REVISED FINAL

CACHE CREEK RESOURCES MANAGEMENT PLAN

for LOWER CACHE CREEK

Yolo County

Adopted
August 20, 1996

Revised
August 15, 2002

REVISED FINAL

CACHE CREEK RESOURCES MANAGEMENT PLAN

for LOWER CACHE CREEK

Yolo County

Adopted
August 20, 1996

Revised
August 15, 2002

TABLE OF CONTENTS

TABLE OF CONTENTS - continued

LIST OF FIGURES

CHAPTER 1.0 INTRODUCTION

On June 14, 1994, the Yolo County Board of Supervisors adopted draft goals and objectives for the Cache Creek Resources Management Plan (CCRMP) and Off-Channel Mining Plan (OCMP). In doing so, the Board recognized that the creek is integrally bound to the environmental and social resources of the County, including drainage, flood protection, water supply and conveyance, wildlife habitat, recreation, aggregate mining, and agricultural production. As such, development of these plans is based on the key assumption that the creek must be viewed as an integrated system, with an emphasis on the management of all of Cache Creek's resources, rather than a singular focus on any one issue. The CCRMP and OCMP establish a number of goals to assist in this overall management, balancing a diverse range of concerns within the overriding vision of enhancing the variety of resource needs for the region.

1.1 HISTORY AND BACKGROUND

Cache Creek has long served as the social and economic heartland of Yolo County. Long before exploration by the French trapper and Spanish soldiers, Cache Creek was one of the main settlement areas for the Patwin tribe, providing a rich environment for water, food, building materials, and recreation. In 1821, when the Spanish first entered the area, they noted a village of about 900 native people situated along the creek in an oak forest. The word Yolo comes from the Patwin "yoloy," which means a place abounding with rushes. These rushes were found in extensive wetlands along the Sacramento River, fed by the waters of Cache Creek.

By 1829, trappers from the Hudson Bay Company had discovered the bountiful nature of what the Spanish referred to as the "Rio de Jesus Maria." Since there was a convenient storage site near the stream for their beaver pelts, they dubbed it "Riviere la Cache," or Cache Creek. This area was one of the first in the Sacramento Valley to be settled by Americans, beginning in the 1840's. Several ranchos were granted to local residents by the Mexican government over the next decade. Soon, agriculture flourished along Cache Creek, especially the raising of livestock. The town of Cacheville (now Yolo) was established in 1857 and the water from Cache Creek was being used to power mills and irrigate nearby fields.

Several ditches were constructed to divert water from Cache creek in the 1850's and 1860's, diversifying the agricultural base of the area by expanding the production of wheat, barley, and alfalfa. In fact, irrigation diversions on Cache Creek are some of the earliest recorded in the state's history. Technological advances in water pumps during the 1880's led to widespread use of groundwater irrigation and the expansion of orchard crops, especially in the Capay Valley. As both surface irrigation and the groundwater pumping improved, agriculture intensified in areas previously dry farmed. The

development of efficient land leveling equipment and continual improvements in water delivery systems after World War II created a shift from grain and orchard crops to irrigated field crops, such as sugar beets and tomatoes.

With the booming postwar economy came rapidly growing subdivisions in the urban areas, dam construction, and the building of the interstate highway system. Consequently, the 1950's saw a dramatic increase in the demand for high-quality sand and gravel for use in concrete and in road construction. Due to its unique hydraulic and geologic characteristics, Cache Creek soon proved to be an important source of construction grade aggregate. In-stream mining grew to meet the demand and several new gravel operators moved into the area. The amount of sand and gravel removed from the channel rose sharply over the next two decades, generating public interest in the environmental effects caused by mining. Concerned over the noticeable degradation of Cache Creek, Yolo County began to turn its attention towards taking better care of this long-neglected and most-valued natural resource.

Aggregate Resources Advisory Committee

Yolo County has been attempting to resolve issues related to Cache Creek for over twenty years. Although much of the debate has centered on the benefits and problems associated with aggregate mining, previous studies have often expanded into other areas of environmental interest. The discussion of managing Cache Creek first began with the formation of the Aggregate Resources Advisory Committee (ARAC) by the Board of Supervisors in 1975. The ARAC described its scope as follows:

> Concern that the high quality aggregate resources of Yolo County may be being depleted led to the need to understand the impact of gravel extraction on: sediment transportation, bank erosion, scour, stream channelization and meandering, groundwater recharge, agriculture, land values, air and nose pollution, environmental and aesthetic considerations as well as obtaining an estimate of needs for Yolo County to the year 2025 for aggregate. There is also concern that alternatives for management are recommended.

The ARAC sought the assistance of Woodward Clyde Consultants to provide an objective technical investigation of the conditions on Cache Creek. The primary purpose of the study was to develop a sound basis for establishing a viable management policy. The report focused on two primary environmental impacts associated with the creek: (1) the causes and effects of streambed lowering; and (2) the causes and effects of stream widening. Woodward Clyde concluded that the streambed had been lowered significantly in many areas, largely as a result of gravel extraction, but that several other factors also contributed, including flood control structures (dams, levees, channelization, etc.), the construction of bridges with piers in the channel, and removal of riparian vegetation. Widening through increased meandering was also determined to be a result of in-stream mining, although the consultants thought that natural processes might have also played a role.

Several of the recommendations described in the Woodward Clyde report have been incorporated into the CCRMP, including; the construction of sills, check dams, and jetties within the channel, to reduce the potential or erosion; limiting the amount and depth of aggregate extraction, to minimize scour; and the additional protection of bridge structures (although the CCRMP recommends bio-engineering methods, rather than traditional techniques depending on the extensive use of concrete and steel). While recommending that in-channel excavation be significantly reduced, the report advised that aggregate mining should be encouraged along the banks and in off-channel pits, as long as such concerns as hydraulics, water, and agricultural land were adequately addressed. Woodward Clyde also suggested that the County undertake further study and regular monitoring of the stream. These concepts have similarly been applied in the policy framework of the CCRMP.

One of the primary recommendations of the ARAC was to update the County surface mining and reclamation ordinances, and require that all in-stream mining operations existing at the time obtain new use permits and reclamation plans consistent with the new ordinances. This was accomplished in 1980. The permits were analyzed in a program-level Environmental Impact Report (EIR), prepared by Environ. In their EIR, Environ also discussed the County's approach to resource management. They reiterated many of the recommendations made by Woodward Clyde and the ARAC, such as the need for additional study and future monitoring; revision of the recently adopted interim mining and reclamation ordinances; encouragement of off-channel mining; and maximization of net benefits from the aggregate industry (similar to the CCRMP's concept of "net gain"). In addition, Environ suggested that the County reexamine its policy with regards to agriculture lands, to allow for reclamation to other compatible uses, such as groundwater storage and recharge basins, recreation ponds, and fish farming. Most importantly, however, was the ARAC's emphasis on developing a coordinated approach to resolving interrelated resource problems.

Aggregate Technical Advisory Committee

In order to implement the directions of the ARAC, the Board of Supervisors appointed an Aggregate Technical Advisory Committee (AgTAC) in 1979 to develop a Resource Management Plan (RMP) for Cache Creek. A new study was prepared by Wahler Associates in 1982, of sand and gravel deposits along Cache Creek, as well as the upper and lower groundwater basins within the plan area. The Draft Resource Management Plan for the Cache Creek area, located between the towns of Yolo and Capay was released by the AgTAC in 1984. The draft plan looked at eleven separate management alternatives, as follows:

1. Eliminate in-channel mining and allow off-channel excavation;

2. Same as Item 1, except dedicate a corridor for the establishment of riparian vegetation;

3. Continue existing permits, as approved, and allow off-channel mining;

4. Repeal existing mining regulations and review in-stream mining on a case-by-case basis;

5. Create a channel of sufficient capacity to convey flood events, with in-channel mining restricted for maintenance and allow off-channel mining;

6. Same as Item 5, except sills would be installed downstream from local bridges to protect the structures against future scour;

7. Same as Item 5, except a low-flow channel would be designed within the floodway to convey smaller flood flows;

8. Same as Item 5, except channel banks would be armored with concrete or riprap;

9. Construct check dams within the channel and mine the materials that would be deposited behind them, as well as permit off-channel excavation;

10. Allow in-stream mining down to a predetermined elevation and prohibit off-channel mining; and

11. Prohibit all mining within the plan area.

After comparing the various benefits and problems of each method of stream management, the AgTAC decided that Alternative No. 5 was the one that would best accomplish the committee's goals, as well as being the most practical and the least expensive to implement. The recommended plan expanded upon this alternative, describing a number of specific actions needed to carry out the development of the flood channel concept. Among the actions to be taken were: the design of a floodway using the 100-year storm event, as determined by the U.S. Army Corps of Engineers; the development of criteria to ensure that off-channel pits would not adversely impact groundwater flow or breach during a flood; adoption of new zoning designations to protect mined lands from encroachment by incompatible uses; and incorporation of the classification study of aggregate resources prepared by the State Department of Conservation. The AgTAC also reiterated earlier recommendations to review the compatibility of the A-P (Agricultural Preserve) Zone with future mining reclamation, as well as a need to revise the County mining and reclamation ordinances.

A Draft EIR was authorized for the Draft Resource Management Plan by the firm of Dames and Moore in 1989. The document looked at seven different mining alternatives, as follows:

1. Continue existing permits, as proposed, and allow off-channel mining;

2. Rescind the County mining and reclamation ordinances, and allow both in-channel and off-channel mining depths and amounts to be set on an individual basis;

3. Implement the floodway channel concept described in the plan recommended by the AgTAC (Recommendation 5);

4. Implement off-channel wet pit mining, as long as it minimizes groundwater lowering and prevents levee breaches. (Note: This alternative and Item 3 together constituted the recommended AgTAC plan);

5. Allow off-channel mining, but restrict it to depths above the water table;

6. Allow in-stream mining below the maximum allowed depth (the theoretical thalweg);

7. Prohibit all mining within the study area.

The environmental impacts of each alternative were examined in a general manner, since no specific applications had been submitted to the County for review. Before any further work could be completed, however, the Draft EIR was subjected to significant controversy regarding the adequacy of the project description and the accompanying analysis. As a result, the document was abandoned by the County if 1991.

Over the next two years, a series of public workshops were held by the Community Development Agency in order to develop a consensus project description to form the basis of a new Resource Management Plan. Although substantial progress was made, the effort was ultimately unsuccessful. This effort was later taken up by a subcommittee of the Board of Supervisors, who made their findings in March of 1994. These findings formed the foundation for the goals and objectives of the Cache Creek Resources Management Plan.

Cache Creek Resources Management Plan

In June of 1994, the Board of Supervisors adopted a framework of goals and objectives for the CCRMP. The document adopted a comprehensive outlook that was reflected in overall goals, which were based on the key assumption that "the Creek must be viewed as a total system, as opposed to a singular focus on the issue of mining." As a result, the conceptual plan offered a far broader scope than previous efforts. It was composed of seven elements, covering agriculture, aggregate resources, riparian and wildlife resources, water resources, floodway and channel stability, open space and recreation, and the cultural landscape. Specific goals and objectives were adopted for each of the elements, with suggested policies for their implementation.

A work schedule was also approved during the June 1994 meeting, outlining the interrelationships between four primary tasks: (1) adoption of a resource management plan to protect and restore the creek; (2) adoption of an off-channel mining plan and implementing ordinances; (3) processing of long-term off-channel mining and reclamation applications; and (4) processing of temporary off-channel mining and reclamation applications to allow operations to continue while the necessary plans are

being developed. This schedule was further refined by staff in order to provide a clear guide for both decision-makers and the public throughout the overall planning process.

In addition to adopting the conceptual framework, the Board also directed the preparation of the "*Technical Studies and Recommendations for the Lower Cache Creek Resource Management Plan"* (Technical Studies). The Technical Studies provide baseline and historical information about the streamway fluvial morphology, groundwater resources, and riparian habitat, so that an accurate assessment can be made of the creek's present condition. Constraints and opportunities for activities such as channel stabilization, habitat restoration, flood control, groundwater management, and mining were also identified in the report. The Technical Studies include an extensive list of recommendations on improving the natural resources of Cache Creek. On October 24, 1995, the Board of Supervisors accepted the Technical Studies and directed staff to utilize them as the basis for preparing both the CCRMP and OCMP.

The framework provided a working outline for development of both the OCMP and the CCRMP. Portions of the framework, such as the cultural landscape element, did not easily lend themselves to specific implementation. Similarly, some of the objectives, such as those requiring certain percentage increases in types of habitat, were not supported by the Technical Studies and have therefore been modified or eliminated. The conceptual framework was intended to be a guide for development of the CCRMP, subject to the conclusions of the Technical Studies. Staff has followed the intent of the framework as closely as possible in developing this plan and balancing the diverse resource needs of the Cache Creek area.

1.2 STUDY AREA

The definition of a waterway is always subject to varied interpretation. Some agencies use the floodplain as the definition, although they may differ on what size event to use, covering everything from a 2-year flood to a 200-year flood. Other jurisdictions define a stream according to its navigability. Still others look at the extent of riparian vegetation, or its suitability for support fish species. The confusion regarding how a creek is defined extends to the literature of channel dynamics. References are made to ordinary high water, active channel, and bank full elevation, all of which may or may not mean the same thing. The CCRMP uses a definition, based on floodplain boundaries and streambank locations, that is measurable and allows the plan to focus on the extent of the present creek and improvement of channel stability.

The 1979 In-Channel Boundary

The existing boundary for defining the Cache Creek channel was adopted in 1979, as a part of the Interim In-Channel Mining Regulations for Yolo County (see Figure 1). The extent of the channel was determined primarily based on those portions of the creek where erosion and deposition had occurred, excluding any areas of land being converted to agriculture. The desires of local landowners were also taken into

consideration with defining the channel boundary. Within this area, commercial mining is allowed with approval of the appropriate permits, zoning, and a reclamation plan. In-channel excavation is also restricted by the "theoretical thalweg," a maximum depth established to minimize streambed lowering.

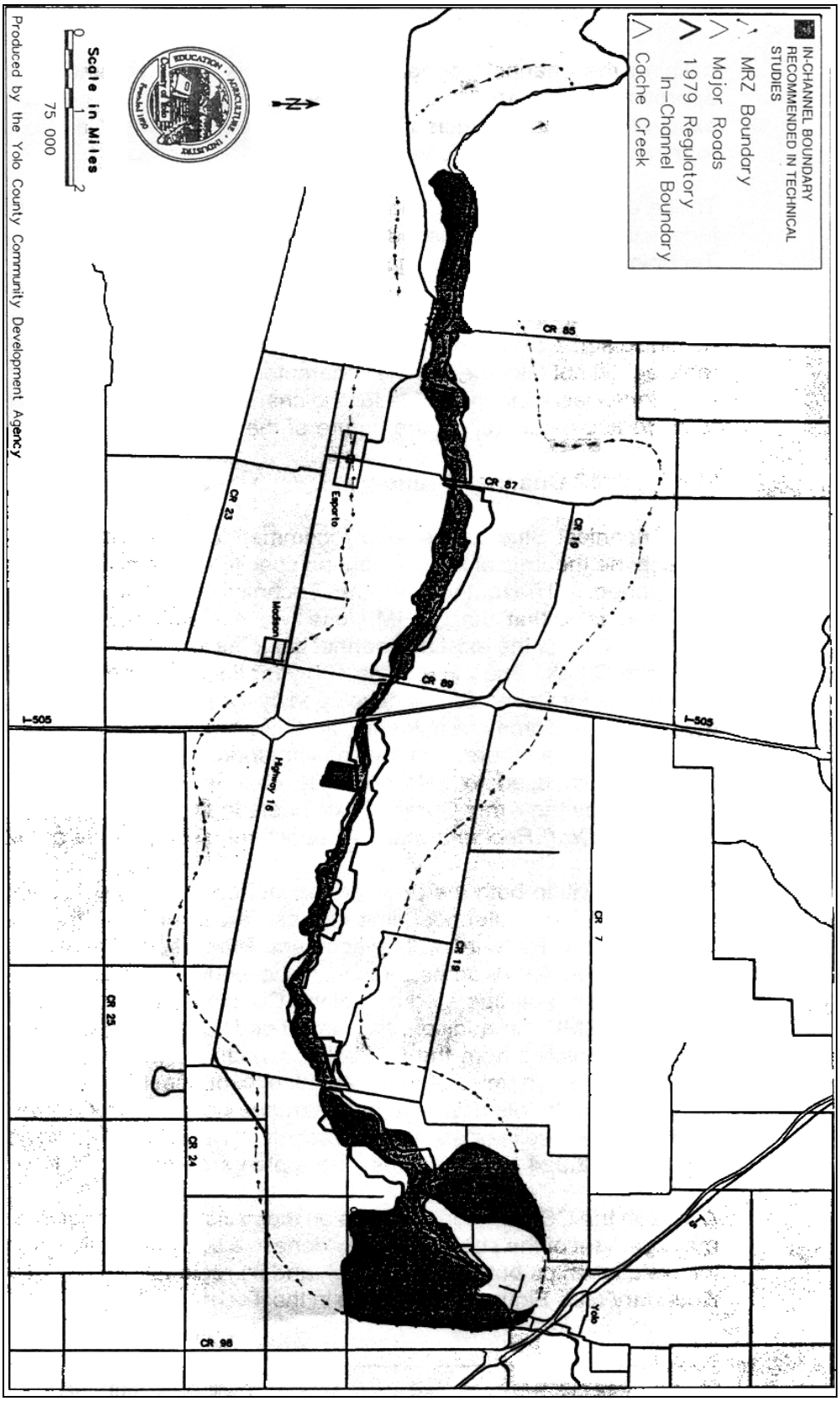

Figure 1. 1979 Regulatory In-Channel Boundary

These early attempts at managing the creek were ahead of their time. Even today, few jurisdictions have established a maximum depth for in-stream mining. However, the Technical Studies indicate that these concepts have since outlived their usefulness. In some areas, levees have been constructed to separate mining and other uses from the channel. Other areas were defined much too broadly, so that "in-channel" mining occurred some distance from the active channel. Similarly, the design of the theoretical thalweg did not take the complex characteristics of Cache Creek into account. Elevations and slopes were inappropriate for the channel hydrology. New definitions must be used, to more accurately reflect the nature of the creek.

The CCRMP Channel Boundary

The Technical Studies provided recommended channel slopes and sinuosity rations to replace the theoretical thalweg, but no specifics were given as to how the channel should be defined. The authors of the Technical Studies, as well as other consultants, recommended that the CCRMP use two measures for determining the extent of the channel. One is the existing channel bank, as shown in recent aerial photographs taken of Cache Creek. The other is the 100-year floodplain boundary. There are several flood boundaries for Cache creek, developed by the Federal Emergency Management Agency, the U.S. Army Corps of Engineers, and the State Reclamation Board, each of which vary slightly from the others. On the recommendation of the County's technical consultants, the floodplain used to determine the channel boundary for the CCRMP is the one calculated by the Army Corps of Engineers in the "*Westside Tributaries to Yolo Bypass, California, Draft Reconnaissance Report"* released in June of 1994.

The areas within both the present channel bank and the 100-year floodplain were then merged, and the outermost limit of these areas became the channel boundary for the Cache Creek Resources Management Plan (see Figure 2). The area originally encompassed 4,956 acres; however, the boundary was modified to eliminate the off-channel mining pit operated by Solano Concrete, as recommended in the Program EIR for the CCRMP. In addition, the large floodplains located downstream of County Road 94B were deleted from the CCRMP boundary. These farmlands do not have a direct impact on the dynamics of the channel, except to serve as overflow areas during severe flood events. In this downstream reach, the boundary is defined by the present channel bank line, as delineated in the Technical Studies. The revised channel boundary, comprising 2,324 acres, serves as the plan area for the CCRMP.

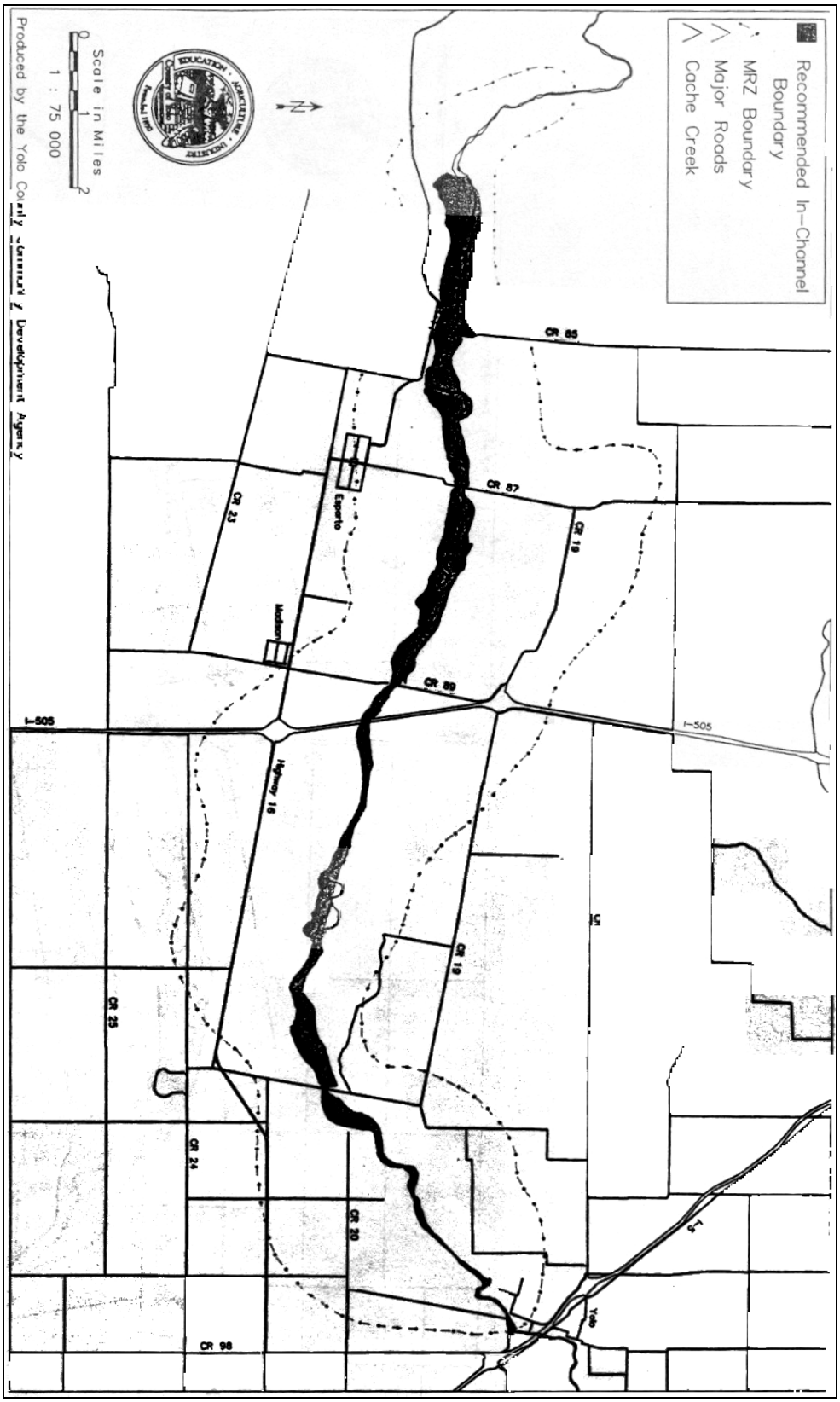

Figure 2. Revised Lower Cache Creek Channel Boundary

Although the CCRMP concentrates on those issues that most directly affect Cache Creek, management of the stream must be done in a comprehensive manner that recognizes the interrelationships between the creek and its regional setting. The Streamway Influence Boundary (see Figure 3) described in the Technical Studies shows the approximate area subject to these interrelationships, based on the extent of the channel's historical meander. Because off-channel mining within the Streamway Influence Boundary ware especially prone to the effects of erosion and groundwater lowering caused by the creek, appropriate engineering is required to account for potential pit capture and fluctuating water levels.

