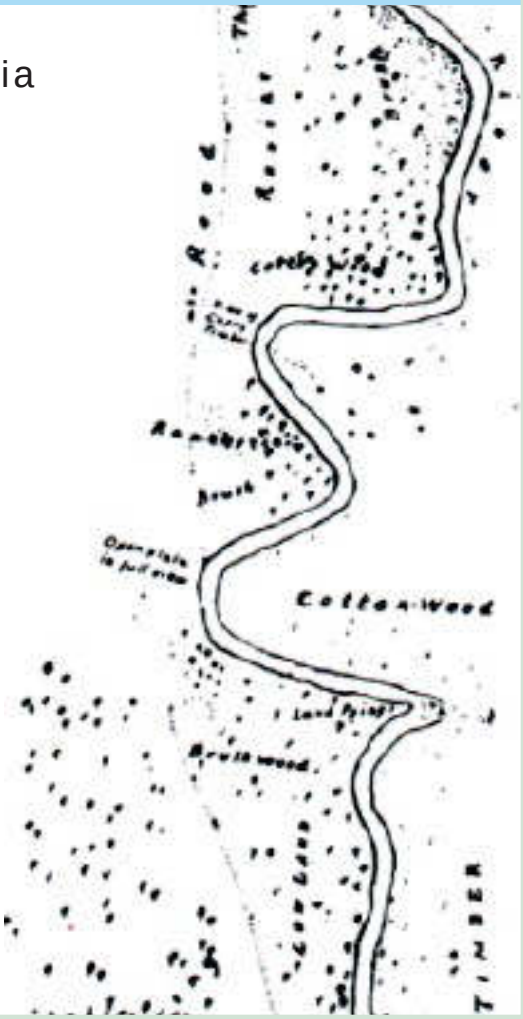
California State University, Chico
Archaeological Research Program
Reports, No. 52

Cultural Resource Investigation for the Colusa Subreach Planning Volume I of II

Glenn and Colusa Counties, California



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14 January 2005

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Note: Confidential Appendices contain information that is restricted from public distribution, such as archaeological site location maps, site records, and personal addresses and phone numbers of Native American individuals and organizations.

1.0 INTRODUCTION

1.1 Project Description and Location

The Nature Conservancy (TNC), a non-profit environmental preservation organization, proposes to conduct riparian restoration activities on eight tracts of land along the Sacramento River as part of the Colusa Subreach Planning (CSP). The planning project, funded by a three-year grant from the California Bay Delta Authority, affects a twenty mile reach of the Sacramento River, within the Sacramento River Flood Control Project levees (TNC 2004).

The project area consists of eight parcels in Glenn and Colusa counties located between Princeton and Colusa, California, referred to as the Cruise'n Tarry, Colusa North, Boeger, 1000-acre Ranch, Stegeman, Jensen, Ward, and Womble tracts (Figures 1 through 5; Appendix A). Specific locational information for each of the analysis areas is presented in Table 1, below.

Table 1. Location Information for Analysis Tracts

Tract Name	Twp	Range	Section	7.5'Quad Map
Womble, Jensen	18N	1W	S½ of SW¼ of the NE¼ and the SW¼ of Section 29; E½ of SE¼ of Section 30; NE¼ of the NE¼ of Section 31; N½ of the NW¼ of Section 32	Princeton and Butte City
1000-acre, Stegeman	16N	1W	NW¼ of Section 6; SE¼ of the NE ¼ and the SE¼ of the SW¼ of the NE¼ of Section 7	Sanborn Slough, and Moulton Weir
Boeger	16N	1W	W½ of the NW¼ and the W½ of the SE¼ of the NW¼ of Section 8; E½ of SE¼ of the NE¼ of Section 7	Colusa and Meridian
Colusa North	16N	1W	S½ of the SW¼ of the SW¼ of Section 8; W½ of the NW¼ of Section 17; E½ of the NE¼ and the NE¼ of the NE¼ of the SE¼ of Section 18	Colusa and Meridian

Tract Name	Twp	Range	Section	7.5'Quad Map
Ward	16N	1W	SW¼ of the SW¼ of Section 17; S½ of the SE¼ of Section 18; NE¼, the E ½ of the NE¼ and the SE¼ of the NW¼ of Section 19	Colusa and Meridian
Cruise'n Tarry	16N	1W	S½ of the SW¼ of the SE¼ of Section 17; N½ of the NE¼ of the NW¼ of Section 20	Colusa and Meridian

Current and previous land use of the project area tracts is limited to agricultural endeavors – both fallow and active – including former prune and walnut orchards and annual row crops. The proposed restoration project entails the disturbance of approximately two feet of soil through the removal of existing agricultural vegetation and nonnative species and the subsequent replanting of native riparian vegetation. The ultimate goal of the proposed undertaking is to restore a continuous riparian corridor along the Sacramento River that addresses flood control and economic and environmental uses of the floodplain.

The interim goal of the CSP is to increase citizen stakeholder involvement in determining realistic conservation strategies for the project area. The planning phases of the CSP will take place over a period of three years. During this time, public outreach, baseline environmental assessments (including cultural resource investigations), and various administrative tasks will occur. The result of the CSP will be the preparation of a Subreach Planning Report, which will synthesize the results of the three-year project and provide recommendations for restoration activities (TNC 2004).

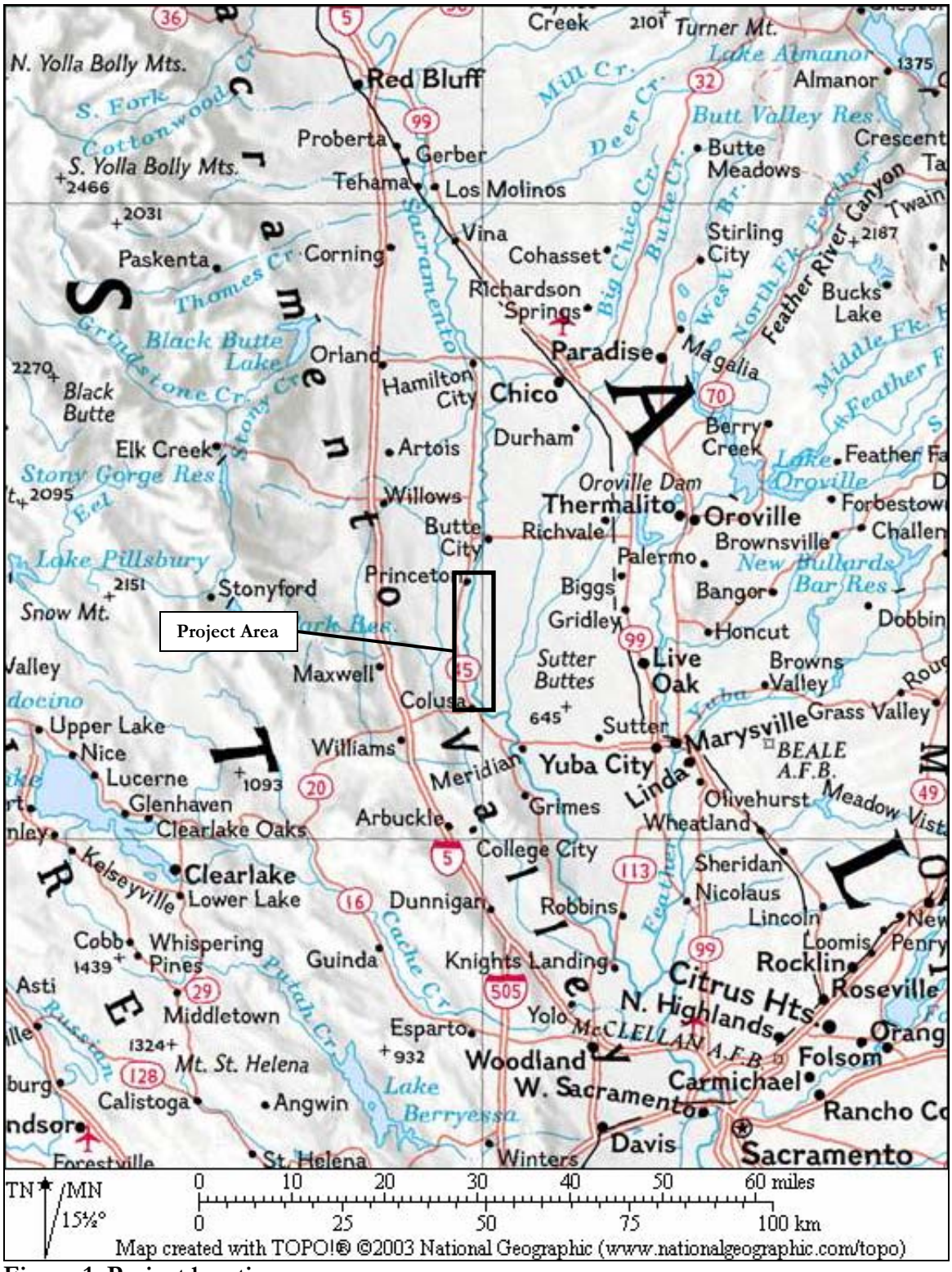

Figure 1. Project location map.

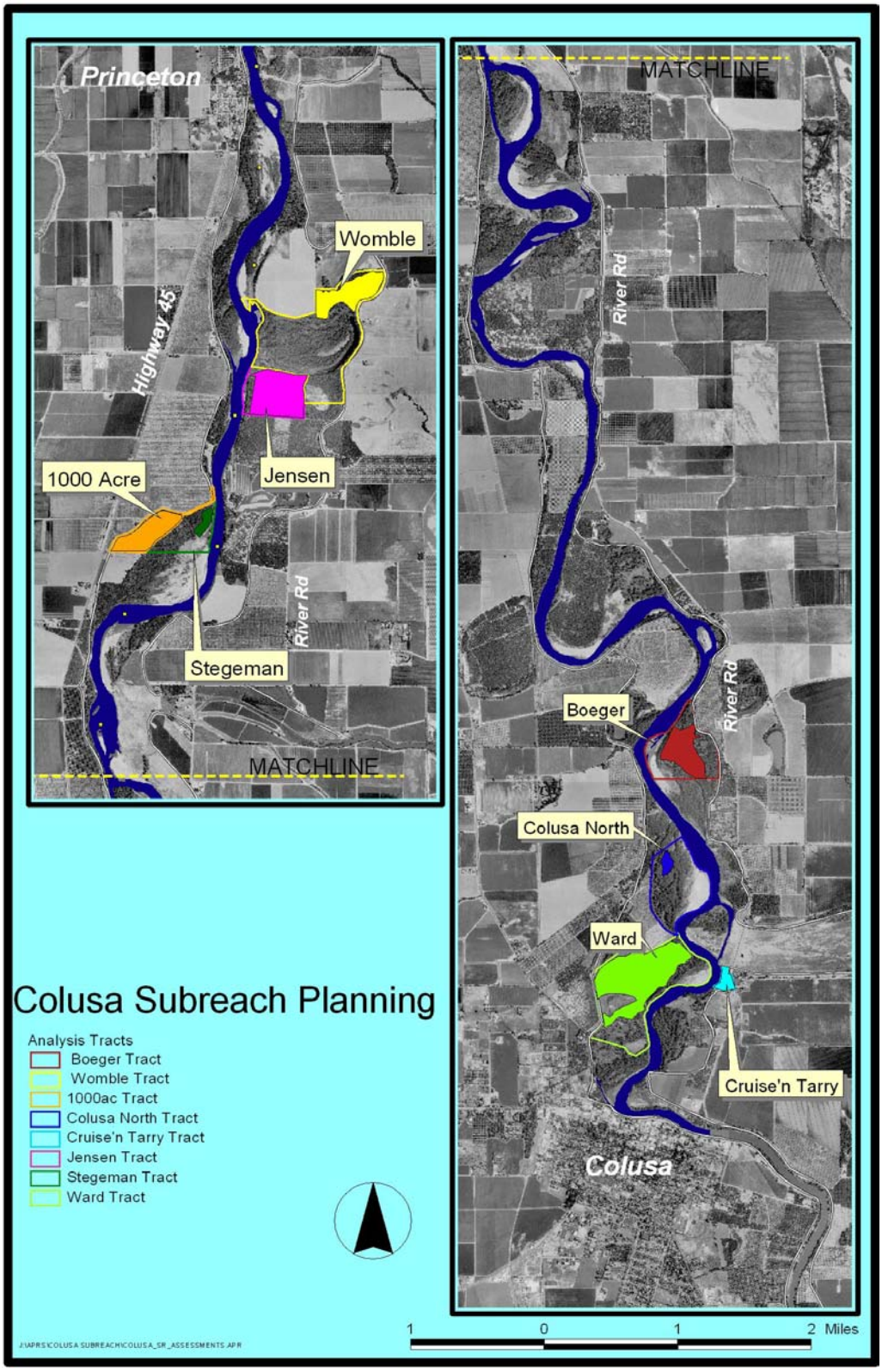

Figure 2. Location of analysis tracts.

The tracts total approximately 1,036 acres in size; however, only 40 percent of the total area will be subjected to restoration activities. As a result, two levels of cultural resource research were applied to the project areas. Each tract was subjected to a records search and literature review ("property boundary"), while only those areas anticipating restoration were subjected to an intensive pedestrian survey ("analysis area"). These areas are designated on aerial photographs of each tract (Appendix A) and on topographic quadrangle maps (Figures 3 through 5). Table 2 lists acreage for property boundaries and analysis areas.

Table 2. Acreage Subjected to the Cultural Resources Assessment

Tract Name	River Mile	Property Boundary (Total Area)[1]	Analysis Area (Surveyed)	Area not Surveyed
Ward	RM 145.5R	238	143	95
Cruise'n Tarry	RM 145.5L	10	10	0
Colusa North	RM 147R	118	5	113
Boeger	RM 148L	129	55	74
1000-Acre Ranch	RM 160R	60	50	10
Stegeman	RM 160R	69	10	59
Jensen	RM 161L	105	83	22
Womble	RM 162L	307	58	249
TOTAL		**1036**	**414**	**622**

[1] all areas are expressed in approximate acres, as calculated by TNC from aerial photographs

1.2 Personnel

All phases of the cultural resources investigation were conducted by, or under the direct supervision of, Archaeological Research Program senior staff. The ARP is led by a team of qualified professional archaeologists that meets the Secretary of the Interior's Standards for prehistoric and historical archaeologists.

Lisa Westwood, MA, RPA is the Assistant Director for the ARP and served as co-Principal Investigator, Project Manager, and Crew Chief for the CSP. She earned a Bachelor of Arts degree in Anthropology from the University of Iowa and a Master of Arts degree in Anthropology (archaeology) from Eastern New Mexico University. Ms. Westwood has over 10 years of cultural resource management, contract archaeology, and museum curation experience in northern and central California, southern Utah, and New Mexico. Ms. Westwood teaches undergraduate introductory archaeology and prehistory courses at Butte College, is listed on the Register of Professional Archaeologists, and is affiliated with the

Society for California Archaeology and the National Association of Environmental Professionals.

