowleaf willow	Yellow	Central Valley	Riparian
35	<i>Salix lasiolepis</i>	arroyo willow	Yellow	Central Valley	Riparian
36	<i>Salix melanopsis</i>	dusky willow	Yellow	Central Valley	Riparian
37	<i>Sambucus mexicana</i>	blue elderberry	Yellow	Central Valley	Riparian, grassland
38	<i>Spirea densiflora</i>	mountain spirea	Evergreen	Sierra	Mixed conifer



Wild rose

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GRASSES					
	<i>Scientific Name</i>	<i>Common Name</i>	<i>Fall Color</i>	<i>Native Region</i>	<i>Generally Found in These Vegetation Types</i>
1	<i>Agrostis exarata</i>	bent grass	Evergreen	Central Valley	Riparian, grassland
2	<i>Bromus carinatus</i>	California brome	Evergreen	Foothills	Woodland, grassland
3	<i>Deschampsia cespitosa</i> ssp. <i>cespitosa</i>	tufted hairgrass	Evergreen	Central Valley	Wetland, grassland
4	<i>Deschampsia elongata</i>	slender hairgrass	Evergreen	Central Valley	Wetland, grassland
5	<i>Elymus glaucus</i>	blue wildrye	Evergreen	Central Valley	Grassland
6	<i>Elymus trachycaulus</i>	slender wheatgrass	Evergreen	Central Valley	Grassland
7	<i>Festuca idahoensis</i>	blue bunchgrass	Evergreen	Central Valley	Woodland, grassland
8	<i>Hordeum brachyantherum</i>	meadow barley	Yellow	Central Valley	Grassland
9	<i>Leymus triticoides</i>	creeping wildrye	Evergreen	Central Valley	Riparian, woodland, grassland
10	<i>Melica californica</i>	California melic	Evergreen	Foothills	Woodland, grassland, riparian
11	<i>Muhlenbergia rigens</i>	deer grass	Evergreen	Central Valley	Riparian, grassland
12	<i>Nassella cernua</i>	nodding needlegrass	Evergreen	Central Valley	Grassland
13	<i>Nassella lepida</i>	foothill needlegrass	Evergreen	Central Valley	Grassland
14	<i>Nassella pulchra</i>	purple needlegrass	Evergreen	Central Valley	Grassland
15	<i>Poa secunda</i>	pine bluegrass	Evergreen	Central Valley	Woodland, grassland



Blue wildrye

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Common tule, native to wetland zones in the Central Valley, will be planted along the river and in the park's stormwater wetlands and swales.

WETLAND PLANTS					
	Scientific Name	Common Name	Fall Color	Native Region	Generally Found in These Vegetation Types
1	<i>Alisma plantago-aquatica</i>	water plantain	Dormant	Central Valley	Wetland
2	<i>Anemopsis californica</i>	yerba mansa	Dormant	Central Valley	Wetland
3	Carex barbarae	sedge	Evergreen	Central Valley	Riparian, wetland
4	<i>Carex</i> sp.	sedges	Evergreen	Central Valley	Riparian, wetland
5	<i>Ceratophyllum demersum</i>	hornwort, common coon's tail	Dormant	Central Valley	Wetland
6	<i>Eleocharis macrostachya</i>	spike rush	Evergreen	Central Valley	Wetland
7	<i>Elodea canadensis</i>	common waterweed	Dormant	Central Valley	Wetland
8	<i>Equisetum arvense</i>	common horsetail	Dormant	Central Valley	Riparian, wetland
9	<i>Juncus balticus</i>	baltic rush	Evergreen	Central Valley	Wetland
10	<i>Juncus effusus</i>	common rush	Evergreen	Central Valley	Wetland
11	<i>Lemna</i> sp.	duckweeds	Dormant	Central Valley	Wetland
12	<i>Myriophyllum hippuroides</i>	western milfoil	Dormant	Central Valley	Wetland
13	<i>Nuphar luteum</i> ssp. <i>polysepalum</i>	yellow pond lily	Dormant	Central Valley	Wetland
14	<i>Potamogeton foliosus</i> var. <i>foliosus</i>	leafy pondweed	Dormant	Central Valley	Wetland
15	<i>Potamogeton natans</i>	floatingleaf pondweed	Dormant	Central Valley	Wetland
16	<i>Potamogeton nodosus</i>	longleaf pondweed	Dormant	Central Valley	Wetland
17	<i>Potamogeton pectinatus</i>	fennelleaf pondweed	Dormant	Central Valley	Wetland
18	<i>Potamogeton pusillus</i>	small pondweed	Dormant	Central Valley	Wetland
19	<i>Sagittaria latifolia</i>	arrowhead	Brown	Central Valley	Wetland
20	<i>Scirpus acutus</i> var. <i>occidentalis</i>	common tule	Dormant	Central Valley	Wetland
21	<i>Scirpus americanus</i>	common three square	Dormant	Central Valley	Wetland
22	<i>Scirpus californicus</i>	California bulrush	Dormant	Central Valley	Wetland
23	<i>Typha angustifolia</i>	narrowleaf cattail	Dormant	Central Valley	Wetland
24	<i>Typha domingensis</i>	southern cattail	Dormant	Central Valley	Wetland