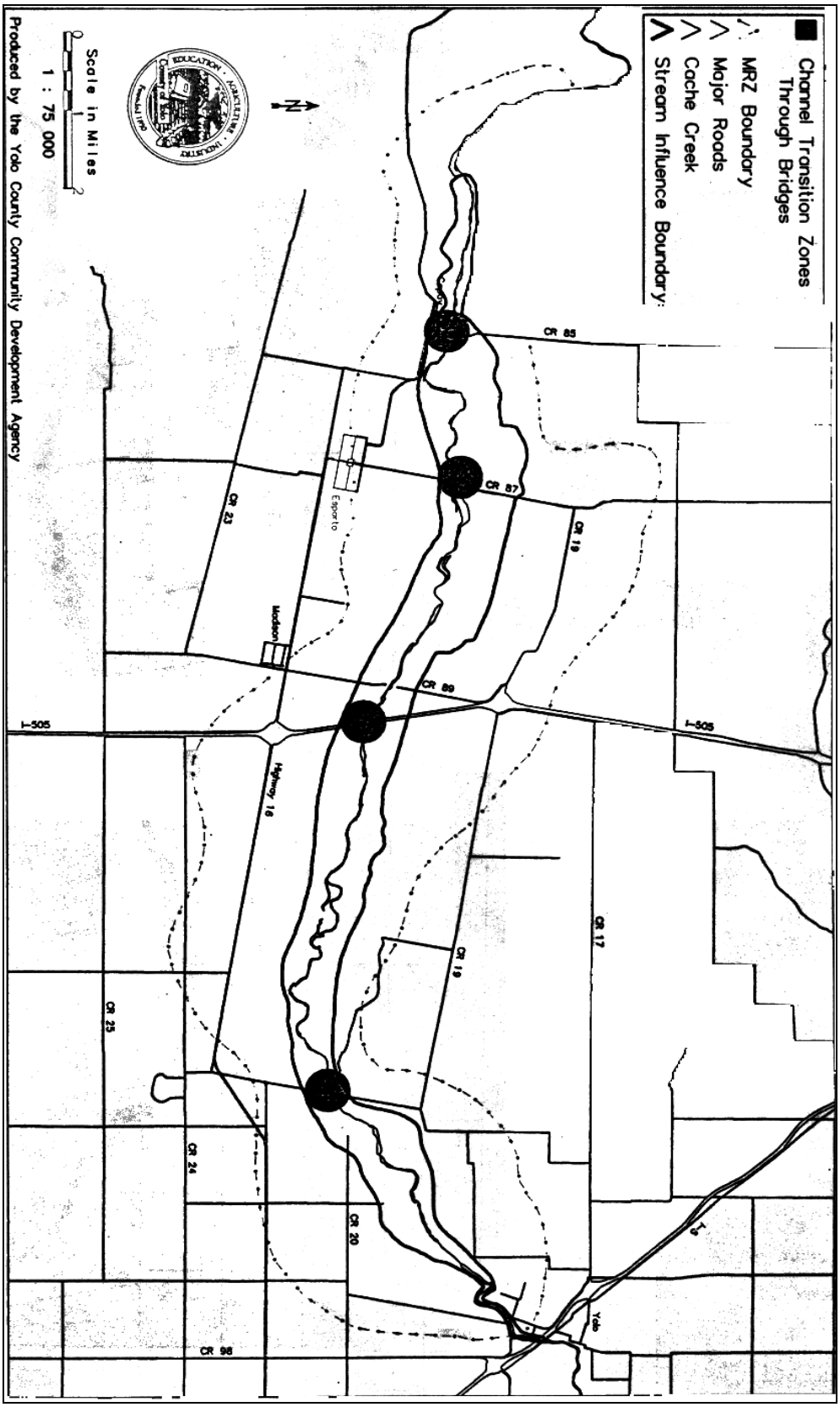

Figure 3. Streamway Influence Boundary

The Off-Channel Mining Plan

SMARA includes provisions to encourage the production and conservation of minerals to ensure that a sufficient supply will be available for the state's future growth. In order to assist local jurisdictions in the identification of significant aggregate resources near urbanizing areas, the State Geologist is assigned the responsibility of classifying the extent and quality of mineral deposits within metropolitan regions around the state. As a part of this program, the State Department of Conservation prepared Special Report 156, *"Mineral Land Classification: Portland Cement Concrete-Grade Aggregate in the Sacramento-Fairfield Production Consumption Region"* in 1988. Included within this report is an analysis of the sand and gravel resources located along Cache Creek.

The planning area for the Off-Channel Mining Plan is defined as those areas designated as potentially containing sand and gravel resources (i.e. Mineral Resource Zones), according to Special Report 156, minus the in-channel area of the creek system, as defined above (see Figure 2). This area includes approximately 28,130 acres in a broad band of varying width along Cache Creek, between the Capay Dam and the town of Yolo. As described in the OCMP, however, less than 3,000 acres of the total plan area is being considered for off-channel mining over the next fifty years.

1.3 RELATIONSHIP TO OTHER REGULATIONS AND PLANS

The CCRMP recognizes that management of the creek cannot occur within a vacuum. Implementation of the CCRMP must take into consideration other policies and plans of the County, as well as the applicable requirements of local, state, and federal agencies of jurisdiction. This section briefly describes compliance of the proposed plan with those regulations of primary relevance.

The Surface Mining and Reclamation Act

Two of the primary recommendations of the Cache Creek Resources Management Plan are: (1) that the amount off in-stream excavation be significantly reduced from present levels; and (2) that future excavation within the channel be restricted to those "channel smoothing and shaping" activities which reduce erosion and improve flow dynamics. Even though large-scale commercial mining would be prohibited, sand and gravel will still need to be removed in order to enhance channel stability. It is envisioned that future channel improvement projects will be directed by the County based on the review of an independent Technical Advisory Committee.

The California Surface Mining and Reclamation Act (SMARA) establishes a regulatory framework, which requires all new excavations to obtain the following: a mining permit, a reclamation plan describing the methods to be employed in returning the site to a beneficial use once operations have been completed, and financial reassurances that provide funds for guaranteeing that the reclamation work is carried out as approved. Lead agencies are required to annually inspect each mine located within their

jurisdiction to monitor permit compliance. In addition, the State Mining and Geology Board has adopted specific standards to ensure that reclamation is performed in a consistent manner.

However, because the activities anticipated under the CCRMP would be performed for the primary purpose of improving channel stability, the Plan may not be subject to SMARA. Provisions in SMARA allow exceptions for those activities which would restore land following a flood, or which are a necessary part of a construction project approved by the lead agency for land improvements, or which involve minor surface disturbances of an infrequent nature. These exceptions are consistent with the intent of the CCRMP. In-channel excavation would only be permitted for the purpose of improving channel stability, maintaining flood control, or preventing the erosion of adjoining lands. Aggradation would be encouraged, with the removal of sand and gravel not exceeding the previous year's deposition. In fact, in-stream extraction is expected to decrease as channel improvements are completed. More importantly, the CCRMP would prohibit future commercial mining within Cache Creek, and all existing mining permits within the active channel would be withdrawn.

If the CCRMP is found to be subject to SMARA, a single mining permit and reclamation plan covering the entire plan area would be requested from the Department of Conservation and administered by the County. Those working in the channel under this permit would likely be required to post financial assurances and offset a portion of the County's reporting fees to the State Department of Conservation. In return, this arrangement would streamline permit processing and allow for emergency work to be performed in a timely manner. Regardless of whether the CCRMP is subject to SMARA, a revised channel ordinance(s) will be required to implement the Cache Creek Resources Management Plan. The ordinance(s) will include standards to carry out the policies of the CCRMP, as well as provisions to ensure compliance with SMARA, if necessary, In order to avoid duplication and strengthen the County's enforcement abilities, the standards listed in the CCRMP will be deleted and subsequently incorporated into the in-channel ordinance, when it is prepared. This procedure is similar to that which occurred with the preparation of the OCMP and its implementing ordinances.

As discussed earlier, the State Department of Conservation released Special Report 156 in 1988. This report classified the sand and gravel deposits along Cache Creek (including the CCRMP plan area) as being regionally significant mineral resources. Section 2762.(a) of SMARA requires that the lead agency (Yolo County) incorporate mineral resource management policies into its general plan within twelve months after receiving a mineral land classification report prepared by the State Geologist. These policies must accomplish the following:

1. Acknowledge the information provided by the State Geologist regarding the extent of mineral resources within the jurisdiction.

2. Coordinate the management of land uses within and surrounding areas of statewide and regional significance to restrict the encroachment of incompatible uses.
3. Emphasize the conservation and development of identified mineral deposits.

In addition, Section 3676 of the State Mining and Geology Board Reclamation Regulations requires that mineral resource management policies incorporate, but not be limited to, the following:

1. A summary of the information provided by the classification study, including, or incorporated by reference, maps of the identified mineral deposits as provided by the State Geologist; and a discussion of state policy as it pertains to mineral resources.

2. Statements of policy as required in Section 2762.(a) of SMARA.

3. Implementation measures that:

    a. Discuss the location of identified mineral deposits and distinguish within those areas between resources which are designated for conservation and those which may be permitted for future extraction.

    b. Provide appropriate maps to clearly define the extent of identified mineral deposits, including those resources designated for conservation and those, which may be permitted for future extraction.

    c. Include at least one of the following:

        i. Adopt appropriate zoning that identifies the presence of identified mineral deposits and restricts the encroachment of incompatible land uses in those resource areas that are to be conserved.

        ii. Require that a notice describing the presence of identified mineral deposits be recorded on property titles within the affected area.

        iii. Impose conditions of approval upon incompatible land uses in and around areas, which contain identified mineral deposits, in order to mitigate any significant land use conflicts.

Policies regarding the conservation and development of classified mineral deposits, in accordance with the above requirements, are contained in the OCMP. As discussed earlier, the CCRMP restricts sand and gravel removal to those activities, which maintain flood control, prevent erosion, or contribute to channel stabilization. In addition, in-channel aggregate extraction is limited to the amount deposited during the previous year. Those aggregate resources remaining within the channel will be conserved and maintained, with Open Space zoning to restrict the encroachment of incompatible uses.

Prior to adoption of the CCRMP, review and comment by the State Mining and Geology Board is required, as stated in Section 2762.(a) of SMARA. Any future proposed amendments to the CCRMP and its policies must also be sent to the Mining and Geology Board for review and comment, prior to their adoption, to ensure that the above requirements are being met. Similarly, if the channel maintenance activities under the CCRMP are determined to be subject to SMARA, then Section 2774.3 of SMARA requires that the in-channel mining and reclamation ordinances also be reviewed by the State Mining and Geology Board, and certified as being in accordance with State policy.

Yolo County General Plan

In its final report in 1977, the aggregate Resources Advisory Committee (ARAC) stressed the need for a coordinated approach to resource management, stating that "the adoption of a Countywide (resource) management policy and plan should maximize the benefits of an aggregate industry in the County." This recommendation lead to the adoption of Conservation Policies 34 and 35, as follows:

CON 34 Mineral Resources
Yolo County shall adopt a Minding Ordinance to implement these policies as they apply to mineral resources, including sand and gravel.

CON 35 Cache Creek
Yolo County shall adopt a Cache Creek Management Program for the carefully managed use and conservation of Cache Creek and its sand and gravel resource, its riverside environment, its relationship to ground and surface water characteristics and its value as a fishery and recreation resource.

In addition, the following General Plan policies are relevant:

CON 2 Yolo County shall foster conservation of its resources and avoid natural hazards by planning, encouraging, and regulating the development and use of these resources and the areas where they exist.

CON 5 In order to avoid conflict with this General Plan, as amended, or to avoid environmental hazards, Yolo County shall require the conservation of natural resources, in their development and managed utilization including:

- Regulations of the use of land in stream channels and other areas required for the accomplishment of the General Plan; and

- The location, quantity and quality of rock, sand, and gravel resources.

CON 6 Yolo County shall plan, encourage, and regulate to ensure that natural resources are maintained for their long-term ecological values as well as for their more direct and immediate benefits.

CON 9 Yolo County shall ensure the protection, maintenance, and wise use of the State's natural resources, especially scarce resources and those that require special control and management.

CON 10 Yolo County shall plan, encourage, and regulate public and private agencies to prevent the wasteful exploitation, destruction or neglect of the State's resources.

OS 1 Yolo County shall preserve appropriate open space land through available means of land use controls, regulations, and advice or guidance and through coordination with other elements of this General Plan, as amended, and with other agencies.

OS 2 Yolo County shall use the Land Use Element policies, together with Specific Plans, zoning, use permits, site plan review, building permits, subdivision maps, the Agricultural Preserve-Land Conservation Act of 1965, assessment practices, coordination with the Soil Conservation Service and other available means to preserve all lands defined as Open Space.

OS 8 Recreation, bikeways, trails, and other public areas shall be integrated with open space plans and the provision of open space areas and corridors; and conformance with such plans shall be mandatory for all new development or redevelopment.

OS 9 Yolo County shall plan to maintain scenic highways and waterways or riverbank corridors or scenic value as part of its open space preservation program and shall use persuasion and regulation to that end.

OS 11 Yolo County shall safeguard existing and encourage additional areas of wildlife habitat as part of its open space preservation program.

REC 6 Development of riverfront recreation areas shall offer recreational facilities, visual aesthetics and open space amenities, while insuring access to the river for all residents.

The CCRMP has been evaluated and determined to be consistent with the various goals and policies of the County General Plan. The CCRMP, together with the OCMP, will constitute the Cache Creek Area Plan, which will provide the necessary structure and policies for implementing a program to manage the wide variety of resources associated with the creek, including habitat, water resources, aggregate, agriculture, and recreation.

Cache Creek Area Plan

An "area plan" is a focused planning policy document that is part of a general plan. The CCRMP meets all the requirements of a State land use law to function as an area plan for the channel boundary area defined herein. It addresses all of the elements specified in Section 65302 of the California Code of Regulations, to the extent that the subject of the elements exists in the planning area. As allowed by State law, the degree of specificity and level of detail of the discussion of each such statement reflects local conditions and circumstances. A brief summary of how all the General Plan requirements are satisfied is provided below.

Planning Area

By taking in the entire channel area as determined by topographic features and flood flow calculations, and by recognizing the Streamway Influence Boundary as defined in the Technical Studies, the CCRMP addresses all land and resources which bear a relationship to streamway planning along the creek.

Time Horizon

The Plan is based on 50- and 100-year projections of channel conditions, and provides for accelerating stabilization conditions projected to otherwise occur over a longer term. Due to the continually changing nature of the creek, the Plan contains a policy to require that it be updated a minimum of every ten years.

Diagrams and Implementation Programs

The Plan contains appropriate diagrams and specific discussion regarding implementation under the Cache Creek Improvement Program (CCIP).

Consistency

The Plan has been examined for consistency and found to be both internally consistent and consistent with appropriate federal and State policies and regulations.

Land Use Element Issues

The Plan contains data, analysis, policies, and programs related to the intensity, location, and type of channel maintenance and riparian restoration activities within the planning area. The Plan clearly specifies where and under what circumstances in-stream extraction is allowed, species of plans to be used in habitat restoration, cross-section profiles and standards for reshaping the channel, and the authority and responsibilities of the Technical Advisory Committee.

It examines the current distribution of habitat and agricultural land, specifies areas where channel widening/narrowing should occur, as well as average levels of sediment discharge and water levels expected from the creek. It also addresses potential

recreational facilities and opportunities associated with creek restoration. A program has been provided to ensure that channel stabilization and maintenance activities do not adversely affect downstream flooding.

Other typical Land Use Element issues such as educational facilities, public buildings and grounds, as well as solid and liquid waste facilities are addressed only in the context of having relevance to the maintenance and stabilization of the creek.

Consistency with the California Surface Mining and Reclamation Act has been addressed in the environmental analysis and found not to be an issue.

Circulation Element Issues

The Plan identifies the location and extent of major thoroughfares, transportation routes, and other local public utilities and facilities in the planning area. The proposed levels of aggregate production from creek maintenance activities would not generate any significant changes in traffic volumes.

Housing Element Issues

The Plan identifies nearby housing for purposes of assessing the potential impact from channel maintenance and recreational activities. Regulations are provided, where appropriate.

Conservation Element Issues

The Plan addresses programs for the conservation, management, and protection of natural resources within the Cache Creek channel, including surface water quality, biological resources, and the erosion of soil resources.

Open Space Element Issues

The Plan includes identification of areas required for the preservation of plant and animal life, including sensitive habitat. The areas within the channel are identified as requiring ongoing monitoring and study. The Plan also contains a program for the encouragement of riparian habitat and the use of biological elements to control erosion and flow velocities.

Scenic resources and cultural resources have been identified in the Plan. The area located within the channel is designated as Open Space in the Plan, in order to preserve it for future habitat and recreational uses. This will compliment the OCMP, which designates future recreation nodes that would provide access to areas targeted for future open space and passive recreation.

Noise Element Issues

Noise identified with in-stream excavation and recreational uses has been identified and is regulated in the Plan.

Safety Element Issues

The effects of dam failure, flooding, and channel instability are discussed. Policies and specific regulations to address these concerns are provided, when necessary.

Other

Coastal issues and timber harvesting plans are not relevant to the CCRMP plan area and have not been addressed in the Plan.

Yolo County Mining and Reclamation Ordinances

In-stream mining is presently governed by Chapter 3 of Title 10 of the County Code. "The Interim In-Channel Surface Mining Regulations of Yolo County" apply only to in-stream mining within Cache Creek. These regulations were intended to be a temporary three-year set of regulations, to be revised by the Resource Management Plan being drafted by the Aggregate Technical Advisory Committee in the early 1980s. As subsequent planning efforts resulted in stalemate, however, the interim regulations were never revised. They continue to remain the standards by which in-stream mining is regulated at the time this Plan has been adopted. However, they are modified by the restrictions and requirements of the Cache Creek Improvement Program (CCIP) which has been adopted as a component part of this CCRMP. As a subsequent clean-up action in 1997, the County will revise the in-stream regulations to be consistent with and carry out the full spirit and intent of the CCRMP and CCIP.

The in-stream mining regulations for Yolo County, prior to adoption of the CCRMP and CCIP, allow excavation within the channel down to the "theoretical thalweg." This is a specific elevation, below which in-stream mining may not occur. In addition, in-channel mining is prohibited within three hundred feet of any County bridge along Cache Creek and nine hundred feet from any State bridge. These measures were established to protect local bridge structures from being undermined and to minimize streambed lowering. The regulations also have designated an in-channel boundary, defined in County ordinance, based on the patterns of erosion and deposition. However, this boundary sometimes extends well outside of the active stream channel, which causes confusion for both miners as well as adjoining landowners, and makes effective management of the creek difficult.

Conclusions reached in the Technical Studies recommended that these regulatory mechanisms be revised to take new information and research into account. In place of the theoretical thalweg, a series of reach-specific slopes an sinuosity rations (comparing the channel width to its length) have been adopted, which provide standards for maintenance excavation that would improve the channel flow. Commercial mining would

be prohibited. The prohibition against working near local bridges is identified as inappropriate, so that effective transitions can be constructed to improve flow efficiency through these portions of the creek. Finally, the in-channel boundary has been revised to more accurately reflect the active flow of Cache Creek, as defined by the existing channel banks and the 100-year floodplain (as determined by the U.S. Army Corps of Engineers).

Chapter 5 of the County Code is entitled the "Yolo County Surface Mining Reclamation Law" and is referred to as the "Reclamation Ordinance." The proposed change in emphasis from aggregate mining within Cache Creek to channel stabilization and floodway management also requires a significant shift in the way in-stream areas are restored. Up until now, in-channel mining reclamation has largely consisted of minimal grading and resoiling standards, with provisions for grass seeding, in order to minimize erosion. Restoration under the proposed CCRMP, however, is primarily aimed at reestablishing a riparian vegetation corridor along the length of Cache Creek, as well as ensuring a stable channel system that allows for flood flow conveyance and erosion protection. New standards are recommended that reflect this change in priorities, by providing guidance on habitat creation and ensuring that in-stream restoration is more sensitive to channel flow dynamics.

Yolo County Flood Damage Prevention Ordinance

In addition to having responsibilities for monitoring aggregate operations and coordinating with other agencies in implementing this Plan, the Community Development Director also serves as the County's Floodplain Administrator. All projects located within the floodplain, as defined by the Federal Emergency Management Agency (FEMA), requires review by the Administrator, to ensure that development such as grading, fill, construction, etc. does not significantly raise flood levels for surrounding property. This authority applies to all flood zones throughout the County, including those associated with Cache Creek. The scope of the Floodplain Administrator's authority and the approval process are contained within the County Flood Damage Prevention Ordinance.

Implementation of the CCRMP will be carried out through the CCIP (Appendix A), which establishes a regulatory framework for stabilizing the channel. Central to this approach is the Technical Advisory Committee, which will identify and establish as priority for channel improvement projects, monitor various issues related to the hydraulic flow of the creek, and review and comment on proposed projects within the channel area. Channel improvements made pursuant to the CCRMP and CCIP will require a Floodplain Development Permit. The TAC will review all permit applications prior to their issuance by the Floodplain Administrator (or designee) and provide recommendations on design, and whether the permit is consistent with the Plan, the implementing ordinances, and other "blanket" permits issued by jurisdictional agencies. Thus, the requirements of the CCRMP and CCIP will be implemented through the Floodplain Development Permit. Unlike the past, where individual property owners modified the creek independently, with sometimes adverse consequences, the CCIP provides a consistent means for coordinating activities along the channel.

The Cache Creek Improvement Program

The CCIP was developed to implement the goals, objectives, actions, and performance standards of the CCRMP as it relates to the stabilization and maintenance of Cache Creek. It has been adopted as a component part of the CCRMP, and generally, where the acronym CCRMP is used it is intended to include the CCIP. The CCIP has three primary components, including the identification of major channel stabilization projects, a description of expected channel maintenance activities, and the establishment of a hydrologic monitoring program. Overall management of the CCIP is the responsibility of the County Resource Management Coordinator (RMC). Scientific analysis of the creek and recommendations will be provided by a Technical Advisory Committee (TAC), who would coordinate with the RMC. In addition, a Cache Creek Stakeholders Group (CCSG) will be established to provide input on how the creek should be managed. Funding for the CCIP will primarily be provided by the aggregate industry through a per ton surcharge on gravel produced within the County.

Commercial mining would be prohibited under the CCIP. Aggregate excavation within the channel may only occur to maintain flood control, protect existing structures, minimize bank erosion, or implement the Test 3 boundary.

Under the CCIP, all applicants proposing to modify the creek channel within the CCRMP boundary will be required to submit applications to the Community Development Agency for a Floodplain Development Permit. The permit will be reviewed by the TAC, who will provide recommendations to the Floodplain Administrator (or designee) prior to permit approval. The County will also pursue general "blanket" permits from agencies of jurisdiction (e.g., Regional Water Quality Control Board, Army Corps of Engineers, and Department of Fish and Game) for channel shaping and maintenance activities. Floodplain development permits within the CCRMP boundary must be consistent with the CCIP and CCRMP, comply with appropriate "blanket" permits, protect sensitive biological resources, and ensure that flooding problems at Woodland aren't worsened.

Channel improvement and maintenance projects will have to comply with design guidelines, target channel characteristics, and typical cross-section profiles, as described in the CCIP. These reach-specific guidelines are based on information developed in the Technical Studies and will periodically updated according to the information obtained through creek monitoring program. The results of the monitoring program will be included in the annual report prepared by the TAC for review by the Board of Supervisors. The annual report will also include program costs, an evaluation of streambed and streambank stability in the CCRMP area, recommended changes in the prioritization of channel improvement projects, and any proposed changes in the monitoring program for the following year.

The Off-Channel Mining Plan

The Cache Creek Resources Management Plan is being prepared as a companion to the Off-Channel Mining Plan (OCMP), which primarily governs the mining of sand and gravel aggregate outside the present channel banks and 100-year floodplain. The two plans, which together comprise the Cache Creek Area Plan, recognize that in-channel and off-channel environments are different and require unique approaches that address their varying needs. At the same time, however, the County also recognizes that Cache Creek and its surrounding areas form an integrated system, and that activities that occur in one environment affect the other. Thus, although the planning areas for the two plans are mutually exclusive, both plans include goals and policies that acknowledge the connections between in-channel and off-channel concerns where they occur.

1.4 REQUIRED APPROVALS

The CCRMP is a complex project and its emphasis on comprehensive and integrated resource e management will require consideration by the County of several additional actions for its implementation. These actions will provide the County with a regulatory framework for carrying out the various policies described within the CCRMP. It should be noted, however, that approval of these actions is just the beginning. Implementation of the CCRMP will require continuing efforts by the County, including public outreach and education programs, monitoring and technical analysis, negotiation with other agencies of jurisdiction, and coordination with volunteer community groups.

