CONSERVATION AND OPEN SPACE ~~NATURAL RESOURCES ELEMENT~~

Introduction

The Conservation and ~~Natural Resources Element~~ Open Space chapter provides supportive and descriptive data on the natural resources of the Capay Valley Study Area and contains the supportive materials behind the goals and policies that have been developed relating to the conservation and management of the natural resources. The Capay Valley possesses prime agricultural soils, open space, and large diversity of plant and wildlife species. These natural elements are recognized as valuable resources to be protected and enhanced. ~~The resources contained in the Conservation and Natural Resources Element are land resources, water resources, plant and animal resources, atmospheric and climatic resources, and open space resources.~~

~~Legal Basis~~

~~The State of California General Plan Guidelines requires that a General Plan include a Conservation Element. This element is addressed in the Capay Valley General Plan's Conservation and Natural Resources Element. The Conservation Element requires that policies be developed for the protection, maintenance and enhancement of natural resources, for the prevention of wasteful practices, destruction and neglect of natural resources, and that these resources be maintained for their ecological value as well as for their direct benefits to the population.~~

~~The specific Government Code section is:~~

~~THE CONSERVATION ELEMENT~~

~~(Government Code Section 65302):~~
~~(d) A conservation element for the conservation, development, and utilization of natural resources, including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources. The conservation element shall consider the effect of development within the jurisdiction, as described in the land use element, on natural resources located on public lands, including military installations. That portion of the conservation element including waters shall be developed in coordination with any countywide water agency and with all district and city agencies that have developed, served, controlled, or conserved water for any purpose for the county or city for which the plan is prepared. Coordination shall include the discussion and evaluation of any water supply and demand information described in Section 65352.5, if that information has been submitted by the water agency to the city or county. The conservation element may also cover the following:~~

> ~~(1) The reclamation of land and waters.~~
> ~~(2) Prevention and control of the pollution of streams and other waters.~~
> ~~(3) Regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan.~~
> ~~(4) Prevention, control, and correction of the erosion of soils, beaches, and shores.~~
> ~~(5) Protection of watersheds.~~
> ~~(6) The location, quantity, and quality of the rock, sand, and gravel resources.~~
> ~~(7) Flood control.~~

~~Yolo County adopted a Conservation Element in 1973. The purpose of addressing the issue of Conservation in the Capay Valley General Plan is to fine-tune goals and policies within the framework of the existing county elements for a specific area based on the input and desires~~

~~of the local residents of the study area. The following chapter describes the environmental setting and reflects the perceptions and knowledge of the local citizenry.~~

~~Land Resources~~

~~The Land Resources section discusses the geological history of the area; soil types and their capabilities; the potential for commercial deposits of minerals, natural gas, or oil, and the potential for geothermal resources within the Capay Valley Study Area.~~

Geological Resources

The Capay Valley is situated in the southeastern portion of the North Coast Ranges geomorphic province. The Rocky Ridge and Blue Ridge, part of the Coast Range, were formed approximately two million years ago as a result of extensive folding and faulting activities. Subsequent erosion and sedimentation have brought about the present topography of the Valley; a long, synclinal, relatively flat valley, ranging in elevation from 210 to 480 feet above Mean Sea Level, bordered by relatively low, but steep mountains averaging 2,400 feet in height, and sharp, deep canyons. The valley floor consists of deep, alluvial soils deposited by Cache Creek and its tributaries. These deposits make up the deep, rich soils that host the productive agriculture of Capay Valley and the Great Central Valley. The western walls of the valley are Cretaceous rocks (formed 145 to 165 million years ago) of the Great Valley Group. As with the rest of the region, the area now known as Capay Valley was under water for millennia. The eastern wall of Capay Valley consists of two different ages and types of rocks. The lower slopes are younger, formed in the Pleistocene era 2 million to 10 thousand years ago. The upper quarter of the eastern wall of the Valley consists of older Cretaceous Great Valley Group rocks (the same as the rocks on the opposite side of the valley). At the interface on the slope, a change in pitch is caused by the thrust fault that has superimposed the older rocks over the much younger Pleistocene rocks exposed at river level.

Due to active tectonics, the floor of Capay Valley is increasingly tipping downward to the east. Unlike most meandering streams, which can meander across the entire valley floor, Cache Creek is confined mostly to the eastern side of the valley.

Because of the tectonically induced confinement of the stream, the effective "floodplain" is much narrower than the whole valley floor. This unique situation impacts Valley land uses. Whereas, on a level valley floor, the water table may be at a fairly uniform depth below the surface, the inclined valley floor affects the water table accordingly. The way in which the stream erodes land and deposits sediment is also affected by the tectonic situation. An ideal single-channel stream would be free to meander across the entire valley floor (where valley floor = floodplain). Because the Capay Valley floor is being tipped eastward, the stream's ability to traverse the entire valley floor is severely limited (see Figure CNR-1).

Erosion-resistant Pleistocene (Ice Age) rock is exposed on the eastern side, forcing Cache Creek to focus its erosive activity on the western banks, which are composed of the much more easily eroded alluvium (older river deposits). The effects of the 1997 New Year's Flood made this point clear: while the stream did not significantly erode the eastern bedrock banks, approximately 30 acres of alluvium on the western bank where eroded at Guinda Park.

The geologic formations in and adjacent to the Capay Valley include sedimentary rock types ranging in age from Cretaceous to Recent. Sandstone and shale of cretaceous age extends beneath the entire area, and are overlain by semi-consolidated tertiary sediments, unconsolidated Pleistocene terrace gravels and recent alluvium. The Chico group underlies the entire area and consists of alternating

beds of sandstone and shale, occasionally interspersed with beds of conglomerate. Overlying the Chico Group and outcropping along the Western flank of the Capay Valley is the Capay formation. Rock units of this formation consist of a tough, brown marine clay shale, interbedded with a hard, well cemented, micaceous sandstone.

Figure CN-1
Geology of Capay Valley Floor

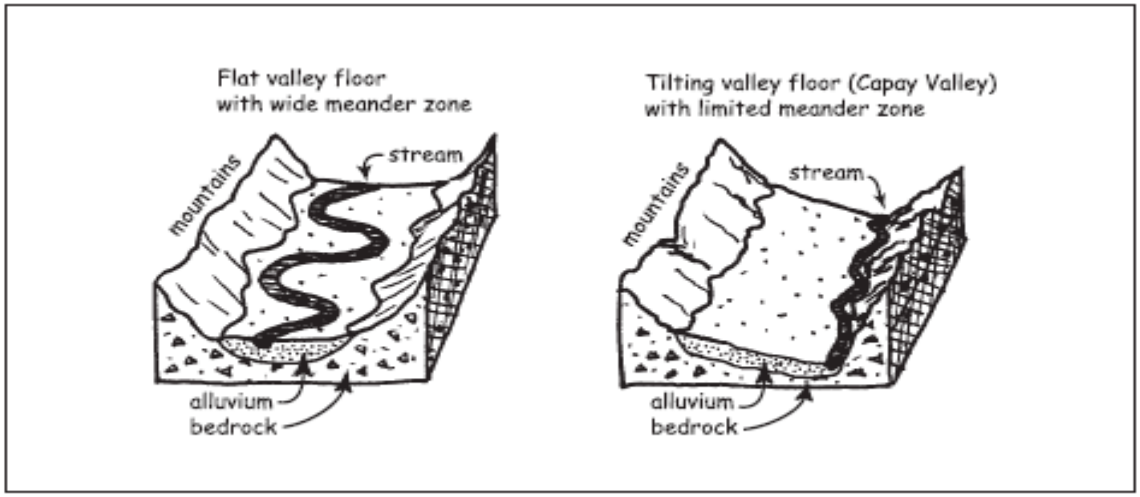


Figure 1: The unique geology of Capay Valley causes the valley floor to 'tilt' to the east.

In the Capay Valley, the Tehama Formation overlies the Capay Formation and the Chico group under all of the valley area and outcrops along the flanks of the Valley. The Tehama Formation consists of non-marine clay, clay and sandy silt, sand, gravel, weak conglomerate, marl, and limestone. At the eastern end of the Capay Valley and in Lamb Valley, continental sediments overlie the Chico group. The continental sediments include the Tehama and Red Bluff Formation and related non-marine sediments. These sediments consist of slightly consolidated clay gravels, moderately consolidate slay, silt, sand, gravel, and tuffaceous deposits.

Terrace and recent alluvial sediments cover the valley floors and overlie the Tehama and continental sediment formations. These alluvial sediments are stream terraces with particles sized up to boulders. At least four terrace levels have been formed by action of Cache Creek. Recent alluvium along the active stream channels occurs as sand and gravel deposits and missed flood plain deposits.

Mineral Resources

A variety of minerals, described below, were once mined in the Yolo County. The chief minerals presently mined are aggregate. **The mineral resources found in a portion of the Capay Valley Planning Area are fully identified, described, and regulated through the Cache Creek Resource Management Plan, which is an adopted element of the 2030 Yolo Countywide General Plan.** ~~**The following discussion is based on the Yolo County General Plan Update dated January 2005.**~~

~~**AGGREGATE**~~

~~**The State of California (Dupras 1988) has mapped the aggregate resources along lower Cache Creek as three Mineral Resource Zones. MRZ-1 comprises 1,458 acres, MRZ-2**~~

~~comprises 18,452 acres, and MRZ-3 comprises 8,220 acres (County of Yolo 1996a). Six aggregate mines (listed below) are currently operational in the County; all are located on the stream terraces of Cache Creek. Most are commercial operations.~~

- ~~Madison Plant: Syar Industries, Inc.~~
- ~~Esparto-Reiff Property and Mast Property: Teichert Aggregates~~
- ~~Solano Concrete Off-Channel: Rinker Materials, Inc.~~
- ~~Capay Facility: Granite Construction Company~~
- ~~Woodland Plant: Teichert Aggregates~~
- ~~Cache Creek Facility: Schwarzgruber & Sons~~

~~The primary mineral resource presently being extracted in the County is aggregate, and most of the aggregate occurs along Cache Creek, beginning at the upstream end of Capay Valley (at County Road 85) and extending downstream to approximately Interstate 5. Throughout this area, the aggregate consists of gravel, sand, and clay and is roughly 100 to 125 feet thick (Dupras 1988). Relatively minor amounts of aggregate (sand and gravel) were once mined along Putah Creek, but the aggregate was of low quality and of limited use (County of Yolo 2000). Mining of aggregate within the Cache Creek channel is no longer permitted; however, removal of aggregate may still be conducted for the purpose of maintaining existing flood capacity and preventing erosion.~~

~~GOLD AND SILVER~~

~~In the past, small amounts of gold and silver were mined from Cache and Putah Creeks (County of Yolo 2000).~~

~~MERCURY~~

~~Mercury (also known as quicksilver) was mined in the northwestern part of the county in the hills west of the Capay Valley, near the Napa-Yolo County border, until 1952. Mercury mining reached its peak during the first and second World Wars (County of Yolo 2000).~~

~~CLAY~~

~~Clay is one of the mineral resources in Capay Valley. Significant clay resource extraction or industry does not currently exist, but handmade and machine-made common bricks were once manufactured from clay beds near Capay (County of Yolo 2000).~~

~~Regulatory Setting~~

~~SURFACE MINING AND RECLAMATION ACT OF 1975~~

~~The principal legislation addressing mineral resources in California is the State Surface Mining and Reclamation Act of 1975 (SMARA) (Public Resources Code Sections 2710–2719), which was enacted in response to land use conflicts between urban growth and essential mineral production. The stated purpose of SMARA is to provide a comprehensive surface mining and reclamation policy that will encourage the production and conservation of mineral resources while ensuring that adverse environmental effects of mining are prevented or minimized; that mined lands are reclaimed and residual hazards to public health and safety are eliminated; and that consideration is given to recreation, watershed, wildlife, aesthetic, and other related values.~~

~~SMARA provides for the evaluation of an area's mineral resources using a system of Mineral Resource Zone (MRZ) classifications that reflect the known or inferred presence and significance of a given mineral resource. The MRZ classifications are based on available geologic information, including geologic mapping and other information on surface exposures, drilling records, and mine data; and socioeconomic factors such as market conditions and urban development patterns. The MRZ classifications are defined as follows.~~

- ~~***MRZ-1*** **Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.**~~
- ~~***MRZ-2*** **Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists.**~~
- ~~***MRZ-3*** **Areas containing mineral deposits, the significance of which cannot be evaluated from available data.**~~
- ~~***MRZ-4*** **Areas where available information is inadequate for assignment into any other MRZ.**~~

~~SMARA governs the use and conservation of a wide variety of mineral resources. However, certain resources and activities are exempt from the provisions of SMARA. Subject to certain conditions, exempted activities include excavation and grading conducted for farming, onsite construction, or recovery from flooding or other natural disaster.~~

~~In addition to mineral resource conservation, SMARA regulates surface mining in California. The California Mining and Geology Board has established mine reclamation regulations that fulfill the reclamation requirements of SMARA. The regulations are summarized below.~~

~~Mining Report~~

~~A mining report is required to be submitted annually. The report must include such information as the amount of land disturbed during the previous year, acreage reclaimed during the previous year, and amendments made to the reclamation plan. The requirement for an annual monitoring report was added to SMARA in 1990 as a result of AB 3903, Chapter 1101.~~

~~RECLAMATION PLAN~~

~~Before a mining project is approved, a reclamation plan must be prepared and approved by the lead agency. The plan must include such information as the following:~~

- ~~Maximum anticipated depth of extraction~~
- ~~Quantity and type of materials to be extracted~~
- ~~Time span of the operation~~
- ~~Mine waste disposal method~~
- ~~Manner in which reclamation will be accomplished including erosion control measures~~
- ~~Post-reclamation land use~~
- ~~How the reclamation will affect future mining in the area~~

~~Additionally, SMARA specifies that lead agencies require financial assurances of each mining operation to ensure reclamation is performed in accordance with the approved reclamation plan. The financial assurances may take the form of surety bonds, irrevocable letters of credit, trust funds, or similar mechanism. Most of the mining operations along Cache Creek are subject to all of SMARA's requirements. However, two of the mines, one of which is inactive, were operating before SMARA was enacted. These "grandfathered"~~

operations are nevertheless subject to certain regulatory requirements, such as providing financial assurances and implementing reclamation plans.

CALIFORNIA CODE OF REGULATIONS

Chapter 4 – Development, Regulation, and Conservation of Oil and Gas Resources of Title 14- Natural Resources of the California Code of Regulations (Department of Conservation 2004) governs natural gas well drilling, operation, and abandonment procedures. Chapter 4 also provides detailed standards and regulations with which operators and local jurisdictions must comply.

Yolo County Code

Chapter 4 – Off-Channel Surface Mining of Title 10 of the Yolo County Code pertains to both in-channel and off-channel mining within the lower Cache Creek watershed. (In-channel commercial mining is no longer permitted in the County, as discussed below.) Chapter 4 of the Yolo County Code sets forth monitoring requirements such that mining activities such protect public health and safety and requires that mining operations are adapted to site-specific conditions.