ANNUALS & PERENNIALS					
	Scientific Name	Common Name	Fall Color	Native Region	Generally Found in These Vegetation Types
1	<i>Achillea millefolium</i>	yarrow	Evergreen		Grassland
2	<i>Anaphalis margaritacea</i>	pearly everlasting	Brown	Foothills, Sierra	Woodland
3	<i>Aquilegia formosa</i>	western columbine	Brown	Foothills, Sierra	Riparian, woodland
4	<i>Artemisia douglasiana</i>	mugwort	Grey	Central Valley	Riparian
5	<i>Asclepias speciosa</i>	showy milkweed	Brown	Foothills	Woodland, grassland
6	<i>Asclepias californica</i>	round hooded milkweed	Brown	Foothills	Chaparral, grassland
7	<i>Epilobium canum</i>	California fuchsia	Evergreen	Central Valley	Woodland, grassland, riparian
8	<i>Eschscholzia californica</i>	California poppy	Brown	Central Valley	Grassland
9	<i>Lilium pardalinum</i> ssp. <i>pardalinum</i>	leopard lilly	Brown	Foothills	Riparian
10	<i>Lilium washingtonianum</i> ssp. <i>washingtonianum</i>	Washington lily	Brown	Sierra	Mixed conifer
11	<i>Lupinus bicolor</i>	miniature lupine	Brown	Central Valley	Riparian, woodland, grassland
12	<i>Mentzelia</i> sp.	blazing star	Brown	Central Valley	Riparian
13	<i>Mimulus cardinalis</i>	scarlet monkey flower	Brown	Central Valley	Riparian
14	<i>Mimulus guttatus</i>	monkey flower	Brown	Central Valley	Riparian, wetland
15	<i>Oenothera elata</i> ssp. <i>hirsutissima</i>	evening primrose	Brown	Central Valley	Riparian, wetland
16	<i>Penstemon azureus</i> var. <i>azureus</i>	azure penstemon	Evergreen	Sierra	Woodland, mixed conifer
17	<i>Penstemon centranthifolius</i>	scarlet bugler	Evergreen	Central Valley	Chaparral, woodland, grassland
18	<i>Urtica dioica</i> ssp. <i>holosericea</i>	hoary nettle	Brown	Central Valley	Riparian
19	<i>Viola douglasii</i>	Douglas violet	Evergreen	Central Valley	Grassland



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Miniature lupines and many other flowering plants will brighten the park's meadows.

VINES & GROUNDCOVERS

	Scientific Name	Common Name	Fall Color	Native Region	Generally Found in These Vegetation Types
1	<i>Arctostaphylos nevadensis</i>	pine mat manzanita	Evergreen	Sierra	Mixed conifer
2	<i>Arctostaphylos uva-ursi</i>	bearberry, kinnikinnik	Evergreen	Sierra	Mixed conifer
3	<i>Aristolochia californica</i>	Dutchman's pipe	Brown	Central Valley	Riparian
4	<i>Ceanothus diversifolius</i>	pine mat	Evergreen	Sierra	Mixed conifer
5	<i>Ceanothus prostratus</i>	mahala mat, squaw carpet	Evergreen	Sierra	Mixed conifer
6	<i>Clematis ligusticifolia</i>	virgin's bowers, yerba de chiva	Yellow	Central Valley	Riparian
7	<i>Rubus leucodermis</i>	black cap raspberry	Red	Foothills, Sierra	Riparian, woodland
8	<i>Rubus ursinus</i>	California blackberry	Red	Central Valley	Riparian, woodland
9	<i>Toxicodendron diversilobum</i>	poison oak	Red	Central Valley	Riparian, woodland
10	<i>Viola adunca</i>	western dog violet	Evergreen	Sierra	Riparian, grassland
11	<i>Viola glabella</i>	stream violet	Evergreen	Sierra	Riparian
12	<i>Vitis californica</i>	California grape	Yellow	Central Valley	Riparian

The fruit of the California grape is an important food source for bird and wildlife species.