Dr. Gregory G. White, PhD has been the Director of the ARP since 1996 and served as co-Principal Investigator. He received a Bachelor of Arts degree in Anthropology (with distinction) from Sonoma State University; a Master of Arts degree in Anthropology from the University of California, Davis; and a Ph.D. in Anthropology from the University of California, Davis. Dr. White teaches introductory and advanced courses in archaeology and cultural resource management, as well as an archaeological field school, for the Department of Anthropology at CSU, Chico. Dr. White also currently serves as Editor-in-Chief of the *Society of California Archaeology Newsletter* and is an Executive Board Member and Business Office Manager for the Society for California Archaeology. He is affiliated with the Society for California Archaeology and the Society for American Archaeology.

Field crew members participating in the CSP were comprised of current student staff and recent graduates from California State University, Chico. At a minimum, crew members participating in the project must have 1) a minimum of 6 months of specialized experience and/or a 4-year course of study above high school at an accredited technical school, college, or university leading to a bachelor's degree with courses related to archaeology; 2) have specialized experience defined as experience that equipped the applicant with the particular knowledge, skills, and abilities to perform successfully the duties of the position; 3) be able to conduct an archaeological pedestrian survey using a compass, topographical map, and aerial photographs; 4) be able to identify historical and prehistoric artifacts; 5) be proficient at preparing sketch maps, site forms, isolate forms, and photography; 6) have the ability to use GPS units, aerial photographs, maps, and compasses in site recording and survey; and 7) be capable of following survey protocol and crew chief or project manager instructions. Field crew was comprised of Tim Carr, Tobin Rodman, BA, and Kristina Crawford, BA. Tim Carr also conducted archival research and oral interviews on the Cruise'n Tarry marina and Tobin Rodman assisted with initial Native American consultation.

Two additional crew members represented the Cortina Band of Indians (Cortina Indian Rancheria, Wintun Tribe) in Williams, California. Howard Whipple, Jr. and Derek Flores were selected for their past experience in archaeological survey and site recording – particularly in the vicinity of the current cultural resources investigation – and participated in all pedestrian surveys in the CSP project area.

1.3 Confidentiality

Sections 6253, 6254, and 6254.10 of the California State Code authorize state agencies to exclude archaeological site information from public disclosure under the Public Records Act. Likewise, the Information Centers of the California Historical Resources Information System maintained by the Office of Historic Preservation prohibit public dissemination of records search information. In compliance with these requirements, and those of the Code of Ethics of the Society for California Archaeology and the Register of Professional Archaeologists, the results of this cultural resource investigation were prepared in a publicly-accessible format that omitted archaeological site locations. Additional restricted information includes the names, addresses, and phone numbers of members of the Native American community contacted during this study. In consideration of these confidentiality concerns,

all sensitive information related to this study is presented in a separately bound volume with highly restricted distribution.

1.4 Regulatory Context

A funding source for the proposed restoration of riparian habitat has not been identified; however, TNC, in meeting its goals of conservation that considers its effects on all natural and cultural environmental issues, initiated the current cultural resources investigation. This study was conducted in a proactive effort to comply with Section 106 of the National Historic Preservation Act (NHPA; 1966 [Public Law 89-665; 16 U.S.C. 470 et seq.], as amended). Moreover, the completion of this cultural resources investigation during the project's early planning phases would allow TNC to more efficiently modify the project's design to avoid impacts to cultural resources.

Section 106 of NHPA states *[16 U.S.C. 470f — Advisory Council on Historic Preservation, comment on Federal undertakings]:*

> The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking (16 USC 470f).

Section 106 (as codified in 36 CRF 800, *Protection of Historic Properties*) further requires that if, through appropriate research and consultation, an adverse effect to historic properties is anticipated, then the lead agency must seek ways to avoid, minimize, or mitigate those adverse effects. The lead agency for this project, when identified, will be responsible for complying with Section 106 and submitting the required documentation to the appropriate consulting parties.

This cultural resources investigation was also conducted in accordance with the provisions of the California Environmental Quality Act (CEQA) that pertain to the treatment of cultural resources in planned projects under the jurisdiction of non-federal agencies. Title 14 of the California Code of Regulations, Chapter 3 (*Guidelines for Implementation of the California Environmental Quality Act*), Article 5 (*Preliminary Review of Projects and Conduct of Initial Studies*), Section 15064.5 states that any project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. As such, the lead agency is required to identify potentially feasible measures to mitigate significant adverse changes in the significance of an historical resource, which are enforced through permit conditions, agreements, or other measures.

Finally, the current project also conducted an historic resource inventory according to the Secretary of the Interior's Standards and Guidelines, compiling information sufficient to permit preliminary evaluation of each property for possible inclusion in the National Register of Historic Places (NRHP), following the Secretary of the Interior's Standards and Guidelines for Evaluation (48 F.R. 190:44729-44738; *Federal Register* Vol. 63 No. 79, April 24, 1998: 20496-20508) and the *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (1991).

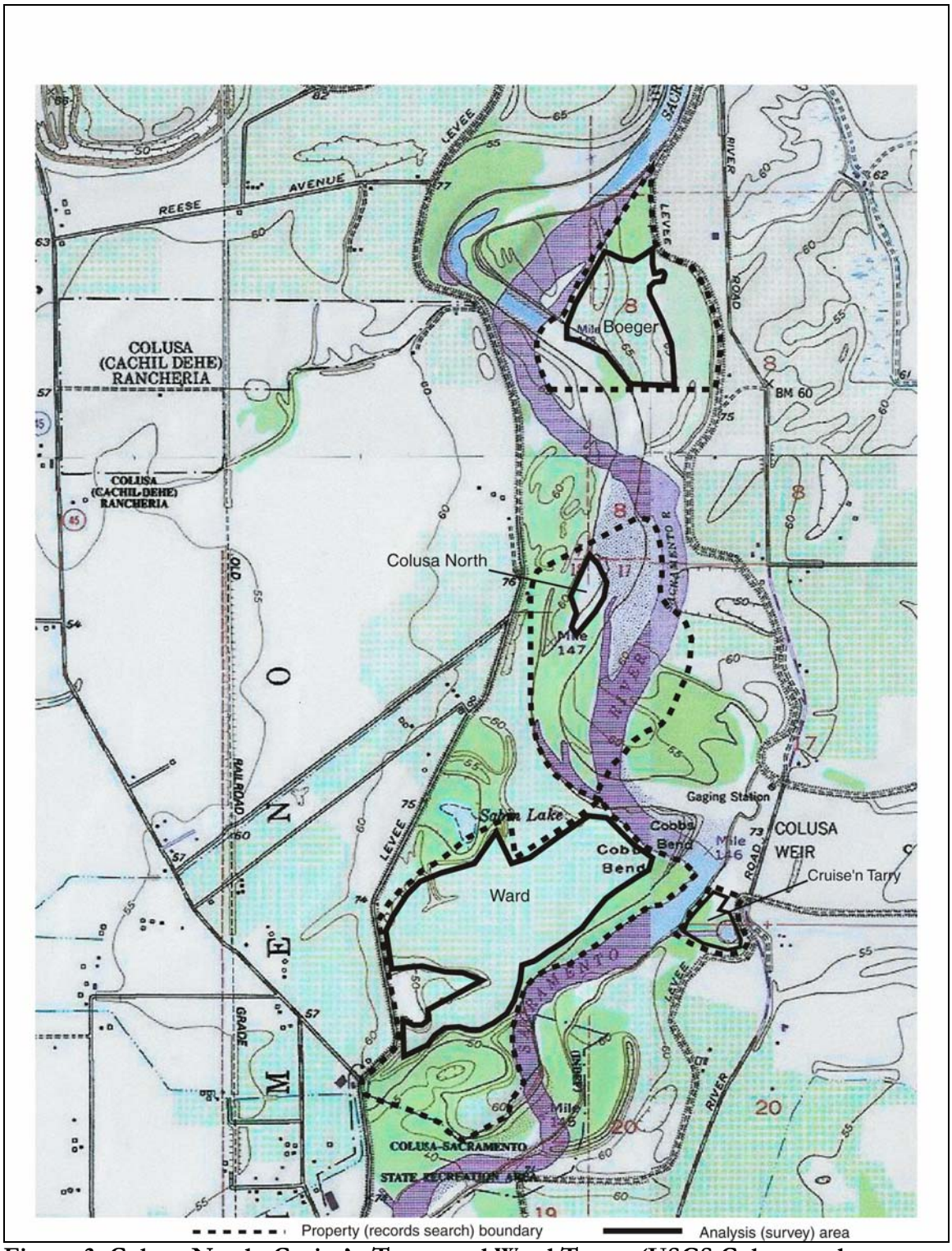

Figure 3. Colusa North, Cruise'n Tarry, and Ward Tracts (USGS Colusa and Meridian, CA 7.5' quads).

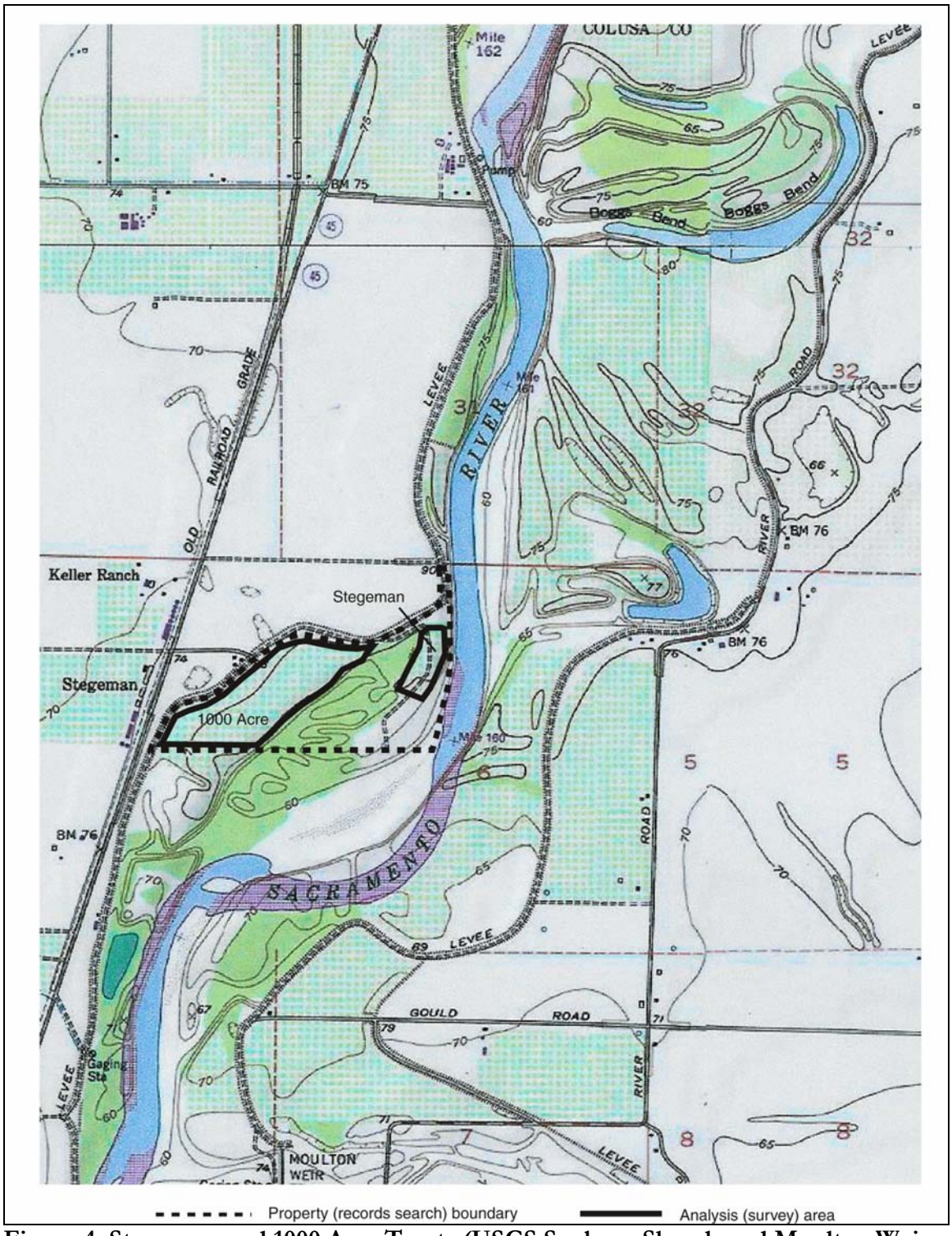

Figure 4. Stegeman and 1000 Acre Tracts (USGS Sanborn Slough and Moulton Weir, CA 7.5' quads).

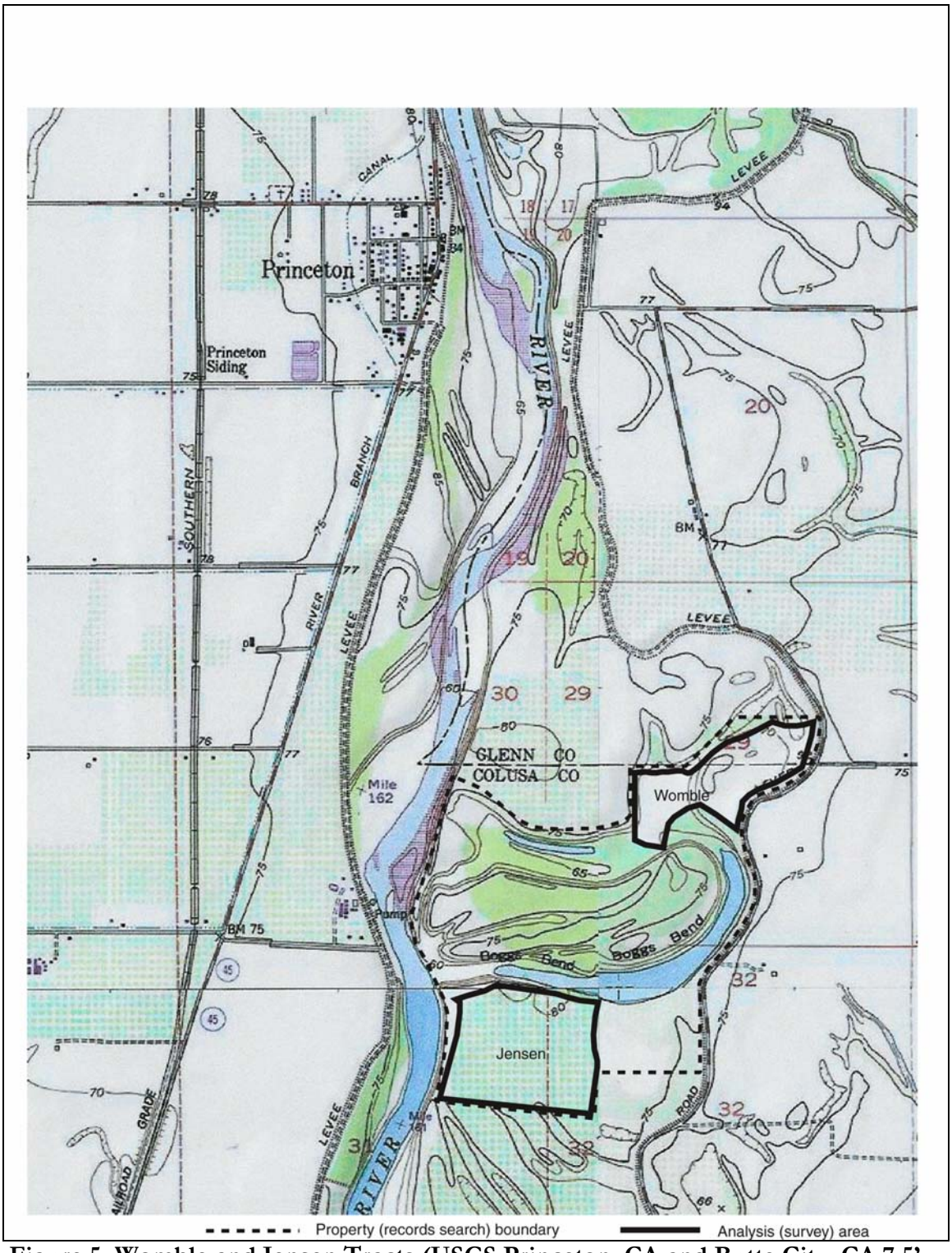

Figure 5. Womble and Jensen Tracts (USGS Princeton, CA and Butte City, CA 7.5' quads).