Chapter 5 – Surface Mining Reclamation of Title 10 of the Yolo County Code (known as the Surface Mining Reclamation Ordinance of Yolo County) ensures reclamation of mined lands to minimize the adverse effects of mining on the environment and to protect public health and safety. Chapter 5 of the Yolo County Code requires that reclamation plans be adapted to site-specific conditions and be directed to reclaiming of mined areas to a beneficial use; in particular, agriculture, wildlife habitat, or recreation.

Chapter 5 – Agricultural Surface Mining and Reclamation Ordinance of Title 10 of the Yolo County Code sets forth restrictions on surface mining of agricultural lands to ensure soil productivity, to protect wildlife habitat, and to maintain drainage and flood control facilities.

Off-Channel Mining Plan for Lower Cache Creek

The Final Off-Channel Mining Plan (OCMP) for Lower Cache Creek (County of Yolo 1996a) established as a comprehensive and integrated planning framework for regulating and protecting the Cache Creek area. The OCMP, together with the Cache Creek Resources Management Plan (described below), constitute the Cache Creek Area Plan. The OCMP accommodates gravel mining on the creek terraces (but not in-channel) while emphasizing habitat restoration, open space, and reclamation of mined lands to agricultural use. The OCMP describes a future groundwater recharge and storage program and allows for future recreation opportunities along the creek.

Cache Creek Resources Management Plan

The Cache Creek Resources Management Plan for Lower Cache Creek (CCRMP) (County of Yolo 1996b) is a comprehensive management plan that eliminated commercial in-channel aggregate mining, established an improvement program from implementing on-going projects to improve channel stability, and ensured restoration of riparian habitat along creek banks in the future. The plan area extends from the Capay Dam to Interstate 5.

Together with the OCMP, the CCRMP comprises the Cache Creek Area Plan. The Cache Creek Area Plan describes approaches for managing riparian habitats along Cache Creek below Capay, in particular, for restoring habitats, reducing erosion, maintaining flood

capacity, and improving water quality. Among the goals of the plan is to promote coordination of local, state, ad federal regulation of activities within Cache Creek.

RESPONSIBLE AGENCIES – MINERAL RESOURCES

Mining activity on lands managed by the U.S. Forest Service, the Bureau of Land Management, or military installations and other Federal proprietors have regulations on resource extraction.

Public Law 95-87, the Surface Mining Control and Reclamation Act of 1977 established Federal policies, guidelines and procedures for the extraction of minerals and reclamation of lands once mined. The U.S. Department of the Interior, Bureau of Mines, is the Federal agency responsible for overseeing the implementation of P.L. 95-87.

The 1975 State Surface Mining and Reclamation Act applies to mining disturbances on private forestlands. The Act requires the State of California Mining and Geology Board to adopt a policy for the reclamation of mined lands. That policy is for local governments' guidance in obtaining reclamation plan for surface mining operations.

A February 1979 memorandum of understanding between the State of California Department of Forestry, the U.S. Forest Service, and the Bureau of Land Management spells out the working relationship between these agencies and the counties and, when fully implemented, should result in satisfactory land reclamation from mining activities.

The Yolo County Flood Control and Water Conservation District monitors and enforces water quality standards and recommends erosion control measures along Cache Creek and its tributaries. The State of California Department of Water Resources indirectly regulates mining activity through monitoring surface water flow and the chemical nature of the runoff. The Department has issued several reports regarding toxic substances in California streams.

The Yolo-Solano Air Quality Management District enforces air quality standards as authorized under State and Federal rules and regulations.

The Yolo County Planning and Public Works Department is responsible for the enforcement of local zoning and mining ordinances, provisions of the California Environmental Quality Act, locally adopted subdivision requirements and general plan policies.

The State Regional Water Quality Control Board has waste discharge requirements on the exploratory operation of Homestake Mining Company and will revise these requirements if and when full-scale mining begins. All discharges of waste are subject to regulation by the Regional Water Quality Control Board.

Natural Gas And Oil Resources

Exploratory drilling for oil and natural gas has occurred in the study area since the turn of the century. To date, 14 exploratory wells have been drilled, primarily located west of Rumsey in the Capay Hills or near Capay and Esparto near the entrance to the valley. The exploratory wells range in depth from 461 feet to 15,198 feet. This latter well was capped in 1957 after eight months of drilling. The core logs reveal successive layers of sandstones, siltstones, shales with small pockets of natural gas and coal deposits. Sufficient quantities of natural gas for continuation of the well were not present. Currently, exploration activity is occurring to the east of the Dunnigan Hills, outside the Capay Valley Study Area boundary.

~~RESPONSIBLE AGENCY – OIL AND GAS RESOURCES~~

~~Within Yolo County, the State Division of Oil and Gas is recognized as a primary agency responsible for regulating oil and gas exploration activities. Journals of all drilling activity are required from the drilling company and the Division monitors the progress of the drilling activity through on-site inspections. Reclamation of the site once a well is capped is also the responsibility of the Division. Geotechnical exploration activities, which use explosive devices, are required to have a permit from the County Sheriff's Department. The permit outlines the type of explosive, quantity, method of storage, and transport.~~

~~Geothermal Resources~~

~~A portion of the Capay Valley Study Area, primarily lands of the Bureau of Land Management, is in the Knoxville Known Geothermal Resource Area (KGRA) (see Figure CNR-2). Geothermal plants do not exist in this portion of the KGRA, although the potential exists for future development. Any commercial geothermal activities in the Capay Valley Study Area would be subject to the policies of not only Yolo County but also of the State of California Energy Commission, the State of California Public Utilities Commission, and Pacific Gas and Electric Company if tied into the local energy grid. Numerous State and local agencies act as responsible agencies in the Environmental Review process for geothermal development activities. Should the Knoxville area eventually develop as a geothermal resource, mitigation measures will be required to address all potential negative impacts associated with such development.~~

~~Figure CNR-2 Knoxville Geothermal Activity~~

Water Resources

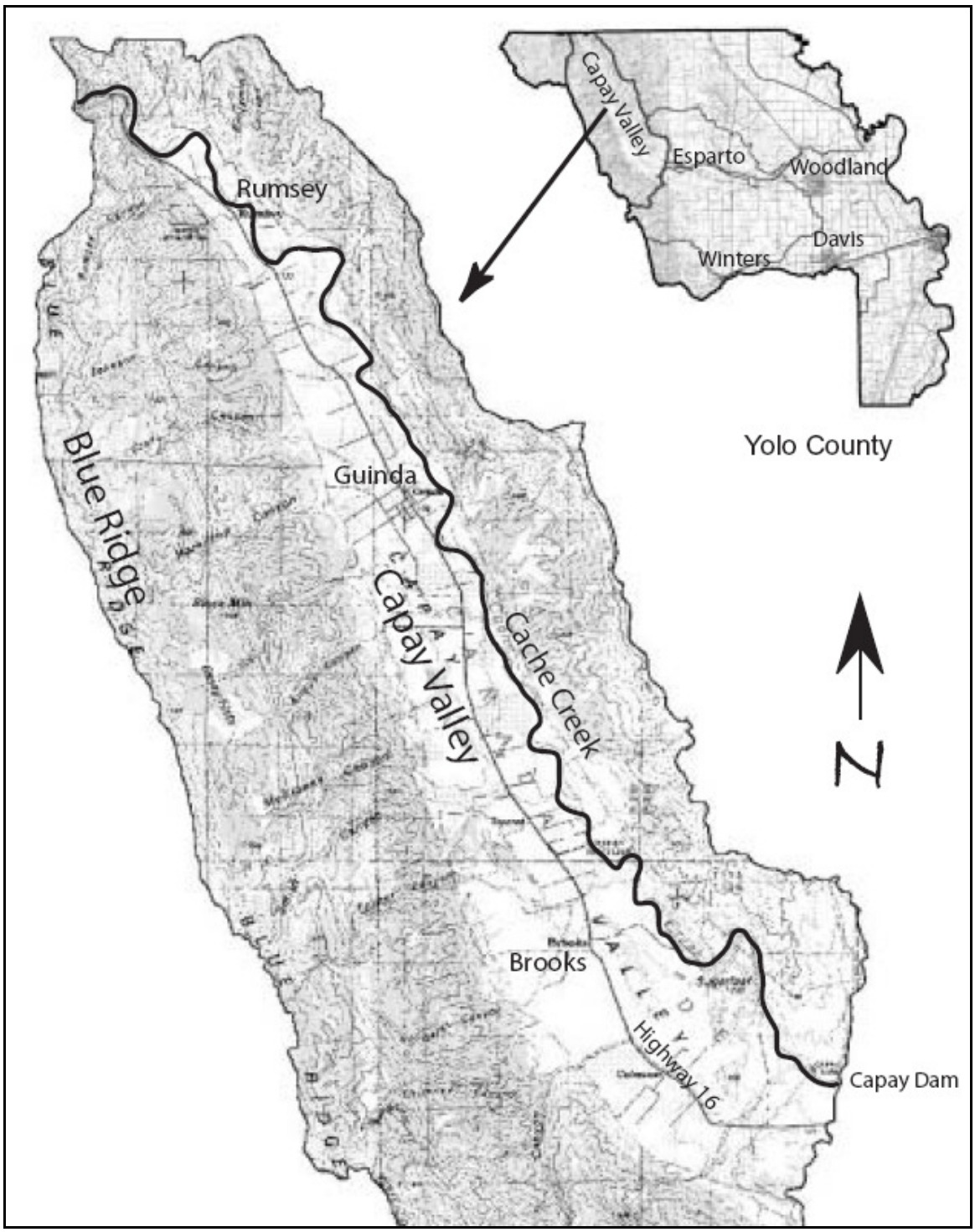
Water is a valuable and vital resource of the Capay Valley. The presence and continuation of sufficient quality and quantities of water to meet agricultural and domestic needs is of the utmost importance to the economy and health of the Valley. The Capay Valley's water supplies come from rainfall, surface waters contained in its streams and waterways and water in the groundwater basins.

The Cache Creek Basin drains the eastern slopes of the Coast Range, approximately 1,150 square miles of watershed, including parts of Yolo and Colusa counties (see Figure CN-2, Sub-Watershed of Cache Creek). The major fork of Cache Creek, running through the Capay Valley, originates at Clear Lake. From there it flow southeasterly through the steep Capay Canyon to the head of the Valley. The Creek then widens and the flow becomes slower as it continues along the eastern side of the Valley to Capay, entering the lower Sacramento Valley. Eventually, it enters the Yolo By-Pass Flood Basin that is dry most of the year and provides relief of flood pressures on the Sacramento River. The By-Pass is a system of drains and sloughs that collect the water from Cache Creek and other creeks and directs them to the Sacramento River via the Cache Slough.

SURFACE WATER

Cache Creek is the largest and the only perennial water source of the Capay Valley. Cache Creek's north fork and Bear Creek are its major tributaries, plus numerous small creeks and unimproved canals that cut across the Valley carrying the winter runoff. Releases of winter rainfall stored in the Clear Lake and Indian Valley Reservoirs are vital to the creek flows throughout the year, especially during the dry summer months. Summer flows range from less than one foot per second to 1,500 feet per second, with an average of 600 feet per second. Winter flows average 6,000 to 8,000 feet per second.

Figure CN-2
Sub-Watersheds of Cache Creek



CAPAY VALLEY WATERSHEDS

In the Capay Valley, over 145 square miles of watershed exist, containing approximately 100 lineal miles of intermittent creeks and perhaps as many miles of small feeder creeks. The Valley also enjoys numerous springs, some active year round, others only seasonal. Watersheds are geographical areas representing the approximate divides for each drainage system of the major creeks. The Capay Valley General Plan Study Area contains 16 such watersheds.

Two major watersheds are the Fiske Creek and the Davis Creek Watershed, located at the northwest end of the Valley, near the Colusa-Napa-Yolo County borders.

The Davis Creek Watershed is the largest watershed in the Valley, draining approximately 23 square miles. A little over seven miles in length, the Davis Creek is fed by numerous smaller creeks as it meanders along its "U" shaped course.

The Fiske Creek Watershed located just east of Davis Creek drains approximately 12 square miles of hilly terrain. Numerous small feeder creeks, running down through canyons and gullies, empty into approximately 5.3 miles of Fiske Creek. The two larger feeder creeks are Bear Canyon Creek and Still Gulch Creek, 1.7 and 1.4 miles long, respectively.

Watersheds are a key factor in the quality and quantity of surface and ground water within the drainage area. Because soils here are protected from wind and water erosion by abundant vegetative cover, they retain large amounts of rainwater, purifying the water as it filters down into the groundwater system, or lows into nearby creeks and streams. Watersheds fall into two general categories – those in the hills which have basically been unaltered by man's activities, and those in the Valley floor which have been subject to clearing, development, and use for crops, orchards, and grazing.

Fires, road cuts, and overgrazing in the hills can lead to the deterioration of water quality due to the removal of the vegetative cover and subsequent erosion and sedimentation. Major surface activities may have effects on both the surface and the groundwater in the area. The quality and quantity of water in Valley watersheds may also be affected by the alteration of stream courses and the removal of vegetation along channels, which leads to increased erosion and sedimentation. Chemicals can enter water systems through leaching or surface runoff. Groundwater overdrafts not only reduce the levels of groundwater, but can reduce the amounts of water in springs.

CACHE CREEK WATER QUALITY

The water quality of Cache Creek is considered to be good. Cache Creek is classified by the State as a Class II waterway for warm water fisheries, and is suitable for water related recreation and for use as agricultural irrigation water. Bear Creek, a tributary to lower Cache Creek, carries a high concentration of boron. Although boron is an essential element for plant growth, concentrations greater than 30 ppm may be toxic to certain plants.

Water is a universal solvent and consequently a wide variety of solubilized substances as well as suspended inorganic and organic substances are present in streams, lakes, and groundwater. The quantity of these materials present at any given time depends upon many factors, such as composition of the streambeds and watersheds, presence of pollutants from agricultural, industrial, and other activities in the adjoining land areas, pH of the water, and rate of flow. Some of these substances are toxic, producing adverse effects in both plants and animals when ingested. Boron, for example, is present in toxic quantities in Cache Creek. Although present throughout the year, the levels vary greatly depending upon whether the water is primary runoff or water released from Clear

Lake or Indian Valley. Other substances such as nickel and lead have been occasionally detected in "grab" water samples. Mercury, a highly toxic material, is generally not detected in water samples when routine analytical tests are run. However, it can be detected in aquatic animals such as fish that have the capacity to accumulate and concentrate this particular toxicant. When in its metallic state, the solubility of mercury in water is generally very low. However, specific bacteria found in certain stagnant water areas can act upon mercury, thereby solubilizing the metal and greatly increasing its reactivity and toxicity.

The following section deals with two toxic agents present in the waters of Cache Creek that can potentially alter crops and/or produce adverse effects on animals and man.

Boron

Trace amounts of boron can stimulate growth in many plants. However, concentrations of boron such as those found in Cache Creek during the summer (one to two parts per million, ppm) can be toxic to most of the crops currently grown in the Capay Valley. Most plants are seriously injured when boron levels reach five ppm or more. This level is routinely present in Bear Creek and may, at times, be present in Cache Creek. Crops sensitive to boron include English walnuts, pecans, apples, pears, plums, apricots, and all citrus. Row crops such as tomatoes, beans, milo, and wheat are also affected. Evidence of boron injury in foliage is manifested by yellowing and by subsequent death of tissue along the margin and tips of leaves. Boron accumulates in these injured leaves and has been recorded at levels of over 1,000 ppm.