Certification of the Program EIR

Section 15168 of the California Environmental Quality Act (CEQA) provides for the preparation of a Program EIR. A Program EIR may serve as an environmental document for a series of individual projects that are located within the same geographical area, or are sequentially related, or have similar environmental effects. There are several advantages to a Program EIR. It provides a more thorough consideration of potential environmental impacts, especially cumulative effects, and encourages a broader discussion of project alternatives. Program EIRs also reduce redundancies in the environmental review process, as well as allow for greater County flexibility in dealing with policy issues.

Subsequent projects approved pursuant to the Program EIR still require additional environmental documents. However, Program EIRs allow subsequent environmental documents to focus on issues unique to the site that were not specifically addressed in the Program EIR. This allows decision-makers and interested parties to concentrate on the primary issues associated with a particular project, without revisiting other issues on which there is general agreement. Although they help to streamline the process, Program EIRs and any subsequent focussed project-level EIRs do not restrict public participation. They still require circulation of the documents and a comment period, notification of interested parties, and public hearing.

The Program EIR has been prepared for the Cache Creek Resources Management Plan. The Draft EIR was made available for public comment on April 8, 1996. The Response to Comments document was released on July 1, 1996. Together, these two volumes constitute the Final EIR for the CCRMP. The Program EIR has been written to fulfill the federal National Environmental Protection Act (NEPA) standards, so that the EIR may be used to support the 404 Permit required by the U.S. Army Corps of Engineers for work within the channel, as well as permits for jurisdictional State agencies (e.g., the Regional Water Quality Control Board, the Department of Conservation, and the Department of Fish and Game).

The Program EIR identifies twelve general areas of potential environmental impact, including: land use, geology and soils, hydrology and water quality, agriculture, biological resources, air quality, traffic and circulation, noise, aesthetics, cultural resources, hazards, and public services. The CCRMP EIR also serves as a project-level EIR for the CCIP, in order to enable the subsequent implementation of the specific channel stabilization and maintenance actions required by the program.

Adoption of the Cache Creek Resources Management Plan

The Cache Creek Resources Management Plan and the Cache Creek Improvements Program, as well as the companion Off-Channel Mining Plan are intended to be evolutionary documents that adjust and change in response to new creek conditions. Adoption of the CCRMP will allow the County to begin taking the first steps towards managing the resources of Cache Creek in a more balanced and sustainable manner. However, the plan should not be seen as a static vision of what the ultimate disposition of the creek will be in the future. As such, it is expected that the CCRMP will undergo periodic review and updating as additional data is gathered through monitoring and the success of habitat restoration projects and channel stabilization are known. The CCRMP should be updated every ten years, at a minimum, in order to allow sufficient time for trends to become evident, yet still be early enough to change any policies that are having an unexpectedly adverse effect on resource management.

A Supplemental Program/Project-Level Environmental Impact Report (SEIR) was prepared and certified in 2002 to inform public agency decisionmakers and the public of the environmental effects of the CCRMP and CCIP on Cache Creek since their implementation. The SEIR was also necessary prior to the County seeking new permits from the appropriate Government agencies.

Adoption of the Surface Mining and Reclamation Ordinances

If the CCRMP is found to be subject to SMARA, planned revisions to the in-channel regulations, as well as the already amended reclamation ordinance, will be adjusted as necessary. These ordinances would then be sent to the State Mining and Geology Board for certification. Should this be the case, in-channel and off-channel mining regulations would be given separate chapters within the County Code. The reclamation ordinance would continue to govern both types of mining. Regardless of whether the

CCRMP is subject of SMARA, performance standards developed through the recommendations of the Technical Studies prepared for Cache Creek, as well as the experience and practices of other jurisdictions, would be incorporated into the new regulations.

Approval of Zone Changes

At present, the majority of the area within the CCRMP plan boundary is zoned with the S-G (Sand and Gravel) overlay, reflecting its recent history of commercial in-stream mining. Under the existing ordinance, the S-G Zone may be combined with either the A-1 (General Agriculture) or A-P (Agricultural Preserve) Zones, within the 1979 Cache Creek Channel Boundary. However, the CCRMP will change the primary focus within the channel from commercial mining to multiple resource management. To reflect this new emphasis, the area within the CCRMP plan boundary will be rezoned to add the Open Space (OS) designation as an integrated zone. Integrated zoning, as allowed under Section 8-2.301.4 of the Zoning Code, is similar to combining zoning, except that where used, both attached zones are "base" zones that would apply while and equally to the subject land. The OS zone would be added to the existing A-1 and A-P Zones (e.g., A-1+OS and A-P+OS), in order to ensure that existing Williamson Act contracts on land within the In-channel boundary are not adversely affected. The SG overlay would be deleted from the area within the CCRMP plan boundary, to preclude commercial mining from occurring in the future. The OS Zone is specifically designed for resource management, including agriculture, groundwater recharge, habitat, recreation, flood control, sand and gravel extraction, and riparian areas. As such, it provides the flexibility needed to meet the various resource needs of Cache Creek.

1.5 ORGANIZATION OF PLAN

As mentioned earlier, the CCRMP contains seven elements, each dealing with a specific resource associated with the Cache Creek area. The elements contained within the CCRMP are as follows:

Chapter 2.0 Floodway and Channel Stability
Chapter 3.0 Water Resources
Chapter 4.0 Biological Resources
Chapter 5.0 Open Space and Recreation
Chapter 6.0 Aggregate Resources
Chapter 7.0 Agricultural Resources

Each element begins by briefly describing the past and current status of the resource under consideration. Next is a summary of the general direction proposed by the CCRMP to manage this resource in the future. Following these initial discussions are a series of goals, objectives, actions, and standards that explain how the general direction will be carried out and what measures will be used to ensure its success. Although each element has its own goals and objectives that address management of the specific

resource, the plan was written so that these policy statements are mutually supportive and coordinated to minimize conflict.

The CCIP comprises Appendix A.

CHAPTER 2.0 FLOODWAY AND CHANNEL STABILITY ELEMENT

2.1 INTRODUCTION

Present Conditions

The dynamics of a river system involve a complex relationship between four primary factors: the amount of water, the amount of sediment in the water (including sand and gravel), the average size of the sediment, and the slope of the channel. If any one of these factors is altered, either naturally or artificially, the other factors will adjust until a new equilibrium is established. If there is too much water and not enough sediment, the river will erode the streambed and adjoining banks in order to obtain more sediment. If the sediment is too large and the slope of the channel too flat, the river will aggrade. Although this relationship may appear simple, flow dynamics are very complex and difficult to analyze and predict. Adjustments are constantly being made in a river system, not only from one flood event to the next, but even between stages within each flood event.

In perennial (year-round) rivers, these adjustments are often made in a slow and steady fashion. Cache Creek is an ephemeral stream. It does not flow year-round naturally or under existing conditions. Furthermore, it is an episodic system that is characterized by brief, intense flows that create dramatic changes in a short period of time. These changes may result in an imbalance between the factors described above. Historically, the creek would have adjusted itself to correct for imbalances during the low flows of later spring and early fall, but a number of artificial constraints have been imposed on Cache Creek which prevent it from achieving a balanced condition.

The bridge structures were designed for a narrow channel width that must be maintained with extensive bank protection measures. These constructions bind the creek, resulting in faster flow velocities and significantly increased scour. Flood control improvements have had an effect as well. At the same time that the capacity of Cache Creek has increased, levees have been constructed throughout the plan area to create new agricultural land and to prevent floods from inundating nearby residences and communities. Thus, more water is being forced into a narrower channel, changing the character of flood peaks and travel time. The diversion of surface water for irrigation during the summer months does not allow for the establishment of the low flow channel to provide stability during average years. Without this partial control, larger floods become even more unpredictable.

Extensive in-stream mining has also contributed to the destabilization of Cache Creek. The annual sediment supply to the plan area is estimated to be approximately 928,000 tons, of which about 163,000 tons is sand and gravel. Annual in-stream excavation of

sand and gravel has averaged some two million tons, however, which has resulted in a cumulative deficit of nearly 80 million tons since mining intensified in the 1950s. At the natural rate of replacement, it would take over 500 years to replenish the material removed. In addition, gravel bar skimming disturbs the formation or armor materials and removes riparian vegetation that allow the channel to readjust, thus increasing the potential for erosion.

In addition to these artificially imposed changes, Cache Creek has periods of natural instability. The upper watershed is narrow and steep, so that flood events carry with them a great deal of force in a short span of time. In addition, the coastal mountains in this area contain areas of highly erosive materials that provide a significant level of sediment to the creek. The combination of energetic flood flows and large sediment supplies create the potential for dramatic changes. Thus, in flashy, episodic systems such as Cache Creek, the stream is constantly lurching from one imbalance to the next after large flood events.

Continuous long-term simulations of Cache Creek indicate that if all in-stream mining were prohibited for 100 years the channel would achieve a substantially more stable configuration but would remain in sediment deficient at the bridges. With intervention, such as recommended in the CCIP, however, this repair can be hastened. It should be noted, though, that it is not possible to return the stream to the conditions of 100 years ago without making significant changes to other influencing factors, including the elimination and/or relocation of flood control levees, reductions in the amount of water diverted to irrigation, the reconstruction of County and State bridges, and reestablishment of the historic width of the channel which approaches one mile in some areas. These are radical requirements, which are obviously not feasible.

Trying to assign proportional responsibility for the degradation of Cache Creek to each of these influences is difficult. As discussed earlier, waterways are complex systems with many interrelated influences that are not easily separated and categorized. Similarly, anticipating how the channel may react to new changes is also uncertain. Nevertheless, there are opportunities, through careful management, to help the river repair itself and improve its present condition.

CCRMP Vision

There are several actions that need to be taken in order to assist Cache Creek in attaining a more stable condition. One of the most important measures is to significantly reduce the amount of aggregate removed from within the channel. In-stream mining should not exceed the annual replenishment of sand and gravel, and, in fact, should be far less than that amount in most years in order to allow the creek to aggrade and reduce the amount of scour. At the same time, the CCRMP would result in the reshaping of portions of Cache Creek according to the conceptual design provided in the Test 3 Run Boundary (see Figure 4). This proposal requires regrading the streambed to create a series of terraces and low-flow channel. These actions will stabilize the channel and allow it to operate more like a natural system. In addition, selected banks and levees will be excavated to provide gentle transitions into and out of

the channel bottlenecks created by the bridge structures. In some areas, jetties will be constructed to encourage expansion of the banks, through sediment deposition and/or the encouragement of riparian vegetation. The overall goal of the Test 3 Run Boundary is to smooth the abrupt width and slope changes that occur along Cache Creek. Supplementing these efforts would be the provision of a regular flow of surface water in Cache Creek through much of the year. This would create a stable low-flow channel that would reinforce the regrading performed in the Test 3 Run Boundary.

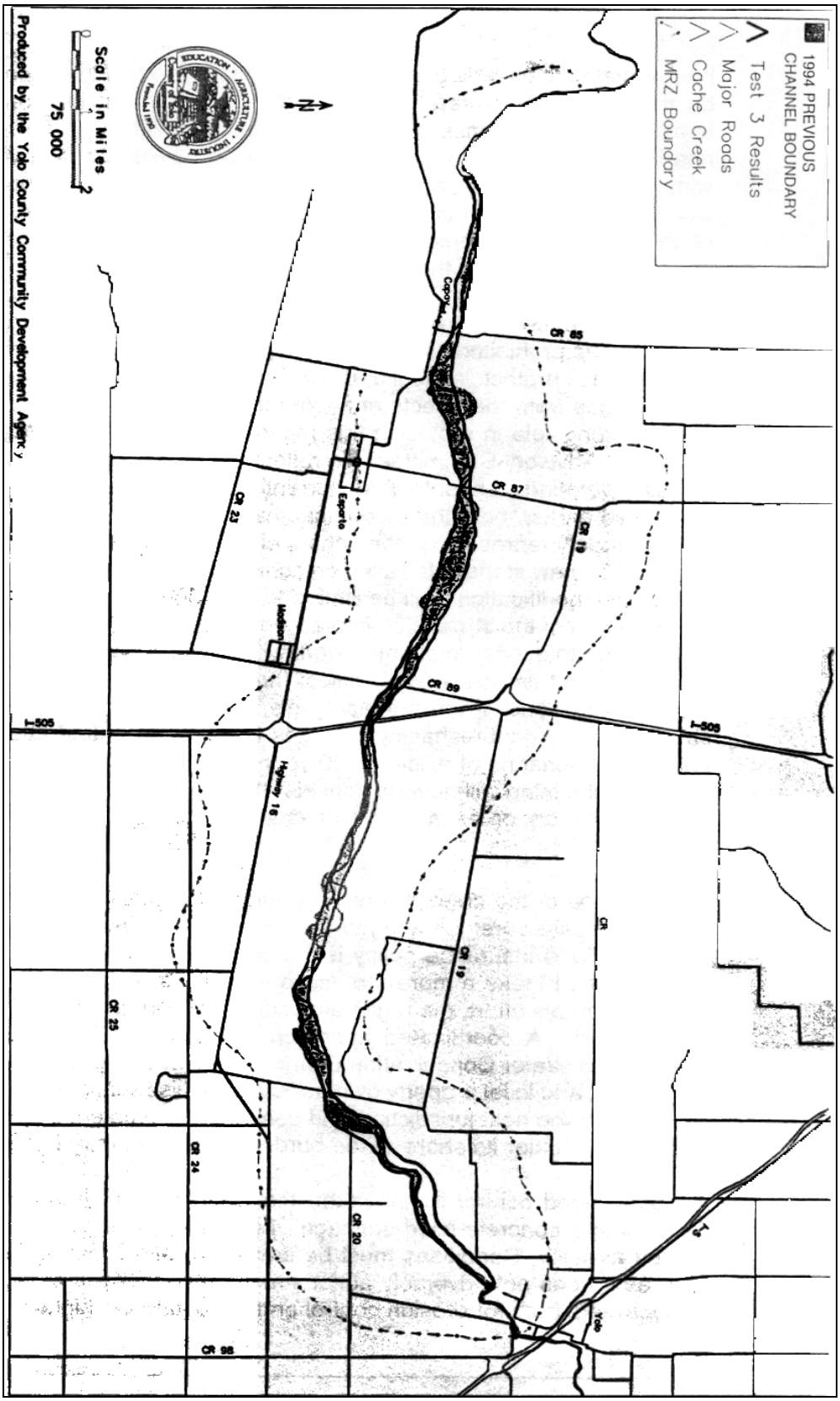

Figure 4. Test 3 Mobile Sediment Modeling Results

Although commercial in-stream mining would be precluded, sand and gravel removal would not be prohibited altogether. Cache Creek will continue to be a managed system in order to protect agricultural land, off-channel mining operations, and nearby communities from the effects of flood and erosion. Under the CCIP, the County would take a strong role in providing this management, based on the recommendations of a Technical Advisory Committee. To reflect this shift in priorities, changes will be required in the operating concepts that currently regulate mining within Cache Creek. As discussed earlier, both the theoretical thalweg and the present in-channel boundary do not accurately represent existing channel conditions and it is recommended that they be replaced by new standards based on concepts provided in the Technical Studies. Future in-channel modifications will be limited to the 100-year floodplain and must take not only the elevation of the streambed into account, but the slope of the streambed and the ratio of the width to depth. In-channel work will generally be guided by specific channel slope standards and cross-section profiles that have been developed for each reach of the creek. Since one of the primary goals of the CCRMP is to allow aggradation of the streambed, channel reshaping activities will remain six feet above the existing thalweg, unless maintenance of the existing 100-year flood capacity requires otherwise. In addition, off-channel mining will have to consider the potential for the streambank to move, either through erosion or as a result of channel reshaping according to the Test 3 Run Boundary.

Maintenance of the creek will have a number of goals, several of which are competing and will require careful management. Retaining 100-year flood capacity will be a high priority. Flood insurance policy is changing, as the federal government expects local communities to take a more pro-active role in preventing flood damage from occurring. As a part of this effort, the regional flooding problem associated with Cache Creek must be resolved. A coordinated approach involving the County, the Yolo County Flood Control and Water Conservation District, the City of Woodland, the U.S. Army Crops of Engineers, and local property owners is vital in this regard. One jurisdiction cannot divert its floods to the next jurisdiction and consider the problem solved. Each group must be willing to shoulder its share of the burden so that all may benefit.

Although flood control is important, the County is not interested in converting Cache Creek into a concrete-lined drainage. Management of the Creek has to consider other values as well. Conditions must be created to allow riparian vegetation to flourish, as long as it does not adversely affect stream flow. Growth along the banks is especially encouraged, both for erosion control and to contain the highest flow velocities within the center of the creek. Streambank transitions and scour reduction measures should be implemented to protect structures along Cache Creek, especially bridges, which represent a major public investment. Groundwater management is also a concern, and the CCRMP encourages coordination with the Flood Control District, where possible, in order to provide more water for both urban and agricultural users in the County.

Implementing these programs will require extensive monitoring and factual analysis. The County will take advantage of the data already available, however new resources of information will need to be developed. These may include re-installation of the stream

gauge at Capay, surface water quality testing, riparian vegetation surveys, and aerial photography. This information would be reviewed by a Technical Advisory Committee tasked with making recommendations to the County on the types and extent of maintenance activities necessary to make Cache Creek more healthy and productive. As a part of this monitoring, the CCRMP would be updated a minimum of every ten years. This would allow the County regular opportunities to review the success and/or failure of past efforts and to set new goals that reflect changing environmental conditions and social priorities.

2.2 GOALS

2.2-1 Recognize that Cache Creek is a dynamic stream system that naturally undergoes gradual and sometimes sudden changes during high flow events.

2.2-2 Establish a more natural channel floodway capable of conveying floodwaters without damaging essential structures, causing excessive erosion or adversely affecting adjoining land uses.

2.2-3 Coordinate land uses and improvements along Cache Creek so that the adverse effects of flooding and erosion are minimized.

2.2-4 Ensure that the floodway is maintained to allow other beneficial uses of the channel, including groundwater recharge, recreation, and riparian vegetation, without adversely affecting flood capacity.

2.3 OBJECTIVES

2.3-1 Provide flood management as required to protect the public health and safety.

2.3-2 Integrate the Cache Creek Resources Management Plan with other planning efforts to create a comprehensive, multi-agency management plan for the entire Cache Creek watershed.

2.3-3 Design and implement a more stable channel configuration that will convey a 100-year flood event.

2.3-4 Protect permanent in-channel improvements (e.g., pipelines, bridges, levees, and dams) from structural failure caused by erosion and scour.

2.3-5 Restrict the amount of aggregate removed from Cache Creek, except where necessary to promote channel stability, prevent erosion, protect bridges, or to ensure 100-year flood protection, in order to allow the streambed to aggrade and create a more natural channel system.

2.3-6 Establish monitoring programs for the continued collection of data and information to be used in managing the resources of Cache Creek.

2.3-7 Manage Cache Creek so that the needs of the various uses dependent upon the creek, such as flood protection, wildlife, groundwater, structural protection, and drainage, are appropriately balanced.

2.4 ACTIONS

2.4-1 Revoke the 1979 In-Channel Mining Boundary, as defined in Section 10-3.303(a) of the Yolo County Mining Ordinance. In its place, adopt a new in-channel area based on present channel banks and the 100-year floodplain, as determined by the U.S. Army Corps of Engineers in the Westside Tributaries Study, whichever is wider. This is a more accurate measure of delineating the boundary between in-channel and off-channel uses.

2.4-2 Limit the amount of aggregate removed from the channel to the amount of sand and gravel deposited during the previous year as estimated by the Technical Advisory Committee based on channel morphology data (approximately 210,000 tones on average), except where ban excavation is necessary to widen the channel as a part of implementing the Test 3 Run Boundary, or where potential erosion and flooding problems exist. The amount and location of in-channel aggregate removal shall be carried out according to the ongoing recommendations of the Technical Advisory Committee, with the voluntary cooperation of the landowners involved.

The County shall negotiate with the Regional Water Quality Control Board to allow 100 percent extraction of the previous year's accumulation of sand and gravel, under the 401 Water Quality Certification, if it can be demonstrated that the removal of sand and gravel is required for flood control purposes.

2.4-3 Implement the Test 3 Run Boundary described in the Technical Studies to reshape the Cache Creek channel. Continue to gather HEC-model erosion and deposition data to initiate streambed and channel alteration projects. Altering the channel banks and profiles will assist in returning the creek to a form that is more similar to its historical condition. This will result in reduced erosion, increased in-channel recharge, and additional riparian habitat opportunities.

2.4-4 Replace the theoretical thalweg, as defined in 10.3-221 of the Yolo County Mining Ordinance, with channel slope, width, depth, and cross-section standards specific to each reach of the creek, based on annual monitoring and periodic engineering analysis of hydraulic and sediment transport conditions. Specific activities associated with this Action include:

A. Amend sediment-monitoring activities under the CCRMP without detracting from any existing CCRMP actions, policies or mitigation measures, to include the following:

- Update the HEC-6 model (or equivalent model - see Item G below) developed for the CCRMP Technical Studies to reflect 2001 topographic and sediment conditions in the Cache Creek channel and compare the results with those of the 1995 model.

- Update the HEC-6 model once ever five years or more frequently as determined necessary by review of aggradation/degradation trends evident from annual topographic mapping. Assess HEC-56 model accuracy and calibrate as appropriate using known flood hydrographs occurring over the previous year, known sediment deposition/scour and known changes in sediment size distribution over the year.

- Use the HEC-6 model and topographic mapping to assess sediment supply and transport conditions for a range of discharges and flood hydrographs up to the 100-year flood. The HEC-6 results shall be used as a guide to estimate probable future areas of risk resulting from changes in sediment transport characteristics of the creek. Areas to be evaluated in detail include, but should not be limited to, areas of known bank erosion, areas of potential degradation at bridges or other infrastructure crossings, and potential aggradation in areas where flood control capacity is limited.

B. Update the 1995 HEC-2 hydraulic model of Cache Creek, from Capay Dam to I-5, developed as a basis for the CCRMP, to evaluate hydraulic changes that have occurred as a result of channel bed elevation changes and other channel modifications since 1995. The following guidelines apply:

- In order that results be comparable, it is suggested that the same HEC-2 model prepared in 1995 be used as a basis (see Item G below). The model should be updated using the same cross-sections modified for 2001 topography, roughness conditions, encroachments, and in-channel structures. Cross-sections may be added or subtracted and other changes made as determined appropriate by a civil engineer, with the intent of maintaining continuity of the model to allow an appropriate comparison.

- Use the 1995 and 2001 HEC-2 models to map the 100-year floodplain boundary as it existed in 1995 and 2001 and assess changes in floodplain extent and water surface elevation. This

information should be used to assess the effect of channel aggradation, degradation, and the various CCRMP policies and projects on flood elevations.

- Model a range of discharges from 2-year to 100-year flood flow velocities and depths.

C. Use the information developed from the HEC-6 and HEC-2 models, along with appropriate local scour analysis techniques, to assess the level of risk to bridges, utilities, and other channel infrastructure of failure or exposure to scour.

D. Identify channel thalweg, slope, and cross-section goals on a reach-by-reach basis, based on the results of the HEC-2, HEC-6, and local scour analysis modeling. Identify appropriate CCRMP management activities to achieve the desired thalweg, slope, and cross-section goals, including potential skimming of accumulated bed material as appropriate to avoid loss of flood control capacity, provided that the total amount skimmed not exceed the previous year's supply nor violate any provision of Performance Standard 2.5-5 of the CCRMP.

E. Use the HEC-6, HEC-2, and local scour information to supplement streamflow, sediment inflow, topographic information, pebble count, and annual inspection information collected under CCRMP Actions 2.4-9 and 2.4-10 as a guide in making CCRMP management and policy decisions, identifying and prioritizing future projects, and in making recommendations regarding approval of proposed in-channel projects.

F. Have a land surveyor stake all excavations of material from the Cache Creek channel bed prior to excavation to ensure proper excavation depths, provide pre- and post-excavation topographic mapping or surveying of the area to be excavated for review and inclusion in the annual TAC report.

G. The technical analysis need not be limited to HEC-6 and HEC-2. Other equivalent models may also be appropriate as determined by the County, provided that modeling consistency be maintained over time to ensure that observed changes in stream hydraulics and sediment transport are due to changes in the river system and not to the modeling methodology.