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2.0 SETTING

2.1 Natural Setting

The natural environment of the northern Sacramento River Valley, including the current project area, was previously examined in the *Cultural Resource Overview and Management Plan* for the US Fish and Wildlife Service, Sacramento River National Wildlife Refuge (White et al. 2003a). Others have thoroughly examined the present, historic, and paleoenvironmental conditions of the study area as well (see White 2003), which leads to a clearer understanding of prehistoric subsistence strategies and lifeways in and around the current project area.

2.1.1 Flora

Since historic times, the entire landscape of the central Sacramento Valley has been remodeled by agriculture and other forms of development, making it difficult to determine the extent and diversity of early ecological communities. Regardless, some early accounts of Euroamerican fur trappers and explorers serve as rare documentation of the natural environment of the area. Historically, three basic ecological communities were in existence: riparian woodland, California prairie, and seasonal wetlands. These zones were sorted laterally across the valley from the river to the foothills (Thompson 1961, 1980).

Riparian Woodland

Based on examination of relict stands, Thompson and others have defined the basic species composition and ecology of the riparian woodland (Barbour and Major 1988; Burcham 1981; Holland and Keil 1990; Ornduff 1974; Thompson 1961, 1980). The woodland had significant floral diversity and a complex architecture with woody Upper and intermediate overstory species and a dense understory of vines and herbaceous and shrubby plants. The overstory canopy was dominated by the California valley oak (*Quercus lobata*), Fremont cottonwood (*Populus fremontii*), and California sycamore (*Platanus racemosa*), all three representing deciduous, flood tolerant species possessing deep tap roots capable of reaching the permanent water table. A distinct intermediate overstory zone was composed of Oregon ash (*Eraxinus latifola*), walnut (*Juglans* sp.), cottonwood (*Populus* sp.), big leaf maple (*Acer macrophyllum*), California box elder (*Acer negundo sub californicum*), White alder (*Alnus rhombifolia*), California bay (*Umbellullaria californica*), and willow (*Salix* sp.). Typical understory species included elderberry (*Sambucus mexicana*), mugwort (*Artemisia douglasiana*), mulefat (*Baccharis viminea*), wild rose (*Rosa californica*), button-willow (*Cephalanthus occidentalis*), and blackberry (*Rubus* sp.). Common vines and climbers included Dutchman's pipe vine (*Aristolochiacalifornica*), poison oak (*Rhus diversiloba*), wild grape (*Vitis californica*), greenbrier (*Smilax californica*), and wild clematis (*Clematis* sp.). The parasitic big mistletoe (*Phoradendron tomentosum sub. macrophyllum*) is found on overstory trees (Katibah 1984; Ornduff 1974; Roberts et al. 1980; White et al. 2003a).

California Prairie

In 1849, Lt. G.H. Derby of the U.S. Army led a mapping expedition which depicted a mile-wide corridor of woodland bordering the river north of Colusa. The Derby and Ide maps depict broad prairies ("low, moist grounds bearing much grain") extending out directly from

the riparian forest. California prairie occupied the largest section of valley floor, the broad, flat to gently sloping plains between the foothills and floodplains. A deep water table and long dry season meant that the grassland habitat lacked moisture for four to eight months every year. Annual weather cycles conditioned the type and density of grassland plant species (Crosby 1986; Heady 1988). Cool season species matured between April to June, while a few warm season annuals reached peak growth during the summer months. Dominant bunch grasses included needle grass (*Stipa pulchra*) and nodding needlegrass (*Stipa cernva*). Common perennial and annual grasses included California oatgrass (*Danthonia californica*), tufted hairgrass (*Dechampsia caespitosa*), three-awn (*Aristida* sp.), hairgrass (*Deschampsia danthonoides*), western and Idaho fescues (*Festuca occidentaus*, *F. idahoensis*, *F. megalura*, and *F. pacifica*), Pacific reedgrass (*Calamagrostis nuthaensis*), rye (*Elymus glaucus* and *E. triteoides*), junegrass (*Koeleria cristata*), melicgrass (*Melica californica* and *M. imperfecta*), and bluegrass (*Poa Scabrella*). Common forbs included brodiaea (*Brodiaea* sp.), buttercup (*Ranunculus occidentalis* and *R. californicus*), blue-eyed grass (*Sisyrinchium bellum*), lupine (*Lupinus variicolor*), clover (*Trifolium* sp.), and vetch (*Vicia* sp.). Primarily a treeless plain, the prairie also had a valley oak phase marked by widespread single trees and an occasional large, closed stand (Burcham 1981:81; Heady 1988:495; White et al. 2003a).

Seasonal Wetlands

Flooding created winter-spring wetlands including vernal pools in the basins alongside the Sacramento River floodplain. Plant succession around the pools and mudflats began with the wet season floods, promoting growth of species adapted to cool weather and fresh water. In the spring the wetlands dried and poor drainage and slow evaporation led to alkali accumulation. Accordingly, alkali-tolerant grasses and forbs dominated in the seasonal wetlands, including saltgrass (*Distichlis stricta*) alkali sacaton (*Sporobolus airoides*), peppergrass (*Lepidium latipes*), saltbush (*Atriplex* sp.), tarweed (*Hemizonia* sp., *Madia* sp.), hareleaf (*Lagophylla* sp.), and clover (*Trifolium fucatum*). Herbs and forbs also followed as the wetlands dried, and prairie grasses described above also intermixed with these elements, dominating in high areas and as the wetlands dried (White et al. 2003a).

2.1.2 Fauna

Commensurate with each floral community was a wide range of faunal species, most of which regularly traversed habitat boundaries. For example, most carnivores and omnivores, including coyote (*Canis latrans*), gray fox (*Urocyon cinerargentus*), badger (*Taxidea taxus*), spotted skunk (*Spilogale putorius*), striped skunk (*Mephitis mephitis*), bobcat (*Felis rufus*), puma (*Felis concolor*), black bear (*Ursus americana*), and grizzly bear (*Ursus horribilis*), had widespread distributions and might prowl all three habitats in a single foray. Storer and Tevis (1955) provide a number of late 19th century accounts of California grizzly in the Sacramento Valley lowlands (White et al. 2003a).

California Prairie Fauna

Of the three habitats, the California Prairie likely supported the highest proportion of large herbivores, including tule elk (*Cervus elophus nannodes*), pronghorn (*Antilocapra americana*), and black-tailed deer (*Odocoileus hemionus columbianus*) (White et al. 2003a).

Tule elk likely served as one of the most significant aboriginal game animals of the grasslands. Living in small, fluid herds whose movements changed "in response to local

conditions" (McCullough 1969:47; see also Smith 1973 and Phillips 1976:62), by September the elk probably accumulated near riparian woodlands within one mile of perennial water sources. The rut probably took place near the end of September, characterized by bull-dominated cow groups of up to 30 to 50 individuals. Larger herds probably coalesced after the rut, feeding primarily on acorn mast until November when they shifted to small, dispersed grazing groups occupying mixed prairie and oak woodland (McCullough 1969; Smith 1973; Phillips 1976; White et al. 2003a).

Pronghorn were also common in the California prairie. Subsisting primarily on annual grasses and forbs and relying on open ground and speed for defense from predation, the pronghorn was most likely a permanent resident of the prairie. The rut took place in October, characterized by small, buck-dominated doe groups of 5 to 15 individuals. Larger herds might gather in the late fall through spring, dispersing into smaller herds in the summer (White et al. 2003a).

Black-tailed deer is a subspecies of the mule deer that is found across a wide area, including coastal southern British Columbia; western Washington; Oregon; and in California south to Santa Barbara County, in the Cascade Range, and in the northern Sierra Nevada. In open prairie regions, like the California prairie, mule deer tend to concentrate in river breaks and brushy stream bottoms. They browse on several thousand different plant species across their range, and as such, they are capable of altering or severely damaging many plant communities. Black-tailed and Mule deer consume the leaves, stems, and shoots of woody plants most often during summer and fall, while grasses and forbs compose the bulk of spring diets. Mating Season can begin in September for black-tailed deer, with a birthing season beginning in April (Snyder 1991; USFS n.d.).

Small game typical of the prairie included the black-tailed jackrabbit (*Lepus californicus*), Beechey ground squirrel (*Spermophilis beecheyi*), kangaroo rat (*Dipodomys heermanni*), and pocket gophers (*Thomomys bottae*). These may have served as an equally important food source for prehistoric populations in the vicinity (White et al. 2003a).

Riparian Woodland Fauna

In light of the widespread dispersal of Black-tailed deer, they are most likely to be found in either open forested regions or on the plains and prairies. The Riparian Woodland community is a natural attractant to this species. Among other places, they are found in alpine, montane, and foothill zones, sheltering at lower elevations when snows become deep. In the high ranges of the Rocky Mountains, mule deer migrate during winter, sometimes moving 50 to 100 miles (80-160 km) (Snyder 1991; USFS n.d.).

However, in the lower elevations of the Sacramento River valley, black-tailed deer were probably fixed to specific territories, relying on cover provided by riparian woodland. Exceptions to this pattern include yearling dispersal, buck travel during the rutting season, wandering by aged deer, desiccation, burning, and disturbance from over-predation. In fact, an established animal can nearly always be found within a 450 m (500 yd) radius of the center of its home range. Black-tailed deer primarily subsist on green grass and browse in November through March, and oak and other browse between April through October (Taber 1956:164-165; White et al. 2003a).

Small game of the riparian woodland included gray squirrel (*Sciurus griseus*), ground squirrel, Audubon cottontail (*Sylvilagus audubonii*), brush rabbit (*Sylvilagus bachmani*), California quail (*Lophortyx californicus*), ringtail (*Bassariscus astutus*), as well as many small perching birds, rodents, reptiles, amphibians, and bats (White et al. 2003a).

River and Stream Fauna

The perennial nature of the Sacramento River meant that it could support a menagerie of river and stream fauna year round. Animals common to the river included beaver (*Caster canadensis*), Pacific pond turtle (*Clemmys marmorata*), molluscs (*Anodonta californiensis* and *Gonidea angulata*), and predators such as raccoon (*Procyon lotor*), ringtail (*Bassariscus astutus*), weasel (*Mustela frenata*), mink (*M. vison*), and river otter (*Lutra canadensis*). Resident riparian avifauna included waterfowl such as ducks, teal, and shovelers (*Anas* sp.), wood duck (*Aix sponsa*), coot (*Fulica americana*), double crested cormorant (*Phalacrocorax auritus*), western grebe (*Aechmophorus occidentalis*), and gulls (*Larus* sp.). Wading birds, some of which were migratory, included great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), snowy egret (*Egretta thula*), great egret (*Casmerodius albus*), and American bittern (*Botaurus lentiginosus*). The project area lies directly in the Central Valley path of the Pacific Flyway. Migratory waterfowl, including swans, geese, and ducks (*Anseriformes*) stop over between approximately November and February. Ethnographic accounts describe the valley thick with waterfowl during the winter season. In general, they favored open ground or shallow water of the basin areas (White et al. 2003a). Today, these migratory waterfowl species rest in flooded agricultural fields along the Sacramento River.

The extraordinary fisheries of the Sacramento River featured a number of resident and anadromous fishes. The largest migratory fish was the white sturgeon (*Acipenser transmontanus*); however, the most common fishes belonged to the cyprinidae family, including hitch (*Lavinia exilicauda*), splittail (*Pogonichthys macrolepidotus*), hardhead (*Mylopharadon conocephalus*), and the western pike-minnow (*Ptychocheilus grandis*). Other common resident fish included the western sucker (*Catostomus occidentalis*), Sacramento perch (*Archoplites interruptus*), and tule perch (*Hysterocarpus traskii*). Each of these species was widely dispersed most of the year, but during the spring season could be found clustered in side streams, sloughs, or shallow water habitats for nesting or spawning. Anadromous fishes primarily spawned in the late fall or winter, but also had spring runs. These included the Pacific lamprey (*Lampetra lethophaga*) and several salmonids, including the king salmon (*Oncorhynchus tshawytscha*), Coho salmon (*Oncorhynchus kisutch*), and steelhead rainbow trout (*Salmo gairdneri gairdneri*) (White et al. 2003a).

2.1.3 Physical Setting

The topography of the current project area is relatively flat, with elevations ranging between 60 and 75 feet above mean sea level. This topographic homogeneity is likely due to the ongoing soil formation processes of the Sacramento River. The project area is situated on relatively recent alluvial flood deposits left by the meandering river over time, resulting in the deposition of well-sorted, sandy alluvium that is easily tilled and well-suited for agricultural use. Meandering is visible by the presence of oxbow lakes, such as Boggs Bend, located between the Womble and Jensen tracts south of Princeton. The eastern extent of Boggs Bend is located approximately 1,400 meters (4,600 feet) from the current stream channel, attesting to the width of the meandering belt of the Sacramento River and the extent of its

resulting alluvial deposition. The relationship between the three soil types located along the river (Basins, Younger Floodplains, and Older Floodplains) with respect to archaeological sites and post-occupational taphonomy is discussed in greater detail in Section 3.0 (Research Design) and Section 6.0 (Discussion), as well as in the *Cultural Resource Overview and Management Plan* (White et al. 2003a).