Boron in concentrations of 30 ppm and more can be toxic to animals and humans as well as plants. A single dose of five grams (0.2 oz.) of boron can be fatal. Unfortunately, meaningful tests for determining the toxicity of chronic low levels of boron are not available and it may be prudent to avoid prolonged ingestion of the material when possible. This would present a problem for many people in the Capay Valley, where many house wells either adjoin Cache Creek or tap aquifers with high boron levels.

Boron levels in Cache Creek show wide seasonal fluctuation. During the summer when the main sources of water are Indian Valley and Clear Lake, levels average between one and two ppm. Most of the boron measured is known to originate in Clear Lake and small tributaries such as Bear Creek. Indian Valley water reportedly contains extremely low boron levels and it helps to dilute relatively high levels coming from the other sources. In the fall, when flow from Indian Valley is stopped, the boron levels increase to two or three ppm. During the winter months, the levels of boron in Cache Creek have reportedly been as high as 8.8 ppm. Bear Creek appears to be the principal source of these very high levels.

An additional factor which leads to increased plant toxicity is that the boron tends to accumulate in soils due to water evaporation. In one study, an average concentration of one ppm in the irrigation water resulted in 6 ppm concentration in the soil. Fortunately, in the Capay Valley this accumulation is offset by heavy winter rains, which tend to leach out to some degree the boron which accumulated in the soil during the irrigation season.

Mercury

As indicated earlier, mercury is a metal known to be toxic in extremely low concentrations. As little as 0.005 ppm is regarded as toxic to humans and has been shown to pass from mother to child via the mother's milk.

In 1976 to 1977, the State Water Resources Control Board authorized a study of toxic substances in various streams within California. The substances covered in this study

included toxicants which had accumulated in the aquatic food chain. Elevated levels of mercury were present in both predator and foraging fish found in Cache Creek. These levels exceeded the FDA limits for human consumption for mercury. Elevated levels of nickel and DDT-related compounds were also reported.

The above study clearly establishes the presence of mercury in Cache Creek water. The source of at least some of the mercury is presumably from watershed areas around old mercury mines that furnished the mercury used for gold extraction during the last century and were also highly active during World Wars I and II. Operations have been suspended but the slag dumps are presumably still a source of mercury that washes into the tributaries of Cache Creek.

GROUNDWATER

Groundwater is vital to agricultural production and to domestic water supply. Groundwater basins capable of holding several millions of acre-feet underlie most of Yolo County at depths of 20 to 200 feet. Recharge of these basins comes from deep penetration of rainwater and excess surface irrigation water, seepage from canals and ditches, percolation from streams, and subsurface inflow. Cache Creek plays an important role in replenishing the groundwater supplies in the Capay Valley. At present, groundwater quantities are generally decreasing due to increasing water requirements as a result of expanding irrigation practices. The Capay Basin overdraft is estimated at 4,100 acre-feet per year.

Groundwater in the Yolo basin is characterized by presence of sodium magnesium, calcium magnesium, or magnesium bicarbonate. The groundwater quality is good for agricultural and municipal uses, though it is hard to very hard overall. Elevated concentrations of selenium, nitrate, and boron have been detected in groundwater along Cache Creek and the Cache Creek Settling Basin area. Brackish and saline waters are found in water bearing units underlying the Tehama Formation (DWR 2004). According to monitoring conducted in the East Yolo subbasin beneath the City of Davis and University of California, average concentrations of arsenic in the Tehama formation below 600 feet below ground surface (bgs) are 0.04 mg/L (Yolo County WRA 2004.) This value exceeds the USEPA maximum contaminant level (MCL) of 0.01 mg/L that will become effective as of January 23, 2006 (USEPA 2005). The existing California MCL for arsenic is 0.05 mg/L, as stated in the California Code of Regulations (§64431 - Maximum Contaminant Levels-Inorganic Chemicals).

Boron

High concentrations of boron are present in the groundwater supply, increasing from Rumsey toward Capay, and outward to the Sacramento River. Tests for boron concentrations in Capay Valley wells showed boron contents ranging from .1 mg/L to 3.33 mg/L. Active wells had concentrations ranging from .6 mg/L to 1.7 mg/L. Wells with boron concentrations over 2 mg/L have, for the most part, been abandoned.

Salinity

The intrusion of saline or brackish water into what was historically fresh water is generally thought to be associated with coastal areas (e.g., the Salinas Valley). However, the intrusion of saline or brackish water could occur in the Sacramento Valley, including eastern Yolo County. New deeper wells for agriculture and municipal supply are being explored. Increase of groundwater use from deeper wells threatens to lower the groundwater basin, thus allowing saline water to upwell and contaminate the water supply.

The salt concentration of groundwater increases with depth. Wells less than 100 feet deep have an average sodium content of 30 mg/1 and thus generally do not have any salinity problems. Deeper wells, those over 200 feet deep, have sodium contents approaching 300 mg/L. The limiting damage threshold value for water sodium concentration is 75 mg/L.

EROSION

Erosion in the Cache Creek watershed is not extensive and is confined mostly to gully heads, roads, and clean cultivated cropland. The damaging effects of sheet, rill, and gully erosion have been minor because of the natural vegetation cover, cultivating practices, and because the heavier winter rains normally come after the grass cover is established. The larger sheet and rill erosion losses occur on the steep Class VI through Class VIII lands that have been overgrazed too heavily. Other losses are from well-used dirt roads along hillsides and from head cutting gullies in canyons.

In the cropland areas, numerous sharply defined channels cross from the uplands to Cache Creek. As cropping patterns shift to more intensive agricultural practices, erosion of channel banks may become more prevalent. Lands may be used closer to the creek banks, thereby removing some of the stabilizing vegetation.

Bank and invert erosion in Cache Creek provide a heavy sediment load. The creek is maintaining its flow conditions in a stream laid alluvial deposit and has many bends in the channel and eddies caused by obstructions. Cache Creek is also attempting to maintain a stable slope against the downstream gravel removal and the resultant bottom movement increases bank height, making the banks unstable. One large source of erosion material to Cache Creek is the slide near Guinda. This slide is undercut by Cache Creek and consists of weathered and fractured sedimentary materials resting on a rock layer that slopes toward the creek.

Cache Creek erosion removes about nine acres per year from possible agricultural production. Three of the nine acres can be considered agricultural Class I through Class IV soils, with the remainder being Class IV through Class VIII mostly in the slide area. About 23 miles of creek bank are affected.

~~SEDIMENTATION~~

~~During most of the year, suspended sediments do not occur in concentrations that are damaging to users of water. During the winter runoff months, when sediment loads are heaviest, they are damaging to aquatic life and detrimental to the long-term life of the waterways.~~

~~Erosion of the stream banks and bottoms account for the largest proportion of sediment yield, especially along Cache Creek where the suspended sediment volume is estimated to average 144,000 tons per year and the bed-load sediment (gravel) at 118,900 tons per year from reaches within the watershed.~~

~~The volume of sediment carried by Cache Creek is deposited mainly in the Sacramento Valley fan. The coarser gravels drop out from Capay to Woodland, the finer sediments in the Yolo Bypass downstream of Woodland, and the clays may be carried into the Sacramento River, thence into the San Francisco Bay. At each of the areas of velocity decrease, sediments are deposited, causing bars to build and streams to swing into banks. Such deposits also cover up bars to build and streams to swing into banks. Such deposits also cover up agricultural soils or fishery habitat. Some of the sediment is carried into irrigation canals and drains, and the remainder is deposited in the watercourses, decreasing the carrying capacity and increasing flood hazard. Removal of sediments is a major~~

maintenance cost for the agencies maintaining these waterways in the Cache Creek drainage.

Sediment borne by water plugs up irrigation sprinklers, carries fertilizer and chemical particles, provides an algae growth medium and increase water temperature by retaining (capturing) heat. Two U.S.G.S. gauges are located on Cache Creek, one above Rumsey and one above Capay.

A potential for production of damaging sedimentation from brush-covered areas of the upper watershed also exists. Natural vegetation protects the soil under normal conditions, but a range fire could remove this protection and allow sheet and rill erosion to result.

Regulatory Setting

The federal Clean Water Act (CWA) and the Safe Drinking Water Act have established water quality standards and attainment programs, which are administered by the U.S. Environmental Protection Agency (EPA). At a statewide level, the California Water Code provides a legal framework and the State Water Resources Control Board (SWRCB) serves as the administrative vehicle for managing water resources. Within Yolo County, water resources are managed through the Yolo County General Plan (Chapter 7, Title 10 of the Yolo County Code) and water agencies, consisting of special districts, cities, and community service districts.

FEDERAL REGULATIONS

Clean Water Act and Associated Environmental Compliance

The CWA is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. The CWA operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool. The following sections of the CWA are particularly relevant to the proposed program:

- Section 303 – Water Quality Standards and Implementation Plans, and
- Section 402 – National Pollutant Discharge Elimination System.

The EPA has delegated its authority to implement and enforce the provisions of these sections to the individual states. In California, the provisions are enforced by nine RWQCBs under the auspices of the SWRCB. Additional information on the requirements imposed by CWA Sections 303, 401, and 402 is provided in "Porter-Cologne Act and State Implementation of Clean Water Act Requirements" below.

Safe Drinking Water Act

The Safe Drinking Water Act of 1974 is the principal federal law that protects the quality of the nation's drinking water. The Act empowers EPA to set drinking water standards and to oversee water providers – cities, water districts, and other agencies – that actually implement those standards. In addition, the Safe Drinking Water Act of 1974 also includes provisions for the protection of surface waters and wetlands, in support of drinking water quality. In California, EPA delegates some of its implementation authority to the California Department of Health Services (DHS) Division of Drinking Water and Environmental Management. DHS administers a wide range of regulatory programs that include components aimed at drinking water quality and safety, including permits for water well installation; potable water

supply monitoring requirements for public drinking water systems and new domestic wells; regulations for septic and sewer systems; regulations governing generation, handling, and discharge/disposal of hazardous materials and wastes; and regulations for underground storage tanks (USTs) and solid waste disposal facilities. Yolo County is required to comply with all federal regulations as administered by state agencies.

STATE REGULATIONS

Porter-Cologne Act and State Implementation of Clean Water Act Requirements

The Porter-Cologne Water Quality Control Act, passed in 1969, implements the federal CWA (see "Clean Water Act and Associated Environmental Compliance" above). The Act established the SWRCB and divided the state into nine regions, each overseen by an RWQCB. The SWRCB is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, but much of its daily implementation authority is delegated to the nine RWQCBs. Yolo County lies within the jurisdiction of the Central Valley RWQCB. The Porter-Cologne Act provides for the development and periodic review of Water Quality Control Plans (Basin Plans) that designate beneficial uses of California's major rivers and groundwater basins and establish narrative and numerical water quality objectives for those waters (Central Valley Regional Water Quality Control Board 1998). Beneficial uses are the resources, services, and qualities of the aquatic system that are the ultimate goals of achieving and protecting high water quality. The purpose of water quality objectives is to protect designated beneficial uses for each basin's waters. To ensure the most current watershed information is considered, Basin Plans must be updated every 3 years. The Central Valley RWQCB enforces compliance with water quality objectives for beneficial uses of surface waters in Yolo County. Basin Plans are primarily implemented by using the National Pollutant Discharge Elimination System (NPDES) permitting system to regulate waste discharges so that water quality objectives are met (see discussion of the NPDES system in the following section). Basin Plans provide the technical basis for determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals. The Porter-Cologne Act also assigns responsibility for implementing the NPDES and TMDL programs to the SWRCB and RWQCBs.

State Responsibility for Clean Water Act Section 303—Total Maximum Daily Load Program Overview

Section 303(d) of the CWA established the TMDL process to guide and ensure the application of state water quality standards. A TMDL represents the maximum amount or concentration of a given pollutant allowable in a given water body, based on the nature of the water body and its designated benefits. To identify water bodies in which the TMDL program may be needed, the SWRCB maintains a Section 303(d) list of water bodies in which water quality is impaired. A water body can be impaired by more than one pollutant. Consequently, multiple TMDLs can be established for a single water body. The most urgent impairments are then prioritized for development of TMDL programs, establishing a means of limiting pollutant input. The Sacramento River is listed as being impaired by unknown toxicity from Red Bluff to Knights Landing and by diazinon, mercury, and unknown toxicity from Knights Landing to the Sacramento River San Joaquin River Delta. Clear Lake and Cache Creek are listed for impairment by mercury and nutrients. Lake Berryessa and Lower Putah Creek, downstream of Lake Solano, are listed for mercury impairment. The establishment of mercury TMDLs for Lake Berryessa and Lower Putah Creek is listed as low priority for the region (U.S. Environmental Protection Agency 2003).

~~State Responsibility for Section 402 National Pollutant Discharge Elimination System Program~~

~~CWA Section 402, enacted as an amendment to the original act in 1972, regulates discharges of pollutants from point sources to surface waters. CWA Section 402 established the NPDES program, administered by EPA. Additional amendments to the CWA in 1987 created a new subsection of the CWA specifically devoted to permitting for discharges of stormwater (Section 402[p]). CWA Section 402 regulates construction-, industrial-, and municipal-related stormwater discharges to surface waters through the NPDES program, administered by EPA. In California, the SWRCB is authorized by EPA to oversee the NPDES program through the RWQCBs (see the related discussion under "Porter-Cologne Water Quality Control Act" below). The NPDES permitting process requires the applicant to file a public notice of intent (NOI) to discharge stormwater and to prepare and implement a storm water pollution prevention plan (SWPPP). The NPDES program provides for *general permits* (those that cover a number of similar or related activities) and *individual permits* (those issued on a project-by-project basis). For example, all construction activities affecting more than 1 (one) acre are regulated under the NPDES General Permit for Discharges of Storm Water Runoff associated with Construction Activity (General Construction Permit). The Industrial Permit Program regulates discharges from ten broad categories of industrial discharges, including manufacturing facilities, mining operations, disposal sites, recycling yards, transportation facilities, and others, under General Industrial Permits. The RWQCB regulates numerous General Industrial Permits covering discharges from industrial activities within Yolo County. Municipal separate storm sewer systems (MS4s) discharges are regulated by General MS4 Permits. These permits were issued in two phases, first for municipalities serving 100,000- 250,000 people (medium) and over 250,000 people (large). Medium or large MS4s do not exist in Yolo County. Phase two covered small municipalities, including non-traditional MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes. Woodland, Davis, Yolo, UCD, and West Sacramento are covered under Phase II General MS4 Permits. Further information about these municipalities is discussed in the water use section below.~~

~~State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California~~

~~Due to a court decision in 1994, California was left with a gap in water quality standards covering priority toxic pollutants. Accordingly, the state developed the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) (State Water Resources Control Board 2000). The SIP established the policy for development of new standards for a variety of toxic pollutants, as required by the CWA. The SIP applies to discharges of toxic pollutants into California's inland surface waters, enclosed bays, and estuaries subject to regulation under the Porter-Cologne Water Quality Control Act and the federal CWA. Such regulation may occur through the issuance of NPDES permits, the issuance or waiver of waste discharge requirements (WDRs), or other regulatory approaches. For instance, the new NPDES general permit for aquatic pesticide application is specifically intended to ensure compliance with the requirements of the SIP. The California Toxics Rule (CTR) implements the SIP through establishment of numeric criteria for priority toxic pollutants. The goal of the state policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency. Accordingly, the state policy is a tool to be used in conjunction with watershed management approaches and, where appropriate, the development of TMDLs, to ensure that water quality standards are met and beneficial uses are protected. The state policy establishes implementation~~