2.4-5 Acknowledge the streamway influence boundary described in the Technical Studies as the general area of the creek which has historically been subject to meandering. The streamway influence boundary also defines the area where in-stream and off-channel issues overlap and are address in both plans.

2.4-6 Work with other agencies having jurisdiction over Cache Creek, including, but not limited to, the Yolo County Flood Control and Water Conservation District, the

U.S. Army Corps of Engineers, the State Reclamation Board, the California Department of Water Resources, and the Federal Emergency Management Agency in developing a coordinated solution for managing flood events throughout the watershed of Cache Creek.

As a part of this effort, the County should coordinate with the U.S. Army Corps to make appropriate sedimentation and channel stability assessments in conjunction with the development of flood control alternatives near the downstream end of the study area. This would ensure that both agencies are using the same sets of assumptions when making recommendations about the management of Cache Creek.

The County Resource Management Coordinator shall maintain contact with the specified agencies. Interagency contact shall be initiated at least annually. The Resource Management Coordinator shall encourage coordination between the County and the other agencies.

The County shall continue to identify all regional groups, landowners, and other jurisdictional agencies involved with the Cache Creek watershed and share information gathered by the TAC and County to better coordinate regional management efforts.

2.4-7 Manage activities and development within the floodplain to avoid hazards and adverse impacts on surrounding properties. This shall be accomplished through enforcement of the County Flood Ordinance and ensuring that new development complies with the requirements of the State Reclamation Board.

The County Floodplain Administrator shall file for a Letter of Map Revision with the Federal Emergency Management Agency to update the Flood Insurance Rate Maps affected by channel reshaping within the planning area every ten years, or as needed.

2.4-8 Enter into a Memorandum of Understanding with the Yolo County Flood Control and Water Conservation District to provide a regular source of surface water flow in Cache Creek throughout the year, when annual precipitation is sufficient. The timing and volume of flows should be established consistent with the Technical Studies in order to create a stable low-flow channel and allow for the natural revegetation of the streambed, where appropriate.

2.4-9 As part of the updating hydraulic modeling of the creek channel, obtain funding to install a gauge at Capay and work with other jurisdictional agencies (e.g. YCFCWCD, USACE, DWR) to establish a gauge maintenance program. This will allow the Technical Advisory Committee to monitor the amount of stream flow and sediment coming into the plan area and compare the results with data obtained from the gauge at Yolo. This information is important in determining how much water is recharged within the plan area, and whether the sediment "budget" is in a net gain or deficit.

2.4-10 The County shall manage collection of the information necessary to make informed decisions about the management of Cache Creek, including: regular water and sediment discharge data at Capay and Yolo gauge sites, water and sediment discharge data at other sites during high flow events, and topographic data showing the erosion, aggradation, and the alignment of the low-flow channel within the creek. This data should be maintained in the County Geographic Information System so that staff can the Technical Advisory Committee can coordinate this information with the results of other monitoring programs to develop a comprehensive and integrated approach to resource management. Monitoring may, at the discretion of the County, be conducted by either consultants or trained volunteers, including landowners, public interest groups, the aggregate industry, and students, as a part of future public education programs associated with Cache Creek. However, the County shall maintain responsibility for the collection of high quality data.

2.4-11 Create a Technical Advisory Committee (TAC) to provide the County with specific expertise and knowledge in implementing the CCRMP and CCIP. The TAC will also provide advice during emergency situations, such as flooding, and will assist the County in carrying out its responsibilities under this plan, as well as recommending changes to the CCRMP, the CCIP, and implementing ordinances.

2.4-12 Focus efforts on reshaping the channel banks immediately upstream and downstream of both County and State bridges to minimize scour and erosion. Work on the stream banks could be accompanied by the construction of check dams or weirs within the channel, downstream of the bridges, to encourage aggradation. These measures will not only create a more stable channel, but also will also help in preventing structural failure and prolong the life of local bridges. The length of the transitions shall be five times longer than the width of the channel at the bridge site, and shall incorporate guide banks, grade control structures, dikes, berms, vegetation, and other similar measures. Such methods and practices shall incorporate riparian vegetation and increase wildlife habitat values to the extent that the objective of minimizing scour and erosion are not compromised.

2.4-13 Update the Cache Creek Resource Management Plan a minimum of every ten years. This will allow the plan to be amended on a regular basis so that the results of monitoring programs and reclamation efforts can be taken into account.

2.4-14 Rezone those lands within the CCRMP plan boundary with to add the Open Space (OS) designation as an integrated zone. This will allow for those excavations necessary to carry out the channel widening envisioned in the Technical Studies, as well as any regular and/or emergency flood control and bank protection activities, riparian restoration, and other resource management efforts.

2.4-15 Present a request to the State Mining and Geology Board to grant an exemption from the requirements of SMARA for all channel improvement projects approved under the CCIP. If the CCRMP is found to be subject to SMARA, the County shall submit the plan, including the CCIP, to the Department of Conservation for review and comment as the mining and reclamation plan for the study area of the creek.

2.4-16 Adopt a County In-Channel Ordinance to prohibit commercial mining within the CCRMP planning area and specify that aggregate extraction within the area shall be limited to activities necessary to complete channel improvement projects.

2.5 PERFORMANCE STANDARDS

2.5-1 All proposed grading and/or construction projects within the channel shall be subject to the Yolo County Flood Damage Prevention Ordinance.

2.5-2 Check dams or sills should be constructed within the channel to stabilize the streambed so that structures, such as County bridges, are protected from the adverse effects of channel scour. Engineered plans for dams or sills shall be submitted to the County Building Division and the County Community Development Agency for approval prior to construction.

2.5-3 Spur dikes, or similar measures, shall be installed to fill in areas to meet the Test 3 Run configuration. The dikes will deflect stream flows to produce zones of higher velocity within the low-flow channel, as well as sheltered backwater sites that will encourage the development of riparian vegetation.

2.5-4 Deleted.

2.5-5 The Technical Advisory Committee shall review topographic data and such other information as is appropriate to determine the amount and location of aggregate to be removed from the channel. Aggregate removal from the channel shall only be recommended in order to provide flood control, protect existing structures, minimize bank erosion, or implement the Test 3 Run Boundary. Except for bank excavation to widen the channel, annual aggregate removal shall not exceed the amount of sand and gravel deposited the previous year, as determined by aerial photography analysis. Recommendations shall take into consideration the desires of the property owner where excavation is to take place, as well as the concerns of property owners in the immediate vicinity.

The provisions of the CCIP shall be implemented by the County Resource Management Coordinator, with the assistance of the TAC. The CCIP shall contain provisions to ensure that Cache Creek management decisions not reduce flood capacity nor exacerbate existing flooding problems downstream through channel reshaping. This will be accomplished by annual monitoring of channel geomorphology, distribution and density of plant material within the

channel, and modeling to forecast changes in base flood elevations by comparing the most current FEMA mapping with 1995 floodplain modeling and either updating the 1995 hydraulic model to forecast changes in base flood elevations or declare the FEMA mapping acceptable.

When modeling indicates that the channel is approaching loss of 100-year conveyance capacity (or has already lost this capacity), the TAC shall identify for consideration actions by the County or landowners to reestablish capacity.

The County shall review and monitor removal of aggregate and/or plant material consistent with the CCRMP and CCIP. The County, at its discretion, may enlist the aid of gravel mining operators, other private property owners, or conduct the maintenance activities using County resources.

2.5-6 Require all channel improvement projects to comply with the requirements of the CCIP and implementing regulations.

2.5-7 Require the TAC to annually prepare a list of priority channel improvement projects which will be identified and described in an annual report to the Board of Supervisors. Projects that could improve channel stability at the location of bridges or other structures shall maintain a high priority until implementation. Following review by the Board of Supervisors, the TAC shall contact individual landowners to explain recommended channel improvements for their property and describe available resources for design and implementation of the projects.

2.5-8 The review by the TAC of all Floodplain Development Permit applications for Cache Creek improvement projects within the CCRMP area shall include an evaluation of potential upstream and downstream effects of the proposed channel modifications. The TAC shall evaluate data on hydraulic conditions presented in the permit application. The TAC shall also examine aerial photographs and perform a reconnaissance investigation of the site and surrounding areas to identify potential upstream and downstream effects.

The TAC shall update the HEC flood modeling and confirm whether the channel is capable of handling a 100-year flood event as indicated in recent FEMA/USACE maps. The TAC shall then review pertinent agreements and coordinate with all parties to ensure that channel conveyance capacity and flood protection is maintained.

2.5-9 Existing flooding problems associated with Cache Creek near the city of Woodland shall not be exacerbated by activities conducted under either the CCRMP or the CCIP.

The County shall evaluate Muskingum and/or Modified Puls hydrologic stream-routing parameters used by the U.S. Army Corps of Engineers in developing the design discharge for the potential Woodland flood control project. They shall use these routing parameters to develop floodplain encroachment guidelines, taking

into account probable cumulative effects when reviewing any projects that may have an effect on downstream discharge through removal of floodplain storage areas.

A stream-routing shall be performed every five years to monitor cumulative effects of development and to adjust encroachment guidelines as necessary.

CHAPTER 3.0 WATER RESOURCES ELEMENT

3.1 INTRODUCTION

Present Conditions

The Technical Studies included a review of recent groundwater studies that shows a consistent pattern of interaction between the stream and the local aquifer. That portion of Cache Creek located between the Capay and Esparto Bridges tends to be a losing reach. Losing reaches are those where the level of the water in the creek is higher than the groundwater table. As a result, water permeates through the streambed and recharges the aquifer. A gaining reach, on the other hand, is one where the groundwater table is higher than the level of the stream. Thus, water permeates through the channel banks and flows into the creek. The reach between the Esparto Bridge and the Dunnigan Hills may either be losing or gaining, depending on the amount of rain. The more rain there is, the higher the groundwater table raises, seeping water into the stream. In a prolonged drought, however, the level of the aquifer drops and the reach loses water. The portion of Cache Creek downstream of the Dunnigan Hills to the town of Yolo is generally a losing reach.

Over the past several decades, the elevation of the Cache Creek streambed has substantially lowered. In one reach, the bed has dropped thirty feet from elevations recorded earlier in the century. A report prepared by Woodward-Clyde Associates for the Aggregate Resource Advisory Committee in 1976, titled "*Aggregate Extraction in Yolo County: A Study of Impacts and Management Alternatives*" stated that this streambed lowering had resulted in a loss of groundwater storage of approximately ten feet throughout the basin. This loss would equate to between 17,000 and 38,000 acre feet of storage.

The "teacup analogy" used to describe this phenomenon suggested that future spring water groundwater levels would not be able to attain their historic highs, since any groundwater perched above the streambed would flow out into the creek and drain away. Subsequent reviews of the wells used in the Woodward-Clyde study showed that during the 1980s, after a couple of years of above-average rainfall, over half of the wells had recovered to levels seen in the 1950s. Thus, the severe groundwater declines noted by the Woodward-Clyde study were the result of intensive pumping and the drought of the 1970s, and were not caused by streambed lowering. The Technical Studies do indicate, however, that, importantly, the decline in groundwater levels can be reversed, which provides an opportunity for developing a groundwater recharge program.

The surface water of Cache Creek tends to have elevated concentrations of boron. Testing done on the North Fork of Cache Creek and lower Bear Creek during the 1950s showed high concentrations of sodium, chloride, and total dissolved solids (TDS), in addition to boron. Of great concern, the Regional Water Quality Control Board has recently designated Cache Creek as an "impaired waterway" due to the high levels of detected mercury. The Regional Board and the County Environmental Health Department are currently working on a program to monitor mercury within the creek in order to detect the source of contamination. Recent broad-based data on surface water quality within the creek is not available.

CCRMP Vision

Although the lowering of the streambed in Cache Creek did not result in a permanent loss of groundwater storage throughout the aquifer, it did result in a decline of groundwater levels of about ten feet near the channel. In order to address this impact, the CCRMP proposed to limit future in-stream mining to those activities that enhance channel stability and/or the establishment of riparian vegetation. Such activities will be restricted to no more than the amount of aggregate deposited during the previous year (approximately 200,000 tons on average), excluding the reshaping of the channel bank to comply with the Test 3 Run conceptual design. Removal of aggregate from the channel will be done under the direction of the County based on the recommendations of a Technical Advisory Committee. It is intended that the streambed aggrade over time in some areas. In most reaches of Cache Creek, within the plan area, the channel can accommodate far more than the 100-year flood and can aggrade without affecting flood capacity. In areas where the rising streambed does reduce channel capacity, periodic maintenance will be necessary to maintain sufficient flood volume.

Recharge can also be accomplished by converting some of the formerly mined pits along Cache Creek into groundwater recharge basins. Excavations where the pit floor is above the groundwater table are especially suitable for recharge. Where appropriate, the County will coordinate with the Yolo County Flood Control and Water Conservation District in their efforts to develop a groundwater management program.

Cache Creek is a major conveyance of stormwater and irrigation water. Landowners along the stream should be encouraged to divert these flows into sediment basins before the water enters the creek. As discussed in the Biological Resources Element, some of the formerly mined pits could be used for this purpose to deposit sediment in areas that need topsoil, as well as to provide a year-round source of water for riparian vegetation. At the same time, the basins would settle out much of the suspended sediment and vegetation could absorb many of the fertilizers and amendments found in agricultural tailwater.

In order to determine whether actions carried out under the CCRMP and CCIP are having an effect on the surrounding area, more information will be needed. One way in which to collect this data is to ask local landowners to submit well level monitoring results on a regular basis. Such an effort would be on a voluntary basis but would provide a clearer picture of how the aquifer operates along Cache Creek. Similarly, it

would be useful to have baseline information about the quality of water flowing down the creek. Potential problems with surface water pollution could be identified and immediate remedial measures taken. Both the groundwater level information and the surface water quality data would be integrated with the groundwater monitoring systems being established for off-channel mining operations.

3.2 GOALS

3.2-1 Improve the gathering and coordination of information about water resources so that effective policy decisions can be made.

3.2-2 Promote the conjunctive use of surface and groundwater to maximize the availability of water for a range of uses, including habitat, recreation, agriculture, water storage, flood control, and urban development.

3.2-3 Maintain the quality of surface and groundwater so that nearby agricultural productivity and available drinking water supplies are not diminished.

3.2-4 Enhance the quality of water resources by stressing prevention and stewardship rather than costly remediation.

3.2-5 Provide habitat restoration without increasing the generation of mosquitoes.

3.3 OBJECTIVES

3.3-1 Encourage the development of a groundwater recharge program, where appropriate, within the Cache Creek basin. The program may specify use of reclaimed mining pits and open lakes to the greatest extent feasible, while maintaining consistency with the other goals, objectives, actions, and standards of both the CCRMP and OCMP.

3.3-2 Use the CCRMP as a basis for developing a comprehensive watershed plan for Cache Creek that eventually integrates the area above Clear Lake to the Yolo Bypass, relying on coordinated interagency management.

3.3-3 Eliminate water quality impacts from the use of pesticides, fertilizers, and other soil amendments in the channel. Promote public education programs that encourage the use of innovative methods and practices for enhancing the water quality of Cache Creek through the voluntary cooperation of local landowners.

3.3-4 Establish monitoring programs for the continued collection of data and information to be used in managing surface and groundwater resources.

3.3-5 Promote the safe use and handling procedures of hazardous materials during creek management activities.

3.3-6 Minimize mosquito generating potential in habitat restoration areas.

3.4 ACTIONS

3.4-1 Discourage activities that impact the surface water quality of Cache Creek. Although surface mining operations are regulated, other land uses along the creek are not. The County shall work with the U.S. Natural Resource Conservation Service and the Yolo County Resource Conservation District to promote alternative soil and water management practices that improve local water resources. The County Resource Management Coordinator shall initiate contact with resource conservation agencies at least annually.

Pesticides and herbicides shall be used within the channel boundary only under the direction of a certified pesticide/herbicide applicator. These chemicals shall not be applied prior to forecasted rainfall. Evaluate the potential for herbicides to cause aquatic life toxicity. Use herbicides with low toxicity to aquatic life (fish, zooplankton, algae). Evaluate the potential for herbicide use to cause pollution of nearby groundwater wells through understanding of groundwater hydrology (i.e., transport of herbicides from creek bed to well). If the potential exists, monitor groundwater in flow path to well in conjunction with requirements of the Yolo County Department of Public Health, Division of Environmental Health.

Public access to County-owned land shall be allowed only at limited points within the CCRMP planning area to facilitate the control of potential releases of deleterious materials (including fuel, motor oil, household waste, and debris) that could affect water quality within the Cache Creek channel. Access to private property along the creek should be discouraged through the posting of "No Trespassing" signs.

3.4-2 Negotiate cooperative agreements with the Yolo County Flood Control and Water Conservation District, U.S. Army Corps of Engineers, Regional Water Quality Control Board, Yolo County Resource Conservation District, and U.S. Bureau of Land Management, among others, to extend the provisions of the CCRMP outside of the plan area and incorporate the requirements of other agencies of jurisdiction into the County's planning efforts. Interagency contact shall be initiated by the County Resource Management Coordinator at least once per year.

3.4-3 Provide for annual testing or more frequent (if necessary) of surface water quality of Cache Creek at Capay and Yolo. The sample collection and testing should be conducted in the fall or early winter so that the "first flush" of runoff is evaluated for water quality. The County should, when appropriate, enlist the assistance of other government agencies in carrying out the measurements to reduce costs and provide accurate information. However, the County should not rely on others to complete the monitoring.

Testing should be comprehensive and respond to all applicable regulatory requirements. It should include, but not be limited to: pH, total dissolved solids, temperature, turbidity, total and fecal coliform, mercury, total petroleum hydrocarbons, dissolved oxygen, nitrogen, phosphorus, herbicides, and pesticides (EPA Methods 8140 and 8150), suspended and floating matter, odor, an color. This information would assist in habitat restoration efforts and allow the County to monitor water quality trends within the planning area. The County Resource Management Coordinator shall be responsible for the collection, management, and distribution of all water quality data.

Testing should also be conducted near projects prior to, during, and after construction/completion (i.e., at first high-flow inundation) to detect any potential non-compliance with Regional Water Quality Control Board (RWQCB) Water Quality Objectives. The testing program(s) should be designed to measure all constituents for which there are RWQCB numeric and/or narrative regulatory limits. If non-compliance is found, modify future projects of similar type to eliminate such non-compliance.

3.4-4 Establish an outreach program to encourage landowners adjoining Cache Creek to participate in a groundwater monitoring program, so that an ongoing groundwater database can be developed for this area. This information would be used as reference material for the Water Resources Agency and other regional water planning efforts. The County shall attempt to coordinate with other relevant jurisdictional agencies to educate landowners regarding ground/surface water interactions and the importance of developing a comprehensive groundwater database, with technical assistance form the TAC.

3.4-5 Deleted.

3.4-6 Establish operating standards for the use and handling of hazardous materials in and near the Cache Creek channel.

3.4-7 Coordinate all habitat restoration efforts with the Sacramento-Yolo Mosquito and Vector Control District.

3.5 PERFORMANCE STANDARDS

3.5-1 All heavy equipment used for channel improvement projects shall be kept in good working order to reduce emissions and preclude the leakage of oils and fuels. Fueling and maintenance activities shall not occur within one hundred (100) feet of the active channel. All procedures for handling, storage, and disposal of hazardous materials shall be described in a Storm Water Pollution Prevention Plan if required for the projects. Any long-term project (e.g., extensive erosion control, gravel removal) shall have a chemical spill prevention and emergency plan filed and approved by the appropriate local agency. The plan must include

training of the equipment operator and workers in spill reporting and how to minimize environmental damage.

3.5-2 Firms or individuals performing work within the channel shall immediately notify the Community Development Director of any events such as fires, explosions, spills, land or slope failures, or other conditions at the site which could pose a hazard to life or property outside the permitted area. Upon request by any County agency, the firm or individual shall provide a written report of any such event within thirty (30) days, which shall include, but not be limited to, a description of the facts of the event, the corrective measures used, and the steps taken to prevent a recurrence of the incident. This condition does not supersede nor replace any requirement of any other government agency for reporting incidents.

A copy of the approved Business Emergency Response Plans and the approved Spill Prevention Control and Countermeasure Plans, if required, shall be filed with the Yolo County Health Department prior to the commencement of work within the channel.

3.5-3 Wastewater should not be directly discharged to Cache Creek. Measures such as berms, silt fences, sediment ponds, hay bales, and/or revegetation should be used to control erosion. Agricultural tailwater should be diverted to catchment basins prior to release to the creek.

3.5-4 Sediment fines generated by aggregate processing of in-channel sand and gravel shall be used for agricultural soil enhancement or -stream revegetation projects. In-channel sediment fines shall not be used as backfill material in off-channel habitat restoration due to potential high mercury content.

3.5-5 All internal combustion engine driven equipment and vehicles shall be kept tuned according to the manufacturers specifications and properly maintained to minimize the leakage of oils and fuels. No vehicles or equipment shall be left idling for a period of longer than ten (10) minutes.

3.5-6 Water quality data collected from Cache Creek shall be regularly evaluated by a trained professional to determine whether the use of chemicals in the habitat restoration areas is affecting water quality. If chemicals are used and a correlation between chemical use and the degradation of water quality is established, the use of chemicals in the habitat restoration areas shall be reevaluated.

3.5-7 For bank repair projects using fill, conduct appropriate leaching tests on fill materials to determine if it contains leachable constituents at concentrations of potential concern.

CHAPTER 4.0 BIOLOGICAL RESOURCES ELEMENT

4.1 INTRODUCTION

Present Conditions

Riparian woodland generally provides significant amounts of cover, roosting and nesting opportunities, and food for wildlife. However, the riparian habitat along Cache Creek has been severely reduced since historic times. The extent of the riparian forest prior to 1850 is not well documented for Cache Creek, but it has been estimated that there may have been between 800,000 and 900,000 acres throughout the entire Sacramento Valley, indicating that this habitat was fairly widespread prior to intensive settlement. The Technical Studies identify that there are only about 125 acres remaining along Cache Creek within the plan area. The riparian woodland around Moore's Crossing is the most important habitat remaining within the plan area due to the abundance of native plant species and wildlife cover. This habitat is characterized by relatively young trees that do not reflect the mature riparian forest that has historically dominated this region, and many of the mature trees are in poor condition. Valley oak woodland, usually found on the upper terraces of Cache Creek, plays a similarly significant role to that of the riparian forest, but much of this habitat has been eliminated by land clearing. Approximately 76 acres remain along Cache Creek within the plan area. Together, these habitats account for some six percent of the total area of the channel. Much of the remaining habitat has a fairly low diversity of species, lowering its wildlife utility even further.

A substantial portion of the mature forest is threatened by a lack of readily available water. Typically dependent upon stream flow, the trees are now well above average groundwater levels due to streambed lowering, and they are unable to regenerate both the canopy and understory characteristics of a mature riparian forest. Although they continue to provide valuable nesting sites for birds that forage in the adjoining agricultural fields (especially Swainsons hawks), these areas are not fulfilling their full habitat potential.

The lack of riparian vegetation has consequences for other aspects of the creek system. Water moves promptly downstream rather than being delayed by vegetation so that the potential for groundwater recharge is reduced. High flow velocities also discourage fish populations. Marshland within the channel is limited which prevents adequate nutrient transformation for vegetation and wildlife. The absence of woody vegetation and steepness of the channel banks also contributes to the excessive erosion that is occurring in many reaches. Thus, reestablishment of the riparian corridor will not only improve conditions for wildlife, but will provide benefits for other resources that are also dependent upon the creek.

Tamarisk and giant reed are found throughout the plan area, and in some reaches of the Creek constitute the dominant plant species. These plants are not native to this area and are aggressive colonizers, thereby providing a threat to the existing riparian habitat. Although tamarisk provides some cover for quail and deer along Cache Creek, both it and giant reed provide far less food and cover for wildlife than native riparian species. Tamarisk is of special concern due to its tendency to build up salts in the surrounding soils. These weeds can also significantly alter stream flow. Both species require a large amount of water and can lower local surface and groundwater levels. In addition, they can also form dense islands in the streambed, resulting in the flooding of areas that are not usually inundated. Although found within the channel throughout the plan area, tamarisk and giant reed have primarily infested the reaches upstream of the Capay Bridge (County Road 85) and downstream of the Stephens Bridge (County Road 94B).