The project area is located in the Colusa Subbasin of the Sacramento Valley Groundwater Basin, which is extends west from the Sacramento River to the Coast Range and foothills, south to Cache Creek, and north to Stony Creek. It accepts precipitation between 17 and 27 inches annually, and runoff, from a surface area of 1,434 square miles (DWR 2003). A number of hydrogeologic formations are present in the Colusa Subbasin; only two of which occurred within the last 10,000 years. The Holocene Stream Channel Deposits are comprised of unconsolidated gravel, sand, silt, and clay derived from the erosion, reworking, and deposition of the adjacent Tehama Formation and Quarternary stream terrace deposits. These deposits typically measure from 1 to 80 feet in thickness (Helley and Harwood 1985; DWR 2003). The Holocene Basin deposits are the result of the transportation of sediment-laden floodwaters across the floodplain. These deposits range in thickness up to 150 feet, and consist primarily of silts, clays, and stream channel deposits (DWR 2003). Hence, evidence for prehistoric human utilization of the project area could lie undetected beneath extensive alluvial deposits.

2.2 Cultural Setting

An understanding of the culture history of the vicinity is crucial to the accurate interpretation of cultural resources located within or adjacent to the project area. The culture history of the current project area can be described in terms of three general time periods: prehistoric (archaeological), ethnographic, and historical.

2.2.1 Archaeology

Evidence for ancient human occupation of the project area or vicinity is scant, but recent obsidian hydration sampling at Borax Lake near Clear Lake provides tentative evidence indicating that occasional obsidian quarrying activity was occurring in northern California as early as 16,000 years ago (White et al. 2003b:448-449). Sparse evidence and parsimonious toolkits indicate that these earliest peoples were culturally conservative, low-density hunters and foragers who moved between widespread resource patches and practiced technological traditions that were similar from region to region. Although human concurrence with Pleistocene megafauna is suspected, it is not well demonstrated in the archaeological record. The most ancient confirmed cultural traces in northern California are associated with the Western Clovis Tradition and Borax Lake Pattern. The Western Clovis Tradition (Willig and Aikens 1988) dating between approximately 10,500 to 13,500 years before present (BP). Western Clovis is represented by one site and a few scattered artifacts in Northern California, marked by use of the distinctive Clovis fluted point. Diet and settlement patterns remain matters of speculation (Fredrickson 1984:497; Fredrickson and White 1988).

Early Holocene cultures are represented in the region by the Borax Lake pattern, which is the northern California manifestation of the Western Stemmed tradition, dating between approximately 7,000 and 10,500 BP (Willig and Aikens 1998). The marker types include

wide-stemmed projectile points, and manos and metates, with deep, flue-like basal thinning, large bladelet flakes, and well-worked unifacial tools, which are carryovers from Paleo-Indian technology. A few sites have produced plant and animal remains indicating that the Borax Lake Pattern diet featured large nuts and small and large game (White et al. 2003b). Several sites attributed to this age have been identified within the foothills of Glenn and Colusa counties, composed of stemmed projectile points, cores and core tools, and a mano and metate; and other sites, whose lower deposits are consistent with a Borax Lake Pattern assignment (White et al. 2003b).

In the Middle and Late Holocene, between approximately 7,000-1,200 BP, distinct regional cultural traditions first emerged in northern California and include the Mendocino and Berkeley Patterns. In the north Coast Ranges, the Berkeley Pattern was endemic to alluvial basins, while the Mendocino Pattern was common to foothills and mountainous terrain, suggesting different ecological niches. Mendocino Pattern artifacts include notched, concave-based, and thick leaf-shaped projectile points, shaped and cobble manos and metates, cobble pestle and mortars, and basalt core tools. Rock features such as hearths, ovens, and cairns were common, although no domiciles have been identified. Components are invariably non-midden deposits ranging from attenuated materials typical of a brief stay to more substantial and diverse assemblages indicating seasonal base camps. Studies of plant and animal remains indicate a focus on small seeds and a mix of small and large game.

After 3,000 BP, the archetypical Upper Archaic culture is the Berkeley Pattern, which had considerable cultural diversity, with distinct variants having been identified in the central Sacramento Valley and central North Coast ranges (Bennyhoff 1994; White et al. 2003b). Certain traits are common to all Berkeley Pattern variants, including a highly developed bone-tool industry, *atl-atl* engaging hooks, and dart-sized non-stemmed points (Beardsley 1954:74; Fredrickson 1974:125-126; Lillard et al. 1939:77). Inter-regional trade intensified, as evidenced by widespread stylistic traits, marine shell beads, and obsidian. Berkeley Pattern sites contain many features, especially fire-cracked rock heaps, shallow hearths, rock-lined ovens, house floors, cairns, and graves. The high frequency of mortars and pestles relative to flaked stone has been read to indicate a heavy reliance on acorn processing (Fredrickson 1974:125; Moratto 1984:209; White et al. 2003b).

During the Late Holocene, after 1,200 BP, many Archaic technologies and cultural traditions disappeared, in each region replaced by the onset of cultural patterns and behaviors similar to those existing locally at the time of culture contact. The archetypical Emergent Period culture is the Augustine Pattern, a widespread tradition marked by the coalescence of long-distance trade spheres and the introduction of the bow and arrow, which replaced the *atl-atl*. The Augustine Pattern has been divided into two phases common to most or all localities. Phase I markers include *Olivella* whole and lipped beads, "banjo" type *Haliotis* ornaments, elaborately incised bird-bone whistles and ear tubes, and "flanged" soapstone pipes. Phase 2 artifacts include small corner-notched and triangular points, clam disc beads and bead drills, magnetite cylinders, bedrock mortars, and house pit sites often ascribable to known ethnographic villages (Beardsley 1954:77-79; Bennyhoff in Elsasser 1978:44; Fredrickson 1984; Moratto 1984:213). Other new traits which distinguished the Augustine Pattern include pre-interment grave pit burning with tightly flexed burials, and cremation, a form of burial apparently reserved for high status individuals during Phase I, but widespread during Phase 2 (Fredrickson 1974:127; Moratto 1984:211). Grave offerings such as shell beads and

ornaments regularly occurred with utilitarian items, including mortars and pestles. The Augustine Pattern economy was regionally variable, although shaped mortars and pestles predominate with charred acorns frequently found in middens. Sites consistent with a Late Holocene occupation in Colusa county include the upper component of Mathis Mound; and several sites excavated north of the town of Sites, which are represented by recent prehistoric short-term seasonal gathering camps or stations occupied by a few individuals and possibly related to a larger permanent or semi-permanent village [West et al. 1976:10].

2.2.2 Ethnography

The aforementioned patterns recognized by archaeologists continued to the point of contact with Western society. Early Euro-American anthropologists and explorers often recorded their observations and opinions of Native American cultures en route across North America, on missions, trade routes, or exploration. This early ethnographic information provides archaeologists with a valuable link between the archaeological record and modern Native American cultures.

The current project area was likely populated by the Patwin (Figure 6), which are linguistically classified as Wintun of the Penutian language stock. The Wintun are separated linguistically and culturally into three major groups: the northern Wintu; the central Wintun, or Nomlaki; and the southern Wintun or Patwin. These three groups represent mutually unintelligible languages, each divided into local dialects. The Patwin themselves are divided into two distinct groups, the River Patwin who inhabited approximately 80 miles along the Sacramento River, and the Hill Patwin, who lived in the Coast Range foothills.

Throughout the middle and late Holocene until European settlement, the early people of northern California remained hunting and gathering subsistence-based cultures. The absence of agriculture in the greater part of California may be linked with an efficiency of the collecting and hunting economy. Acorns were the staple food source of the Patwin, and were used in making gruel, soup, and bread. Other foods used by the Patwin include deer; fish, including salmon, perch, pike, and sucker; birds such as geese, duck, and quail; blackberries and elderberries; grubs; worms; and wild honey.

Patwin architecture is some of the most complex in terms of its permanence, size, and the amount of people required to organize and build community structures. Patwin dance houses are said to be some of the largest in California (Kroeber 1932, McKern 1923). Patwin houses were constructed for both permanent and temporary functions, and have been designated into four types of permanent housings: the dwelling house, the menstrual hut, the sudatory (sweat) house, and the ceremonial dance house. Patwin dance houses were the largest community structures, and were greater in size than those of the Nomlaki and Northern Wintun (Kroeber 1925). Unique to the Patwin, through also employed by the Pomo, are the use granaries, which were used to store acorn and other grains.

The Patwin traded for obsidian, along with cordage, headbands, and other commodities from the Pomo along the coast, with shell beads being the dominant monetary unit (Kroeber 1925, Powers 1975). Patwin ceremonial and religious practices combined elements of social performance, lineage, social hierarchy, economy, and technology. The Kuksu society, or

"Big-Headed" dance, practiced in varying forms throughout California, was a male secret society focusing on initiation through ritualistic raising of the dead (Kroeber 1925, 1932).

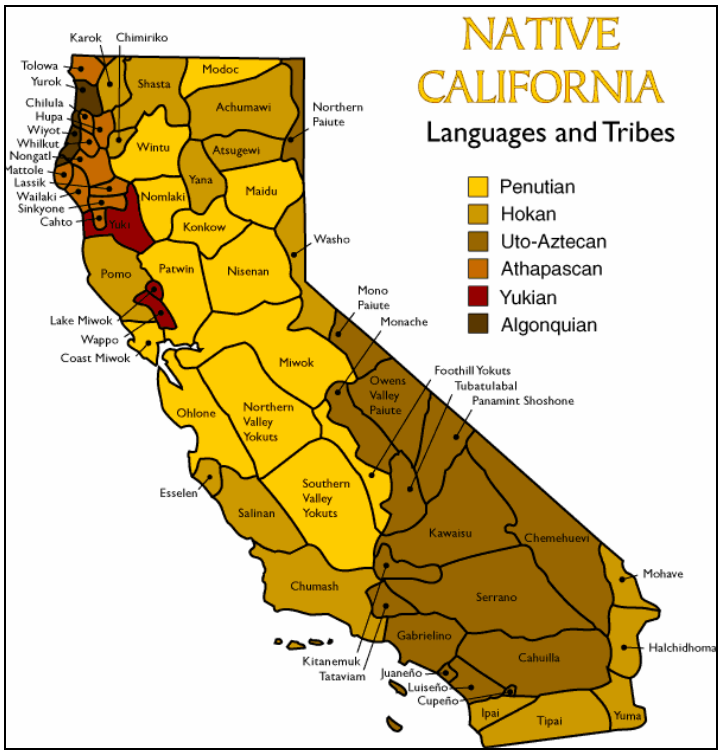

Figure 6. California Native American Tribal Groups (California Native American Heritage Commission 2004).

Culture contact between Native Californians and immigrant populations the world occurred at various times in northern California, dating to as early as 1579, when Sir Francis Drake visited the Coast Miwok. The project area formed the northern frontier of Spanish and Mexican territory, and accordingly, the region's earliest known non-Indian visitors consisted of Spanish military expeditions on patrol.

Early contact between the Euro-American settlers and the Native American inhabitants was relatively peaceful. The Colus Indians were prominent along the Sacramento River basin. Chief Sioc was the primary authority figure, well respected and feared by the people (Rogers 1891). The main Native American village site was located in Colusa, called Ko-ru or Coru, situated at the place where the Municipal Water Works of Colusa was built. An epidemic in 1832 forced the remainder of the native inhabitants across the river. At least a dozen villages were known to exist between Princeton and Sycamore, and many more in other areas along the Sacramento River (McComish and Lambert 1918).

2.2.3 History

It is believed that perhaps the first Euroamerican to enter the Colusa area was Spanish explorer Captain Gabriel Moraga in 1808. At that time, Moraga traveled from the San Francisco Bay, up the Sacramento River to a point about 18 miles north of the town of Colusa. Moraga traversed through an area that was home to Native American groups, which had occupied the area around Colusa for thousands of years. The name "Colusa" is believed to have been derived from the indigenous word, *coru*, referring to a Patwin village site.

The area likely remained relatively unknown to Euroamericans until 1843, when John Bidwell and Peter Lassen, in the interest of their employer, John Sutter, visited the area in pursuit of horse thieves. Bidwell was soon fascinated with the area, and eventually received two land grants by the Mexican government – one in Solano County and the other in Colusa County, named the Colus Grant. The appeal of the Colusa area to Bidwell, however, was not enough to outweigh that of the gold-bearing Feather River. However, Thomas Larkin, the American consul to the Mexican government in Monterey, built an adobe in 1847 near the abandoned Patwin village of Chah' de'-he near Princeton (Bidwell 1877 in Rogers 1891; White et al. 2003b).

Euroamerican settlement of the Colusa area is credited to a Kentuckian in 1846 or 1847, Dr. Robert Semple, when he became enchanted with the Colusa area during a passage up the Sacramento Valley to see Red Bluff. Optimistic about the potential of the Sacramento River for commerce, Semple later journeyed up the Sacramento River on a homemade vessel of cottonwood logs. He inquired about the ownership of land north of the Colus Indians, and discovered that it was part of a Mexican land grant owned by John Bidwell (Green 1876). Dr. Semple's brother, Charles D. Semple, was encouraged by his brother to purchase the land from Bidwell to establish a new city, at the location where Dr. Semple had originally observed the Colus Indian settlement. However, C. Semple misinterpreted his brother's directions, at originally set up camp at a temporary camp of the Colus, seven miles north of the actual location. A visit from Dr. Semple cleared up the misunderstanding, and realized that the most desirable location for the town – the location that Dr. Semple had intended – was downstream at Salmon Bend. Col. Semple, with the help of a carpenter named Hicks and an 18-year old man named Green, decided to move the new town to its intended location downstream. Several streets were initially laid out by Green, and the first house built was on Lot 2, in block 6, on Levee Street between 5th and 6th Streets. It measured 20 x 30 feet and 1.5 stories high, and operated as a store and bar by the firm of Semple & Green. Later, a hotel was attached (Green 1876).

Colusa soon became a way station on the route of wagon and mule trains that serviced Shasta and the northern mines. Several people recognized the potential of the Sacramento River for transportation of goods, people, and livestock from Sacramento north. Unfortunately, the river was known for its snags. The first steamboat commissioned to navigate the waters of the Sacramento River was called the "Colusa" in 1850. The ship was purchased for a total of $60,000, but broke down on her maiden voyage. Semple tried again with the Martha Jane. It proved unsuccessful, and was eventually sold to alleviate increasing debts. In 1851, Shasta merchant Lewis Johnson agreed to use a ship regularly if one could be found – and the Benicia boat was commissioned soon after. George V. Hight captained the vessel on its route from Sacramento with flour, but encountered snags at Knight's Landing

and sunk. The Orient was next in line, and was more successful. By 1854, the snags between Monroeville and Colusa were removed by town founder U. P. Monroe (Green 1876).

The town of Colusa began to grow. In just two months Levee Street was built up from 4th to 7th Streets. Early mercantile houses included Chenery & Hazzletine, Carpenter & Spalding, Alderman Brothers, Hoop & L'Ameroux, P. B. Woods, Van Wie & Co., Proctor N. Smith, and Patch Brothers. William Vincint and O. C. Berkey built the Colusa House, J. H. Leining built a restaurant in 1851, and W. Riley built a blacksmith shop (Green 1876). On approximately the fifth day of September 1855, the town of Colusa was nearly destroyed by a fire that started in a stable on the northwest corner of 6th and Main streets during a strong northerly wind. The only structures left after the fire were in the business district, the Colusa House, the National Hotel, and several one-story houses between the Colusa House and the river (Green 1876).