~~provisions for priority pollutant criteria promulgated by EPA through the California Toxics Rule (CTR), and for priority pollutant objectives established by the RWQCBs in their respective Basin Plans. The state is required to use the CTR criteria together with the state's existing water quality standards when controlling pollution in inland waters and other water bodies in Yolo County.~~

~~Groundwater Management Act (AB 3030)~~

~~California's Groundwater Management Act (Water Code Sections 10750-10756) provides guidelines by which local agencies not having authority for groundwater management can acquire that authority over the management of groundwater resources in basins recognized by the Department of Water Resources. Its intent is to promote the voluntary development of groundwater management plans and provide criteria for the plans in order to ensure sustainable groundwater supplies for the future. The Act stipulates the technical components of a groundwater management plan as well as procedures for such a plan's adoption, including passage of a formal resolution of intent to adopt a groundwater management plan, and holding a public hearing on the proposed plan. The Act also allows agencies to adopt rules and regulations to implement an adopted plan, and empowers agencies to raise funds to pay for the facilities needed to manage the basin, such as extraction wells, conveyance infrastructure, recharge facilities, and testing and treatment facilities. The passage of SB 1938 (Machado 2002) also required basin management objectives and other additions to be included in the groundwater management plans to comply with California Water Code Section 10750 et seq.~~

~~RESPONSIBLE AGENCIES – WATER RESOURCES~~

~~A number of State and County agencies have duties and responsibilities relating to water quality, erosion, sediment management, and conservation.~~

~~The Central Valley Regional Water Quality Control Board has jurisdiction over water quality standards and monitoring waste discharge requirements that apply not only to groundwater and surface water, but also to soil erosion and runoff, and over water rights, water diversion and use. The State has established erosion control guidelines in the Regional Board's Basin Plan for the Sacramento River Basin (5-A). The Yolo County Public Health Department is responsible for the location and inspection of domestic water wells and the placement of septic tank systems in relation to stream courses or existing wells and water bodies.~~

~~The Water Resources Association of Yolo County (WRA) is a non-profit mutual benefit corporation. The WRA was organized to coordinate implementation of the Water Resources Management Program as identified in the Yolo County Water Plan Update (1992).~~

~~The United States Army Corps of Engineers, Sacramento District, has studied the sedimentation in the Cache Creek Basin and has proposed various measures that would decrease sediment loads. Their primary concern is to reduce sediment from Cache Creek entering the Sacramento River and the deep-water channel used by ocean going ships.~~

~~The University of California, Davis, and its Extension Service are providing information on boron tolerant crops and varieties, new crop varieties using less water, new irrigation methods, and seminars in establishing the developed crops and methods.~~

~~Atmospheric Resources~~ Air Quality

Capay Valley has a southeast-northwest alignment into the east side of the coastal mountains that form the western edge of the Sacramento Valley. The Capay Valley is within northwestern Yolo County, which is part of the larger Sacramento Valley Air Basin (SVAB). The basin is relatively flat and bordered by mountains on the east, west, and north.

WIND CHARACTERISTICS

The winds in the Capay Valley Study Area are greatly influenced by the north coastal mountain range on the west and the proximity to the Pacific Ocean. Westerly winds are modified into southerly directions by the mechanical barrier of these mountain ranges. Prevailing winds are predominately southerly. Three-fourths of the time, winds have velocities below four miles per hour and only exceed 16 miles per hour one-tenth of the time. Occasionally, strong winds blow from the north causing lower temperatures in winter and hot, dry conditions in the summer. North winds are more persistent and irritating in the summer than in the winter.

Southerly winds predominate the Valley during the summer, but an eddy-like air movement appears to occur in the morning hours, bringing changes in wind direction. This change in wind direction is especially important when considering aerial application of sprays or agricultural burning hours.

At present, air quality in the study area is considered good. The extent to which increased numbers of potential pollution sources will affect the air quality of the Capay Valley area will depend upon the effectiveness of different technical advancements and air quality monitoring systems.

CLIMATE CHARACTERISTICS

The climate of the Capay Valley is similar to the Sacramento Valley Interior Area climate with hot, dry summers and cool, damp winters. The rainfall varies from 17 to 24 inches, with an average rainfall of 22 inches.

Most precipitation occurs from November through March, though storms occasionally occur in late September or early May. Snowfall occurs infrequently at the higher elevations. The temperature extremes (at Brooks) are recorded as a maximum of 177 degrees F. and a low of five degrees F. Daytime highs average about 100 degrees F., dropping normally to the mid-50's at night. Low averages are around 20 degrees F.

The frost-free growing season is about 235 days, from April through October. The foothills adjacent to the Valley are considered to have a "citrus climate", and the Valley floors to have a "deciduous climate".

Annual evaporation rates in the Valley are high, due to summer high temperatures and low humidity. Average annual rates are between 70 and 75 inches per year, with about three-fourths of the evaporation occurring from May through October.

AIR POLLUTANTS

Yolo County is within the Yolo-Solano Air Quality Management District (YSAQMD). The district is currently a non-attainment area for ozone (State and Federal ambient standards) and Particulate Matter (State ambient standards). While air quality plans exist for ozone, none exists (or is currently required) for PM10. The project site is in an attainment area for carbon monoxide (the State and Federal ambient standards are met), since Yolo County has relatively low background levels of carbon monoxide.

~~**Ozone (O_3)**~~

~~**O_3 is the most prevalent of a class of photochemical oxidants formed in the urban atmosphere. The creation of O_3 is a result of complex chemical reactions between hydrocarbons and oxides of nitrogen in the presence of sunshine. Unlike other pollutants, O_3 is not released directly into the atmosphere from any sources. The major sources of oxides of nitrogen and reactive hydrocarbons, known as O_3 precursors, are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.**~~

~~**The health effects of O_3 are eye irritation and damage to lung tissue. O_3 also damages some materials such as rubber, and may damage plants and crops.**~~

~~**Particulate Matter ($PM_{2.5}$ and PM_{10})**~~

~~**Particulate matter consists of solid and liquid particles of dust, soot, aerosols, and other matter, which are small enough to remain suspended in the air for a long period of time. Typically, particulate matter is measured as 2.5 microns ($PM_{2.5}$) or 10 microns or less (PM_{10}). A portion of the particulate matter in the air is due to natural sources such as windblown dust and pollen. Manmade sources include combustion, automobiles, field burning, factories, and road dust. A portion of the particulate matter in the atmosphere is also a result of photochemical processes.**~~

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

~~**Carbon Monoxide**~~

~~**A colorless, odorless gas, CO results from the incomplete combustion of fossil fuels, most often in motor vehicles and power plants. CO has also been identified as a possible precursor to the formation of O_3. High ambient levels of CO are most common in colder months. Sources of CO vary by location, although in all cases, emissions from mobile sources far outstrip industrial or small business sources.**~~

~~**CO can interfere with the blood's ability to carry oxygen to the heart, brain, and other tissues. People with heart disease and unborn or newborn children are especially susceptible to CO poisoning.**~~

~~**Toxic Air Contaminants (TACs)**~~

~~**In addition to the criteria pollutants, TACs are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria standards. The identification, regulation, and monitoring of TACs is relatively recent compared to that for criteria pollutants.**~~

~~**EXISTING AIR QUALITY**~~

~~**The closest air monitoring station to the study area is located in Woodland. The Woodland monitoring site measures O_3 several gaseous pollutants, and PM_{10}. A three-year summary of air quality data from this monitoring site is shown in Table CNR-1, which shows that the federal/state standards for O_3, PM_{10}, and $PM_{2.5}$ are sometimes exceeded in the County.**~~

Table CNR-1 Ambient Air Quality at Woodland Monitoring Site		
Pollutant/Standard	Year	Days exceeding standard at Woodland monitoring site
O_3/State 1-hour	2000 2001 2002	3 3 9
O_3/Federal 1-hour	2000 2001 2002	0 0 0
O_3/Federal 8-hour	2000 2001 2002	0 1 4
PM_{10}/State 24-hour	2000 2001 2002	2 3 5
PM_{10}/Federal 24-hour	2000 2001 2002	0 0 0
$PM_{2.5}$/Federal 24-hour	2000 2001 2002	0 0 1
Source: California Air Resources Board, Aerometric Data Analysis and Management System (ADAM) (www.arb.ca.gov/adam/), 2004		

Figure CNR-4 identifies sensitive receptors to air pollutants within Capay Valley.

Figure CNR-4 Air Quality - Sensitive Receptors and Emission Sources

Regulatory Setting

Federal and State ambient air quality standards are shown in Table CNR-2.

Table CNR-2 Federal and State Ambient Air Quality Standards			
Pollutant	Averaging Time	Federal Primary Standard	State Stand
O_3	1-hour 8-hour	0.12 ppm 0.08 ppm	0.09 ppm --
CO	8-hour 1-hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
NOx	Annual 1-hour	0.05 ppm --	-- 0.25 ppm
Sulfur Dioxide (SO2)	Annual 24-hour 1-hour	0.03 oon 0.14 ppm --	-- 0.05 ppm 0.5 ppm
PM_{10}	Annual 24-hour	50 ug/m2 150 ug/m3	20 ug/m3 50 ug/m3
$PM_{2.5}$	Annual 24-hour	15 ug/m3 65 ug/m3	12 ug/m3 --
Lead	30-day avg.	--	1.5 ug/m3

	~~Month avg.~~	~~1.5 ug/m3~~	~~--~~

~~Notes:~~
~~ppm = parts per million~~
~~Ug/m3 = micrograms per cubic meter~~

~~FEDERAL REGULATIONS~~

~~The Federal Clean Air Act (FCA) requires states to classify basins (or portions thereof) as either "attainment" or "non-attainment" with respect to the criteria air pollutants. The FCAA also requires states to prepare air quality plans containing emission reduction strategies for those areas designated as "non-attainment." YSAQMD is classified as a "severe" non-attainment area for the federal one-hour O_3 standard. The YSAQMD is classified as attainment or unclassified for other national standards.~~

~~Because the air basin is designated as a non-attainment areas for O_3, the air pollution control districts and air quality management districts within the air basin have prepared the Sacramento Area Regional Ozone Attainment Plan as the basin's contribution to the State Implementation Plan (SIP), pursuant to the FCA. The SIP includes plans for each of the state's non-attainment areas, along with rules and regulations and other control measures adopted by the air districts and the California Air Resources Board (CARB). The air districts included in the Sacramento Metropolitan Federal Ozone Non-Attainment area, which includes YSAQMD, prepared an update to the Attainment Plan that was scheduled for completion at the end of 2004.~~

~~STATE REGULATIONS~~

~~The CARB, California's state air quality management agency, regulates mobile emissions sources and oversees the activities of County Air Pollution Control Districts (APCDs) and regional Air Quality Management Districts (AQMDs). The CARB regulates local air quality indirectly by state standards and vehicle emission standards by conducting research activities and through its planning and coordinating activities.~~

~~California has adopted ambient standards that are in some cases more stringent than the federal standards for the criteria air pollutants (see Table CNR-1). Under the California Clean Air Act (CCAA), patterned after the FCAA, areas have been designated as attainment or non-attainment with respect to state standards. The region is considered to be in attainment for the state CO standard, non-attainment for the state O_3 standard, and non-attainment for the state PM_{10} standard.~~

~~LOCAL REGULATIONS~~

~~Capay Valley is in Yolo County, under the jurisdiction of the Yolo-Solano Air Quality Management District (YSAQMD). The YSAQMD is responsible for implementing emissions standards and other requirements of federal and state laws.~~

~~The YSAQMD developed the 1992 Yolo-Solano Air Quality Attainment Plan, which addresses the requirements designed to bring the district into compliance with the federal and state ambient air quality standards. The plan includes carefully planned strategies for progressive reduction of air pollutants by promoting active public involvement, by encouraging compliance through positive influence and behavior, and through public education in both the public and private sectors. YSAQMD also provides a handbook of~~

~~guidelines for determining air quality thresholds of significance and mitigation measures for proposed development projects that generate emissions from motor vehicles.~~

~~Reducing Air Quality impacts (construction and traffic)~~

~~All new construction shall incorporate standard mitigation measures recommended by the Yolo Solano Air Quality Management District (YSAQMD). In addition, any new development project that is greater in size than the "trigger levels" set by the YSAQMD and which is anticipated to generate emissions over the YSAQMD thresholds, shall be required to reduce their air quality impacts to a less than significant level to the extent feasible.~~

~~Incorporating trip reduction measures and specific design features into the project, and/or adopting other measures that are recommended by the YSAQMD shall accomplish the reduction in anticipated emissions.~~

~~These measures may include planning for a mixture of complementary uses; increasing planned residential densities; providing multiple and direct pedestrian access to adjacent, complementary land uses; providing bicycle lanes, racks, lockers and showers; requiring use of electric maintenance equipment such a lawn mowers; and others.~~

~~All new construction projects shall incorporate the standard dust suppression requirements recommended by the YSAQMD, including:~~

- ~~Nontoxic soil stabilizers according to manufacturer's specifications shall be applied to all inactive construction areas (previously graded areas inactive for ten days or more).~~
- ~~Ground cover shall be reestablished in disturbed areas quickly.~~
- ~~Active construction sites shall be watered at least three times daily to avoid visible dust plumes.~~
- ~~Paving, applying water three times daily, or applying (non-toxic) soil stabilizers shall occur on all unpaved access roads, parking areas and staging areas at construction sites.~~
- ~~Enclosing, covering, watering daily, or applying non-toxic soil binders to exposed stockpiles (dirt, sand, etc.) shall occur.~~
- ~~A speed limit of 15 MPH for equipment and vehicles operated on unpaved areas shall be enforced.~~
- ~~All vehicles hauling dirt, sand, soil, or other loose materials shall be covered or shall be maintained at least two feet of freeboard.~~
- ~~Streets shall be swept at the end of the day if visible soil material is carried onto adjacent public paved roads.~~

~~All new construction projects shall incorporate the standard NOx reduction requirements recommended by the YSAQMD, including:~~

- ~~Construction equipment exhaust emissions shall not exceed District Rule 2-11 Visible Emission limitations.~~
- ~~Construction equipment shall minimize idling time to 10 minutes or less.~~
- ~~The prime contractor shall submit to the District a comprehensive inventory (i.e.,make, model, year, emission rating) of all the heavy-duty off-road equipment (50 horsepower or greater) that will be used an aggregate of 40 or more hours for the construction project.~~
- ~~District personnel, with assistance from the California Air Resources Board (CARB), will conduct initial Visible Emission Evaluations (VEE) of all heavy-duty equipment on the inventory list.~~

- ~~An enforcement plan shall be established to weekly evaluate project-related on-and off-road heavy-duty vehicle engine emission opacities, using standards as defined in California Code of Regulations, Title 13, Sections 2180 - 2194.~~
- ~~An Environmental Coordinator, CARB-certified to perform Visible Emissions Evaluations (VEE), shall routinely evaluate project related off-road and heavy duty on-road equipment emissions for compliance with this requirement.~~
- ~~Operators of vehicles and equipment found to exceed opacity limits will be notified and the equipment must be repaired within 72 hours.~~

~~Construction contracts shall stipulate that at least 20% of the heavy-duty off-road equipment included in the inventory be powered by CARB certified off-road engines, as follows:~~

- ~~175 hp - 750 hp 1996 and newer engines~~
- ~~100 hp - 174 hp 1997 and newer engines~~
- ~~50 hp- 99 hp 1998 and newer engines~~

~~In lieu of or in addition to this requirement, the applicant may use other measures to reduce particulate matter and nitrogen oxide emissions from project construction through the use of emulsified diesel fuel and or particulate matter traps. These alternative measures, if proposed, shall be developed in consultation with District staff.~~

~~The YSAGMD also indicates any new residential projects with wood burning appliances shall use only pellet-fueled heaters, U.S. EPA Phase II certified wood burning heaters, or gas fireplaces. Installation of open-hearth wood burning fireplaces shall be prohibited.~~

~~The County is to implement the agreement with Cache Creek Casino and Resort and develop a park-and-ride lot to provide a shuttle for casino patrons and employees as an alternative to automobile use.~~

Plant and Animal Resources

The Capay Valley has a rich and diversified flora and fauna. The Valley is comprised of five major habitats (natural communities) – Riparian, Woodland, Openland, Chaparral and Aquatic and Wetland – each having its set of species that is best adopted to its particular characteristics.