The reach of Cache Creek located between the Capay Bridge and the Dunnigan Hills presents several constraints to potential riparian revegetation, including: a lack of silt and organic debris, absence of a defined low-flow channel, low groundwater levels and seasonal surface water supply, and extensive surface disturbance from in-stream mining. Although measures may be taken to address some of these problems, the channel flow characteristics in this reach may prevent it from becoming a riparian forest similar to that found in the Dunnigan Hills reach.

CCRMP Vision

Although the CCRMP cannot reestablish the diversity and extent of riparian habitat that existed 150 years ago, there is substantial opportunity for improving the degraded situation that occurs today. Eventually, the plan seeks to establish a continuous corridor of vegetation along Cache Creek throughout the plan area. One of the foremost considerations in achieving this goal is a more available supply of surface water. This may be accomplished by either coordinating revegetation efforts with agricultural drainage, or regrading the channel to create pools. Another approach would involve the Yolo County Flood Control and Water Conservation District. The District is currently applying for additional allocation rights for water from Cache Creek. An added increment of this water supply could be reserved for maintaining a summer surface flow in the low-flow channel, thus enhancing the potential for riparian habitat restoration.

This plan identifies a number of recommended sites along Cache Creek for habitat restoration (see Figures 5 and 6). Due to the changing hydrological and geological conditions that exist throughout the plan area, the type and extent of habitat vary from one reach to another. In general, the recommendations may be summarized as follows:

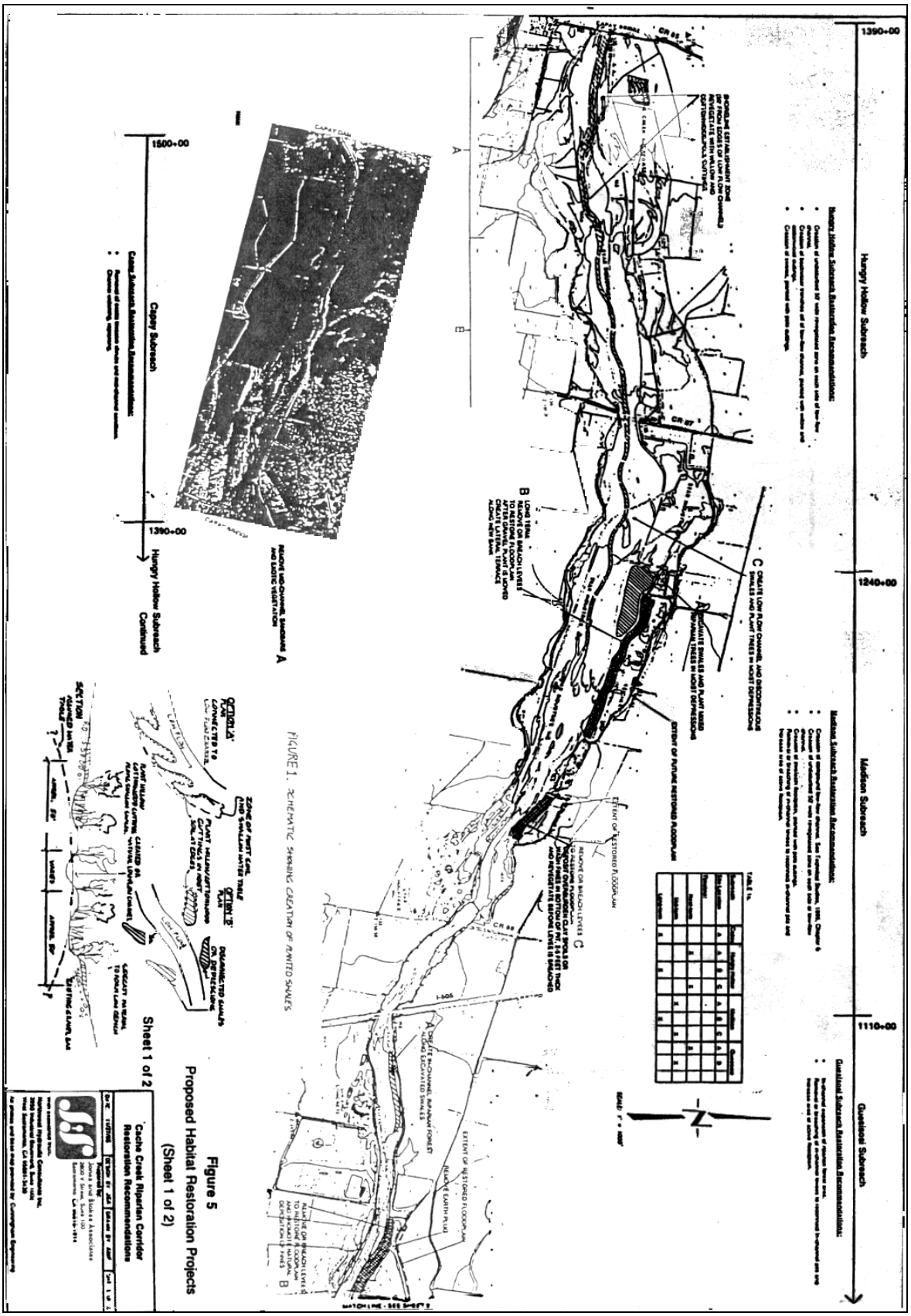

Figure 5. Proposed Habitat Restoration Projects (Sheet 1 of 2)

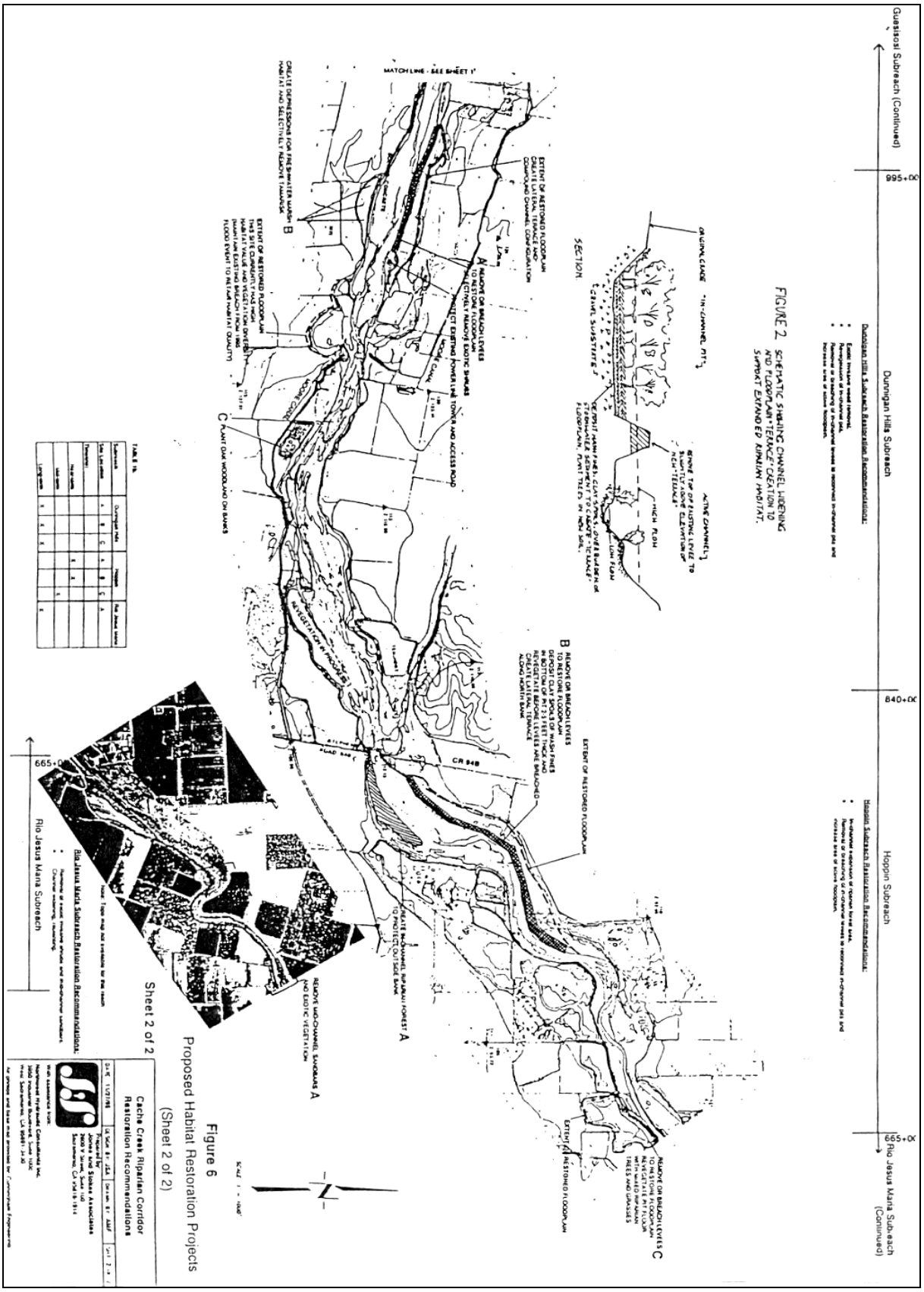

Figure 6. Proposed Habitat Restoration Projects (Sheet 2 of 2)

County Road 91B to County Road 94B: The primary emphasis is on removing or minimizing exotic, invasive shrubs, such as the giant reed and tamarisk, in order to maintain channel stability and to allow for the development of native vegetation. This reach is especially well suited for removing existing embankments that protected former mine sites and widening the channel. However, due to the high recharge value in this area, the recommended restoration projects will be coordinated with the Flood Control District so as not to preclude future recharge opportunities. Work should focus on the restoration of old existing in-channel pits. Where groundwater recharge is not feasible, the floor of the pit should be elevated and riparian forest planted. In-channel forest should also be created along the south portion of the channel, downstream of Road 94B, to provide additional bank stabilization.

County Road 91B to County Road 94B: The Dunnigan Hills reach already contains several sites that have naturally revegetated and created well-developed and diverse habitat. Some areas could be improved, however. The former Cache Creek Aggregates (Patterson) pit should be revegetated with oak woodland habitat, while shallow depressions should be created in portions along the south bank owned by Solano Concrete to allow for the development of riparian wetlands. A riparian forest has already been established on the north bank, west of the Moore Dam Sanctuary, but it is recommended that the levee be removed so that the area can be hydrologically connected to the creek.

Interstate 505 to County Road 91B: This portion of the creek serves as a transition zone between the barren, braided channel upstream, and the well-vegetated, narrow channel downstream. Two projects are proposed here. One is to remove the levee separating one of the old Solano sites on the north side of the channel and allow the natural deposition of material from the creek to improve the existing stunted riparian forest. The other is to plant additional riparian forest along the north bank of the channel, immediately downstream of the I-505 Bridge, to close a gap in the habitat corridor, as well as to enhance the hydraulic transition near the bridge.

County Road 87 to Interstate 505: A low-flow channel should be created in this reach, along with 50 foot wide revegetated zone of cottonwoods and willows on either side, as is being proposed for the Capay reach (see below). Levees should be removed to connect formerly mined pits on the north side of Cache Creek to the channel. However, similar to the Dunnigan Hills reach, this creek segment is known to have important recharge and recovery opportunities that should be considered. Furthermore, one of the pits contains an operating gravel processing facility owned by Teichert Aggregates that will likely not be abandoned for decades. There is a small portion of streambed next to the Teichert site that is already on a low terrace with good access to groundwater that would provide riparian forest habitat.

County Road 85 to County Road 87: This reach of the creek is the main area of natural sediment deposition that results in a braided channel. Groundwater levels are lower here than in other portions of the plan area. These two factors tend to discourage extensive revegetation unless irrigation is used on an ongoing basis. However, this area also forms a significant gap in the wildlife corridor. Subsequently, restoration work will concentrate on establishing riparian vegetation along the low-flow channel where more water is available. The low-flow channel will meander and shift so that a series of narrow vegetation ribbons will eventually cover the floodplain in an alternating pattern of forest and open gravel bars.

Upstream of County Road 85: Due to the high flow velocities and widespread exposure of bedrock within the channel, there is currently little opportunity for in-stream revegetation in this reach. Efforts should focus on removing the extensive stands of giant reed and tamarisk within this reach. The reestablishment of native vegetation would be undertaken with the cooperation of local landowners along the south bank of the channel.

Several of the reaches include proposals to remove levees and connect formerly mined pits to the channel. This could be accomplished in a series of steps, as shown in Figures 7 and 8. The first would be to backfill the pit, if necessary, with four to six feet of overburden and topsoil. A number of sources could be used for this material, including sediment runoff from adjoining agricultural fields, waste fines from off-channel aggregate processing, surplus soil from grading projects, and/or backwash from Cache Creek (if a small breach is constructed on the downstream portion of the levee). Once sufficient material had been accumulated, the area should be planted with riparian vegetation and allowed to mature for two or three years. At that time, most of the levee would be removed, leaving a gently sloping transition from the newly revegetated terrace to the more active area of the channel.

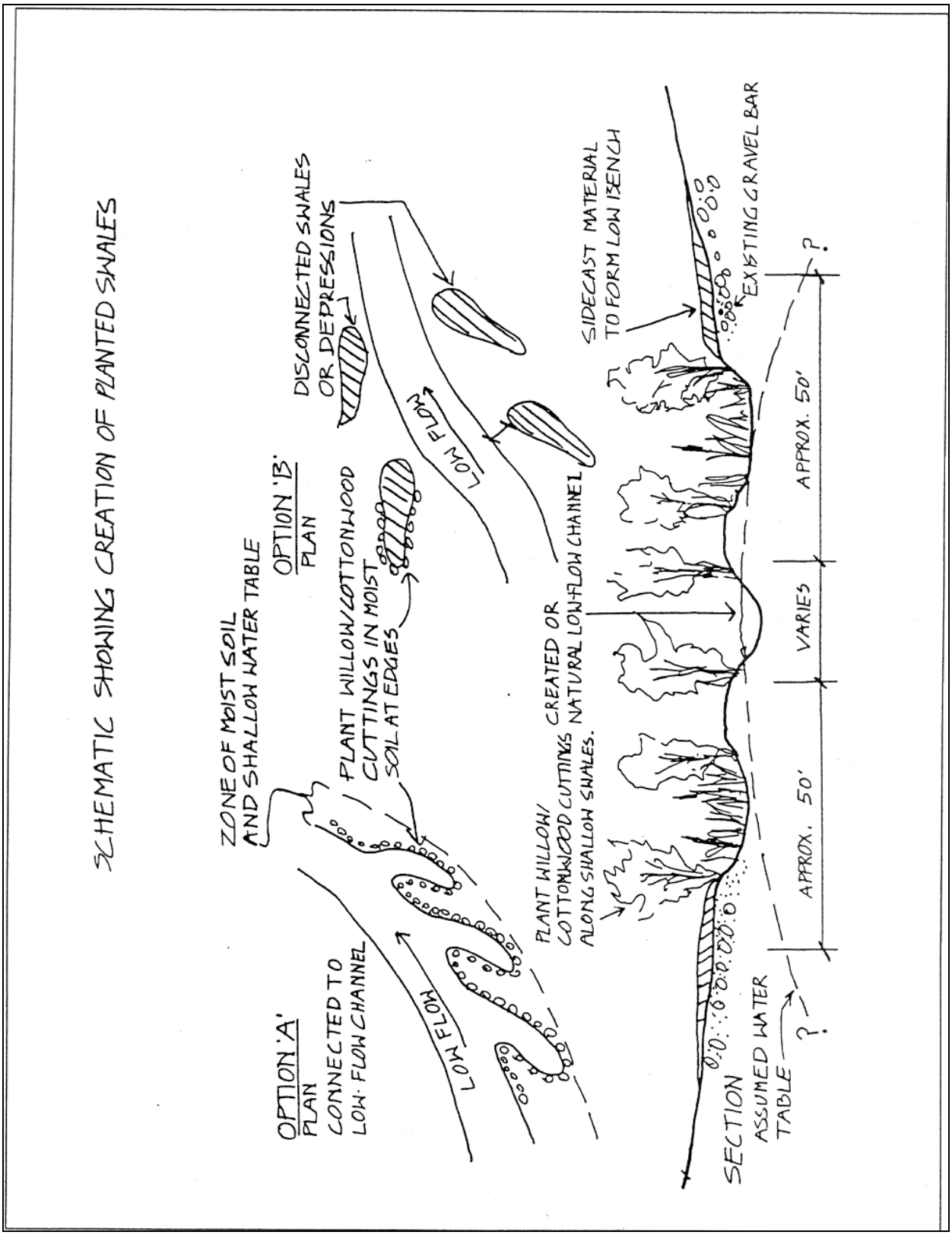

Figure 7. Habitat Restoration Diagram (Sheet 1 of 2)

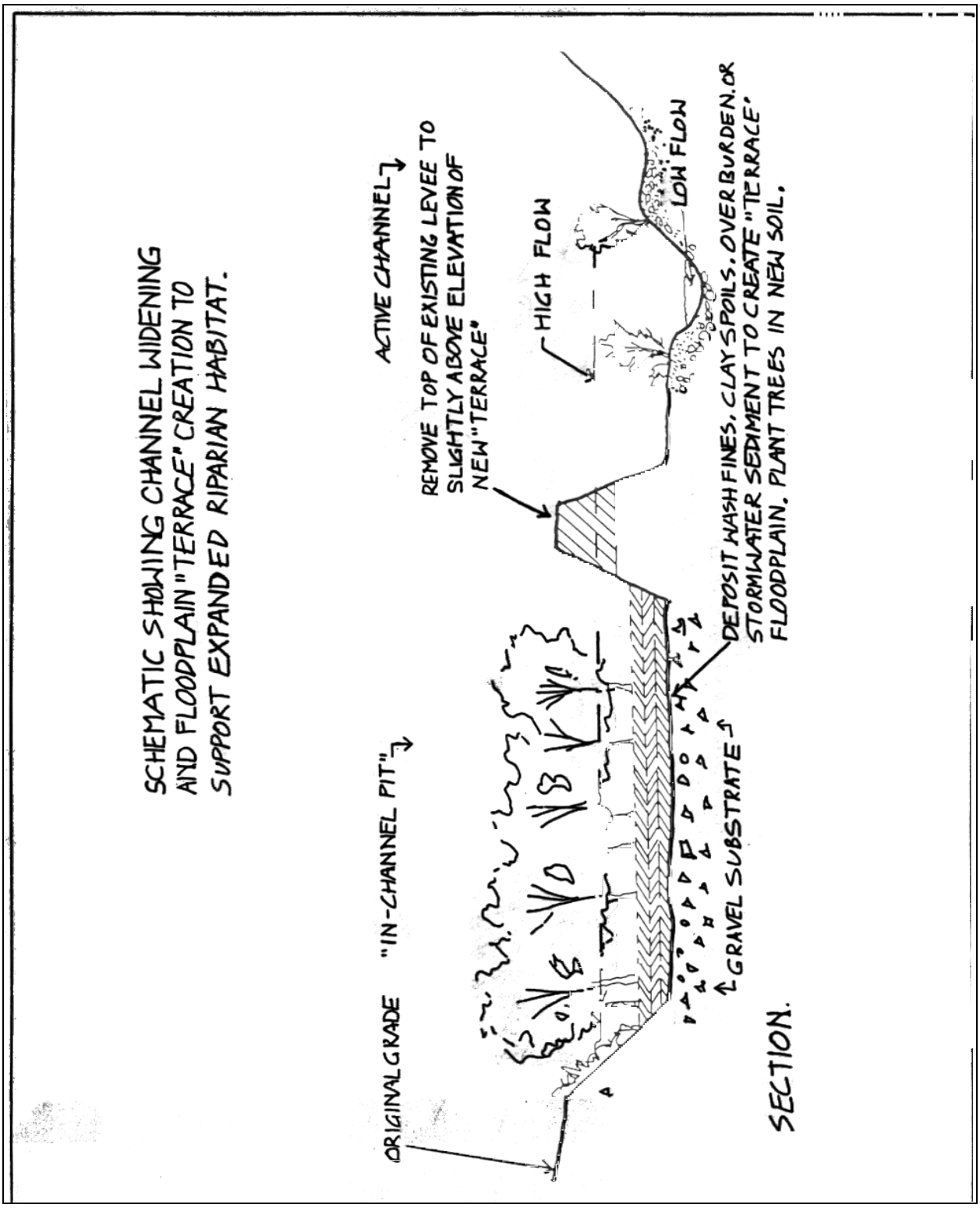

Figure 8. Habitat Restoration Diagram (Sheet 2 of 2)

Alternatively, a breach could be constructed in the downstream portion of the levee. The revegetated terrace would still be connected to the creek, while the remaining portion of the levee would increase the variety of natural landforms to diversify habitat opportunities. The remaining portion of the levee would be strengthened through riprap and other means to protect it from stream erosion. By implementing these recommendations incrementally, the vegetation is given enough time to become well established so that it can withstand the forces of large flood events. Providing a dense planting of vegetation along the toe of the streambanks will also stabilize the new banks and reduce erosion, as well as encourage higher flow velocities to remain in the center of the creek.

The development of riparian habitat along Cache Creek will require careful consideration. In some areas, the ability of vegetation to provide erosion control will be encouraged to protect nearby property or structures, while in other areas vegetation will have to be removed when it adversely affects channel flow. Similarly, the elimination of invasive weeds will be a high priority so that native vegetation has a chance to become established. In other areas, non-native weeds may be retained so that they can stabilize banks in some areas where native plants cannot grow. Generally speaking, the CCRMP calls for the widespread establishment of riparian woodlands. Restoration of this type of habitat would not only be consistent with historical conditions but would increase the presence of an ecosystem that is rapidly diminishing in California. Standards for developing habitat have been provided to guide revegetation projects and provide a measure of consistency in their implementation.

It is anticipated that much of the revegetation efforts along Cache Creek will be undertaken by volunteer organizations such as the Cache Creek Conservancy. As such, the County will have to work closely with these groups in order to ensure that the various habitat development projects are carried out in a consistent manner and do not conflict with one another, that the projects contribute to the overall functioning of the riparian corridor, and that there is appropriate follow-up, maintenance, and monitoring to ensure success. A similar approach will be necessary to link the efforts of individual land owners, such as those found in the Moore Dam Sanctuary and Gordon Slough area, so that gaps in the corridor can be identified and filled. The County will also have to coordinate with other government agencies, such as the Flood Control District and the U.S. Army Crops of Engineers, so that a mutually agreed upon and coordinated approach can be implemented. Assistance will be sought to help in monitoring the results of these diverse efforts. Public service organizations and university students with environmental expertise will be approached to perform pro bono plant and wildlife surveys for the County's database and monitoring efforts.

4.2 GOALS

4.2-1 Provide for a diverse riparian ecosystem within the Cache Creek channel that is self-sustaining and capable of supporting wildlife.

4.2-2 Create a continuous corridor of riparian and wetland vegetation to link the foothill habitats of the upper watershed with those of the settling basin.

4.2-3 Develop high quality natural habitat that is dominated by native plants.

4.2-4 Manage riparian habitat so that it contributes to channel stability.

4.2-5 Establish monitoring programs for the continued collection of data and information to be used in measuring the success of revegetation efforts.

4.3 OBJECTIVES

4.3-1 Conserve and protect existing riparian habitat within the channel to the greatest extent possible. Where channel maintenance or improvement activities result in the removal of riparian habitat, require disturbed areas to be replanted. Where vegetation has been removed within the channel for flood protection and/or erosion control purposes, replanting shall be done in nearby areas that do not adversely affect stream flows.

4.3-2 Establish conditions to encourage the development of a variety of natural riparian habitat types within the Cache Creek channel.

4.3-3 Adopt standards for planning and developing habitat revegetation areas in order to assure consistency and reasonable success, as well as provide information for public service groups seeking to undertake restoration projects.

4.3-4 Ensure that the establishment of habitat does not significantly divert streamflow or cause excessive erosion or damage to nearby structures and/or property.

4.3-5 Encourage the use of alternative methods and practices for stream and erosion control that incorporate riparian vegetation in the design.

4.3-6 Coordinate restoration programs with relevant planning efforts of both the County and other private and public agencies.

4.4 ACTIONS

4.4-1 Encourage the use of riparian vegetation and other "soft-engineering" methods in bank or channel protection. Methods may include willow spiling (retaining walls constructed of woven willow stems from which trees will sprout); spur dikes to deflect the current away from the bank and create areas for vegetation; and cabling dead trees along the bank to provide both bank stabilization and additional habitat.