The town of Colusa was finally incorporated in 1868 (Green 1876) after the upper-class citizens of Colusa were distressed over the wallowing of pigs and miners in the streets (Cook n.d.). The Webster School House, on Webster Street between 4th and 5th Streets, was erected in 1871 by R. Fariss. A rear wing was added in 1874, and the building supported 500 students and teachers. The Colusa Water Works plant on 3rd and Levee was erected in 1870 to pump water from the Sacramento River to houses for domestic use. Over 10,000 feet of primary pipe was laid within the town (Green 1876). City Hall was built in 1870, known as the Station House at 6th and Main Streets. A new city hall was built on Market at 4th and 5th Streets in 1890 (Cook n.d.). The town grew to include the typical array of nineteenth-century small town businesses: attorneys, banks, barbers, bakeries, blacksmiths, cobblers, breweries, carpenters, clothing merchants, carriage painters, civil engineers, confectioners, dentists, pharmacists, hotels, music teachers, newspapers, oyster saloons, restaurants, saloons, tobacco and cigar shops, telegraph stores, wagon makers, wheat dealers, and wool dealers (Green 1876). In 1876, the town's population reached and estimated 2,500 residents, including 430 school children and six teachers. Colusa also was the home of the county courthouse and a county hospital (Green 1876).

Early on, lands in the Sacramento Valley were considered useless – fit only for raising and grazing stock. The first crop experimented with was wheat, planted about 0.5 mile west of Colusa, near Klew's Slaughter House in 1852. These early plantings were unsuccessful. Farming was primarily restricted to lands along the river, although a few inland farmers were successful as well (e.g., Gibson, Williams, Elrey, Weyand, Miller, Stoval, and Johns farms). By the mid 1800s, many people were farming wheat. The best soil, called black "dobe" was preferred for wheat crops, whereas the sandy soil mixed with gravel was better for barley (Green 1876).

Cruise'n Tarry Marina

The growth in the population of Colusa was undoubtedly related to its location along the navigable – yet perilous – Sacramento River. Thus, Colusa's tie to river commerce and recreation started early, and continues today. Evidence for recent historical use of the Sacramento River is located in the Cruise'n Tarry tract of the CSP. The Cruise'n Tarry marina site was constructed between 1958 and 1961 by the Stifler family (Don Stifler,

personal communication December 21, 2004). The marina complex included a launch ramp, boat dock, and a campsite (Jeff Fong, personal communication January 14, 2005).

During it's height of operation, the marina area was connected to the Sacramento River via a 450-yard channel. The complex covered eight acres, and was capable of docking up to 85 boats. Once a year, members of the non-profit sail and boating club called the United States Power Squadron sailed up the Sacramento River from the San Francisco Bay to the Cruise'n Tarry marina, bringing with it several large yachts up to 80 feet in length. The marina was a destination point for many Californians, who stayed at the marina's hotel and restaurant (Don Stifler, personal communication December 21, 2004).

Although the marina was a popular spot for local, Bay area, and Northern California hunters, fisherman, and vacationers, The Cruise'n Tarry marina also attracted popular figures such as Jack Elam and Merle Haggard. The use of the Upper Sacramento River by the movie industry for filming introduced many of its constituents to the area (Don Stifler, personal communication December 21, 2004).

The economic viability of the Cruise'n Tarry marina, however, suffered a decline in the 1960s, following severe erosion of the marina property. Business declined as maintenance and erosion abatement costs increased, and the marina was no longer profitable. It was sold in 1973, and changed hands several times since then (Don Stifler, personal communication December 21, 2004) – most recently to the Department of Water Resources.

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3.0 RESEARCH DESIGN

3.1 Previous Research

Prior to the initiation of fieldwork, the Archaeological Research Program contacted the Northeast Information Center and the Northwest Information Center of the California Historical Resource Information System, California Office of Historic Preservation to conduct a records search and literature review of previous research conducted within or immediately adjacent to the current project area (Confidential Appendix B). The Northeast Information Center at California State University, Chico was contacted for approximately 25 acres of property in the Womble Tract located in Glenn County. The Northwest Information Center at Sonoma State University was contacted for information on the remainder of the project area, located within Colusa County.

The Northeast Information Center (NEIC) examined official records and maps for archaeological sites and surveys located within the Glenn County portion of the project area and within a one-half mile radius of the project area (NEIC File #D04-75). According to the NEIC, no previously recorded prehistoric or historic archaeological sites are located within the records search area. The nearest recorded historical resource is Bridge #11-24, located near Butte City, as indicated in the Office of Historic Preservation Directory of Properties in the Historic Property Data File. In addition, no portion of the project area within Glenn County (i.e., the northern 25 acres of the Womble Tract) has been previously surveyed for cultural resources, nor has any property been surveyed within a one-half mile radius of the project area (NEIC 2004).

The NEIC also conducted a literature search, which included the following: the National Register of Historic Places – Listed Properties and Determined Eligible Properties (1988, Computer Listings 1966 through 7/2000 by the National Park Service), the California Register of Historical Resources (2004), the California Points of Historical Interest (1992), the California Inventory of Historic Resources (1976), the California Historical Landmarks (1966), the Directory of Properties in the Historic Property Data File for Glenn County (2004), and the Handbook of North American Indians, Vol. 8, California (1970). Based on the records search and literature review, the NEIC concluded that the project area appears to be located in an area considered to be moderately sensitive for prehistoric, protohistoric (ethnographic), and historical cultural resources (NEIC 2004).

The Northwest Information Center (NWIC) conducted a similar records search and literature review for the remainder, and majority, of the project area, which is situated within Colusa County (NWIC File #04-438). The NWIC examined official records and maps for archaeological sites and surveys located in Colusa County (NWIC 2004). While no previously recorded sites were located within the project area, two known prehistoric sites were noted within a one-half mile of the project area. These include CA-COL-8 and CA-COL-158.

Site CA-COL-8 is a habitation site recorded in 1949 by Sampker and Gilmer. The site was described as destroyed and formerly located in a "deep bend of the Sacto river" (Sampker

and Gilmer 1949). Beads and human remains were reportedly removed and taken to Sacramento. This site is believed to have been located immediately adjacent to one of the tracts in the current project area; however, discrepancies on its location and its destruction make identification in the field difficult. In fact, attempts to relocate CA-COL-8 during the 2004 survey were futile.

Site CA-COL-158 was first recorded in 1988 by Robert I. Orlins of California Archaeological Consultants. It was revisited and tested by the Archaeological Research Program in 2000, when it was determined to be much more extensive than previously thought. The site is now known to be comprised of habitation materials and features, including four separate, intact midden deposits, freshwater mussel shell, large and small mammal bone, baked clay, waterfowl and fish bone, fire-affected rock, obsidian flakes, at least three housefloor features, and human remains (ARP 2000). The site record indicates that the boundaries of CA-COL-158 are unknown, and possibly extend into one of the tracts located within current project area.

A number of previous cultural resource investigations have taken place within the current project area, or within a one-half mile radius of the project area. These studies are listed in Table 3, below.

Table 3. Previous Cultural Resources Investigations Conducted in the Vicinity

Report No.	**Date**	**Author[1]**	**Project Area Size**	**# Prehistoric Sites**		**# Historical Sites**		**# Multi-component Sites**		**Notes**
				Total	**Within 0.5 mi**	Total	**Within 0.5 mi**	Total	**Within 0.5 mi**	
S-945	1978	G. Greenway	c. 49 ac	15	**0**	0	**0**	0	**0**	
S-2917	1979	M. Russo		?	**0**	?	**0**	?	**0**	29 sites[2]
S-2948	1979	M. Russo	c. 50 ac	0	**0**	0	**0**	0	**0**	
S-7385	1985	H. Bass	c. 2000 linear ft	0	**0**	0	**0**	0	**0**	
S-9666	1986	J. and M. Maniery	c. 5.17 linear mi	1	**0**	0	**0**	0	**0**	
S-10064	1988	R. Orlins	c. 30 ac	1	**1**	0	**0**	0	**0**	
S-21783	1999	F. Deitz	c. 5 linear mi	0	**0**	0	**0**	0	**0**	
S-22818	2000	W. Nelson, M. Carpentar, K. Holanda		9	**0**	1	**0**	0	**0**	
S-24035	2001	A. Huberland, L. Westwood	c. 164 linear mi	23	**1**	1	**0**	0	**0**	
S-26001	2002	R. Klemm, et al.	City of Colusa	?	**0**	?	**0**	?	**0**	262 sites[2]
S-26288	1999	R. Mason et al.	c. 0.44 ac	1	**0**	0	**0**	0	**0**	
S-27129	2003	G. White, et al.		2	**1**	0	**0**	2	**0**	

Report No.	Date	Author[1]	Project Area Size	# Prehistoric Sites		# Historical Sites		# Multi-component Sites		Notes
				Total	**Within 0.5 mi**	Total	**Within 0.5 mi**	Total	**Within 0.5 mi**	
S-27477	2003	G. White	c. 12,837 ac	17	**1**	0	**0**	2	**0**	
S-27658	2003	G. White et al.	c. 7,102 ac	27	**1**	0	**0**	2	**0**	
S-27984	1999	Basin Research Associates	c. 5.5 ac, 4.2 linear mi	0	**0**	0	**0**	0	**0**	
S-27988	2001	C. Busby	25.5 linear mi	0	**0**	0	**0**	0	**0**	
S-28969	2003	C. Busby		1	**0**	1	**0**	0	**0**	

[1] The full citation for each report is provided in the References Cited section of this report.
[2] component not identified in NWIC bibliography.

Several of the previous investigations listed above overlapped areas located within the current project area. These include S2987, S2917, S-27658, which are located within the boundaries of the Ward Tract. In all cases, no new cultural resources were identified.

The NWIC also examined historical maps on file (see Confidential Appendix B). These included the 1907 USGS Colusa quadrangle map and the 1906 USGS Maxwell quadrangle map. Both maps, in comparison to modern topographic maps, illustrate the drastic changes in the path of the Sacramento River over time. The 1906 USGS Maxwell quadrangle map further indicates that the levee was in place at that time; therefore, any sites that were covered or destroyed during levee construction were done so before 1906.

The NWIC records search also revealed information about known or previously recorded resources in the area. The Office of Historic Preservation's Directory of Properties in the Historic Property Data File for Colusa County indicates that there are no less than 295 historic properties located in the City of Colusa, which attest to the historical significance of the town. These include the Colusa County Courthouse, the Hall of Records and County Jail, houses, home sites, schools, churches, hotels, barns, and one turkey shed.

Based on the record searches and literature reviews, expectations can be formed about the nature and extent of cultural resources that may be encountered in the project area. The likelihood exists that both prehistoric and historical unrecorded cultural resources are located within the project area.

The types of cultural resources that are potentially located within the site boundaries consist of prehistoric midden deposits, artifact scatters, and house-pit depressions. Midden deposits are recognized by the concentration of dark organically-rich and artifact laden soils, usually with bone and shell. Surface artifact scatters can range from a single to a thousand or more

artifacts, including flaked stone, baked clay, fire-affected rock, and culturally modified bone or shell. Obsidian and temporally diagnostic projectile point types are useful for determining the chronology of the site, among many other things. House pit features are often observed as slight rounded depressions in the topography that often co-occur with midden or surface artifact scatters.

Historical cultural resources may be present in the form of trash scatters, building foundations, collapsed structures, and road segments. Historical trash scatters often consist of metal can fragments, glass shards, and fragmented ceramics, among other household debris. These trash scatters can occur in association with former living sites, or may be the result of dumping. Hole-in-cap cans, amethyst glass, and ceramics stamped with the manufacturer's mark are examples of temporally diagnostic artifacts. Building foundations may take the form of low, concrete perimeter features, and are often associated with historical domestic trash scatters and other surface and subsurface features and deposits. Collapsed structures, such as chicken coops, well houses, and other outbuildings are usually constructed of wood, and may be associated with foundations. Abandoned historical road segments are often overgrown, but can be distinguished as linear, leveled areas, usually devoid of cultural material.

3.2 Native American Consultation

In compliance with Section 106 of the National Historic Preservation Act (1966; as amended), the ARP consulted with the Native American Heritage Commission and members of the Native American community regarding the effects of the proposed undertaking on traditional cultural properties, sacred sites, or other areas of sensitivity to the Native American community. On November 10, 2004, ARP requested a Sacred Lands Search of the project area from the California Native American Heritage Commission. In a letter report dated November 17, 2004, the search of the sacred land file "failed to indicate the presence of Native American cultural resources in the immediate project area." Because the absence of data in the file does not indicate the absence of cultural resources in the project area, the Native American Heritage Commission recommended that ARP contact nine individuals or organizations who may have knowledge of cultural resources in the project area (Confidential Appendix C). Individuals were contacted by letter on November 19, 2004 and by phone on December 8. None expressed any concerns about the proposed project. If comments are received after the submission of this report, they will be forwarded to TNC for further consideration and action.

3.3 Research Questions

Under Section 106, an historical resource is determined significant if it is eligible for listing on the NRHP. Sites are considered eligible for inclusion in the NRHP if they retain integrity of location, design, setting, materials, workmanship, feeling, or association (36.CFR800.5(a)(1)). In addition, a site must meet one of the following four criteria to be eligible:

> a) associated with events that have made a significant contribution to the broad pattern of our history; or

> b) associated with the lives of persons significant in our past; or
>
> c) the property embodies the distinct characteristics of a type, period, method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; or
>
> d) have yielded or may be likely to yield, information important in prehistory or history (§60.6).

Prehistoric sites are most often found to be eligible under criterion (d), while sites containing historical components are also considered under additional criteria.

To be determined significant under CEQA, cultural resources must meet one of three criteria—similar to Section 106 criteria—that define its eligibility for listing on the California Register of Historical Resources (Title 14 CCR Chapter 3 Article 5, Section 15064.5):

"Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code SS5024.1, Title 14 CCR, Section 4852) including the following:

> (A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
>
> (B) Is associated with the lives of persons important in our past;
>
> (C) 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
>
> (D) Has yielded, or may be likely to yield, information important in prehistory or history."

The California Office of Historic Preservation requires the use of a research design with testable hypotheses, which presents important research questions recognized for the region and relevant to the study, based upon previous research (OHP 1989). In effect, well-designed research questions guide the research methods and assess the potential for the recovery of scientifically valid data that is measured up to one or more of the significance criteria.

Several potential research questions pertinent to the area were developed by White, et al. (2003a) for the *Cultural Resource Overview and Management Plan*. While many potential research questions are appropriate, few are applicable to surface surveys. Only one, regarding density

and location of archaeological sites, is pertinent to the current investigation, and was considered herein.