RIPARIAN

Riparian communities exist in and along Cache Creek and the ephemeral streams and sloughs in the Valley. The dominant tree species include Fremont cottonwood, valley oak, black walnut, California buckeye, salt cedar, and button willow. The understory is composed of Gooding's black willow, arroyo willow, Canada thistle, vetch, and rough cocklebur. Riparian scrub occurs along both sides of Cache Creek and is dominated by dense stands of introduced species, giant reed, and tamarisk. Western ground squirrel, raccoon, black-tailed deer, mice, muskrat, weasel, skunk, opossum, and an occasional beaver are among the animals sharing this habitat. Numerous bird species inhabit this community. Species include red-breasted sapsucker, golden-crowned sparrow, yellow-rumped warbler, hawks, owls, ducks, herons, grebes, towhees, blackbirds, crows, flicker, phoebes, jays and magpies. Reptiles such as lizards, snakes, Pacific chorus frogs, turtles, newts, and toads can be found here. Cache Creek supports a variety of warm water fish – crayfish, bass, blue gill, crappie, squawfish, carp, and hard head, plus a variety of benthic organisms.

OAK WOODLAND AND SAVANNAH

Woodland habitats are wooded areas with some grassy meadows, located in the foothills. Oak grass and various forbes grow underneath digger pine, toyon, buckeye, manzanita, and buckbrush, as well as blue oak and foothill pine. Purple needlegrass, a native bunchgrass, is scattered through the oak oak woodlands. Skunks, coyotes, bobcats, badger, bats, mice, weasels, squirrels, blacktailed deer, and an occasional bear or mountain lion frequent this type of habitat. Birds include woodpeckers, flickers, swallows, jays, crows, magpies, towhees, sparrow, finches, quail, titmice, bluebirds, warblers, and nuthatches. Salamander and toads live in the moist areas, lizards and snakes in the meadows.

The common tree in the savannah is blue oak. Common species in the annual grass understory of the oak woodland and savannah include wild oat, ripgut brome, soft brome, ryegrass, and filaree.

OPENLAND

Cropland with occasional oak trees comprises the Valley's openland habitat. Various trees and row crops provide feed, cover, and space for gophers, mice, rats, rabbits, moles, bats, opossums, weasels, skunks, badgers, coyotes, squirrels, and deer. Deer coming down from the hills to water and to browse on crops and in the orchards continues to present a special problem to the farmers. The numerous bird species include kites, hawks, owls, eagles, vultures, crows, starlings, blackbirds, sparrows, wrens, larks, bluebirds, swallows, Kingbirds, finches, doves, killdeer, and pheasants. Salamanders, toads, lizards, and snakes are also numerous.

CHAPARRAL

The fourth major habitat is chaparral, occurring primarily on the steep hillsides. Manzanita, chamise, and grasses dominate the hills with toyon, oak, bay trees and digger pines growing in the canyons. These plants and trees provide a home for deer mice, opossums, skunks, bobcats, fox badger, rabbits, black-tailed deer, squirrels, chipmunks and white-throated woodrats, and birds including hawks, owls, vultures, jays, quail, pigeon, wrens, warblers, towhees, bushtits, and sparrows. Snakes and lizards also abound.

AQUATIC AND WETLAND

Cache Creek is a perennial creek with flows controlled by the Yolo County Flood Control and Water Conservation District by regulating releases from Clear lake and Indian Valley Reservoir. Downstream, the Capay Diversion Dam blocks the movement of anadromous fish farther upstream. The creek supports crayfish, blue gill, squawfish, suckers, and small mouth bass.

Along Cache Creek and near springs, small areas of wetland habitat occur. Wetlands vegetation includes that of the surrounding areas, plus willows and water plants. Beaver, mink, raccoons, and muskrats are found here, along with kites, hawks, ducks, and herons.

OTHER HABITAT AREAS

A variety of wildlife can be found around the edges of the towns in the Valley. Squirrels, mice, gophers, and jackrabbits are common, as are house sparrows, white crowned and golden crowned sparrows, magpies, flickers, scrub jays, robins, crows, brown towhees, blackbirds, hummingbirds, and cedar waxwings.

NATURAL AREAS AND WILDLIFE HABITATS OF CRITICAL CONCERN

The Sacramento Audubon Society's Research and Scientific Committee has identified natural areas and wildlife habitats of critical concern in Yolo County. Three such areas are within the Capay Valley Study Area22:

1. *The Cache Creek Flysch* beds are located on lands under private, Yolo County, and Bureau of Land Management ownership, about four miles northwest of Rumsey, adjacent to State Route 16 (Yolo County, Glasscock Mountain, Quad RW, T12N, S3-4). The beds cover approximately 600 acres, ranging in elevation from 550 to 2,000 feet.

They are a rugged formation comprising an eastern segment of the Coast Range, characterized by steep, abrupt slopes, and furrowed by gulches and canyons. The major watershed is Cache Creek with generally west to east flow. State Route 16 is north of the creek.

These exposed flysch beds, of alternated layers of sand and shale, are located along a two to three mile strip of Cache Creek. The visible, cross-section beds present strikingly folded patterns, varying from 1 to 25 inches thick. The beds likely are a product of advancing and retreating seas some 65 to 100 million years ago, and the result of a marine environment. Creek bank erosion exposes the beds where little vegetation can survive. Oak, willow, and occasional conifer, and a variety of shrubs and grasses are located along the creek and slopes of the hills. Representative birds and mammal of the Upper Sonoran Life Zone characterize the area.

2. *The Capay Valley and Wilbur Springs* follow State Route 16 generally north northwest from Capay (15 miles west of Woodland) to junction with Highway 20, then eight additional miles North along Bear Valley Road, Yolo and Colusa Counties (Lake Berryessa and Wilbur Springs Quads R2, 5W, T10, 14N, S4, 23). The approximately 41 miles of winding springs are located both on public and private lands. In Cache Creek Canyon, near the Yolo-Colusa County line, is the 700 acre Regional Park. The large colony of adobe lily grows on private land. Elevations range from 250 to 1,300 feet.

Capay Valley is primarily farmland and orchards. The surrounding hillsides retain the only near natural vegetation, mainly oak woodland and chaparral. The steep hillsides of Cache Creek Canyon are covered mostly with chaparral, scattered oaks, and pines. Similar vegetation exists on the mountains bordering narrow Bear Valley, which follows Bear Creek to the north. Herbaceous plants are the main attraction, with outstanding displays in some years. Species not found in the Sacramento area include Calochortus amabilis, Clarkia coccinea, Delphinium nudicaulel, Fritillaria lanceolata, Pedicularis densiflora, Sidalcea diploscypha, and Zigadenus fremontii. In early spring, a huge field of pink at the north edge of the area signals the presence of the uncommon adobe lily. Cache Creek Canyon Regional Park contains two miles of creek frontage and six miles of trails.

3. *The Berryessa Peak-Cottonwood Canyon* lies on a north-south ridge which forms part of the Napa-Yolo County boundary. The Canyon is about 10 miles west of Esparto. Access is by dirt roads from State Route 16 between Esparto and Brooks (Brooks and Esparto Quads R2, 3W, Tn, 10N). Elevations range from 1,200 to 3,057 feet. The 3,000 acres fall on both private and Bureau of Land Management lands.

The Berryessa Peak-Cottonwood Canyon is located on a steeply sloping ridge of the Coast Range, covered by dense chaparral in the higher elevations, and with scattered groves of larger trees at the lower elevations.

A large tract of relatively undisturbed land on the inner North Coast Range, this area is representative of the Inner Coastal Range chaparral. There is some oak woodland, with black oak, blue oak, interior live oak, and some digger pine. Along the intermittent Cottonwood Creek is some riparian vegetation with big leaf maple and spice bush. The dominant cover is chaparral, which includes Arctostaphylos manzanita, A. glauca, California lilac, buck brush, chamise, and mountain mahogany. Animal life is relatively abundant and typical.

A variety of ferns and herbs including coffee fern, dutchman's pipevine, gooseberry, currant, and western rueanemone occur here. Flannel bush occurs in scattered populations adjacent to this area.

Special-Status Species

Special-status species are plants and animals that are legally protected under federal and state endangered species acts or other regulations, as well as species that are considered sufficiently rare as defined by CEQA Guidelines §15380. Special-status plants and animals are species in the following categories:

- Species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (FESA), 50 CFR 17.11 for listed plants and various notices in the Federal Register (FR) for proposed species and 50 CFR 17.11 for listed animals and various notices in the FR for proposed species;
- Species that are candidates for possible future listing as threatened or endangered under the FESA (FR 67 (114): 40657-40679, June 13, 2002);
- Species listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (CESA) (14 CCR 670.5);
- Plants considered by California Native Plant Society (CNPS) to be "rare, threatened or endangered" in California (Lists 1B, 2, and 3 in Skinner and Pavlik {1991]);
- Plants listed under the California Native Plant Protection Act (California Fish and Game Code 1900 et sec.);
- Plants considered sensitive by other federal agencies (i.e., U.S. Forest Service, Bureau of Land Management) or state and local agencies or jurisdictions;
- Animals of special concern to the California Department of Fish and Fame (CDFG) (http://www.dfg.ca.gov/hcpb/species/ssc/ssc); and,
- Animals that are fully protected in California (California Fish and Game Code §3511 [birds], 4700 [mammals], and 5050 [repitles and amphibians].

A list of special status species that occur in the Capay Valley was developed by conducting a search of nine U.S. Geographical Survey quadrangles on the California Natural Diversity Database (CNDDB 3.0.5 2003), as well as on the California Native Plant Society Inventory of Rare and Endangered Plants (http://www.cal.net/~levinel/cgi-bin/cnps/sensinv). The quadrangles searched were Esparto, Brooks, Walter Springs, Bird Valley, Guinda, Knoxville, Wildwood School, Rumsey, and Glascock Mountain. Some of the individual quadrangles may include areas both within and outside the planning area.

It should be noted, however, that species not recorded for a given area may nonetheless be present, especially where favorable conditions occur. Therefore, the following table (Table CNR-3) is not to be considered an exhaustive listing of the special-status species occurring the Capay Valley, but only a list of species that has been observed and subsequently recorded within the CNDDB or CNPS Inventory as occurring within the planning area.

Table CNR-3 Special-Status Plant and Animal Species Potentially Occurring or Known to Occur in the Capay Valley		
SPECIAL-STATUS ANIMAL SPECIES		
Name (Scientific/Common)	**Legal Status: Fed/State**	**Habitat Requirements**
Ambystoma californiense California tiger salamander	T/SC	Need underground refuges, especially squirrel burrows and vernal pool or other seasonal water sources for breeding.
Aquila chrysaetos Golden eagle	--/SC	(Nesting and wintering) Rolling foothills, mountain areas, sage juniper flats, desert. Cliff-walled canyons provide nesting habitat in most of range as well as large trees in open areas.
Athene cunicularia Burrowing owl	--/SC	Grasslands for foraging and abundant rodent burrows for nesting.
Buteo swainsoni Swainson's hawk	--/T	Nests in oaks or cottonwoods near riparian habitat; forages in grasslands, row crops and pastures.
Charadrius montanus Mountain plover	--/SC	(Wintering) Short grasslands, freshly plowed fields, newly sprouting grain fields, sod farms. Short vegetation, bare ground. Flat topography. Prefer grazed areas and areas with burrowing rodents.
Corynorhinus townsendii townsendii Townsend's western big-eared bat	--/SC	Mesic habitats; preys on insects along habitat edges.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	T/--	Elderberry shrubs, usually located in riparian or streamside habitat.
Emys (=Clemmys) marmorata marmorata Northwestern pond turtle	--/SC	Rivers, streams, lakes, ponds, and irrigation canals with muddy or rocky bottoms and aquatic vegetation.
Falco mexicanus Prairie falcon	--/SC	Nests on cliffs or escarpments adjacent to open upland and marsh habitats.
Haliaeetus leucocephalus Bald eagle	T/E	(Nesting and Wintering) Most nests within one mile of water. Nests in large, old growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.
Litta molesta Molestan blister beetle	--/--	Inhabits the Central Valley of California, from Contra Costa to Kern and Tulare Counties.
Rana boylii Foothill yellow-legged frog	--/SC	Partly shaded, shallow streams and riffles with rocky substrates in a variety of habitats.
Riparia Riparia Bank swallow	--/T	Nests in burrows near vertical cliffs along streams, coastal bluffs, and sand and gravel pits.
Spea (=Scaphiopus) hammondii Western spadefoot	--/SC	Occurs primarily in grassland habitats, but can be found in valley foothill hardwood woodlands. Vernal pools essential for breeding and egg-laying.