4.4-2 Remove vegetation when it threatens channel stability. In particular, the growth of tamarisk, giant reed, and willow on mid-channel gravel bars shall be controlled to prevent streamflows from being diverted towards nearby banks.

4.4-3 Promote the eradication of invasive species, such as the giant reed and tamarisk, in areas where they inhibit the growth and development of native riparian vegetation.

4.4-4 Coordinate with the Cache Creek Conservancy, the Yolo County Flood Control and Water Conservation District, the California Department of Fish and Game, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and all other appropriate agencies and organizations to ensure that habitat restoration projects proposed by these and other entities are consistent with the Cache Creek Resources Management Plan. Restoration plans shall compliment the preservation and enhancement measures in the Yolo County Natural Communities Conservation Program.

4.4-5 Establish a series of wildlife preserves (see Figure 9) to provide core areas for maximizing wildlife and fish habitat, to help protect areas of high habitat quality from future degradation, and to provide source areas from which native plants and wildlife can colonize other reaches of the creek. Wildlife preserves should emphasize the preservation of high quality existing habitat, areas with high species diversity, areas supporting unique species or biotic communities, and habitat for rare, threatened, and endangered species.

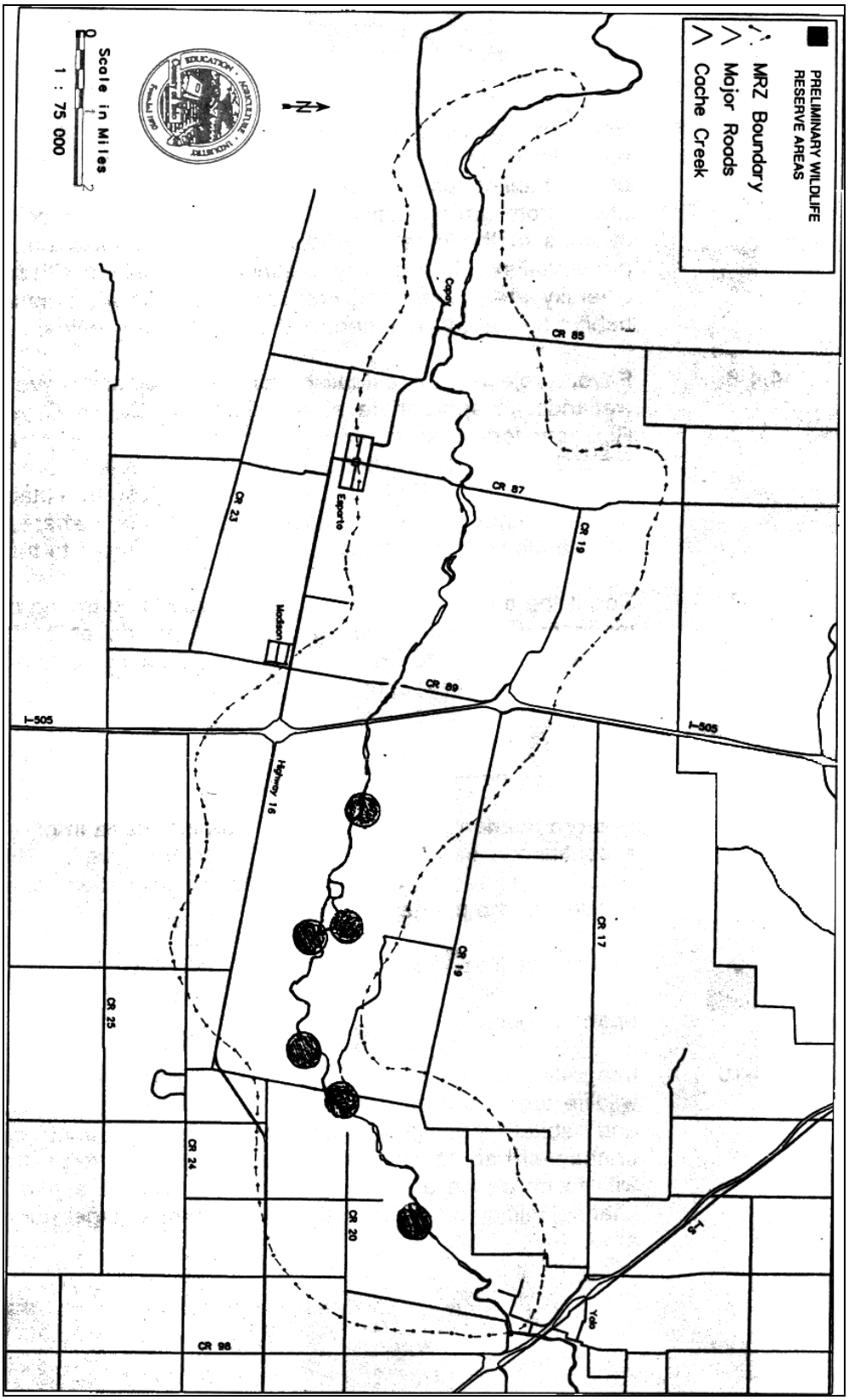

Figure 9. Preliminary Wildlife Reserve Areas

4.4-6 Favor projects that establish riparian woodlands over emergent wetlands in appropriate areas within the Cache Creek channel. Riparian forest and scrub habitats have largely disappeared regionally and are much more difficult to recreate than are emergent wetland habitats. Emergent wetlands can also be established in a greater range of environmental conditions, whereas riparian woodlands require specific considerations in order to thrive.

4.4-7 Solicit the assistance of community groups in carrying out ongoing monitoring programs. Examples may include enlisting the local Audubon Society to perform annual bird counts at specific points along Cache Creek; coordinating with UC Davis to create a program whereby students could obtain class credits for performing surveying, vegetation mapping, or bed material counts; and collecting well levels from landowners in the plan area.

4.4-8 Restore riparian habitat throughout the plan area in order to create a continuous habitat corridor along Cache Creek. The CCRMP includes a series of recommended restoration sites located throughout the plan area.

4.4-9 Revise the Yolo County In-channel Reclamation Ordinance to provide specific guidelines for design, implementation, and maintenance of riparian habitat.

4.4-10 Integrate in-channel revegetation plans through development of a *Comprehensive, Integrated Revegetation Plan* in order to connect disparate wildlife habitat. Ensure that elements such as drainage, slopes, and habitat types complement one another in a coordinated effort. In-channel habitat areas shall also be coordinated with proposed wildlife mitigation and "net gain" established as a part of the off-channel mining operations in order to create a larger riparian habitat area. The integrated plan should include measures to evaluate the feasibility of creating contiguous wildlife habitat by physically connecting individual wildlife areas via riparian corridors or some other connecting habitat.

4.4-11 Work with the aggregate industry to develop a regional Mitigation (Conservation) Banking Program, whereby habitat developed as a part of a reclamation plan may be dedicated for preservation to offset development projects elsewhere. The program shall identify priority locations and create en ecologically functional pattern of wildlife habitat within the planning area that could be enhances through mitigation funds to improve habitat for special status species or sensitive natural communities. Augmenting existing restoration/reclamation efforts through establishment of a regional Conservation Bank could accelerate achievement of CCRMP goals and objectives and integrate well with those of the Yolo County Natural Communities Conservation Program (NCCP).

4.4-12 Standards identifying planting procedures and materials, soil amendments and stabilizers, and appropriate species and planting densities for marshland, oak woodland, and riparian woodland restoration efforts should be considered guidelines. Variations from these guidelines shall be acceptable if alternative restoration plans have been prepared by a qualified biologist, consistent with the policies of the CCRMP.

4.4-13 Avoid disturbance to important wildlife habitat features such as nest trees, colonial breeding locations, elderberry host plants for VELB, and essential cover associated with riparian forest and oak woodland habitat. This should include sensitive siting of, maintenance access, and recreational facilities away from these features.

4.4-14 A biological database search shall be completed prior to implementation of priority projects. The database shall compile existing information on occurrences of special-status species and areas supporting sensitive natural communities that should be considered for preservation. Where detailed information is not available, the database shall be supplemented by reconnaissance-level field surveys to confirm the presence or absence of populations of special-status species, location of elderberry shrubs, and extent of sensitive natural communities along the previously unsurveyed creek segment. Essential habitat for special-status species shall be protected and enhances as part of restoration efforts or replaced as part of mitigation plans prepared by a qualified biologist.

4.4-15 Coordinate with jurisdictional agencies to establish "blanket" permits and agreements to ensure a consistent multi-agency approach to managing the creek.

4.4-16 Modifications to the in-channel areas shall be reviewed and approved by the TAC to ensure that sensitive biological resources are protected and enhances, that restoration plans are consistent with the policies of the CCRMP, and that various habitat restoration projects are compatible.

4.4-17 Investigate the feasibility of establishing a "safe harbor" agreement between resource agencies and local farmers to encourage the creation of new wildlife habitat on agricultural lands within the CCRMP planning area. Also evaluate the feasibility of conservation easements as an alternative to a "safe harbor" strategy on private property within the planning area. The Yolo County Resources Manager shall coordinate the development of any "safe harbor" initiative with all appropriate agencies to explore opportunities for broadening the program and its benefits.

4.5 PERFORMANCE STANDARDS

4.5-1 No new haul roads shall be constructed through significant riparian vegetation. Haul roads shall be realigned or redesigned to avoid established habitat.

4.5-2 No excavation shall take place within twenty-five (25) feet of any mature trees to be retained within the channel.

4.5-3 Oaks and drought-tolerant shrubs should be planted on streambank slopes due to the lack of water on the high elevations. Oaks and shrubs should be especially encouraged on slopes facing north or east.

4.5-4 Shallow terraces may be created along the banks of the low-flow channel from I-505 to the Capay Bridge, with cottonwood and willow pole cuttings planted on the benches. One alternative would involve digging short trenches diagonally to the low-flow channel (angled downstream), with prerooted willow and cottonwood cuttings planted on the upstream edge of the trench. Another would be to create in-channel riparian plots along this reach to trap bed materials to aid in creating the shallow terraces. These measures would allow for the development of a ribbon of vegetation to establish along the low-flow channel in this area, thereby helping to connect the riparian corridor.

4.5-5 Planting shall be conducted immediately after grading, before invasive vegetation has become established. If undesirable vegetation does become established, it should be removed by mechanical means and approved herbicides, such as glyphosphate, under the supervision of a licensed applicator.

4.5-6 Dense vegetation shall be emphasized along the stream bank to create a distribution of velocities within the channel, with the highest velocities occurring within the low-flow channel. To ensure adequate water supply for new plantings, secure irrigation systems shall be provided for revegetation projects within the planning area.

4.5-7 Habitat areas located next to grazing lands shall be fenced in order to prevent vegetation disturbance.

4.5-8 Fertilizer shall not generally be used because its application favors non-native vegetation. Where appropriate, however, trees and shrubs may be planted with a slow-release fertilizer.

4.5-9 All plant materials should be collected in the vicinity of the project site in order to maintain the genetic stock and provide the most site-adapted ecotypes. If seeding of native herbaceous species is proposed, seeds should be collected, cleaned, tested for viability, and stored appropriately by a qualified native seed supplier. Cottonwood cuttings shall be collected and contract-grown at a nursery with staff experienced in the propagation of native plants. Alternatively, cottonwood cuttings can be collected from vegetation in the project vicinity and

stockpiled for planting within twenty-four (24) hours of collection. Willow cuttings can be collected from vegetation in the project vicinity and stockpiled for planting within 24 hours of collection. Other woody riparian species should be collected and contract-grown from local seed by a qualified native plant nursery.

4.5-10 Planting should be initiated in the fall after the first soaking rains. Container plants should be planted in holes at least twice as deep and wide as the plant container. The rootball should be thoroughly dampened before planting and the planting holes deeply irrigated prior to planting. After planting, the holes should be backfilled with native substrate material (with no mulch added) and thoroughly tamped to remove air pockets. Willow cuttings may be planted in clusters in planting holes prepared and backfilled in a similar manner. Trees, shrubs, and willow cutting clusters should be located in randomly spaced, naturally clumped patterns. Herbaceous seed mix (if used) should be hydroseeded (without hydromulch) or broadcast over planting area, then covered with blown rice straw meeting State "weed-free" standards at one ton per acre. Soil stabilizer or tackifier, such as Ecology Controls M-Binder, should be included at 150 pounds per acre. Hydromulching is not recommended because of a history of poor results with native seedings.

4.5-11 Existing hydraulic conditions shall be assumed for all proposed biotic reclamation activities. The County shall work with the the Yolo County Flood Control and Water Conservation District to arrive at an agreement regarding long-term water supply to Cache Creek from Gordon Slough. The TAC would be responsible for identifying and implementing new restoration opportunities resulting from the increased water availability. All plantings should be carefully selected based on the existing hydrology and water availability of the reclamation area.

Irrigation of tree and shrub plantings may be necessary for the first two or three summers in drier sites to allow the roots to develop sufficiently to tap into the summer ground water level. Irrigation may be necessary at least twice per month during dry periods for the first three years. Water requirements of young plantings should be evaluated as part of routine monitoring, with adjustments to the frequency and duration of irrigation made in response to indications of stress.

4.5-12 The site should be closely monitored for competing non-native vegetation. Non-native species can be sprayed or removed by hand as necessary to attain the success criteria, as defined in each site-specific plan.

4.5-13 The following guidelines shall be followed when developing wetland habitat areas:

(a) Limit dense stands of aquatic vegetation in shallow areas to lower mosquito harborage and enhance wave action. This will also serve as substrate for mosquito predators.

(b) The banks of areas that retain water after June 1 (the beginning of the optimal mosquito breeding season) shall be steep enough to prevent isolated pooling as the water level recedes, to allow for wave action and to provide access by mosquito predators. Shorelines shall be configured so as not to isolate small channels or shallow ponding areas from the main body of water, to provide continuos access by predators, especially mosquito fish.

(c) Seasonal marshes shall be designed to have at least four months of soil saturation or shallow inundation. Water depths shall not exceed two (2) feet of water.

(d) Marsh species shall be planted every six (6) feet, using plugs salvaged from marshes in the immediate vicinity or obtained from a nursery. Transplanting shall take place within twelve (12) hours after salvage and the root masses shall be kept continuously inundated from the time of transplanting.

(e) Wetland areas shall cover a minimum of one (1) acre. Side slopes shall be no steeper than 3:1 (horizontal:vertical). Small islands and complex shorelines shall be provided to create a diverse environment. Wetland designs shall include provisions for the wetlands to be partially drained periodically, in order to allow for the reseeding of aquatic plants and to promote the decay of built up organic debris.

(f) Pit bottoms should be recontoured to create areas for waterfowl nesting and depressions to provide a more permanent water feature. Islands should generally be located on the upwind side of the water body to minimize exposure to the prevailing winds. Island slops above the water level should be no steeper than 2:1 (horizontal:vertical). Emergent vegetation shall be placed around the edges of islands to reduce wave-related erosion. Shrubs shall be widely spaced. Trees and tall shrubs shall not be planted on the islands, since predators perch in them to prey on waterfowl.

(g) Appropriate species and densities for marsh restoration may include the following:

Species (common name)	Density (plugs per acre)
Creeping spikerush	200
Baltic rush	100
Tule	100
Bulrush	100
Three-square	10
Beaked sedge	5
Scouring rush	5
Buttonbush	5

4.5-14 The following guidelines shall be followed when developing riparian woodland habitat areas:

(a) Riparian woodland shall be established only where there are coarse slopes containing soil types such as cobbly loam, gravelly loam, or other loamy textures. Where slopes contain significant clay layers, open woodland s or grasslands shall be restored instead.

(b) Trees and shrubs shall be planted in clusters to create alternate patterns of open and enclosed spaces.

(c) Appropriate species and densities for riparian woodland restoration may include the following:

Species (common name)	Density (number or pounds/acre)
Wild rose	36
Valley oak	33
Fremont cottonwood	26
Black willow	23
Red willow	23
Arroyo willow	23
Sandbar willow	23
Goodings willow	23
Native blackberry	19
Box elder	18
Wild grape	16
Dogwood	16
Oregon ash	16
Western sycamore	16
Blue elderberry	12
Mugwort	10
Mule fat	6
Creeping wildrye	16 pounds

4.5-15 The following guidelines shall be followed when developing oak woodland habitat areas:

(a) Trees and shrubs shall be planted in clusters of six (6) to seven (7) individuals, typically consisting of a single species. Some mixed groupings, such as valley oak and elderberry may occur where appropriate. Gray pine, however, shall be planted singly (not in clusters) at the higher elevations of the site. Clusters of trees and shrubs shall be planted from twenty-five (25) to fifty (50) feet apart, with native grasses in-between.

(b) Appropriate species and densities for oak woodland restoration may include the following:

Species (common name)	Density (number or pounds/acre)
Valley oak	20
Wild rose	15
Blue elderberry	10
Coyote bush	10
Toyon	10
Redbud	10
Coffeeberry	10
Native blackberry	8
Interior live oak	6
California buckeye	5
Gray pine	3
Creeping wildrye	16 pounds
California brome	10 pounds
California barley	5 pounds
Pina bluegrass	5 pounds
Purple needlegrass	5 pounds

4.5-16 The following guidelines shall be followed when creating habitat areas within previously mined areas outside of the active channel:

(a) Basins that have floors close to the groundwater level should be restored to seasonal marsh and riparian wetlands. Those that are permeable, dominated by sand and gravel, should promote woodland habitat.

(b) Pit floors shall have sufficient topsoil and overburden to support the proposed habitat. Overburden and soil may be obtained from the diversion of agricultural tailwater, aggregate processing wash fines, of deposition by the creek. Areas to be planted shall be appropriately prepared prior to planting. If necessary, soils may be tested after preparation has occurred in order to determine the need for soil amendments.

(c) Pits should then be planted and irrigated until the plants have established. Agricultural tailwater is encouraged as an irrigation source. It would provide a valuable source of water for revegetation projects, and would also provide bio-filtering for the sediment and residue pesticides contained within the tailwater.

(d) Areas that will not be planted may be graded to create steep, barren slopes to provide habitat for the bank swallow.

(e) Except in important recharge areas, levees may be removed, breached at the downstream end, or a culvert installed at the downstream end to allow for dynamic interaction with the variable water level in the creek. Natural flooding will provide additional water, increase the diversity of tree species through colonization, and allow for the accumulation of organic nutrients and sediment.

(f) Habitat plans shall take into account the range of expected water level fluctuations and shall adjust the siting and design of the pit accordingly.

(g) In areas where fluctuating groundwater levels may affect revegetation plots at wet pit sites, consult with the TAC hydrogeologist and biologist to develop a viable, site-specific planting area.

4.5-17 Topsoil and vegetation removed from the streambed shall be salvaged for use in restoration planting within the channel.

4.5-18 Where the low-flow channel is creating excessive bank erosion problems and its relocation becomes necessary, grading within the low-flow channel shall provide a smooth surface, without undulations. This will ensure the safe passage of fish and prevent them from becoming trapped in isolated packets of water.

4.5-19 Low weirs may be installed, outside of the low-flow channel, to provide shallow pools for encouraging the establishment of riparian vegetation. When establishing shallow pools out of the low-flow channel, but within the floodplain of Cache Creek, the County shall coordinate with the California Department of Fish and Game to minimize the potential for native fish species mortality due to potential impediments to fish migrations.

4.5-20 The in-channel area located west of the Capay Bridge is the highest priority for tamarisk elimination. Weed control, using the most up-to-date technology, shall begin within the first year after ground disturbance in order to prevent tamarisk from outcompeting native vegetation. A combination of mulching and spraying is preferred. Chemicals should be applied to freshly cut stumps and must cover the entire cambium layer. Cut plants should be removed from the channel and either disposed of or burned. Cutting and chemical treatment is most effective during from July through "first frost" (November), when the plant enters dormancy. Application should be repeated to control shoots growing from root systems. All chemical spraying must be done by a certified herbicide applicator. All cut plants should either be disposed of or burned. Monitoring and mapping of the tamarisk

removal shall be coordinated with the Yolo County Weed Management Area efforts.

In marshy areas, when chemical treatments are prohibited, tamarisk may be uprooted with a backhoe or tractor. This is best performed when the plants are flowering and more visible. When the soil is moist, saplings may also be removed by hand with relative ease.

4.5-21 Giant reed shall be removed from areas of high flow velocity, using the most up-to-date technology, especially within the channel area located west of the Capay Bridge. The most effective control is the chemical application of Roundup (away from water) and Aqua Master (near water) during March and April. Optimum results are achieved with total spray coverage. Alternatively, reed may be sprayed with follow up removal of the dead plants. All cut plants should be either disposed of or burned. Applications should be repeated to treat shoots that resprout when re-growth is approximately 4 feet tall and 60% of the original stem density. All chemical spraying must be done by a certified herbicide applicator. Monitoring and mapping of the giant reed removal shall be coordinated with the Yolo County Weed Management Area efforts.

4.5-22 Where riparian reforestation is proposed in streambed areas located outside of the low-flow channel, cottonwood and willow cuttings should be placed within existing swales and other naturally-occurring low-elevation areas in order to provide them with sufficient water to survive the summer months.

4.5-23 The TAC shall evaluate the vegetative cover within the CCRMP on an annual basis. At a minimum of once every five years, the existing hydraulic model of the Cache Creek channel shall be updated based on current conditions, including estimated of channel roughness. If sensitivity analysis indicates that the existing vegetation is contributing to adverse channel roughness, the TAC shall recommend removal of vegetation within selected areas of the channel.

CHAPTER 5.0 OPEN SPACE AND RECREATION ELEMENT

5.1 INTRODUCTION

Present Conditions

Currently, there are no public recreational facilities located along Cache Creek within the plan area. However, plans are underway for a 41-acre open space park on land dedicated to the County by Granite Construction Company near the junction of County Road 85 and Highway 16 (see Figure 10.). Although there are County parks near Rumsey and Guinda, and several campgrounds and whitewater rafting areas near Bear Creek, the lower portions of the stream are predominantly characterized by agricultural and mining uses. Due to the high proportion of land in private ownership, access to the creek is severely limited. In-stream mining has historically compounded the problem, often creating an unattractive landscape where the use of heavy equipment generates noise and hazards for visitors to the creekbed. Present recreational uses are limited to general uses, such as canoeing, hunting, and fishing.

There are a number of recreational areas in the immediate area, including: the Esparto Community Park, the Madison Community Park, and the Flier's Club (a private golf course and clubhouse). In addition, there are several private equestrian facilities on the north side of the creek, just west of County Road 94B. None of these uses, however, provide direct access to the creek.

According to local landowners, there is a great deal of unauthorized recreational usage. Off-road vehicles use formerly mined pits and streambanks, creating erosions and damaging riparian vegetation. Trespassing is frequent, with people poaching, camping, and loitering along the creek, leaving behind graffiti, property damage, and trash. These areas of the creek are typically found in remote locations, away from nearby residences and areas frequented by authorized visitors.

CCRMP Vision

The recreation and open space uses discussed in the CCRMP are conceptual in nature, providing some guidelines for implementation and suggesting general areas for access and future projects. The plan recommends that the County pursue an integrated system of trails and recreational areas along Cache Creek, similar to efforts occurring along the San Joaquin and American Rivers, although at a less intensive scale of development. Such a system would require a more detailed analysis of the recreational needs of Yolo County and the resulting environmental effects of a regional parkway. Future development of a parkway plan would allow for community involvement and provide

specific proposals for directly addressing creek ownership and access issues. In the long run, planning efforts for this portion of Cache Creek should be coordinated with recreational plans being developed by the U.S. Bureau of Land Management for the upper watershed.

Until such time as a parkway plan is approved, however, the CCRMP has designated six general areas for future recreational use (see Figure 10). Sites are located at regular intervals of approximately two miles along Cache Creek, in order to function as trailheads or staging areas for a possible system of bicycle, pedestrian, and/or horse paths. Recreational areas were also sited on lands included for off-channel mining, where proposed reclamation is to permanent ponds. This ensures that no additional farmland would be lost, while taking advantage of the amenities associated with the bodies of water to be reclaimed through mining. Frontage to County roads and State highways is an important consideration to provide the public with adequate access. When specific sites are approved, the CCRMP recommends that they be designated as open space in the General Plan, so that subsequent surrounding land uses may account for future park development.