Archaeological Visibility and Prehistoric Population Density

Previous research along the Sacramento River indicates that archaeological sites are not equally distributed across space or over time in the Sacramento River corridor. There are significant gaps in the spatial distribution of sites along the river, with broad swaths absent any recorded sites. With respect to dating evidence, among the sites for which dating evidence is available, most date less than 1,100 BP and only two (But-233 and Col-247) may be more than 2800 years old, both dating to a maximum age of around 4,500 BP. This is particularly striking in light of a foothill and mountain archaeological record which demonstrates that the human occupation of Northern California dates back to at least 13,500 BP. Interpretation of this pattern has been the subject of extensive local debate.

To date, most researchers have assumed that the temporal distribution of archaeological sites along the river is a direct reflection of colonization patterns and population density in the Sacramento Valley region. For example, Dreyer (1984) and Deal (1987) argue that the valley floor was initially colonized only after 4,500 BP and settlement intensified after 1,100 BP. All of the archaeological models developed for the region rely on this assumption, including cultural-historical models which propose a sequence of entry for the Konkow, Patwin, and Nomlaki culminating in a conflation of these tribes after 1,100 BP (Kowta 1988) and optimization models which cast the dynamic relationship between a logarithmic human population increase and change in diet breadth culminating after 1,100 BP (e.g., Bayham and Johnson 1990; Broughton 1994). The intuitive appeal of these models is their ability to account for the empirical pattern itself. However, the models also must assume that valley resources were not desired for the first 9,000 years of human occupation, sponsoring intensive use only in the last 1,000 years. This is improbable given an environmental record which indicates a high density and diversity of high-ranked foods along the river corridor and a regional archaeological record demonstrating that early populations in adjoining regions were interested in exactly these foods. Further, the archaeological record of adjoining regions clearly shows increased population density and an increase in adaptive diversity throughout the early to mid-Holocene, and these changes should have also occurred along the river corridor. In light of these concerns, it is not feasible to assume that the spatial and temporal distribution of archaeological sites along the river is *prima facae* evidence for prehistoric population. In fact, the river corridor should have been among the earliest habitats colonized in the region. There must be something else affecting the spatial and temporal distribution of archaeological sites along the Sacramento River, something that has diminished and/or deleted the older sites.

The *Cultural Resource Overview and Management Plan* (White et al. 2003a) investigation established that the density and distribution of archaeological sites in the study zone has been conditioned by the river's massive sediment budget, its propensity to deposit and erode masses of sediment and create and remove habitable landforms and their associated habitation traces. That preliminary study allows us to draw the conclusion that archaeological deposits were not draped upon but built into this landscape, and that throughout the span of human occupation this landscape constantly evolved. Older sites were diminished in number by the cumulative and ongoing effects of erosion and deposition. The alluvial fans,

floodplains, and basins on the floor of the central Sacramento Valley have a long and complex depositional history that is only partly understood. The present land surface caps an array of buried land surfaces, inundated by overflow sediments from the Sacramento River and associated tributaries. Buried archaeological phenomena are probably quite common in these deposits. Can we learn enough about Quaternary landscape formation along the river to predict the location and depositional context of subsurface archaeological deposits, particularly the early to mid-Holocene sites that, until now, have been missing from the record? If we become more skilled at identifying and investigating the limited geomorphic contexts where these older sites might be found, will our results revise our understanding of the rate and sequence of habitat colonization in Northern California?

The *Cultural Resource Overview and Management Plan* (White et al. 2003a) archaeological sensitivity study provided a model of expectation for the general location and depositional context for mid- to early Holocene archaeological sites. Near the CSP project area, older floodplains are laterally massive, and as a result, prehistoric archaeological deposits dating in excess of 3,000 BP should be located in deposits with a high medial distance (measured from the floodplain midline) and low lateral distance (measured from the nearest basin soil).

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4.0 METHODS

On November 20 and December 5, 2004, ARP conducted an intensive pedestrian survey of the entire project area, comprised of the Cruise'n Tarry, Colusa North, Boeger, 1000-acre Ranch, Stegeman, Jensen, Ward, and Womble tracts (Figures 1 through 5; Appendix A). The area subjected to an intensive pedestrian survey represented a subset of the entire project area, for which a records search was conducted. Table 2 listed the approximate acreage subjected to intensive pedestrian survey that corresponds to the analysis areas plotted on Figures 3, 4, and 5. A total of 414 acres was surveyed for indications of unrecorded prehistoric and historic cultural resources that may be impacted by the proposed riparian restoration project.

Survey transect intervals were spaced according to the amount of ground surface visibility present. In areas with 100 percent exposure of surface soils, transects were widened to 30 meters, while areas of higher sensitivity or low ground surface visibility were conducted using 10 meter transect intervals. Survey transects were completed in alignment with compass bearings to ensure complete coverage. In parcels where orchards were still present, crew walked between rows, while still maintaining the required interval spacing.

During the field investigation, the ground surface was examined for indications of surface or subsurface cultural resources. The general morphological characteristics of the ground surface were inspected for indications of subsurface deposits or those which may manifest themselves on the surface, such as depressions or ditches. Whenever possible, locations of subsurface exposures caused by such factors as road use, rodent burrows, and erosion were examined for indications of buried deposits. Upon the recognition of darker soil, field crew employed a hand trowel to further investigate the nature of the deposit and to distinguish it from the numerous burn piles observed throughout a number of the tracts. However, no subsurface investigations or artifact collection were undertaken during the archaeological survey.

Procedures for recording cultural resources used in the CSP are those required by the California Office of Historic Preservation and documented in *Instructions for Recording Historical Resources* (OHP 1995). Through the use of standardized archaeological site record forms developed by the Department of Parks and Recreation (DPR), important information on site location, description, constituents, features, and other important data is recorded. Isolated artifacts are recorded using a DPR Primary Record and Site Location Map.

OHP advocates density of cultural material as a key criterion for site identification: three associated artifacts at least 45 years of age (DPR 1992:2). A cultural resource was recorded as a site if there were three qualifying objects within 100 m^2 (e.g., 10 x 10 m area). Sites are also defined by the presence of buildings, structures, or features. Minimum documentation required for the recording of archaeological sites is contained with the *Instructions for Recording Historical Resources* (OHP 1995). Copies of all isolate and site records, as well as the final technical report, are submitted to the Northeast Information Center and the Northwest Information Center for inclusion in their files.

A hand-held 12-channel Global Positioning System (GPS) receiver was used to determine the Universal Transverse Mercator (UTM) coordinates of the beginning point of the survey for each tract. These coordinates were used in conjunction with the appropriate USGS topographic quadrangle map and aerial photograph to verify ground position. The GPS receiver was also to be used to document site datum locations or isolate locations.

An Olympus Camedia D-565 Zoom digital camera was used to take a minimum of one overview photograph of each tract surveyed to document the ground surface conditions at the time of survey. The camera was also to be used to supplement illustrations and sketch maps generated during site recording. Copies of all digital photographs and maps produced by ARP have been submitted to TNC in digital format.

5.0 REPORT OF FINDINGS

5.1 Ward Tract

The Ward tract was previously surveyed by ARP on December 5, 2002 as part of the *Cultural Resource Overview and Management Plan* (White et al. 2003a). At that time, a total of eight person days was spent on pedestrian survey of the 320-ace unit. Consistent transect intervals were maintained and good ground visibility was encountered throughout. No cultural resources were encountered in this unit.

The tract was resurveyed by ARP on November 20, 2004 to verify the absence of cultural resources. Minor ground disturbance (ie., tilling) since 2002 was believed to present an opportunity for previously undetected cultural deposits to appear on the surface. In light of the previous survey and absence of previously recorded sites, the ARP resurveyed the Ward tract in 2004 using 50 meter transect intervals.

The Ward project area consists of tilled row crops, primarily carrots, which replaced a former orchard in 1999. The field is currently fallow, and signs of emerging annual grasses are present (Figure 7).

Figure 7. Ward tract, view east.

In the eastern portion of the project area was observed a small burn pile, comprised of fire-affected rock, large charred pieces of wood, heat-affected glass, and burned clay. Upon further investigation and surface scraping, the burn pile was determined to be recent in origin. In fact, a number of burn piles with recent domestic and agricultural debris had been observed along the length of the levee. Therefore, the 2004 survey of the Ward tract confirmed the absence of cultural resources located within the project area.

5.2 Cruise'n Tarry Tract

The 10-acre Cruise'n Tarry tract analysis area was subjected to an intensive pedestrian survey using 10 meter transects on November 20, 2004. The former marina site was overgrown and only visible by an old paved access road and landscaped trees parallel to River Road, at its entrance. A large and debris-filled stagnant pond, possibly the marina itself, is situated between the access road and the Sacramento River (Figure 8). An old electrical box was also observed in the northern portion of the project area.

Figure 8. Cruise'n Tarry tract, view west from access road. Note the possible former marina in the foreground and the Sacramento River in the background, on the right.

The survey of the parcel was limited to the semicircle-shaped property that surrounds the marina. The thick overgrowth and steep slopes along the marina pond made survey in those areas impossible. No cultural resources were observed within the project area.

5.3 Colusa North Tract

On November 20, 2004, ARP crews surveyed the 5-acre Colusa North tract analysis area. The project area consists of a former orchard surrounded by dense riparian vegetation. The fruit trees were devoid of leaves or other clear indication of species. Annual grasses dominated the ground surface, resulting in very low ground surface visibility (Figure 9).

Figure 9. Colusa North tract, viewing at 250 degrees from the center of the former orchard. Note the taller riparian zone located in the background, which forms the perimeter of the survey area.

East-west transects, spaced 10 meters apart, were used to inspect the project area for indications of cultural resources. Particular attention was paid to a cut bank exposure (possible former stream terrace) in the western portion of the project area, which led to a lower ground surface level than that of the eastern portion of the tract. Aside from the former orchard itself and its access at the northern edge, however, no cultural resources were identified within the project area.

5.4 Boeger Tract

The Boeger tract analysis area was surveyed on November 20, 2004. This 55-acre survey area was comprised of recently tilled and very sandy alluvium with river gravel and small water

worn stones. Evidence for row crops was observed – a use that post-dated an orchard. Ground surface visibility was at 100 percent, and therefore, survey transects were spaced at 15 to 20 meters. Annual grasses were emerging in the fallow field (Figure 10).

Figure 10. Boeger tract, viewing west from levee road.

During the survey, a low-density scatter of shell (possibly clam shell) was observed along the southwestern property line. Upon further examination, and given the lack of midden soil, artifacts, or any other indication of cultural materials, the scatter was determined to have been carried in with the alluvium or by wildlife and did not represent a cultural resource. No other indications of cultural resources were observed within the Boeger tract.

5.5 1000 Acre Tract

The 50-acre analysis area of the 1000 Acre tract was surveyed on December 5, 2004. The former prune orchard had been recently mowed, with relatively low ground surface visibility (Figure 11).

A number of burn piles had been observed along the levee that forms the western boundary of the project area. These burn piles contained fire-affected recent refuse and charred wood. One small concentration of dark soil observed in the project area, however, was devoid of heat-affected materials and surface scraping indicated that it has depth. The lack of artifacts could not confirm it as a midden deposit, but its proximity to a previously recorded NRHP-

eligible site with midden suggests that it could be related to that prehistoric site. The precise location of the dark soil was noted in field notes and plotted in Confidential Appendix D.

Figure 11. 1000 Acre tract analysis area, view west from the eastern property boundary. Note the Farmers Rice Cooperative Stegeman Station in the background, along Highway 45.

5.6 Stegeman Tract

The 10-acre Stegeman tract analysis area was subjected to an intensive pedestrian survey on December 5, 2004. The former orchard was extremely overgrown with annual grasses and star thistle (Figure 12). Very large rodent or subterranean mammal disturbances were observed; each was examined for indications of subsurface deposits.

Figure 12. Stegeman tract, view northeast from access road.

The intensive pedestrian survey, which used 10 meter transect intervals, failed to indicate the presence of cultural resources in the Stegeman tract analysis area.

5.7 Jensen Tract

The 83-acre Jensen tract analysis area was surveyed on December 5, 2004. This project area consists of an active walnut orchard, recently mowed, and containing several smoldering burn piles and irrigation piping. Ground surface visibility was approximately 35 percent (Figure 13).

Twenty-meter transect intervals were used during the survey of the Jensen tract. No cultural resources were observed during the survey.

Figure 13. Jensen tract, view east from the western property boundary.

5.8 Womble Tract

The 58-acre Womble tract analysis area was surveyed on November 20, 2004. The project area was comprised of waist high non-native intrusive weeds, stickers, and green groundcover, resulting in a ground surface visibility of nearly zero (Figure 14). The property had been previously cultivated for annual row crops, as indicated by the remnants of furrows in portions of the project area.

Figure 14. Womble tract, view northwest from the northern portion of the project area. The vegetation in the photograph is comprised primarily of non-native intrusive weeds.

The project area was broken by one cluster of large riparian vegetation, located in the eastern portion of the project area. An abandoned access road led from the cluster to the levee road.

Ten to twenty meter transect intervals were used during the survey. No cultural resources were identified in the Womble tract analysis area.

6.0 DISCUSSION

The cultural resources inventory of the entire project area, including 622 acres subjected to a records search and an additional 414 acres subjected to both a records search and a pedestrian survey, indicated the presence of one possible midden deposit. This deposit may be related to a previously recorded and investigated NRHP-eligible site located in the vicinity; however, in the absence of surface artifacts, this identification remains tentative.

Still, the absence of cultural resources in the project areas near the Sacramento River remains an enigma. The river was, prehistorically and historically, a permanent source of drinking water, irrigation water, and attracts a diversity of wildlife; all of these would also be a magnet for humans.

The overall lack of cultural resources identified in the project area can be explained in several ways. First was the poor ground surface visibility present in all but three of the eight parcels surveyed. Although transect intervals were adjusted to compensate for low ground surface visibility, the presence of annual grasses, weeds, and other ground cover made identification of archaeological sites difficult. The possibility remains that following ground clearance, indications of buried cultural resources will emerge. Mitigation measures, as presented in the following section, are recommended to avoid adverse impacts to inadvertent discoveries of cultural resources.

Second, as discussed in Section 3.0 (Research Design), there are significant gaps in the spatial distribution of prehistoric sites along the river, despite the fact that the river corridor was likely among the earliest habitats colonized in the region. The *Cultural Resource Overview and Management Plan* (White et al. 2003a) investigation established that the density and distribution of archaeological sites in the study zone has been conditioned by the river's massive sediment budget, its propensity to deposit and erode masses of sediment, and create and remove habitable landforms and their associated habitation traces. In essence, archaeological deposits were not draped upon but built into this landscape, and throughout the span of human occupation this landscape constantly evolved. Older sites were diminished in number by the cumulative and ongoing effects of erosion and deposition. The present land surface caps an array of buried land surfaces, inundated by overflow sediments from the Sacramento River and associated tributaries. Buried archaeological phenomena are probably quite common in these deposits.