Table CNR-3 (Continued)
SPECIAL-STATUS PLANT SPECIES

Name (Scientific/Common)	Legal Status: CNPS/Fed/State	Habitat Requirements
Astragalus rattanii var. jepsonianus Jepson's milk-vetch	1B	Cismontane woodland, valley and foothill grassland, chaparral. Commonly on serpentine in grassland or openings in chaparral 320-700 meters.
Astragalus tener var. ferrisiae Ferris's milk-vetch	1B	Meadows, valley and foothill grassland. Subalkaline flats on overflow land in the Central Valley; usually seen in dry, adobe soil. Only a few extant occurrences remain.
Atriplex joaquiniana San Joaquin spearscale	1B	Chenopod scrub, Alkali meadow, valley and foothill grassland. 1-250 meters.
Castilleja rubicundula ssp. Rubicundula Pink creamsacs	1B	Chaparral, meadows and seeps, valley and foothill grassland. On serpentine 20-900 meters.
Cordylanthus palmatus Palmate-bracted bird's-beak	1B	Chenopod scrub, valley and foothill grassland. Usually on Pescadero silty clay, which is alkaline, with distichlis, frankenia, etc. 5-155 meters.
Eriogonum nervulosum Snow Mountain buckwheat	1B	Chaparral. Dry serpentine outcrops, balds, and barrens 300-2,100 meters.
Erodium macrophyllum Round-leaved filaree	1B	Cismontane woodland, valley and foothill grassland. Clay soils 15-1,200 meters.
Fritillaria pluriflora Adobe-lily	1B	Chaparral, cismontane woodland, foothill grassland. Usually on clay soils, sometimes on serpentine. 55-820 meters.
Harmonia hallii Hall's harmonia	1B	Chaparral. Serpentine hills and ridges. Open, rocky areas within chaparral. 500-900 meters.
Hesperolinon bicarpellatum Two-carpellate western flax	1B	Serpentine barrens at edge of chaparral. 150-820 meters.
Hesperolinon drymarioides Drymaria-like western flax	1B	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland. Serpentine soils, mostly within chaparral. 390-1,000 meters.
Hesperolinon sp. nov. "serpentinum" Napa western flax	1B	Mostly found in serpentine chaparral. 228-850 meters.
Layia septentrionalis Colusa layia	1B	Chaparral, cismontane woodland, valley and foothill grassland. Scattered colonies in fields and grassy slops in sandy or serpentine soil. 145-1,095 meters.
Navarretia leucocephala ssp. Bakeri Baker's navarretia	1B	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest. Vernal pools and swales, adobe or alkaline soils. 5-950 meters.

~~*Streptanthus breweri var. hesperidis*~~ ~~Green jewel-flower~~	~~1B~~	~~Chaparral m cismontane woodland. Serpentine, rocky sites. 130-760 meters.~~
~~Notes:~~ ~~T = Threatened~~ ~~E = Endangered~~ ~~SC = Species of Concern~~ ~~CNPS 1B = CNPS list plants rare, threatened, or endangered in California and elsewhere~~		

Regulatory Setting

FEDERAL REGULATIONS

Federal Endangered Species Act

The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction. The FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

The FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined as harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species, or any attempt to engage in such conduct (16 USC 1532, 50 CFR 17.3). Taking can result in civil or criminal penalties.

The FESA and NEPA Section 404 guidelines prohibit the issuance of wetland permits for projects that would jeopardize the existence of threatened or endangered wildlife or plant species. The U.S. Army Corps of Engineers must consult with the U.S. Fish and Wildlife Service (USFWS) and National Oceanic Atmospheric Administration (NOAA) when threatened or endangered species may be affected by a proposed project to determine whether issuance of a Section 404 permit would jeopardize the species.

Migratory Bird Treaty Act

Raptors (birds of prey), migratory birds, and other avian species are protected by a number of state and federal laws. The federal Migratory Bird Treaty Act (MBTA) prohibits the killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of Interior. Section 3503.5 of the California Fish and Game Code states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

Clean Water Act

The U.S. Army Corps of Engineers regulates discharge of dredged or fill material into Waters of the United States under Section 404 of the Clean Water Act (CWA). "Discharge of fill material" is defined as the addition of fill material into Waters of the U.S., including but not limited to the following: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and sub-aqueous utility lines (33 C.F.R. §328.2(f)). In addition, Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the United States to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Waters of the U.S. include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows. Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal

~~circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 C.F.R. §328.3(b)).~~

~~Furthermore, Jurisdictional Waters of the U.S. can be defined by exhibiting a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the Corps as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 C.F.R. §328.3(e)).~~

~~STATE REGULATIONS~~

~~California Endangered Species Act~~

~~The State of California enacted the California Endangered Species Act (CESA) in 1984. The CESA is similar to the FESA but pertains to state-listed endangered and threatened species. CESA requires state agencies to consult with the California Department of Fish and Game (CDFG) when preparing California Environmental Quality Act (CEQA) documents to ensure that the state lead agency actions do not jeopardize the existence of listed species. CESA directs agencies to consult with CDFG on projects or actions that could affect listed species, directs CDFG to determine whether jeopardy would occur, and allows CDFG to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if they determine that "overriding considerations" exist; however, the agencies are prohibited from approving projects that would result in the extinction of a listed species.~~

~~The CESA prohibits the taking of state-listed endangered or threatened plant and wildlife species. CDFG exercises authority over mitigation projects involving state-listed species, including those resulting from CEQA mitigation requirements. CDFG may authorize taking if an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy is implemented. CDFG requires preparation of mitigation plans in accordance with published guidelines.~~

~~CDFG Species of Special Concern~~

~~In addition to formal listing under FESA and CESA, plant and wildlife species receive additional consideration during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern" developed by the CDFG. CDFG tracks species in California whose numbers, reproductive success, or habitat may be threatened.~~

~~Natural Community Conservation Planning Act~~

~~The Natural Communities Conservation Planning Act (NCCP) program is an unprecedented effort by the State of California, as well as numerous private and public partners that takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity. The program, which began in 1991 under the California Natural Community Conservation Planning Act, is broader in its orientation and objectives than CESA and ESA; these laws are designed to identify and protect individual species that are already listed as threatened or endangered. The primary objective of the NCCP program is to conserve natural communities at the ecosystem scale while accommodating compatible land use (CDFG, 2003).~~

In 1991, Yolo County and its member cities began the process of developing a Habitat Conservation Plan (HCP) to obtain an incidental take permit under §10(a) (1) (B) of ESA. In 2001, the participating jurisdictions agreed with a request from the CDFG to extend the planning process so that the HCP could be rewritten as an NCCP.

In 2002, Yolo County was awarded USFWS Section 6 funding to complete the NCCP. However, at this time, when and exactly how much funding will actually be available for this effort is unclear. Yolo County is currently seeking additional funding to update the biological data, rewrite the HCP into an NCCP document, and develop an EIR and EIS. Currently, the date of the NCCP's completion is unknown (EDAW, 2003).

LOCAL REGULATIONS

Draft Yolo County Habitat Conservation Plan

The Draft Yolo County Habitat Conservation Plan (HCP) addresses impacts resulting from 11,672 acres of development within a 403,052-acre plan area in eastern Yolo County. The Draft Yolo County Habitat Conservation Plan is under development to comply with the requirements of the federal Endangered Species Act (ESA) of 1973, as amended, and the California Endangered Species Act (CESA). Specifically, the Draft HCP is designed to mitigate for the "take" of threatened and endangered species as a result of urban development. The Draft HCP will also establish a long-range strategy or framework for the conservation and enhancement of the habitats of the Plan's 26 covered species. The Draft HCP has not yet been adopted; however, a 2001 draft is currently out for review.

Cache Creek Resources Management Plan (CCRMP)

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). 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, and was composed of seven elements: 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.

Cache Creek Improvement Program

The Cache Creek Improvement Program (CCIP) was developed by the Yolo County Planning and Public Works Department (formerly the Yolo County Community Development Agency) to implement the goals, objectives, actions, and performance standards of the Cache Creek Resource Management Plan (CCRMP) as it relates to the stabilization and maintenance of the Cache Creek channel. It has been adopted as a component part of the CCRMP. The CCIP provides the structure and authority for a Technical Advisory Committee (TAC), defines the procedures and methodologies for stream monitoring and maintenance activities, and identifies initial high priority projects for stream stabilization.

Responsible Agencies – Plant and Animal Resources

FEDERAL AGENCIES

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers regulates discharge of dredged or fill material into Waters of the United States under Section 404 of the Clean Water Act (CWA). Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the United States to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

U.S. Fish and Wildlife Service and National Oceanic Atmospheric Administration

The Fish and Wildlife Service, in the Department of the Interior, and the National Oceanic and Atmospheric Administration (NOAA) Fisheries, in the Department of Commerce, share responsibility for administration of the Endangered Species Act. Before a plant or animal species can receive protection under the Endangered Species Act, it must first be placed on the Federal list of endangered and threatened wildlife and plants. The listing program follows a strict legal process to determine whether to list a species, depending on the degree of threat it faces. An "endangered" species is one that is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is one that is likely to become endangered in the foreseeable future. The Service also maintains a list of plant and animals native to the United States that are candidates or proposed for possible addition to the Federal list.

STATE AGENCIES

California Department of Fish and Game

Specific State legislative acts have charged the State of California Department of Fish and Game with the responsibilities and powers to see the preservation and management of California's fish and wildlife resources. The California Species Preservation Act of 1970 (Stats. 1970, Chap. 1036, p. 1847) directed the Department to inventory all threatened fish and wildlife, to develop criteria for all rare and endangered species, and to implement measures to protect these animals. The California Endangered Species Act of 1970 (Stats. 1970, Chap. 1510, p. 2998) gives the Department the authority to deem what animals in California are rare and endangered.

In 1965, the Department proposed specific management policies regarding the Tule Elk, as follows:

- **It is the policy of the California Fish and Game Commission to maintain the present California elk herds primarily for aesthetic enjoyment.**

- **The Fish and Game Commission recognizes that the management of these herds must be consistent with land uses by other big game species and by agriculture and forestry. The policy goals will be attained by:**
  1. **Protection of elk herds through enforcement of laws and regulations.**

  2. **Protection of elk habitat in cooperation with public and private agencies.**

  3. **Managing elk herds on the basis of natural forage without recourse to artificial feeding.**

4. Selective removal of animals when necessary to control elk numbers for the benefit of the herd or to alleviate agricultural or forest damage.

5. Plans will be formulated for the management of each of the elk herds in the State, based on biological, economic, and other factors determined from research and investigations.

The above listed policies proposed in 1965 were not adopted by the legislature against the wishes of the Department of Fish and Game. With the adoption of the California Environmental Quality Act in 1970 and subsequent legislation recognizing and protecting endangered species, many of the proposed issues raised in 1965 were addressed through other channels.

The Department also has control via permit requirements for all activities that change the natural state of any river, stream, or lake. Permits are required for all work undertaken within the mean high water mark of a body of water containing fish or wildlife resources.

LOCAL ORGANIZATIONS

Cache Creek Technical Advisory Committee

The Technical Advisory Committee (TAC) was established to provide scientific and technical oversight for the Cache Creek Resources Management Plan (CCRMP) and the Cache Creek Improvement Program (CCIP). The TAC collects and analyzes data, identifies maintenance needs and priorities, and provides critical review of the design and construction of improvement projects. The TAC also works with a variety of local stakeholders in making recommendations regarding management of the riparian area.

Cache Creek Conservancy

The Cache Creek Conservancy (CCC) is a 501(c)(3) non-profit corporation dedicated to the restoration of the lower Cache Creek corridor whose mission is to promote the restoration, enhancement and management of the stream environment along Cache Creek from Capay Dam to the Settling Basin. The Conservancy was created in 1996 as a vehicle to implement projects, provide environmental education, hold conservation easements, and manage land for wildlife habitat. During the past five years CCC has implemented two wildlife habitat improvement projects, worked with local landowners on an experimental erosion control method using rice-straw bales and willows, initiated a Tamarix and Arundo donax removal and control demonstration project, and developed a 130-acre property into the Cache Creek Nature Preserve (CCNP). CCC works closely with Yolo County's Resources Manager to plan, organize and implement projects. Conservancy staff include an executive director who runs the day-to-day operations and an educational coordinator who develops and implements on site curricula, organizes community and school tours, facilitates docent and internship programs, and provides various outreach programs to local communities.

OTHER ORGANIZATIONS

California Native Plant Society

The California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Plants of

~~California (Tibor, 2001). Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The following identifies the definitions of the CNPS listings:~~

- ~~List 1A: Plants believed extinct.~~
- ~~List 1B: Plants rare, threatened, or endangered in California and elsewhere.~~
- ~~List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere.~~
- ~~List 3: Plants about which we need more information - a review list.~~
- ~~List 4: Plants of limited distribution - a watch list.~~

~~A number of local and nationally based environmental organizations may have concerns and comments regarding the plant and wildlife species in the Capay Valley and regarding the actions of the Department of Fish and Game. These organizations include: The Sierra Club, the National Audubon Society, the California Wilderness Coalition, the Friends of the Earth, the Conservation and Planning League, the California Natural Resources Federation, and the California Wildlife Federation.~~

~~Several hunting and fishing organizations also have interests in the Capay Valley. They include the Yolo Sportsmen's Club, various private hunting clubs, and several fishing organizations.~~

Archaeological and Cultural Resources

Capay Valley is located in Yolo County within the Sacramento Valley, the northern half of California's Central Valley. This area is primarily defined as a hydrographic unit—the contiguous watershed drained by the Sacramento River and its tributaries. This vast drainage stretches 384 miles, from the headwaters in the northern Sacramento Valley to the Sacramento–San Joaquin River Delta (U.S. Forest Service 2001). These watercourses have moved alluvium from the Sierra Nevadas.

PREHISTORY

Although humans may have inhabited the Sacramento Valley as early as 10,000 years ago, the evidence for early human use likely is buried by deep alluvial sediments that accumulated rapidly during the late Holocene epoch.

Although rare, archaeological remains of this early period have been identified in and around the Central Valley (Johnson 1967; Peak & Associates 1981; Treganza and Heizer 1953), although to date none has been located in the county. These archaeological remains have been grouped into what is called the Farmington Complex, which is characterized by core tools and large, reworked percussion flakes (Treganza and Heizer 1953). The economy of this early period is generally though to have been based on the exploitation of large game. Later periods are better understood because of more abundant representation in the archaeological record.

The taxonomic framework of the Sacramento Valley has been described in terms of archaeological patterns (Moratto 1984). A pattern is a general mode of life characterized archaeologically by technology, particular artifacts, economic systems, trade, burial practices, and other aspects of culture. Fredrickson (1973) identified three general patterns of resource use for the period between 4,500 B.P. and 3,500 B.P.: the Windmiller, Berkeley, and Augustine Patterns. The Windmiller Pattern (4,500 B.P.–3,000 B.P.) shows evidence of a mixed economy of game procurement and use of wild plant foods. The archaeological record contains numerous projectile points and a wide range of faunal remains. Fishing was also an important activity, as is evidenced by fishing hooks and spears that have been found in association with the remains of sturgeon, salmon, and other fish (Moratto

1984). Plant use is indicated by ground stone artifacts and clay balls that were used for boiling substances like acorn mush. Settlement strategies during the Windmiller period reflect seasonal adaptations: habitation sites in the valley were occupied during the winter months, but populations moved into the foothills during the summer (Moratto 1984).

The Windmiller Pattern ultimately changed to a more specialized adaptation labeled the Berkeley Pattern (3,500 BP–2,500 B.P.). A reduction in the number of handstones and millingstones and an increase in mortars and pestles indicate a greater dependence on acorns. Although gathered plant resources gained importance during this period, the continued presence of projectile points and atlatls (spear-throwers) in the archaeological record indicates that hunting was still an important activity (Fredrickson 1973). The Berkeley Pattern was superseded by the Augustine Pattern around A.D. 500. The Augustine Pattern reflects a change in subsistence and land use patterns to those of the ethnographically known people (Nisenan) of the historic era. This pattern exhibits a great elaboration of ceremonial and social organization, including the development of social stratification. Exchange became well developed, and an even more intensive emphasis was placed on the use of the acorn, as evidenced by the presence in the archaeological record of shaped mortars and pestles and numerous hopper mortars. Other notable elements of the artifact assemblage associated with the Augustine Pattern include flanged tubular smoking pipes, harpoons, clamshell disc beads, and an especially elaborate baked clay industry, which included figurines and pottery vessels (Cosumnes Brownware). The presence of small projectile point types, referred to as the Gunther Barbed series, suggests the use of the bow and arrow. Other traits associated with the Augustine Pattern include the introduction of preinterment burning of offerings in a grave pit during mortuary ritual, increased sedentary villages, population growth, and an incipient monetary economy in which beads were used as a standard of exchange (Moratto 1984).