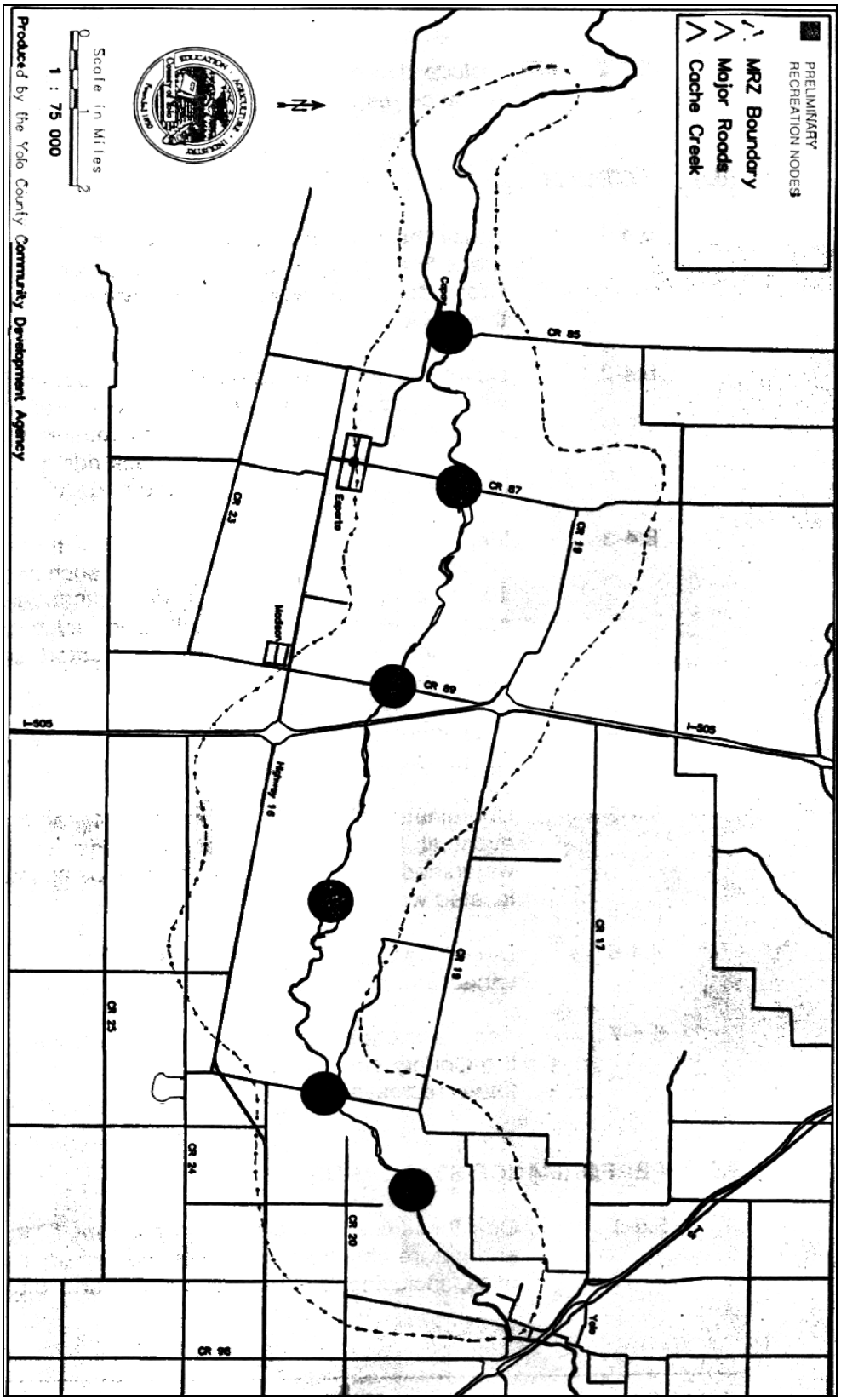

Figure 10. Preliminary Recreation Nodes

Future recreational sites should be acquired by the County, or other non-profit entity, so that facilities may be appropriately managed for public use. Over time, Cache Creek will support a variety of resources, including riparian habitat, off-channel mining, flood control and groundwater management facilities, agriculture, and private homes, many of which may not be compatible with intensive recreational uses. Trespassing would not only disturb nearby residents and business operations but may endanger the safety of violators. Therefore, one of the primary goals of the County is to manage future public access, including any undesirable activities such as vandalism, public disturbance, and unlawful conduct.

5.2 GOALS

5.2-1 Improve scenic resources within the Cache Creek channel.

5.2-2 Establish a variety of outdoor recreational and educational opportunities along Cache Creek for use by the public.

5.2-3 Ensure the compatibility of recreational facilities with surrounding land uses and sensitive wildlife habitat, in order to minimize adverse impacts.

5.3 OBJECTIVES

5.3-1 Create a continuous corridor of natural open space along the creek and provide for limited access, at specific locations, to recreational and educational uses.

5.3-2 Include use of the "Open Space" designation for the areas where resource management and habitat protection is warranted.

5.4 ACTIONS

5.4-1 Solicit the dedication of restored habitat areas and/or recreational areas to the County or an appropriate land trust, such as the Cache Creek Conservancy, in order to provide continuous open space along the creek.

5.4-2 Develop a future recreation plan for Cache Creek, in consultation with the County Parks Administrator, to provide a range of public activities and uses. Suggested recreational uses may include, but are not limited to: hiking, horseback riding, fishing, picnic grounds, boating, educational exhibits, and birdwatching.

5.4-3 Identify possible locations for future recreational, habitat, and educational uses along Cache Creek, such as those shown in Figure 10. Sites shall be

located at regular intervals throughout the plan area. Intensive recreational uses, such as horseback riding, picnicking, and boating shall be located away from designated habitat areas.

5.4-4 Designate identified recreational areas as "Open Space" in the Cache Creek Resource Management Plan.

5.4-5 Coordinate with the Bureau of Land Management to investigate the eventual linkage of recreational uses located along the upper watershed of Cache Creek to the designated recreational sites located within the plan area.

5.4-6 Design and manage recreational sites so that trespassing, vandalism, and other undesirable activities are discouraged. The TAC, in consultation with resources agencies, shall develop measures to control human access to sensitive wildlife habitat or other sensitive communities (i.e., wetlands) in the planning area to minimize impacts on these resources.

5.4-7 Acquire future sites, through purchase or voluntary donation, so that the County can maintain and develop the areas according to the future recreation plan.

5.5 PERFORMANCE STANDARDS

5.5-1 Only those uses that are river dependent, such as fishing, canoeing, and nature observation shall be located on the creek. More active uses, including parking, restrooms, and picnic areas should be located in areas located away from sensitive habitat, preferably on land that has been reclaimed from sand and gravel mining.

5.5-2 Recreational uses shall be clustered at locations along the creek, in order to limit public access, minimize habitat disturbance, and provide efficient and cost-effective management by the County. All access, whether by road or by trail, shall be through an entry point which can be controlled.

5.5-3 Physically control access with gates and collect user fees to support operations and deter inappropriate activities. Limited public access will also reduce impacts to sensitive habitat and adjoining private uses. Additional options include permits, volunteer docents to patrol the site, and escorted tours.

5.5-4 Recreational facilities shall be located a minimum of one-hundred and fifty (150) feet from private dwellings, with a landscaped buffer provided to reduces noise and maintain privacy.

5.5-5 Educational and interpretive curricula shall be developed that will reach all segments of the community. The County shall rely heavily on compatible programs already developed by volunteers, schools, and nonprofit organizations.

5.5-6 Large-scale, high-intensity recreational uses, such as amusement parks, off-road vehicle parks, or uses involving motorized watercraft, are not compatible with land uses along Cache Creek.

5.5-7 The recreational use of off-road vehicles and all-terrain vehicles on public property shall be prohibited.

5.5-8 The hunting and/or discharge of firearms along Cache Creek shall be prohibited on pubic property.

5.5-9 Noise analyses shall be conducted for proposed recreational uses where medium to large groups would congregate in common use areas. The study shall identify likely sources of noise and ways to reduce levels to minimize annoyance at adjacent properties.

CHAPTER 6.0 AGGREGATE RESOURCES ELEMENT

6.1 INTRODUCTION

Present Conditions

In-channel mining is currently regulated under Chapter 3 of Title 10 of the Yolo County Code, while reclamation is administered under Chapter 5 of the same title. Although minor amendments have been made over the years, these regulations are essentially the same as they were when adopted in 1979. At the time of adoption, the mining and reclamation ordinances were considered to be interim measures which the County would use until a more thorough revision could be made as a part of the Resource Management Plan being developed by the Aggregate Technical Advisory Committee (AgTAC). However, that planning effort later was halted and the interim regulations have remained in place ever since. As a result, many of the operational and reclamation alternatives that were adopted in 1980 are still in effect today.

Most of the in-channel mining permits were approved in 1980, with the exceptions of several Teichert operations, specifically: Reiff/Esparto (1986), Muller (1989), and Coors-Fong (1989). Figures from 1994 show that within the plan area, approximately 70 to 75 percent of the Cache Creek channel is being mined. The conditions of approval associated with these prior permits, though typical for the time, do not adequately reflect the increased level of concern an expanded body of knowledge regarding Cache Creek that has developed since. As described in the Technical Studies, in-stream mining has created a significant sediment deficit, removing more aggregate than has been annually deposited. Although not the only cause, this deficit has contributed to the lowering of the streambed, which has in turn increased scour and flow velocity, resulting in a generally imbalanced creek system. While a number of factors besides in-channel mining have played a role in creating these conditions, channel stability cannot be achieved unless the amount of in-stream mining is significantly reduced.

CCRMP Vision

The key to future management of Cache Creek lies in the channel maintenance and improvement activities carried out under the CCIP. Sand and gravel mining, operating under the guidelines established in the Technical Studies and incorporated into the CCRMP, will guide the creek to a more stable shape through selected aggregate removal and grading. The Technical Studies identified general cross-section templates to guide in-channel excavation so that terraces and a low-flow channel are provided to enhance the stability of the creek. These activities will not only maintain the capacity to adequately convey floods, but will play a determining role in forming a low-flow channel and slowing flow velocities, which in turn will create more beneficial conditions for the

establishment of riparian vegetation. More vegetation will provide more habitat for wildlife, as well as assist in flowing surface water flows and encouraging aggradation in some areas, which will improve in-channel groundwater recharge. Increased groundwater supplies will lower pumping costs, thereby helping local agriculture. Finally, the resulting improvements will create a more attractive and enjoyable environment for limited use by the public.

It is important that these activities be managed in a way that carries out the stated objectives. To do so will require a cooperative partnership between local landowners, aggregate companies, the County, and various other government agencies. The first step is to allow them to excavate within the active channel. This approach is necessary to implement the CCRMP and will be required as a part of any future off-channel approvals. Accomplishment of this would be a substantial net gain. Existing operations that mine outside of the active channel, such as Granite Construction and Schwarzgruber and Son, would not be affected.

The plan and its implementation may qualify for exemption from the Surface Mining and Reclamation Act. If, however, the CCRMP and CCIP are found to be subject to SMARA, the County would file as the applicant for a surface mining permit and reclamation plan for the area covered CCRMP plan boundary. This would allow in-channel excavation to occur near State and County bridges. The County would not acquire the land within the channel under this permit, nor would any exercise of eminent domain occur. No mining within the channel would occur without the express consent of the affected landowner. Royalties would be paid to any person who owned land that was mined. This would save individual property owners the time and expense of acquiring all of the various permits necessary to work in the channel, while assuring the County a role in determining how to best mange the above relationships, as well as establishing prearranged procedures for performing repairs an maintenance during an emergency. Gravel operators will enter into these agreements for maintenance for their own properties.

As a part of managing Cache Creek, the County would work with other agencies of jurisdiction to establish "blanket" permits for the portion of Cache Creek to be permitted. Of particular importance would be the U.S. Army Corps of Engineers (404 Permit), State Reclamation Board (Encroachment Permit), State Department of Fish and Game (Stream Alteration Agreement), and the Federal Emergency Management Agency (Letters of Map Amendment and Map Revision). Standard conditions will be sought to streamline the permit process and ensure a consistent multi-agency approach to managing the creek. Coordination with Caltrans would have to be on a project-by-project basis due to the nature of their approvals.

Finally, there is the cost of doing the actual aggregate removal and channel shaping. The County has neither the funds nor the equipment and labor to implement the required tasks. It is the intention of the County to require the aggregate companies to perform a portion of this work. All work would have to comply with all applicable regulatory requirements, as well as any other recommendations made by the Technical Advisory Committee. In return, any material removed would not be counted against the

company's maximum annual production limits. This arrangement would be beneficial for all parties involved and would allow the County to provide close monitoring of in-channel mining, without incurring significant new costs.

6.2 GOALS

6.2-1 Use the removal of in-channel aggregate deposits as an opportunity to reclaim, restore, and/or enhance the channel stability and habitat of Cache Creek.

6.2-2 Provide for effective and systematic monitoring and reclamation of aggregate removal activities within Cache Creek.

6.3 OBJECTIVES

6.3-1 Reduce duplication of effort and conflicting regulatory authorities in order to encourage implementation of appropriate management measures and practices within and adjacent to Cache Creek.

6.3-2 Revise existing regulatory measures to more accurately reflect the environmental processes of Cache Creek.

6.3-3 Enlist the cooperation of private and public interests to assist in maintenance and channel reshaping efforts.

6.4 ACTIONS

6.4-1 Revise the existing ordinances contained in the Yolo County Code to incorporate performance standards to prevent hazards and reduce potential environmental impacts; programs to carry out the policies included within the Cache Creek Resources Management Plan and Cache Creek Improvements Program; and recent amendments to SMARA, if appropriate.

6.4-2 Provide for the relinquishment of existing permits for mining within the active channel before off-channel operations may commence. The reclamation of former in-channel mining areas shall be consistent with and fully implement the CCRMP and CCIP.

6.4-3 Pursue joint regulatory efforts with other agencies of jurisdiction in order to streamline and standardize conditions for performing work within the creek. The County shall coordinate with other government agencies that have permit authority over Cache Creek to obtain "blanket" permits for the entire reach of the stream located within the plan area. This will give the County more local control over management of the creek, while providing certainty for the Technical Advisory Committee as to what activities may or may not occur.

6.4-4 Draft the County In-Channel Ordinance to require that, upon revocation of existing in-channel mining permits, the tonnage of aggregate removed by an aggregate mining operator in the completion of approved channel improvement projects is excluded from the operator's permitted maximum annual production. These market incentives would ensure that the necessary work would be accomplished at little cost to the County, while generating royalties for the owner of any property where excavation takes place.

6.4-5 Provide technical support through the TAC to mining operators, property owners, and government agencies involved with Cache Creek to provide a professional and scientific basis for making decisions regarding the removal of channel deposits that affect property and structures, the construction of flood protection and erosion control measures, and the provision of emergency labor, equipment, and materials during and/or after flood events.

6.4-6 If the CCRMP and CCIP are determined to come under the provisions of SMARA, the County shall apply for a mining permit that would encompass the area within the CCRMP plan boundary, along the entire 14.5 mile reach of Cache Creek contained within the plan area. This will allow the CCIP to be implemented, without going through lengthy individual permit analyses and incremental environmental reviews. It should be emphasized, however, that the County would not be exercising eminent domain in applying for this permit.

6.5 PERFORMANCE STANDARDS

6.5-1 All in-channel operations shall be limited to the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday, unless emergency conditions require otherwise.

6.5-2 If human skeletal remains are encountered during excavation, all work within seventy-five (75) feet shall immediately stop and the County Coroner shall be notified within twenty-four (24) hours. If the remains are of Native American origin, the appropriate Native American community identified by the Native American Heritage Commission shall be contacted, and an agreement for treating or disposing, with appropriate dignity, of the remains and associated grave goods shall be developed. If any cultural resources, such as chipped or ground stone, historic debris, building foundations, or paleontological materials are encountered during excavation, then all work within seventy-five (75) feet shall immediately stop and the Community Development Director shall be notified at once. Any cultural resources found on the site shall be examined by a qualified archaeologist and the information shall be submitted to the County.

Damaging effects on cultural resources shall be avoided whenever possible. If avoidance is not feasible, the importance of the site shall be evaluated by a qualified professional prior to the commencement of excavation operations. If a cultural resource is determined not to be important, both the resource and the

effect on it shall be reported to the County, and the resource need not be considered further. If avoidance of an important cultural resource is not feasible, a mitigation plan shall be prepared and implemented. The mitigation plan shall explain the importance of the resource, describe the proposed approach to mitigate destruction of damage to the site, and demonstrate how the proposed mitigation would serve the public interest.

6.5-3 All unpaved roads shall be adequately watered to keep soil moist at all times, in order to control fugitive dust.

6.5-4 Operational areas and haul roads that are not required for future use of the site shall be ripped and prepared accordingly to prevent compaction and allow for revegetation.

6.5-5 Noise levels shall not exceed an average noise level equivalent (Leq) of eighty (80) decibels (dBA) measured at the outermost boundaries of the property being excavated. However, noise levels may not exceed an average noise level equivalent (Leq) of sixty (60) decibels (dBA) for any nearby off-site residences or other noise-sensitive land uses, unless emergency conditions require otherwise.

6.5-6 Final slopes for in-channel excavations shall conform with the channel slope and sinuosity guidelines shown in Figure 11 of the CCRMP. Excavations shall be sloped in a downstream direction, towards the low-flow channel. When recommended by the TAC, alternate grading plans may be approved.

6.5-7 In-channel excavations shall generally conform with the cross-section profiles shown in Figures 12 through 16 of the CCRMP. When recommended by the TAC, alternate grading plans may be approved.

6.5-8 No excavation shall take place within one hundred and fifty (150) feet of the centerline of the low-flow channel, where the creek is contained within a single channel. Where the creek is braided or contains multiple channels, no excavation shall take placed within one hundred and twenty-five (125) feet of each channel.

REACH CHARACTERISTICS

Reach	Year	Channel Slope	Sinuosity[1]
Rio Jesus Maria Subreach 2	1905	0.16%	1.18
	1995	0.12%-0.13%	1.18
	Target	0.12%-0.14%	1.18
Hoppin Subreach 3	1905	0.10%	1.20
	1995	0.14%-0.15%	1.08
	Target	0.12%-0.14%	1.15
Dunnigan Hills Subreach 4	1905	0.14%	1.05
	1995	0.19%-0.20%	1.00
	Target	0.15%-0.18%	1.05
Guesisosi Subreach 5	1905	0.14%	1.05
	1005	0.12%-0.14%	1.01
	Target	0.12%-0.14%	1.05
Madison Subreach 6	1905	0.18%	1.17
	1995	0.21%-0.23%	1.03
	Target	0.19%-0.21%	1.15
Hungry Hollow Subreach 7	1905	0.15%	1.16
	1995	0.21%-0.24%	1.02
	Target	0.19%-0.21%	1.10
Capay Subreach 8	1905	-	-
	1995	0.18%-0.20%	1.04
	Target	0.18%-0.20%	1.04

[1]Sinuosity is channel length divided by valley length.

SOURCE: NHC, 1995.