J.E. and Bonnie McClellan, California Academy of Sciences



Gladys Lucille Smith, California Academy of Sciences

Dutchman's pipe, a vine found in Central Valley riparian zones, attracts local butterfly species.

Appendix B
Conceptual Cost Estimates for
Tudumne River Regional Park

Area / Item	Estimated Cost
AIRPORT AREA	
Trails	\$ 25,000
Riparian Restoration	\$ 6,000
Special Features:	
River Overlook	\$ 118,000
Site Furnishings	\$ 45,000
Subtotal	\$ 194,000
LEGION PARK	
Trails	\$ 890,000
Riparian Restoration	\$ 57,000
Park Landscaping	\$ 3,384,000
Special Features:	
Small Pedestrian Bridges	\$ 126,000
Deck Overlooks	\$ 137,000
Boat Pier	\$ 70,000
Canoe & Kayak Beach	\$ 14,000
Small Group Event Space	\$ 28,000
Picnic Shelter	\$ 14,000
Site Furnishings	\$ 206,000
Streets / Parking	\$ 119,000
Subtotal	\$ 5,045,000
MANCINI PARK	
Trails	\$ 102,000
Riparian Restoration	\$ 19,000
Park Landscaping	\$ 504,000
Special Features:	
Pedestrian Bridge	\$ 434,000
River Overlook	\$ 88,000
Site Furnishings	\$ 79,000
Parking	\$ 26,000
Subtotal	\$ 1,252,000

Area / Item	Estimated Cost
GALLO RIPARIAN AREA	
Trails	\$ 172,000
Riparian Restoration	\$ 86,000
Park Landscaping	\$ 150,000
Special Features:	
Overlook	\$ 50,000
Site Furnishings	\$ 40,000
Subtotal	\$ 498,000
GATEWAY PARCEL	
Trails	\$ 921,000
Riparian Restoration	\$ 7,861,000
Park Landscaping	\$ 7,014,000
Special Features:	
Pedestrian Bridge	\$ 368,000
Amphimeadow	\$ 46,000
Stormwater Wetlands	\$ 26,000
Overlooks	\$ 188,000
Fishing Piers	\$ 168,000
Children's Play Area	\$ 112,000
Vista Points	\$ 84,000
Site Furnishings	\$ 1,203,000
Utilities	\$ 375,000
Streets / Parking	\$ 1,030,000
Subtotal	\$ 19,396,000

Area / Item	Estimated Cost
GOLF COURSE AREA	
Trails	\$ 559,000
Riparian Restoration	\$ 318,000
Park Landscaping	\$ 3,859,000
Special Features:	
Pedestrian Bridge	\$ 770,000
River Overlook	\$ 102,000
Boat Pier	\$ 70,000
Site Furnishings	\$ 120,000
Streets / Parking	\$ 56,000
Subtotal	\$ 5,854,000
CARPENTER ROAD AREA	
Trails	\$ 1,579,000
Riparian Restoration	\$ 8,420,000
Park Landscaping	\$ 19,950,000
Special Features:	
Overlooks	\$ 140,000
Canoe & Kayak Launch	\$ 154,000
Sports Complex	\$ 803,000
Interpretive Center / Sports Bldg.	\$ 9,800,000
Stormwater Wetland	\$ 619,000
Treatment Plant Upgrade	\$ 6,227,000
Site Furnishings	\$ 1,043,000
Site Utilities	\$ 375,000
Streets / Parking	\$ 787,000
Subtotal	\$ 49,897,000
SOUTH SIDE PARCELS	
Trails	\$ 3,000
Riparian Restoration	\$ 409,000
Site Furnishings	\$ 9,000
Street Trees	\$ 193,000
Subtotal	\$ 614,000
TOTAL	\$ 82,750,000

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Paul Caruso, Commission Vice Chair, Chairman Stanislaus County Board of Supervisors

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