ETHNOGRAPHIC CONTEXT

The Capay Valley lies within the southern part of the territory of the Wintun. Kroeber located the Wintun in a relatively long, narrow territory on the western side of the Sacramento Valley, between the Sacramento River and the crest of the Coast Range. The Wintun were the most numerous and occupied the largest territory of the five tribal groups occupying parts of the Sacramento Valley in late prehistoric times and were important for their role in the development and diffusion of customs to other valley tribes. The Wintun were speakers of a Penutian dialect of language as were other Native American cultures found in the Sacramento Valley. The Wintun of the Capay Valley were one of several valley tribes that have been linked due to proximity and language stock under the name "Patwin".

Among the Patwin, the major dialects corresponded to the major differences of their places of occupation – the hills and valleys of the Sacramento Valley. Those speaking the valley dialect of Patwin made their permanent villages in the marsh belt near the river during the rainy season and moved to live in the adjacent plains near tributary streams during the dry part of the year. The Hill Patwin, located in and around the Capay Valley lived in winter villages near streams running into the valley and in summer moved into the cooler and more hospitable hills.

HISTORICAL OVERVIEW

The first Euro-American contact with the Wintun of the Capay valley is uncertain, but even before the arrival of great numbers of Euro-Americans, a wave of devastating illnesses known as "the great pandemic of 1833" struck a devastating blow at the stability of Native American cultures throughout the valley. Kroeber estimates the precontact Wintun population at around 12,000. Beginning in 1833 and again in 1838 and 1846 a series of epidemics, including smallpox killed a large percentage of the Wintun population. While no numbers specific to the Wintun population decline in this period are available, by the end of the Mexican occupation of California the overall population of northern

California Native Americans had been reduced by 60% by disease and an additional 12% by ~~murder~~ State-sanctioned killing. Kroeber remarks that the Wintun were more heavily affected by the epidemics than were their neighbors to the North and South.

Further disruption of the traditional economy was a consequence of the destruction of the resources on which the Wintun and other tribes of California had traditionally depended. Cattle and hogs changed the landscape and ate the acorns and grasses whose seeds the tribes had depended upon. Agricultural and fencing removed access to traditional gathering and hunting areas and the California State Legislature in 1850 passed a law that reduced Indians to a state of virtual slavery.

~~Settlement of Capay Valley by immigrants from the United States and other countries occurred relatively early compared to other areas of California. For this reason, a wealth of historic resources are found in the area, in addition to the prehistoric cultural resources.~~

The Capay Valley is located on lands that were a portion of the Canada de Capay Land Grant. In 1843 a huge tract of land, 40,079 acres, along Cache Creek and including all of the Capay Valley was granted by the Spanish to Francisco Berryessa and his brothers Santiago and Demsio. With the arrival of countless Americans on the eastern part of the continent the system of Spanish land grants was quickly disregarded.

Capay Valley is part of Yolo County, which was one of the original 27 counties created when California became a state in 1850. At one time, the region abounded with fields of tule rushes, as well as swamplands, marshes, and sloughs (Gudde 1969; *Daily Alta California* 1850; Coy 1973). As early as 1808, the Central Valley was explored by Spaniards, including Gabriel Moraga who guided an expedition up the Sacramento River to present day Sutter County in search of potential inland mission sites.

During the early 1800s, the region was also explored by hunters and trappers such as Jedediah Strong Smith, Ewing Young, and a group of Hudson's Bay Company trappers. The hunters found the banks of the rivers and streams rich with beaver, otter, and other animals whose pelts were highly valuable commodity in the worldwide trade of the time (Kyle 1990). They used to "cache" their pelts near Cache Creek, hence the name.

History of the Capay Valley

~~The evolution of land uses in the Capay Valley has not occurred overnight. From the time of early habitation by Native Americans to the present, people have changed the physical setting of the Capay Valley. In order to understand the historical record for the Capay Valley area, a brief history of the people who occupied the valley is presented as follows.~~

~~The Capay Valley General Plan is designed for a 20-year life span, with revisions occurring as necessary. Realizing the immediacy and relatively short life span of the planning period in relation to the history of the Capay Valley, it is hoped that this history will provide the reader knowledge useful in making future decisions.~~

Pre-1840

The Cache Creek watershed supported Indian tribes for centuries before nineteenth-century European and American explorers and trappers began to move through the area in the 1830's. Archeological investigations have established that over 5,000 Native Americans once inhabited the Cache Creek Basin, which extends from Clear Lake east toward the Sacramento River. Surveys within this area have identified numerous archeological sites, some of which possess considerable antiquity. Small remnants of one large village on the

bank of Cache Creek have provided the oldest record of human habitation in Capay Valley. The tribes indigenous to the valley primarily consisted of Patwin/Southern Wintun of the Pennintian Family. Pomo and Lake Miwok Indians lived on adjacent land. The word Capay is a derivation of the Wintun word for "stream." Early nineteenth-century disease epidemics took a heavy toll on the Native Americans, although some of the Southern Wintun tribe continued to inhabit the upper reaches of the Capay Valley even after Mexican land grants appropriated most of the territory.

1840's

In 1842, the Mexican government granted William Gordon two leagues of land (the Guesissosi grant) on both sides of Cache Creek from the western hills to the Sacramento River. In 1846, the nine-league (40,000-acre) Rancho Canada de Capay, extending from the western edge of Gordon's grant through the north end of the Capay Valley was granted to the three Berryessa brothers by Mexico's Governor Pio Pico.

1850's and 1860's

In 1858, the land speculators Arnold and Gillig purchased 13,760 acres of the Berryessa grant and began to subdivide the land into parcels of 200 to 3,800 acres. Gillig planted grain, grapevines, and fruit trees northwest of Langville (the present community of Capay) and established the County's first winery in 1860. Other speculators, Rhodes and Pratt, each took title to 6,800 acres in the northern valley and began to sell parcels to settlers. Scattered ranches and tiny settlements developed along the primitive road leading to the quicksilver (mercury) mines in the canyon country to the west.

1870's

Livestock and grain farming were the mainstays of the region's developing agricultural economy, although several small vineyards and orchards offered promise. The Orleans Hill Winery in the Lamb Valley area west of Esparto gained recognition until disease destroyed its vineyards. In the early 1870's, local farmers formed the Rumsey Ditch Association to build and operate an eight-mile irrigation canal (later shortened) from Cache Creek above Rumsey to the vicinity of Guinda. Several small schools were established in the Capay Valley. After the Central Pacific Railroad established a line from Elmira in Solano County to Winters in Yolo County, five investors incorporated the Vaca Valley and Clear Lake Railroad in 1877, planning to extend the line north from Winters to Cache Creek and thence through the Capay Valley on to Clear Lake. Although financing for the line was not soon secured, the town of Madison was established where the railroad was to curve north toward the valley. Most of the village of Cottonwood to the south was moved to the new town, which became a center for grain shipping.

1880's

In 1887, several San Francisco investors incorporated the Capay Valley Land Company, composed chiefly of officers of the Southern Pacific Railroad. The company planned to divide several large land holdings into 10- to 40-acre parcels for fruit farming and to establish town sites along the length of the coming railroad. In 1888, the new town of Esperanza (renamed Esparto, after a native bunch grass, in 1890) was laid out, and railroad track was laid up to Rumsey (named for a local landowner) at the north end of the valley, with the first passenger train running in July. At the terminus of the railroad were railroad sidings, a manually operated turntable, a section house, and the site for a planned 23-room hotel (never built). Guinda had a house for the section supervisor and a bunkhouse for workers. In 1889,

a three-story hotel was completed in Esparto, featuring gaslights, a pressurized water system and electric bells. (The hotel was damaged in the 1892 earthquake but repaired; after a succession of ownerships, the building was torn down in 1935.) Postmasters were appointed at Guinda (the Spanish word for the wild cherry tree) and Rumsey, and Langville was renamed Capay.

1890's

The Guinda store (still in use) was built in 1891. The Guinda Hotel was built in 1893 (torn down in the 1990's). Both were busy and successful during their early years, and the Guinda Hotel supported a popular bar until the 1950's. A substantial two-story elementary school building was erected at Guinda. Fruit packing sheds began to operate in Guinda and Rumsey, making daily seasonal deliveries to two trains with ice cars. Other land company plans were short-lived. A community four miles west of Capay called Cadenasso (after local landowners) never developed into a town, and six miles to the north a colony near Tancred (named for a hero of the First Crusade) lasted only until a hard frost killed many of the young fruit trees in 1896 and the colony went bankrupt. Tancred had a post office from 1892 until 1932 but never became a functioning town. In 1893, Yolo County's second high school was established in Esparto. In the early 1890's a single-wire grounded telephone line between Guinda and Rumsey was laid and a phone placed in a store in each town, for use by the public when the stores were open.

1900's

In 1900, the population of the Capay Valley was recorded at 1,381. Rumsey residents built a hall for a local women's group in 1903, and Guinda built a community hall in 1909 (now the Western Yolo Grange Hall). The small band of local Wintun Indians was relocated from its old village site northeast of Rumsey to a federally purchased rancheria on the other side of the valley (later some of the band moved to a new site near Brooks, while others moved to Colusa County). Plans to extend the railroad through the Rumsey canyon were abandoned. A low-water wooden bridge crossed Cache Creek from County Road 53, and several families lived in the hills on the east side. Constables and judges were elected for each judicial district, and small jails were erected in Guinda and Capay. For a time, a Capay doctor made house calls in the valley.

1910's

A catholic Church was built in Guinda (demolished about 1930), and in 1914, the Yolo Water and Power Company completed a concrete dam across the outlet of Clear Lake that feeds into Cache Creek, improving storage capacity for flood control and irrigation downstream. In 1915, the valley's first Almond Festival took place, with the crowing of an Almond Queen at Guinda's Methodist Church; thereafter, the festival became an annual celebration of spring blossoms and local products. A new wooden bridge across Cache Creek was built near Guinda about 1916 (later washed out, and then replaced by an iron structure about 1956 on County Road 57). In 1918, a new elementary school was built in Guinda, and a high school building in Esparto (later enlarged in a 1939 WPA project). A second general store opened in Guinda in 1919. The Capay Valley Almond Growers Exchange began to serve the area's growing almond acreage as farmers converted unprofitable fruit orchards.

1920's and 1930's

In 1928, electric power became available in the valley and was extended to outlying areas over the next decade. In 1929, the present Rumsey Bridge replaced an earlier bridge

destroyed by flooding; a chair carrier bridge also spanned the creek to carry people and supplies across to the east side. Until the late 1930's there was also a cable suspension footbridge south of Guinda. In the early 1930's, the Victoria Land Company, owned by a Stockton man, farmed a large plot of land in the Guinda and Rumsey areas, producing almonds, apricots and peaches and hiring mostly local people as needed. The Great Depression discouraged local economic activity, but government projects provided some employment. Many local farmers had graded and constructed the original roads, however starting in 1931, State Highway 16 was cut through the Rumsey canyon, and by 1934, and transportation was opened up to Highway 20. Six gas stations served motorists between Brooks and Rumsey (the last closed in the 1990's). By 1937, the railroad tracks were being taken out from Rumsey on down the valley, and rail service ceased north of Esparto in 1941 (passenger service continued between Esparto and Elmira until 1957). A daily motor stage took passengers and freight from Rumsey to Woodland. During these decades, several families operated small Grade B dairy farms.

1940's and 1950's

Major flooding occurred during the high-water year 1940-41 and again in 1955-56. During World War II, many of the valley's young men served in the military, while remaining residents participated in various wartime activities. Several Japanese families, who had operated fruit orchards in the upper valley, were relocated to wartime internment camps and did not return after the war. In 1948, the original Capay Valley Telephone Company changed hands and began expanding services through a 10-line switchboard in Brooks, which later became a 30-line switchboard in Guinda. (The company was locally owned until 1988.) Efforts to convince voters to create a consolidated school district in Esparto were finally successful in 1959-60, and the small elementary schools dotting the valley closed down as school bus service expanded.

1960's and 1970's

After a series of hard late freezes, walnut plantings began to replace old valley almond orchards. In 1975, the newly completed Indian Valley Dam in the mountains north of the Capay Valley began to store water for flood control and irrigation; the reservoir was not yet filled when the 1976-77 drought period began.

1980's

Organic growers first began farming in the Capay Valley. In 1982, Yolo County Planning staff, in consultation with the resident-formed General Plan Citizens Advisory Group, prepared a Capay Valley Community Area Plan, which became part of the Yolo County General Plan in 1983. In 1985, the Rumsey Band of the Wintun Tribe opened a bingo parlor near Brooks.

1990's

A series of drought years after 1987 ended in 1992. The Rumsey Rancheria bingo parlor became the Cache Creek Casino, which developed rapidly into a major gambling venue. In 1994, the Yolo County Flood Control and Water Conservation District retrofitted the original Capay diversion dam with a "bladder" dam, at that time the longest inflatable dam in the world, to conserve water and revenue from the valley's agriculture. Winter floods in 1995 and 1998 caused severe erosion along Cache Creek. In addition, after years of fundraising, the new Esparto Regional Library branch of the Yolo County Library opened in 1999.

2000 to Present

In year 2001, Capay Valley residents reactivated the Citizen's Advisory Committee for the update of the 1983 Capay Valley General Plan. In 2002, plans were proposed for a massive expansion of the Indian casino at Brooks. Yolo County Supervisors, local residents, and tribal representatives sought ways to find common ground on approaches to growth and change. In late September 2002, the Board of Supervisors reached an agreement with the Wintun Tribe over terms of the expansion and mitigations on environmental impacts.

EARLY SETTLEMENTS

The California Gold Rush transformed the Capay Valley area from an isolated farming community into a booming agricultural region as disenchanted miners realized they could make a greater fortune through farming and ranching rather than gold prospecting. The majority of growth occurred in near roads and fords crossing Putah and Cache Creeks. Characteristic of this period in northern California, remaining Native residents were moved to a series of reservations until few remained in their aboriginal homelands. Two Rancheria parcels were reserved in 1907 and 1908 for the remaining Patwin of the area. However, as was frequently the case throughout northern California, these parcels provided to be too productive in their agricultural potential and the residents were removed to a 66-acre parcel between Tancred and Brooks (Gerry:).

Guinda

In 1887, Capay Valley Land Company, a subsidiary of Southern Pacific Railroad Company, established the Guinda townsite adjacent to the railroad depot. Called the Guinda Colony Tract, 1,380 acres were laid by the company for a subdivision that included rural lots of 10 and 20 acres. Packing and shipping orchard fruit products stabilized the town's economy until the 1920s. By the 1980s, the town consisted of a small settled residential area and local businesses (Walters 1986).

Rumsey

Like Guinda, the Southern Pacific Railroad established the townsite of Rumsey in 1887, as it was the terminus of the railroad alignment from Elmira. The town was named for Captain DeWitt C. Rumsey, a pioneer landowner in the Capay Valley. Growth of Rumsey was slow and the town hall was not constructed until 1906. Agricultural land, especially organic farms, surrounds the town and much of the land is zoned as an agricultural preserve (Walters 1986).