Figure 11. Reach Characteristics Table

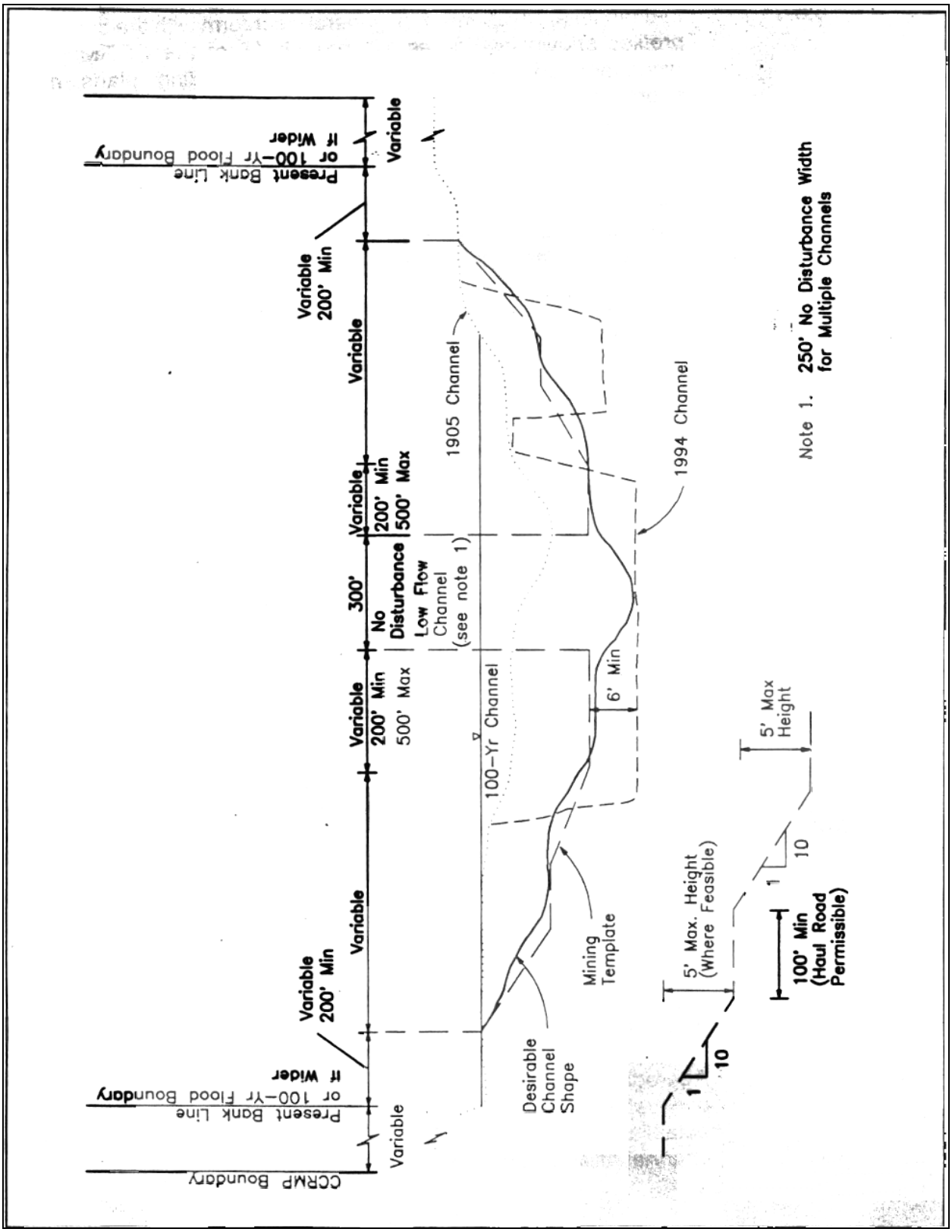

Figure 12. Generalized Creek Cross Section

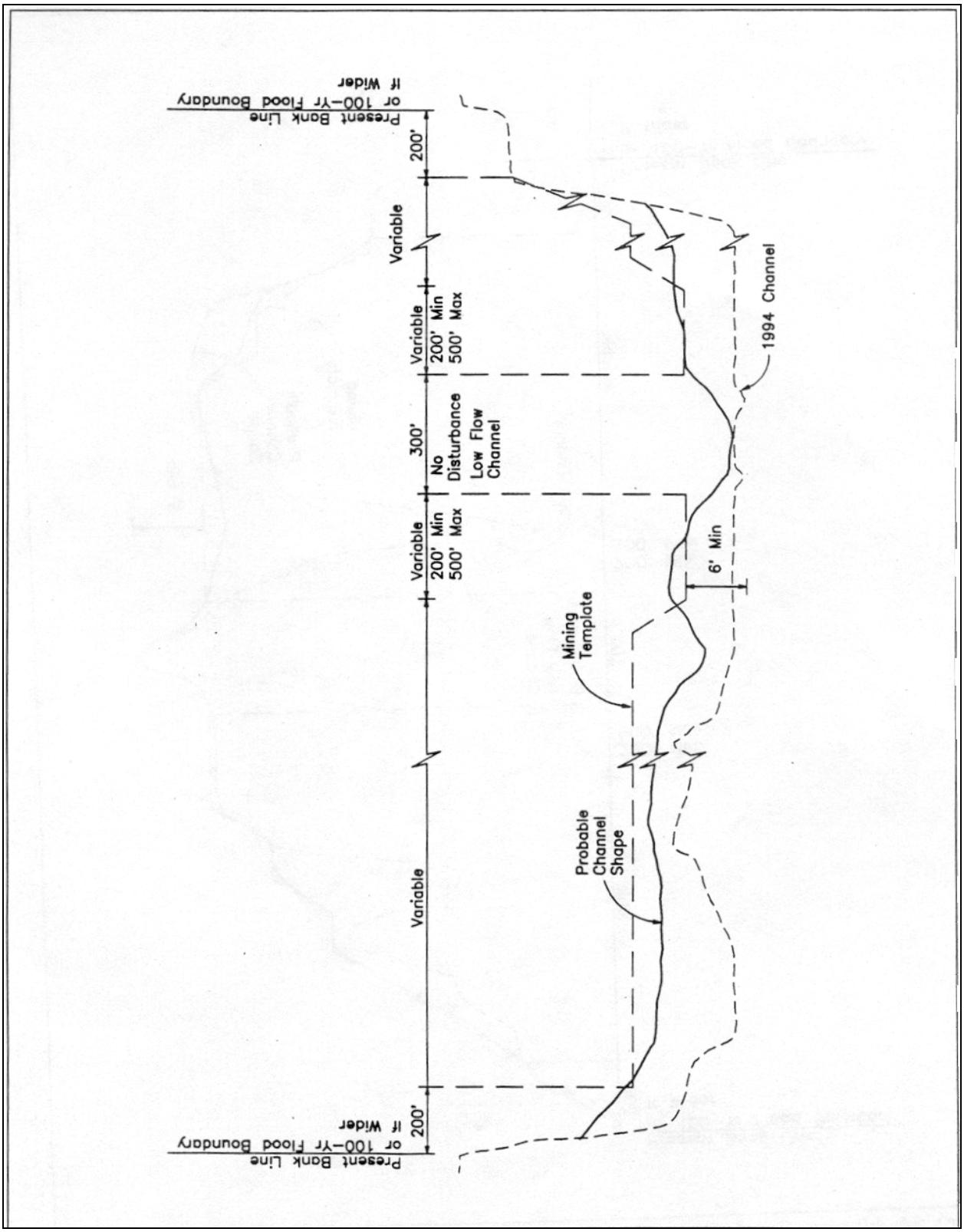

Figure 13. Wide Creek Cross Section

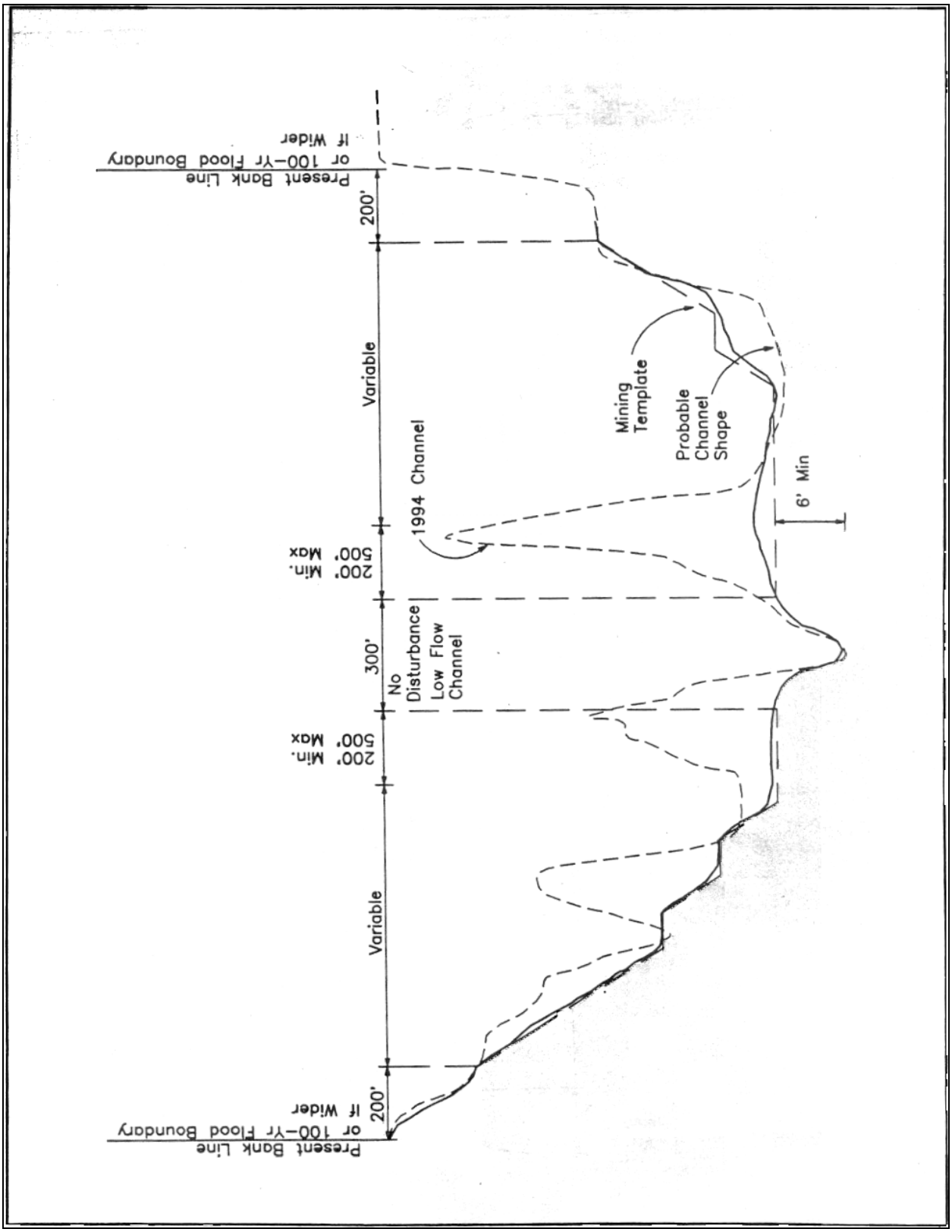

Figure 14. Narrow Creek Cross Section with Adjacent Pits

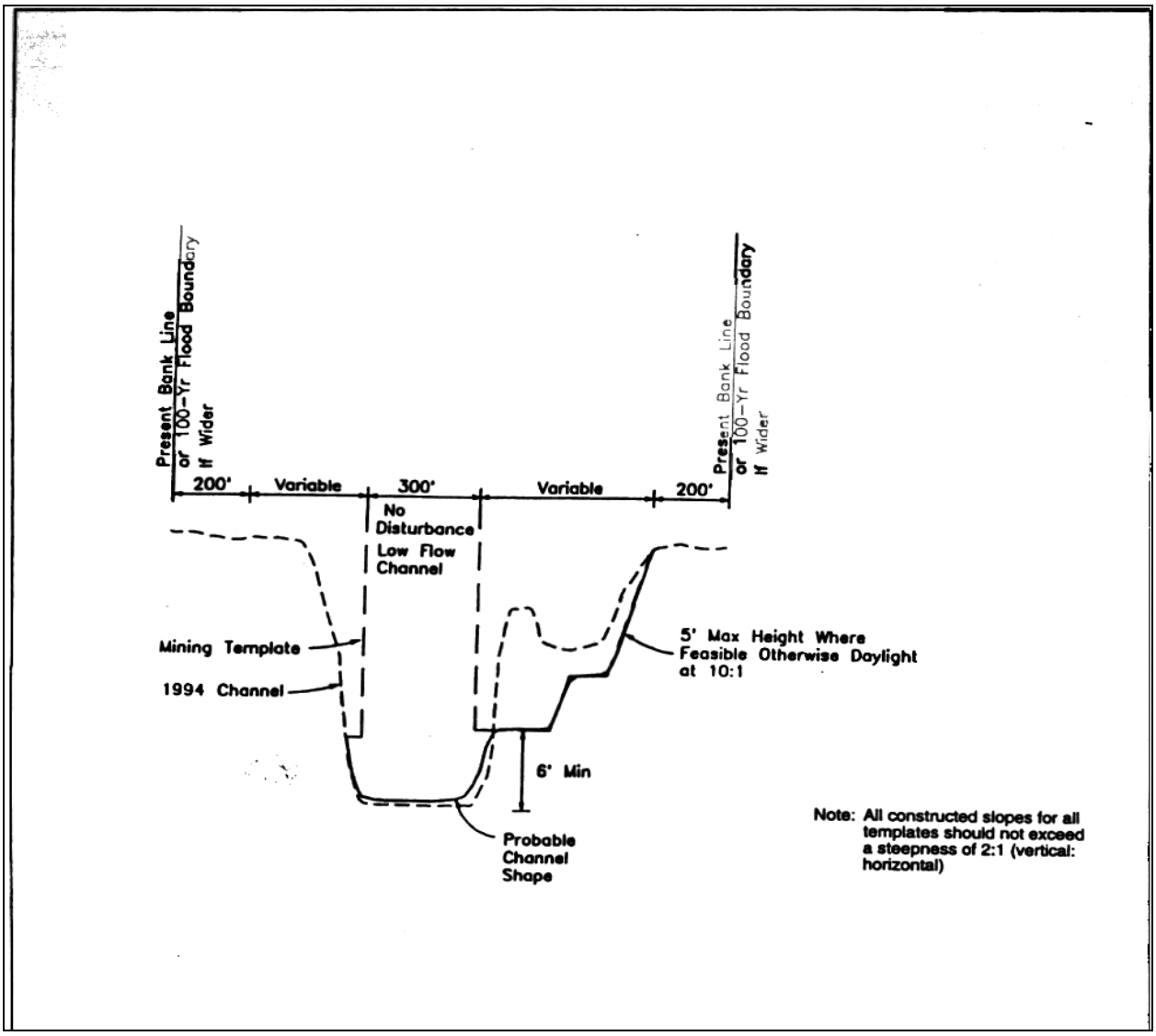

Figure 15. Narrow Creek Cross Section

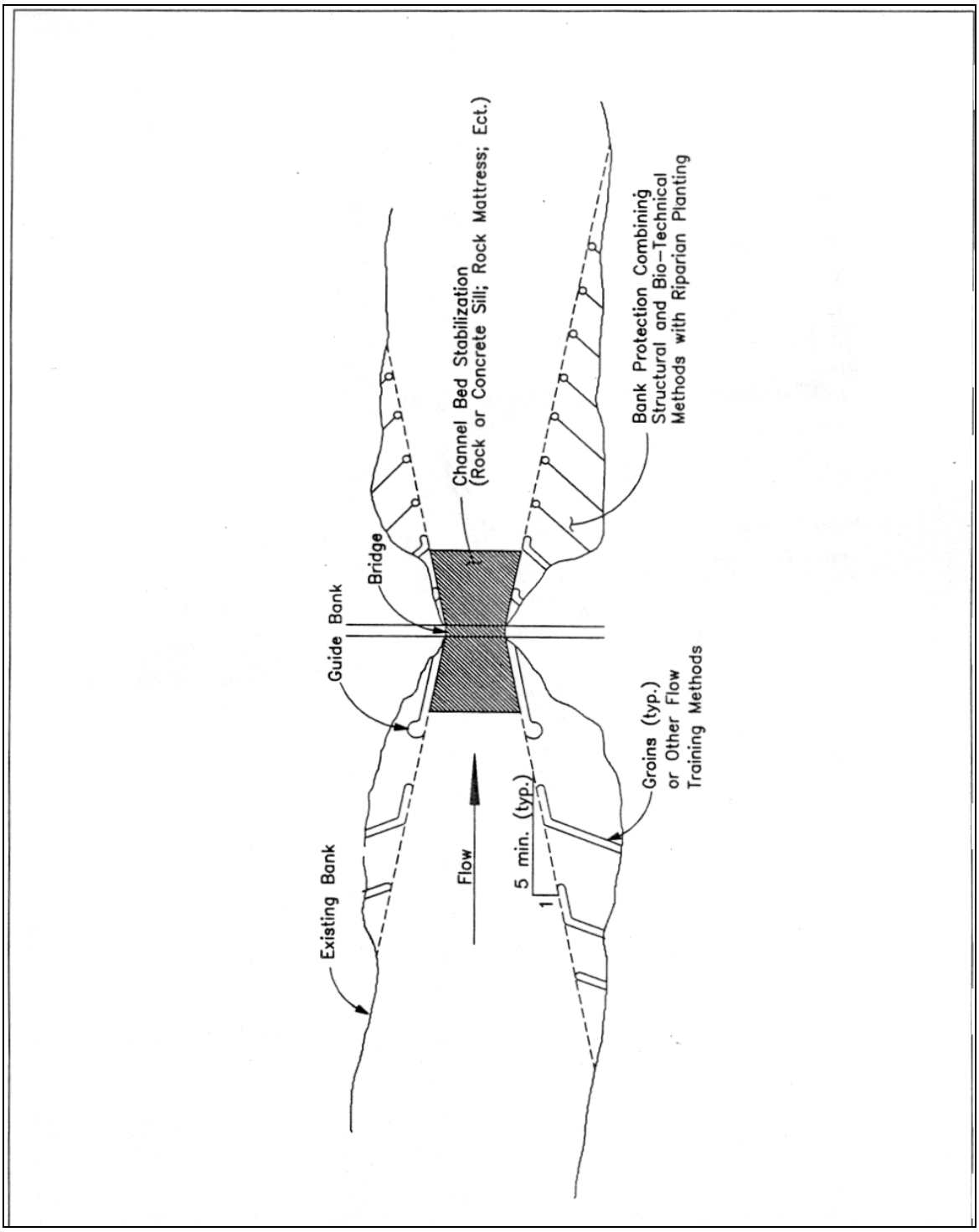

Figure 16. Typical Channel Transition at Bridges

6.5-9 In-channel haul roads shall be located along the toe of the streambank, in order to provide additional bank stabilization and to minimize disturbance of the low-flow channel. Each operation may have no more than two (2) haul roads at one time that cross the low-flow channel. Construction of the haul roads shall not result in excavation of the toe of the streambank, and shall be designed to avoid existing or restored riparian habitat. Haul roads shall comply with all applicable requirements.

6.5-10 Approved channel improvement projects requiring excavation of channel banks and removal of riparian vegetation shall revegetate upon the completion of excavation activities or shall develop similar habitat at a suitable off-site location.

6.5-11 All work within the channel shall comply with the requirements of all agencies of jurisdiction, including but not limited to: the State Department of Fish and Game, the U.S. Army Corps of Engineers, the State Regional Water Quality Control Board, CalTrans, and the State Reclamation Board.

6.5-12 Where gravel bars are to be excavated, aggregate removal shall be limited to the downstream portion of the deposit and may not exceed seventy-five (75) percent of the length of the bar. Twenty-five (25) percent of the upstream portion of the gravel bar shall be retained, in order to allow for the establishment of riparian vegetation. Complete removal of gravel bars may be recommended by the TAC only if hydraulic conditions related to the bar are recognized to threaten structures and property.

6.5-13 Aggregate material to be removed from the streambed shall be excavated as soon as is practicable after deposition, prior to the establishment of vegetation. No stockpiles shall be left within the channel after excavation has been completed.

6.5-14 Proposed off-channel excavations located within the streamway influence boundary shall be set back a minimum of seven-hundred (700) feet from the existing channel bank, unless an engineering analysis demonstrates that a small distance will not adversely affect channel stability within the reach. If the proposed engineering measures are demonstrated to be feasible, then the minimum setback distance shall be no less than two hundred (200) feet.

Approval of any off-channel mining project located within seven-hundred (700) feet of the existing channel bank shall be contingent upon an enforceable agreement which requires the project operator to participate in the completion of channel improvement projects, along the frontage of their property, consistent with the CCRMP and CCIP. The agreement shall also require that the operator provide a bond or other financial instrument for maintenance during the mining and reclamation period of any bank stabilization features approved for the mining project. The agreement shall also require that a deed restriction be placed on the underlying property which requires maintenance of the streambank protection by

future owners of the property. Maintenance of the bank stabilization features following completion of reclamation shall be the responsibility of the property owner.

6.5-15 Streambed regrading after excavation shall leave behind an undulating surface outside of the low-flow channel, so that the resulting surface depressions expose the shallow water table and encourage the colonization of riparian trees. Features such as channels and pools maximize the diversity of environmental conditions for the establishment of riparian habitat, and are therefore encouraged.

6.5-16 Provide for the existing use permits that allow in-channel surface mining to be relinquished by the permit holders and the continued right to mine within Cache Creek terminated, prior to the commencement of newly permitted off-channel mining operations.

6.5-17 The County shall identify the costs of implementing the policies contained in the CCRMP, and determine a fair-share cost program for reimbursement by gravel operators and any other affected parties.

CHAPTER 7.0 AGRICULTURAL RESOURCES ELEMENT

7.1 INTRODUCTION

Present Conditions

Although there are no agricultural operations located within the Cache Creek channel, the surrounding region is largely characterized by farmland and related issues. The functioning of both Cache Creek and the adjoining agricultural land are closely intertwined. The rich agricultural soils found throughout the area are deposited by the stream hen it was part of a meandering floodplain. Cache Creek has provided surface irrigation water for over 100 years, while the channel serves as a drainage conveyance for tailwater and nearby sloughs. Farmers have also constructed extensive bank improvement measures, building riprap, spur dikes, and levees to protect agricultural land and nearby homes from flooding and erosion.

CCRMP Vision

As discussed earlier, the Test 3 Boundary is a conceptual model for reshaping the Cache Creek channel in order to improve streamflow characteristics and reduce erosion and scour. One of the primary purposes of this reshaping effort is to smooth out the transitions into and out of bridge crossings, so that the severity of these constrictions on the creek channel is lessened. In some areas, jetties or groins will be constructed to encourage sediment deposition and extend the banks further into the creek. Other areas may require excavation, to eliminate peninsulas that interrupt the even flow of the creek. It is estimated that approximately 33 acres of existing farmland (11 acres of which are prime agricultural land) lie within the Test 3 Boundary and would therefore be lost to channel widening activities. However, farmland may be expanded in those areas where the bank is extended, reducing or offsetting expected losses. In addition, the erosion of streambanks has resulted in substantial removal of crop land in the past. The channel stabilization program proposed under the CCIP will offset the loss of adjoining agricultural land in the future.

The restoration of Cache Creek and agricultural production are not only compatible, there are several instances where each may prove beneficial to the other. As described in earlier elements, implementation of the CCRMP will involve careful management of the stream by the County. Two of the primary goals in carrying out this management will be to minimize erosion and to allow for aggradation (as long as flood volume capacity is not substantially affected). A stable channel will result in reduction in the loss of farmland, while a higher streambed will provide more opportunity for groundwater recharge, which should help to offset or lower pumping costs for nearby land owners.

Conversely, there are also a number of things that agriculture can do to help out in the revegetation of Cache Creek. One of the most interesting proposals is a program that is currently in the process of being developed by the State Department of Fish and Game and the U.S. Fish and Wildlife Service. The "Safe Harbor" program would encourage voluntary restoration or habitat enhancement activities, by limiting the land owner's future liability for any incidental take of listed species to that which existed at the time the agreement was reached. Thus, if a land owner agrees to create new habitat under a Safe Harbor conservation agreement, and then some years later decides to terminate the agreement and farm the created habitat, the owner would not be liable for the incidental taking of any species that had become established on the newly created habitat. This plan is still in the development stages and is currently proposed only for the San Joaquin Valley, but efforts should be made to extend the program to Yolo County.

On a more immediate level, groups seeking to restore habitat along Cache Creek should become partners with local farmers to include existing agricultural operations in their revegetation plans. Irrigation tailwater may provide a valuable means of sustaining newly established riparian vegetation during the summer months when in-stream flows are low. These partnerships should also take into consideration the potential impacts of habitat formation on agricultural production and design projects accordingly so that features such as buffers and weed control measures are incorporated.

7.2 GOALS

7.2-1 Protect farmland along Cache Creek from land uses that may conflict with agricultural operations.

7.2-2 Develop opportunities where restoration efforts and agriculture can provide mutual benefits.

7.3 OBJECTIVES

7.3-1 Ensure the compatibility of planned habitat and the channel floodplain with adjoining agricultural land, so that productivity is not adversely affected.

7.3-2 Coordinate with local farmers to employ existing agricultural practices in improving the quality of riparian habitat.

7.3-3 Manage Cache Creek to reduce the loss of farmland from erosion and increase the recharge potential of the channel.

7.4 ACTIONS

7.4-1 Work with the Department of Fish and Game to investigate the feasibility of developing a "Safe Harbor" program for agricultural operations potentially impacted by the development of riparian habitat along Cache Creek.

7.4-2 Design and develop habitat restoration projects so that they do not adversely impact the agricultural productivity of nearby farmland.

7.4-3 Incorporate agriculturally related features, such as agricultural forage areas and drainage systems, into the design of habitat planning.

7.5 PERFORMANCE STANDARDS

7.5-1 Revegetation projects may be coordinated with agricultural drainage structures that empty into Cache Creek or previously mined areas separated from the creek, so that the sediment deposited can provide additional topsoil and so that riparian species requiring a more steady supply of water can be established.

7.5-2 Vegetated buffers should be placed between restored habitat areas and adjoining farmland in order to minimize the potential for riparian areas to serve as reservoirs for predators and insect pest. Said buffers will also reduce the effects of noise, dust, and spraying generated by agricultural operations on wildlife and riparian vegetation.

7.5-3 Species and water features included in habitat areas should be designed to discourage the intrusion of wildlife, insect pest, and weeks that would impair local crops.

7.5-4 Trees that are suitable for wildlife perching near agricultural fields dedicated to row crop production should be incorporated into habitat design in order to provide foraging habitat for Swainsons hawks and other birds of prey.

7.5-5 The Yolo County Community Development Agency, in consultation with the Yolo County Resource Conservation District Board, and with approval by the Board of Supervisors, shall present a request to the California Department of Fish and Game of initiate a "Safe Harbor" program for the CCRMP/OCMP planning area, or develop a functionally equivalent program.

7.5-6 All habitat restoration, creation, or enhancement plans proposed within the CCRMP channel boundary shall be reviewed by the County Agricultural Commissioner if requested by proponents of channel modification projects. The Agricultural Commissioner shall identify and recommend appropriate vegetative buffers between habitat areas and agricultural fields and effective management of site water resources (including appropriate integration of agricultural drainage features into habitat planning). Buffers that would result in partial or secondary

loss of agricultural land shall not be recommended by the Agricultural Commissioner.

ACKNOWLEDGEMENTS

The improvement of nearly fifteen miles of creekway is a tremendous undertaking that will require the participation and cooperation of landowners, aggregate companies, government agencies, public interest groups, consultants, and private citizens. The County must act as a catalyst to mobilize the resources necessary to accomplish the goals outlined in this plan. Programs, policies, and technical assistance should focus on local planning, local implementation, and volunteer monitoring for both individual parcels and the entire watershed. As such, opportunities for encouraging the participation by landowners and residents in planning and carrying out the restoration of Cache Creek are essential to the plan's success. Cache Creek has the capacity to be of enormous benefit to the people of Yolo County, but it will require the combined efforts of the community to realize its full potential. Long years of work have already been expended to produce this plan, and long years of labor lay ahead before we see its completion. Our efforts will be well rewarded, however, by the legacy of a natural streamway and healthy riparian habitat that we leave to future generations.

Yolo County Board of Supervisors

Mike McGowan ..... District 1
Helen Thompson ..... District 2
Frank Sieferman ..... District 3
Mariko Yamada ..... District 4
Lynnel Pollack (Chair) ..... District 5

Yolo County Planning Commission

Amy Cameron ..... District 1
Jay Gerber ..... District 2
Aurora Cornejo ..... District 3
Betty Woo ..... District 4
Donald Peart ..... District 5
Merrideth Stephens ..... At Large
Jeff Mervin ..... At Large

Key Members of Staff

Vic Singh ..... County Administrative Officer
David Morrison ..... Resource Management Coordinator
Linda Fiack ..... Parks and Resources Manager (Present)

Project management was provided by Heidi Tschudin of TSCHUDIN CONSULTING GROUP, under contract to the County as an extension to staff.

The primary technical basis for this Plan was provided by the *Technical Studies and Recommendations for the Lower Cache Creek Resource Management Plan* (October, 1995). A special thanks to the authors of this comprehensive report.

Funding for this project was provided by R.C. Collet, Solano Concrete Company, Syar Industries, and Teichert Aggregates.

◊ ◊ ◊

To find out more about this Plan, or the process through which it was developed, please contact:

The County of Yolo, Parks and Resources Manager
YOLO COUNTY COMMUNITY DEVELOPMENT AGENCY
292 West Beamer Street
Woodland, CA 95695
(530) 666-8019