This conclusion was based upon a recent study (White 2003) that examined the chronostratigraphic relationships of four prehistoric archaeological sites on the Sacramento River floodplain. The sites were all on the western side of the Sacramento River, including two between Princeton and Colusa, and two within the Colusa city limits immediately south of the Ward Unit. Soils were grouped into three basic units, Basins, Younger Floodplains, and Older Floodplains. Basin landforms were mapped as Marvin, Willows, and Corbiere Series soils. Younger floodplains are mapped as Grandbend, Colusa, Scribner, Vina, and Tojunga soils, consisting of shallow to deep silty to sandy loams on low floodplains, with A/C profiles and no salinity. Based on coassociation with the younger soils and medial position in the river corridor, Moonbend Silt Loam (Soil 126) was also assigned to the

younger floodplains. Older Floodplains are mapped as Moonbend Silt Loam – Soils 124/125 and Grandview Series, both possessing complex profiles with buried soils within 2 m of the surface. Generally, Older Floodplain areas have a longer period of accretion (4,500 years) compared to the younger floodplains (1,100 years) (White 2003; White et al. 2003a).

Table 4 lists the soil association of each project area in the CSP, based upon previous geoarchaeological research (White 2003; White et al. 2003a). The CSP project area is dominated by the Younger Floodplain soil types, with only a single tract partially situated among Basin soils. Figure 15 illustrates the location of each tract relative to soil types.

Table 4. Soil Types Present Within the CSP Project Areas

Project Area	Soil Type
Ward	Younger Floodplain/Basin
Cruise'n Tarry	Younger Floodplain
Colusa North	Younger Floodplain
Boeger	Younger Floodplain
1000-Acre	Younger Floodplain
Stegeman	Younger Floodplain
Jensen	Younger Floodplain
Womble	Younger Floodplain

Geoarchaeological modeling suggests that massive erosion took place during the earliest phase of the mid-Holocene warm interval, leading to evacuation of a huge body of sediments from the middle Sacramento Valley as the river scoured out a broad swath of channels and ravines. The younger floodplains are inset into the older floodplains, and thus the lateral extent of both units was primarily established via cut and fill achieved by meander loops. Generally, the older floodplains were erased or are being erased by later floodplain formation within the medial corridor (White et al. 2003a).

The *Cultural Resource Overview and Management Plan* (White et al. 2003a) study indicated that early to mid-Holocene deposits are present in the old floodplains, but are deeply buried (>2.5 m). The oldest floodplains identified here were established sometime before 5,970 BP, and it is reasonable to expect these to have formed on an erosional interface coinciding with the onset of mid-Holocene conditions. Stratigraphic profiles obtained from the excavation of several prehistoric sites in the area indicate a stratigraphic break dating between 4,385-5,970 BP suggesting that the new deposition resulted from a change in flow rate or baseline. Notably, this inferred new depositional regime at 4,385-5,970 BP in the study area is contemporaneous with the termination of marine transgression in the Sacramento/San Joaquin Delta, an event that shifted the hydrological baseline upstream leading to higher rates of deposition of transported sediments throughout the Delta system (Atwater 1980; Atwater and Belknap 1980; Gorman and Wells 2000). The findings of White (et al. 2003a) indicate that this event resulted in a new baseline for lateral accretion and floodplain

formation in the study area, as well. An ensuing pattern of increased sediment supply and landform stability 1,550-4,500 BP is indicated by the stack of soils at one local site.

The stratigraphic profiles show the emplacement of two major alluvial units via high-energy events, one dating between 1,180-1,550 BP, the other between 650-750 BP. Both of these were clearly major floods initiating with high energy events marked by sand-sized particles and fining upward. Both events resulted in deposition of approximately 1 m of sediments. What lies beneath these deposits (i.e., deposits dating 1,550-2,200 BP) is not known. However, the weight of the paleoenvironmental evidence from the Sacramento River watershed indicates that late Holocene climatic amelioration resulted in floodplain formation and stability by 2,200 BP.

Further analysis indicated that there is no overlap in dating of the older floodplains (4,500-1,550 BP) and younger floodplains (1,180 BP-modern). Further, excepting recent natural levees, the young and old floodplains are at approximately the same elevation, with small differences attributable to epiphenomena of the old floodplains, including erosion on lateral (basin) facies and minor silt overburden on the medial (young floodplain) facies. In fact, buried cultural features dating 970-1,180 BP in the young floodplains are at the same elevation as features dating 2,159-3,220 BP in the old floodplains. This would indicate that the hydrological baseline has not changed significantly since the 4,385-5,970 BP event. Thus, there is no indication of structurally different depositional regimes, in other words, floodplain accretion post-1,550 BP did not build a new unit on top of the old unit, and the post-1,550 BP phase of accretion must have been produced by a different mechanism.

The mid-Holocene resulted in substantial meandering and scouring in the river corridor 2,800-7,500 BP, mediated by lateral accretion after 4,500 BP. Thus, the young floodplains are probably established within the scoured and weathered features of the mid-Holocene meander belt, accounting for their medial mass.

Several of the CSP tracts are confined strictly to younger floodplain soils. Assuming a common pattern of floodplain accretion across the study area, the upper 75 cm of deposit in these units is probably less than 800 years old. Based upon research at prehistoric sites in similar geological contexts, surfaces dating between 1035 and 1550 CAL BP are typically buried at depths of 150 cm and greater. Therefore, we can expect archaeological traces exposed on the surface in these units to be sparse and biased to recent cultural activity. Moreover, surface archaeological reconnaissance in these units combined produced no confirmed archaeological sites. This is consistent with geomorphic expectations for youthful landforms. With respect to the question of buried deposits, in a few cases river bank exposures were available for inspection, but no buried cultural deposits were observed.

The units possessed a minimum of soil variability so they exhibit no specific signals for subsurface archaeological potential. On the other hand, since archaeological potential is dependent on the stability of the deposit, then the most stable deposits have the highest potential. From this standpoint, it is clear that, for surface soils the greatest archaeological potential exists on the lateral sides of meander loops. For buried soils, the greatest archaeological potential exists in deposits greater than 100 cm deep.

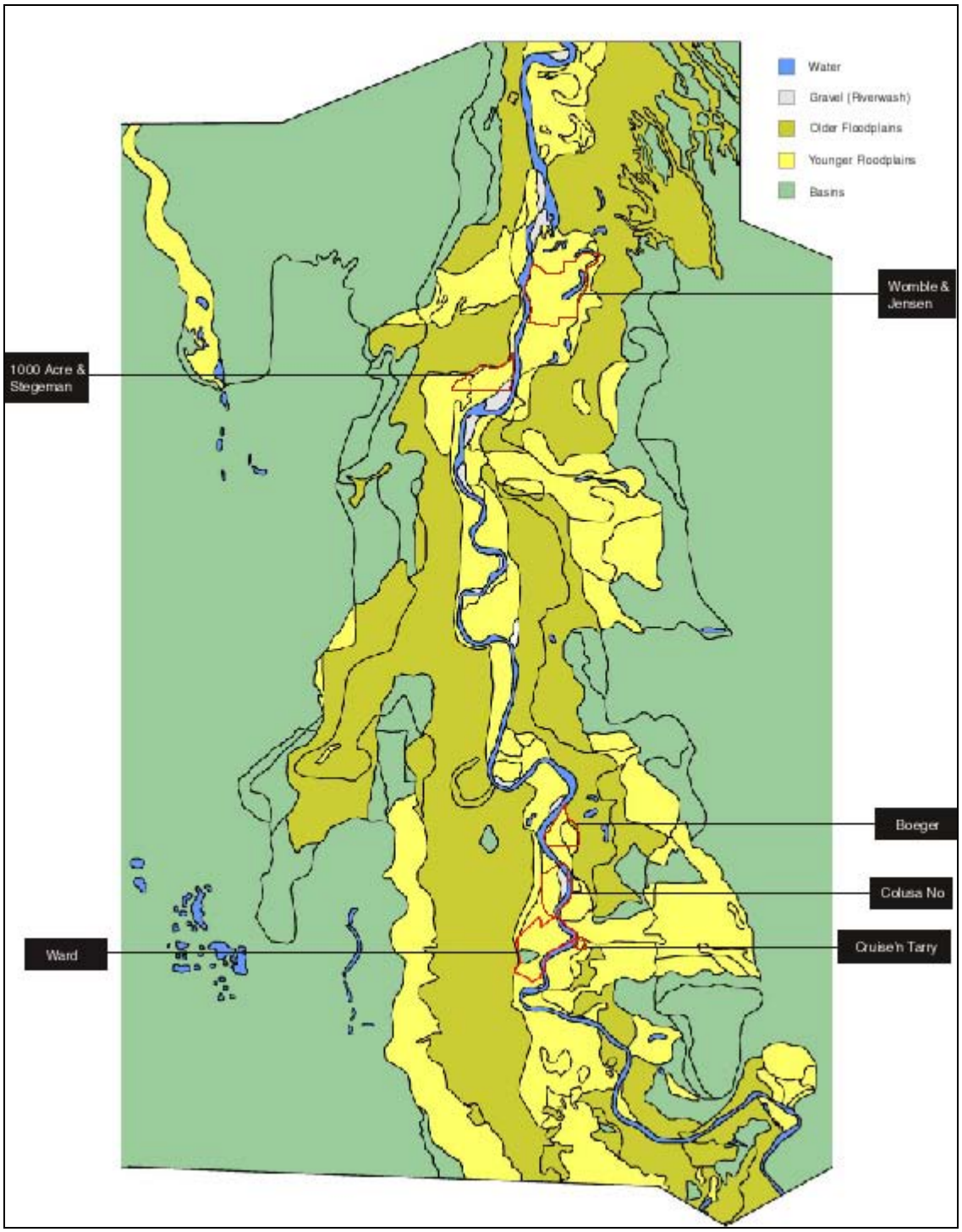

Figure 15. Soils of the Colusa reach (adapted from White et al. 2003a: Figure 53).

One tract (Womble) possesses complex soils with a combination of young floodplains and Basin soils. Archaeological survey in these units combined produced no archaeological sites, though this tract has greater potential for buried archaeological resources. In fact, buried sites have already been found in similar geological contexts in the area.

The research question postulated for the current research indicates that prehistoric archaeological deposits dating in excess of 3,000 BP should be located in deposits with a high medial distance (measured from the floodplain midline) and low lateral distance (measured from the nearest basin soil). All of the CSP project areas are situated on young landforms that could contain archaeological deposits at any depth; however, additional data, such as subsurface testing and absolute dating, is needed in order to answer this research question. Moreover, archaeological sites located in the younger floodplain deposits are likely to be younger in age, as well.

A third possible explanation for the relative absence of cultural resources in the project area is the historic use of the land for agricultural endeavors. Previous disturbance of the project area may have obliterated historical cultural resources and surface prehistoric sites.

In summary, no confirmed cultural resources were identified in the CSP project area. This does not preclude the presence of cultural resources in the project area, however. Mitigation measures to address unanticipated discovery are provided in Section 7.0, Management Considerations.

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7.0 MANAGEMENT CONSIDERATIONS

Because a funding source and lead agency have not yet been identified, it is not known if the TNC is subject to compliance with the California Environmental Quality Act (CEQA) or Section 106 of the National Historic Preservation Act (NHPA). Therefore, the current cultural resources investigation was conducted in compliance with the requirements for both laws.

Habitat restoration might involve state government agency approval, permitting, or funding with no federal involvement. In this case, the projects must comply with the California Environmental Quality Act (CEQA; Pub. Res. Code §21000 et seq.). CEQA applies to both historical resources and archaeological sites, as defined by Article 5, Section 15064.5, Determining the Significance of Impacts to Archeological and Historical Resources. The CEQA process requires review by the California Office of Historic Preservation (OHP)—or one of its local offices in the California Historical Resources Information System—to determine if the project may cause a substantial adverse change to the status of potential cultural resources. An inventory and assessment is required for sensitive locations, and a mitigated Negative Declaration or an Environmental Impact Report (EIR) is required if it is determined that a project may adversely affect significant historic or archaeological resources.

Appendix G of CEQA provides checklists for measuring the environmental effects of proposed projects on cultural resources (Table 5). Mitigations incorporated into project design will reduce the potential impacts of the proposed undertaking to a level that is less than significant. Mitigation measures are presented in the following section.

Table 5. Environmental Effects Checklist for Cultural Resources

Effect[1]	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
CULTURAL RESOURCES -- Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in ‘15064.5?	□	X	□	□
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to ‘15064.5?	□	X	□	□
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	□	X	□	□

Effect[1]	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	X	☐	☐

If the project entails some form of federal agency review, permitting, or funding, then the CSP will be subject to compliance with Section 106 of the National Historic Preservation Act (NHPA), which requires Federal agencies and other entities working under federal permits or using federal funds to take into account the effect of their undertakings on historic properties. However, the CEQA Guidelines indicate that a public agency also following the Section 106 process (NHPA) may use the documentation prepared under federal guidelines in place of documentation called for under CEQA. Thus, given the complex relationships and responsibilities that pertain throughout the system, it decided to use the Section 106 process and documentation as a default for the CSP cultural resource investigations.

The possible midden deposit noted in one tract is adjacent to a previously recorded NRHP-eligible prehistoric archaeological site. Because the site boundaries have been previously reported to *possibly* extend into the project area, the likelihood exists that the deposit observed during survey is cultural in origin and related to the previously recorded site. Moreover, this midden deposit, if deemed cultural, may satisfy significance criterion D in both NHPA and CEQA. Although no surface artifacts were observed during a surface scrape of the deposit, subsurface cultural materials may be revealed during future restoration activities.

The State Code of Regulations, Guidelines for Implementation of CEQA (Title 14, Chapter 3, Article 5, Section 15064.5f) requires that "as part of the objectives, criteria, and procedures required by Section 21082 of the Public Resources Code, a lead agency should make provisions for historical or unique archaeological resources accidentally discovered during construction. These provisions should include an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be an historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could continue on other parts of the building site where historical or unique archaeological resource mitigation takes place." Given the differential archaeological sensitivity of the tracts, two mechanisms should be in place for addressing unanticipated discovery of cultural resources during project implementation, as expressed in Mitigation Measures 1 and 2, below.

Mitigation Measure #1: Focused Monitoring

- **A cultural resource specialist who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historical archaeologist shall be present during ground breaking activities, particularly during the removal of the orchard, in the designated tract to recover any additional data that may shed light on the significance of the deposits. If cultural materials that are potentially significant are discovered, all work shall halt within a 100-foot radius of the find until clearance is provided by the archaeologist on site. The extent of the need for cultural resource monitoring beyond the removal of the orchard shall be determined by the professional judgment of the archaeologist. In the absence of a cultural resources monitor, Mitigation Measures #2 and 3 still apply.**

- **In addition, an experienced Native American monitor shall be present during ground breaking activities in the designated tract. In the event of the inadvertent discovery of human remains (see Mitigation Measure #3), the monitor will facilitate Native American consultation, but does not replace the required protocol outlined below. The extent of the need for Native American monitoring beyond the removal of the orchard shall be determined by the professional judgment of the archaeologist and Native American monitor. In the absence of a cultural resources monitor, Mitigation Measures #2 and 3 still apply.**

The on-site archaeologist should be proficient in the identification and significance evaluation of historical archaeological materials and be able to work with construction crews and the developers to facilitate mitigation of suspected significant cultural deposits. The on-site Native American monitor should represent a local group and should be experienced in construction monitoring. A monitor from the Cortina Band of Indians (Cortina Indian Rancheria, Wintun Tribe) in Williams, California would be an appropriate selection.