PREHISTORIC ARCHAEOLOGICAL RESOURCES

Prehistoric site types include: habitation sites, limited occupation sites, hunting/processing camps, lithic reduction stations, milling stations, quarries/single reduction locations, rock art sites, rock features and burial locations. Sites may fall into more than one category. For example, habitation sites may be associated with rock art. Therefore, sites may be classified as more than one site type. The most common prehistoric site types found in the County are temporary occupation sites, followed by hunting/processing camps, habitation sites, milling stations, lithic scatters, rock features, quarry/single reduction loci, burial sites and rock art sites. The distribution of prehistoric sites is highly correlated to the presence of major rivers in the Sacramento Valley with their associated areas of high ground and natural levees, as well as creeks and minor drainages along the eastern slopes of the North Coast range and their adjacent interior valleys and grasslands.

The overall prehistoric archaeological sensitivity of the area is generally considered high, particularly in those areas near water sources, on terraces along watercourses, or along natural levees above sloughs in the delta area. In particular, the Cache Creek watershed in the Capay Valley watershed

possess river terraces that are rich in archaeological resources. In general, the lands on the margins of the Sacramento River are sensitive for prehistoric archaeological resources. Prehistoric archaeological sites often are located along riverbanks in the Central Valley, although they usually are found on natural rises that protected the inhabitants from frequent floods. Sites along the Sacramento River in Yolo County do exist, and the possibility remains that additional prehistoric deposits may be buried in similar locations, in natural buried contexts (such as under alluvial deposits) as well as cultural buried contexts (such as below constructed levees or mixed in as a portion of levee fill material).

HISTORIC LANDMARKS AND POINTS OF HISTORIC INTEREST

Several structures and one point of historic interest lie within the Capay Valley.[26,27] The Rumsey Town Hall located in Rumsey and the Canon School located north of Brooks have been designated as Historic Landmarks by the County and the State. The site of the former Capay-Langville School in Capay was designated a point of historic interest in July of 1981 by the State Historical Resources Commission upon recommendation by the Yolo County Museum and Historical Landmarks Advisory Committee.

Several other structures may be eligible for inclusion as a state or local historical landmark. The Rumsey School, Guinda Grange Hall, Guinda Store, the Capay Jail, and several of the older homesteads may be future candidates for inclusion in the historical records of either Yolo County or the State or National records. As activity occurs in the Capay Valley, either building or farming, and an archaeological or historical resource be encountered, the Yolo County Planning and Public Works Department is to be contacted prior to any further work. The agency may refer the matter to the appropriate historical agency for a determination as to appropriate safeguards to protect the archaeological find or historic site or structure. The agency may be the University of California at Davis, State Historical Resources Commission, or the Yolo County Museum and Historical Landmarks Advisory Committee.

Guinda Area

In the Guinda and surrounding area, five buildings and structures appear to meet the criteria for listing in the NRHP, the CRHR, or have local designation. However, these have not been formally nominated and listed in the National Register.

Rumsey Area

The town of Rumsey includes 7 properties that have been surveyed, evaluated, and found to meet the criteria for listing in the NRHP, the CRHR, or have local designation. The Rumsey Town Hall on Manzanita Street was listed in the National Register in 1972.

Brooks Area

One National Register-listed building is located in the vicinity of the settlement of Brooks in the Capay Valley. The Canon School on State Route 16 was constructed in 1884. It was listed in the National Register in 1972. Seven other historical resources in the vicinity appear in the Nation Register of Historic Places.

~~**Regulatory Setting**~~

~~**The 2003 General Plan Guidelines prepared by the Governor's Office of Planning and Research states that an area plan should considered during the preparation of the conservation element "the enhancement and protection of archaeological, historical, and**~~

paleontological resources" (p. 81). The California Environmental Quality Act (PRC 21001) declares the policy of the State to be that of taking "all action necessary to provide the people of this State with enjoyment of aesthetic, natural, scenic, and historic environmental qualities." The reference to "historic" environmental qualities has been taken to indicate that cultural resources must be considered in the preparation of Environmental Impact Reports, and that mitigation measures must be developed whenever these resources are jeopardized.

FEDERAL

The National Historic Preservation Act (NHPA) of 1966, as amended, is the primary mandate governing projects under federal jurisdiction that may affect cultural resources.

National Historic Preservation Act

Section 106 of the NHPA, requires federal agencies, or those they fund or permit, to consider the effects of their actions on the properties that may be eligible for listing or are listed in the NRHP. The regulations implementing Section 106 are codified at 36 CFR Part 800 (2001). The Section 106 review process involves four steps:

1. Initiate the Section 106 process by establishing the undertaking, developing a plan for public involvement, and identifying other consulting parties,

2. Identify historic properties by determining the scope of efforts, identifying cultural resources and evaluating their eligibility for inclusion in the NRHP,

3. Assess adverse effects by applying the criteria of adverse effect to historic properties (resources that are eligible for inclusion in the NRHP),

4. Resolve adverse effects by consulting with the State Historic Preservation Officer (SHPO) and other consulting agencies, including the Advisory Council if necessary, to develop an agreement that addresses the treatment of historic properties.

   To determine whether an undertaking could affect NRHP-eligible properties, cultural resources (including archaeological, historical, and architectural properties) must be inventoried and evaluated for listing in the NRHP. The criteria applied to evaluate the significance of cultural resources are defined as follows:

   (a) The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that are associated with events that have made a significant contribution to the broad patterns of our history; or
   (b) That are associated with the lives of persons significant in our past; or
   (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
   (d) That has yielded, or may be likely to yield, information important in prehistory or history.

Integrity refers to a property's ability to convey its historical significance. The seven aspects or qualities of integrity are: location, design, setting, materials, workmanship, feeling, and association. The importance and applicability of these qualities depend on the significance

of the property and the nature of the character-defining features that convey that significance.

Ordinarily, properties that have achieved significance within the past 50 years are not considered eligible for listing in the NRHP. However, such properties will be considered eligible if a property that achieved significance within the past 50 years is of exceptional importance.

As codified in 36 CFR Part 800.4(d)(2), if historic properties may be affected by a federal undertaking, the agency official shall assess adverse effects, if any, in accordance with the *Criteria of Adverse Effect* (36 CFR 800.5 (a)(1)). In general, an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP. Adverse effects include, but are not limited to physical destruction, damage, alterations not consistent with the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36 CFR part 68), removal, neglect, or change of setting, or the introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.

STATE

CEQA is the primary mandate governing projects under state jurisdiction that may affect cultural resources. A few other laws governing cultural resources may also pertain. These include California Public Resources Code 5097.9 et seq. (Native American Heritage), Senate Bill 18, Health and Human Safety Code 7050.5 et seq. (Human Remains). Records about Native American graves, cemeteries, and sacred places, as well as information about the location of archaeological sites are exempt from being disclosed to the public under California's equivalent of the Freedom of Information Act (also known as "Sunshine Laws") (California Government Code 6254.10). Such information is considered sensitive and confidential and should not be contained in a public document.

California Environmental Quality Act

CEQA requires that public or private projects financed or approved by public agencies must assess the effects of the project on historical resources. Historical resources are defined as buildings, sites, structures, objects or districts, each of which may have historical, architectural, archaeological, cultural, or scientific significance.

CEQA requires that if a project results in an effect that may cause a substantial adverse change in the significance of an historical resource, then alternative plans or mitigation measures must be considered; however, only significant historical resources need to be addressed. Therefore, prior to the assessment of effects or the development of mitigation measures, the significance of cultural resources must first be determined. The steps that are normally taken in a cultural resources investigation for CEQA compliance are as follows:

1. Identify potential historical resources

2. Evaluate the eligibility of historical resources

3. Evaluate the effects of a project on all eligible historical resources

CEQA Guidelines define three ways that a property may qualify as a *historical resource* for the purposes of CEQA review:

1. The resource is listed in or determined eligible for listing in the CRHR.

2. The resource is included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in a historical resource survey that meets the requirements of Section 5024.1(g) of the Public Resources Code, unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

3. The lead agency determines the resource to be significant as supported by substantial evidence in light of the whole record (14 CCR, Division 6, Chapter 3, Section 15064.5[a]).

These three conditions for qualifying as a historical resource under CEQA are related to the eligibility criteria for inclusion in the CRHR (Public Resources Code, Sections 5020.1[k], 5024.1, 5024.1[g]). A cultural resource may be eligible for inclusion in the CRHR if it:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, properties that are listed in or eligible for listing in the NRHP are considered eligible for listing in the CRHR, and thus are significant historical resources for the purposes of CEQA (Public Resources Code, Section 5024.1[d][1]). According to CEQA, a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant impact on the environment (CEQA rev. 1998, Section 15064.5[b]). CEQA further states that a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource would be materially impaired. Actions that would materially impair the significance of a historical resource are any actions that would demolish or adversely alter the physical characteristics of a historical resource that convey its historical significance and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of Sections 5020.1 (k) and 5024.1 (g) of the Public Resources Code.

Unique Archaeological Resource

CEQA (Public Resources Code, Division 13, Section 21083.2) states that a *unique archaeological resource* is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, a high probability exists that it may meet any of the following criteria:

1. Contains information needed to answer important scientific research questions and that a demonstrable public interest in that information;
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Regulations Concerning Native American Heritage

California Public Resources Code 5097.9 states that no public agency, or a private party on a public property, shall "interfere with the free expression or exercise of Native American Religion…." The Code further states that:

> No such agency or party [shall] cause severe or irreparable damage to any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine…except on a clear and convincing showing that the public interest and necessity so require. County and city lands are exempt from this provision, expect for parklands larger than 100 acres.

State Bill (SB) 18 went into effect March 1, 2005, and is intended to provide additional protection for Traditional Tribal Cultural Places. Any agency contemplating adoption or amendment/ update of any General Plan or Specific Plan must call the Native American Heritage Commission (NAHC) for a consultation as soon as possible in the planning process. NAHC will determine the relevant tribes to contact, and the lead agency must then contact them with their plan proposal. Under the law, the tribes have 90 days from the time they are contacted about the project to respond with comments, which must be considered in the planning process. This legislation stipulates the following planning regulations:

1. Recognize that California Native American prehistoric, archaeological, cultural, spiritual, and ceremonial places are essential elements in tribal cultural traditions, heritages, and identities.
2. Establish meaningful consultations between California Native American tribal governments and California local governments at the earliest possible point in the local government land use planning process so that these places can be identified and considered.
3. Establish government-to-government consultations regarding potential means to preserve those places, determine the level of necessary confidentiality of their specific location, and develop proper treatment and management plans.
4. Ensure that local and tribal governments have information available early in the land use planning process to avoid potential conflicts over the preservation of California Native American prehistoric, archaeological, cultural, spiritual, and ceremonial places.
5. Enable California Native American tribes to manage and act as caretakers of California Native American prehistoric, archaeological, cultural, spiritual, and ceremonial places.
6. Encourage local governments to consider preservation of California Native American prehistoric, archaeological, cultural, spiritual, and ceremonial places in their land use planning processes by placing them in open space.
7. Encourage local governments to consider the cultural aspects of California Native American prehistoric, archaeological, cultural, spiritual, and ceremonial places early in land use planning processes.

~~**Regulations Concerning Human Remains**~~

~~**Disturbance of human remains without the authority of law is a felony (California Health and Safety Code, Section 7052). If the remains are Native American in origin, they are within the jurisdiction of the Native American Heritage Commission (NAHC) (California Health and Safety Code, 7052.5c; Public Resources Code, Section 5097.98). According to state law (California Health and Safety Code, Section 7050.5, California Public Resources Code, Section 5097.98), if human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the coroner of the county has been informed and has determined that no investigation of the cause of death is required; and if the remains are of Native American origin: the descendants from the deceased Native Americans have made a recommendation to the landowner or the person**~~

responsible for the excavation work for means of treating or disposing of with appropriate dignity the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98; or the NAHC was unable to identify a descendent or the descendent failed to make a recommendation within 24 hours after being notified by the commission. the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located is not damaged or disturbed by further development activity until the landowner has discussed and conferred with the most likely descendant(s) regarding their recommendations as prescribed in this section and, if applicable, has taken into account the possibility of multiple human remains. The landowner shall discuss and confer with the descendents regarding the descendents' preferences for treatment.

The descendents' preferences for treatment may include: preservation of Native American human remains and associated items in place, the nondestructive removal and analysis of human remains and items associated with Native American human remains, relinquishment of Native American human remains and associated items to the descendents for treatment, or other culturally appropriate treatment. The parties may also mutually agree to extend discussions, taking into account the possibility that additional or multiple Native American human remains, as defined in this section are located in the project area and to provide a basis for additional treatment measures.

According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the NAHC.

LOCAL GOVERNMENT REGULATIONS

Yolo County Code

Chapter 8 of the Yolo County Code pertains to the treatment of local historic landmarks and historic districts. Overseen by the Historic Resources Commission with guidance from the Historical Advisory Committee, the section of the Code provides for the identification, protection, enhancement, perpetuation, and use of cultural resources within the county that reflect elements of its cultural, agricultural, social economic, political, aesthetic, military, maritime, engineering, archaeological, religious, ethnic, natural, architectural and other heritage. A building, structure, object, particular place, vegetation or geology, may be designated a County historic landmark if it meets one or more of the following criteria:

1. It exemplifies or reflects valued elements of the county's cultural, agricultural, social, economic, political, aesthetic, military, religious, ethnic, natural vegetation, architectural, maritime, engineering, archaeological or geological history; or
2. It is identified with persons or events important in local, state or national history; or
3. It reflects significant geographical patterns, including those associated with different eras of settlement and growth and particular transportation modes; or
4. It embodies distinguishing characteristics or an architectural style, type, period, or method of construction or is a valuable example of the use of indigenous materials or craftsmanship; or
5. It is representative of the notable work of a builder, designer or architect; or
6. It represents an important natural feature or design element that provides a visual point of reference to members of the community.

~~When an area includes at least two designated historic landmarks in such proximity that they create a setting historically or culturally significant to the local community, the state, or the nation, sufficiently distinguishable from other areas of the County, then a historic district may be established. Historic Districts may include structures and sites that individually do not meet criteria for landmark status but which geographically and visually are located so as to be part of the setting in which the other structures are viewed. With the exception of those types of projects specified in the design review guidelines or work authorized by the Building Official upon written approval of the Planning and Public Works Department for protection of public safety, projects that would demolish, move, remove, alter the exterior appearance of, or otherwise affect a designated historic landmark or any structure located in a designated historic district must first obtain written approval from the Historic Preservation Commission. (§ 1, Ord. 1104, eff. May 17, 1990).~~

~~Responsible Agencies~~

~~The Yolo County Museum and Historical Landmarks Advisory Committee, in conjunction with the Yolo County Parks and Recreation Advisory Committee, inventory and recommend places and structures of local historical significance for inclusion in local, state, or national registers of historical sites, places, or points of interest.~~

~~Once a site gains formal historical status, the Yolo County Planning and Public Works Department reviews all development applications in light of possible conflicts with historically recognized attributes of the area as part of the general processing of a land development application.~~