To address unanticipated cultural resources in all eight tracts in the CSP project area, both monitored and un-monitored, the following mitigation measure shall apply.

Mitigation Measure #2: Unanticipated Discovery

- **If subsurface deposits believed to be cultural in origin are discovered during restoration, then all work must halt within a 100-foot radius of the discovery and a qualified professional archaeologist retained to evaluate the significance of the find.**

A qualified professional archaeological consultant will meet or exceed the US Secretary of the Interior's Professional Qualification Standards for a prehistoric and historic archaeologist.

Additionally, although no indications of human remains were identified on the surface, subsurface human remains may become evident during construction activities. Applicable procedures should be followed upon the unanticipated discovery of human remains, in accordance with provisions of the State Health and Safety Code, Sections 7052 and 7050.5

and the State Public Resources Code Sections 5097.9 to 5097.99. Sections 7052 and 7050.5 of the State Health and Safety Code define the disturbance of Indian cemeteries as a felony. The code further requires that construction or excavation be stopped in the vicinity of the discovered human remains and the Sheriff and Coroner notified immediately. The Coroner must determine whether the remains are those of a Native American within 48 hours. If the remains are determined to be Native American, the Coroner shall contact the California Native American Heritage Commission within 24 hours. Subsequent procedures shall be followed, according to State Public Resources Code Sections 5097.9 to 5097.99, regarding the role of Native American participation. If the remains are determined to be the result of a crime scene, and not an archaeological site, then appropriate protocol will apply.

Mitigation Measure #3: Human Remains

- **If human remains, or remains that are potentially human, are discovered during project construction or implementation, all work must stop within a 100-foot radius of the find. The construction supervisor must notify the county Sheriff and Coroner immediately, and take appropriate action to ensure that the discovery is protected from further disturbance or vandalism.**

Finally, the California State Code, Sections 6253, 6254, and 6254.10 authorizes state agencies to exclude archaeological site information from public disclosure under the Public Records Act. The Federal Archaeological Resources Protection Act of 1979 (Public Law 96-95, as amended 1988) applies to all Federal fee title lands and Indian lands held in trust by the United States, and specifically dictates that information disclosing the nature and location of any archaeological resource on Federal or Indian lands may not be made available to the public unless it is determined that such disclosure would further the purposes of the Act and not create a risk of harm to the resources or to the site at which such resources are located. In order to follow the State and Federal provisions, and to further ensure the protection of cultural resources on all lands subject to the proposed project, it is essential that TNC take steps to make certain that specific archaeological site locations are not disclosed to the public. This includes, but is not limited to, ensuring that portions of this report that provide information about archaeological site locations have strictly limited distribution. Confidential appendices, in particular, contain information not intended for public distribution.

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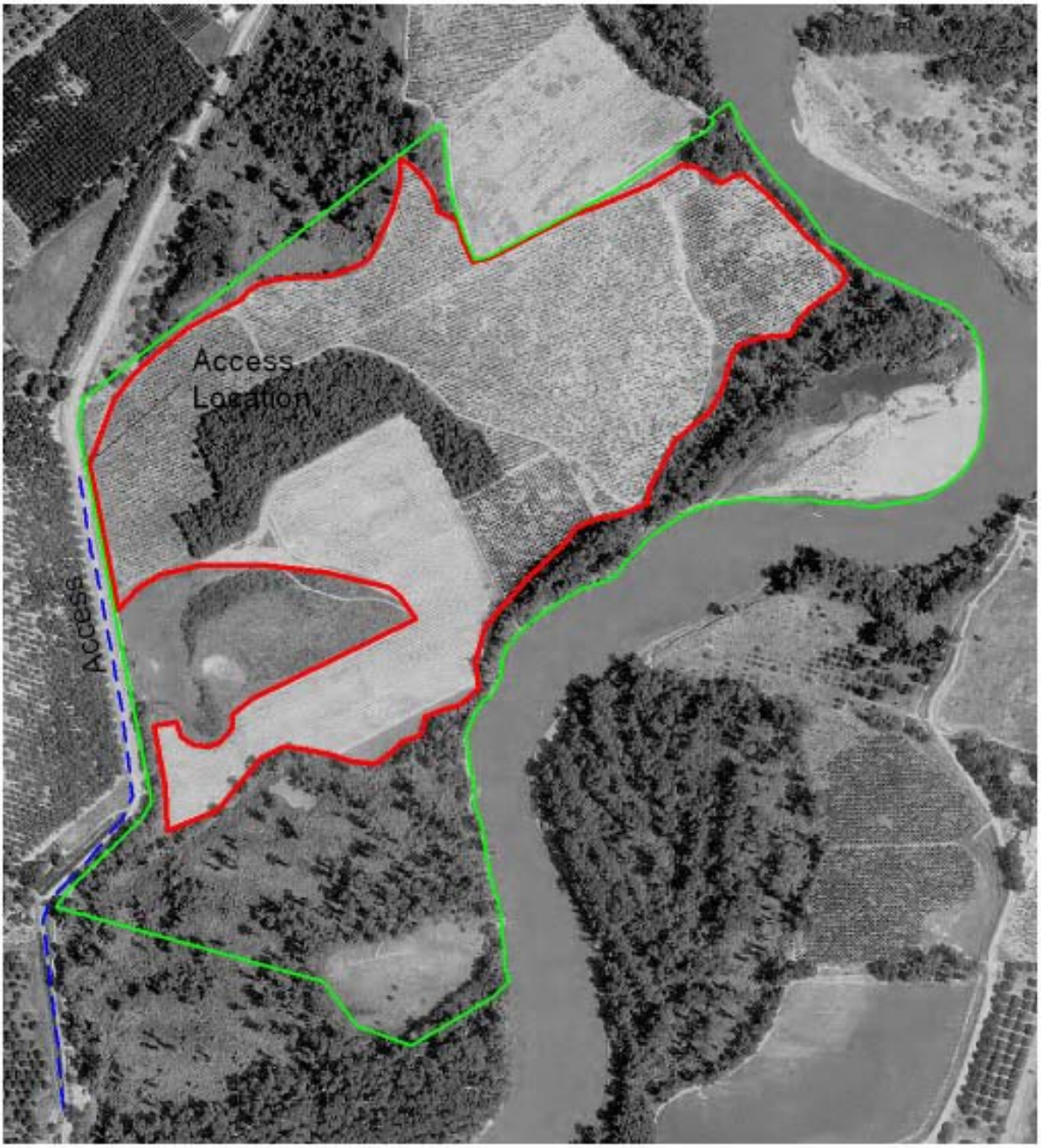
APPENDIX A:

AERIAL PHOTOGRAPHS OF THE EIGHT CSP TRACTS

Ward Tract


Access
Location
Access
0.2
0
0.2
0.4 Miles
Property Boundary
Analysis Area
N
W
E
S

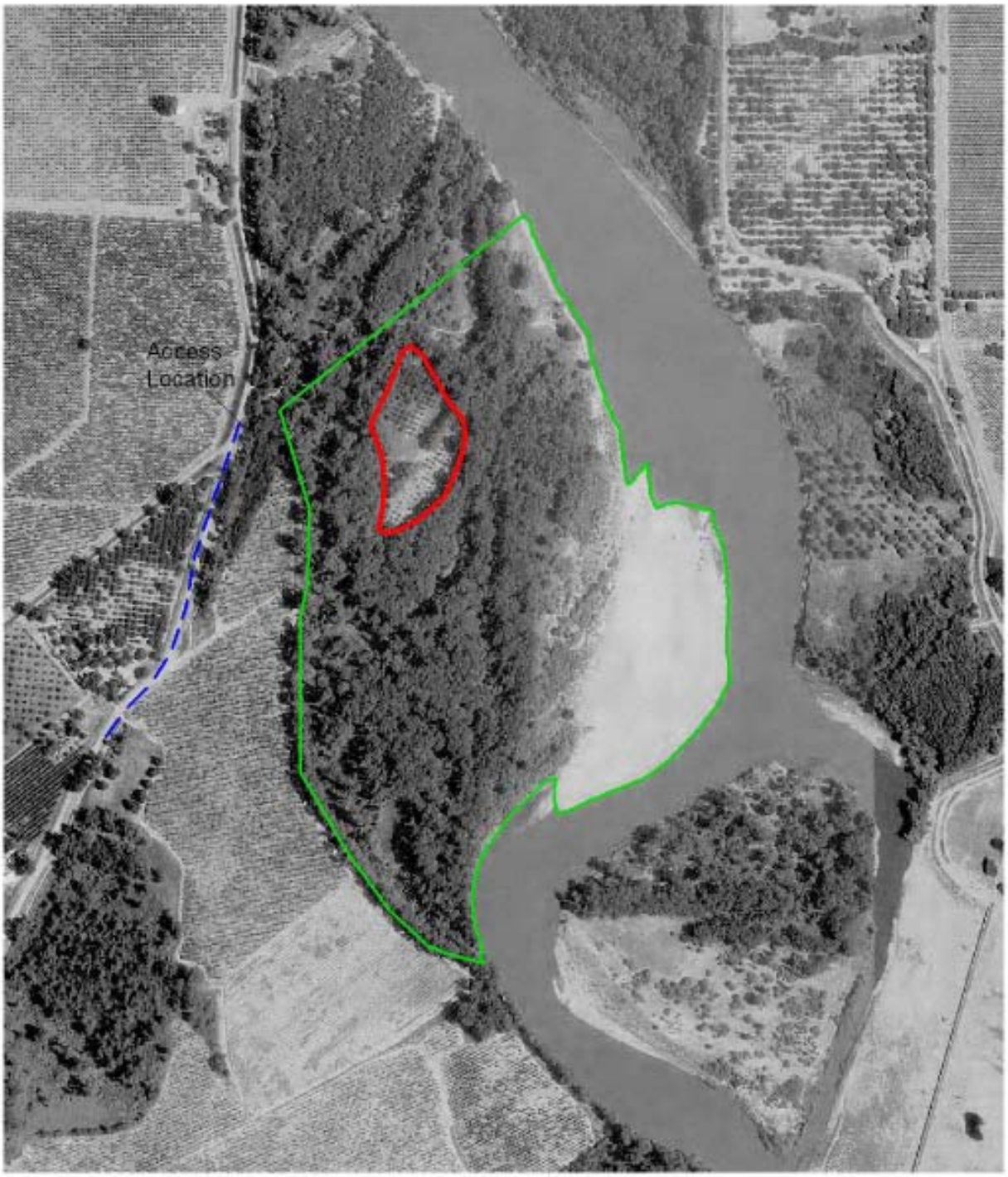
Cruise'n Tarry Tract

0.07 0 0.07 0.14 Miles

N
W E
S

Property Boundary
Analysis Area

Colusa North Tract

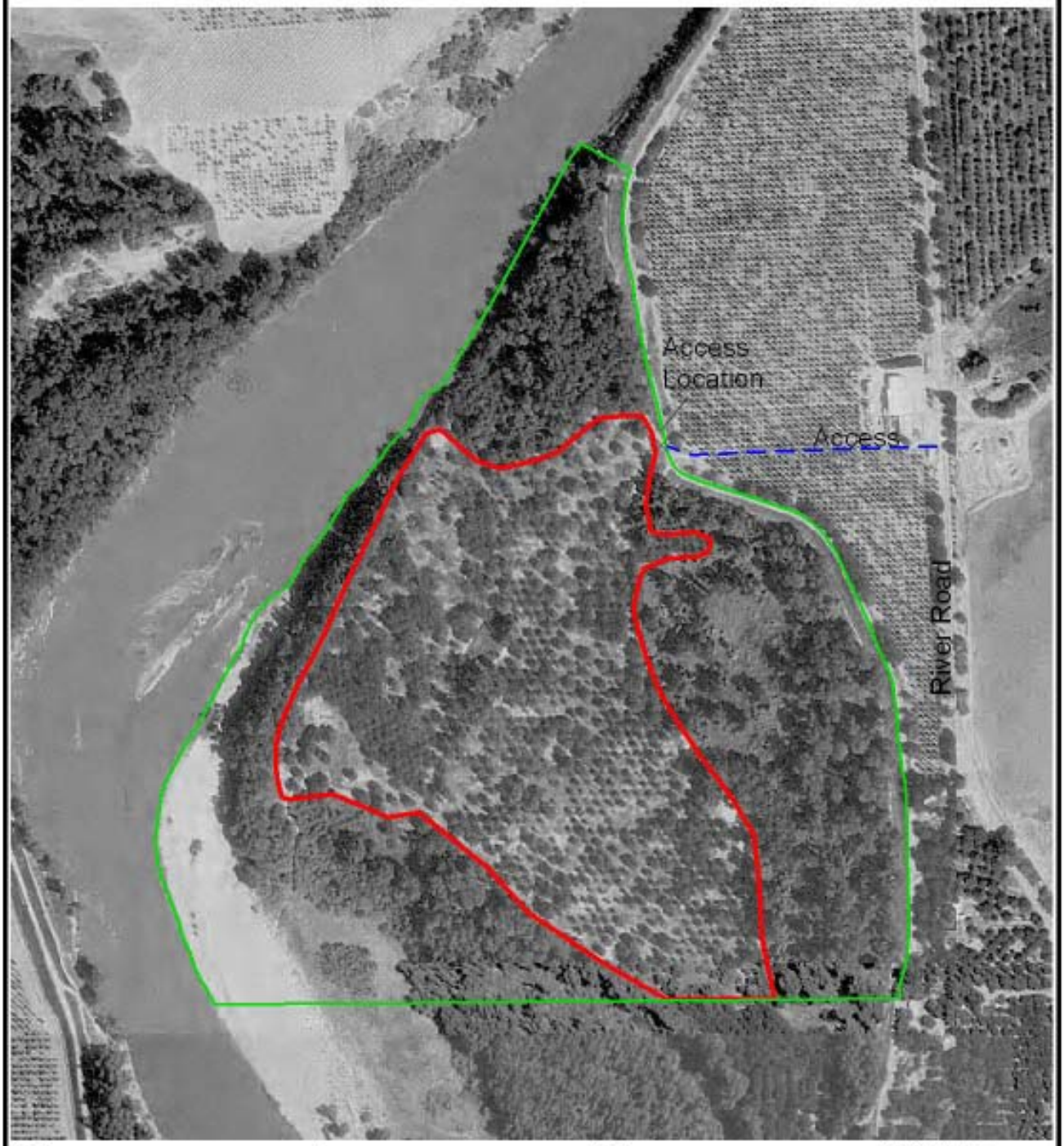


0.3 0 0.3 0.6 Miles

Property Boundary
Analysis Area

N
W E
S

Boeger Tract

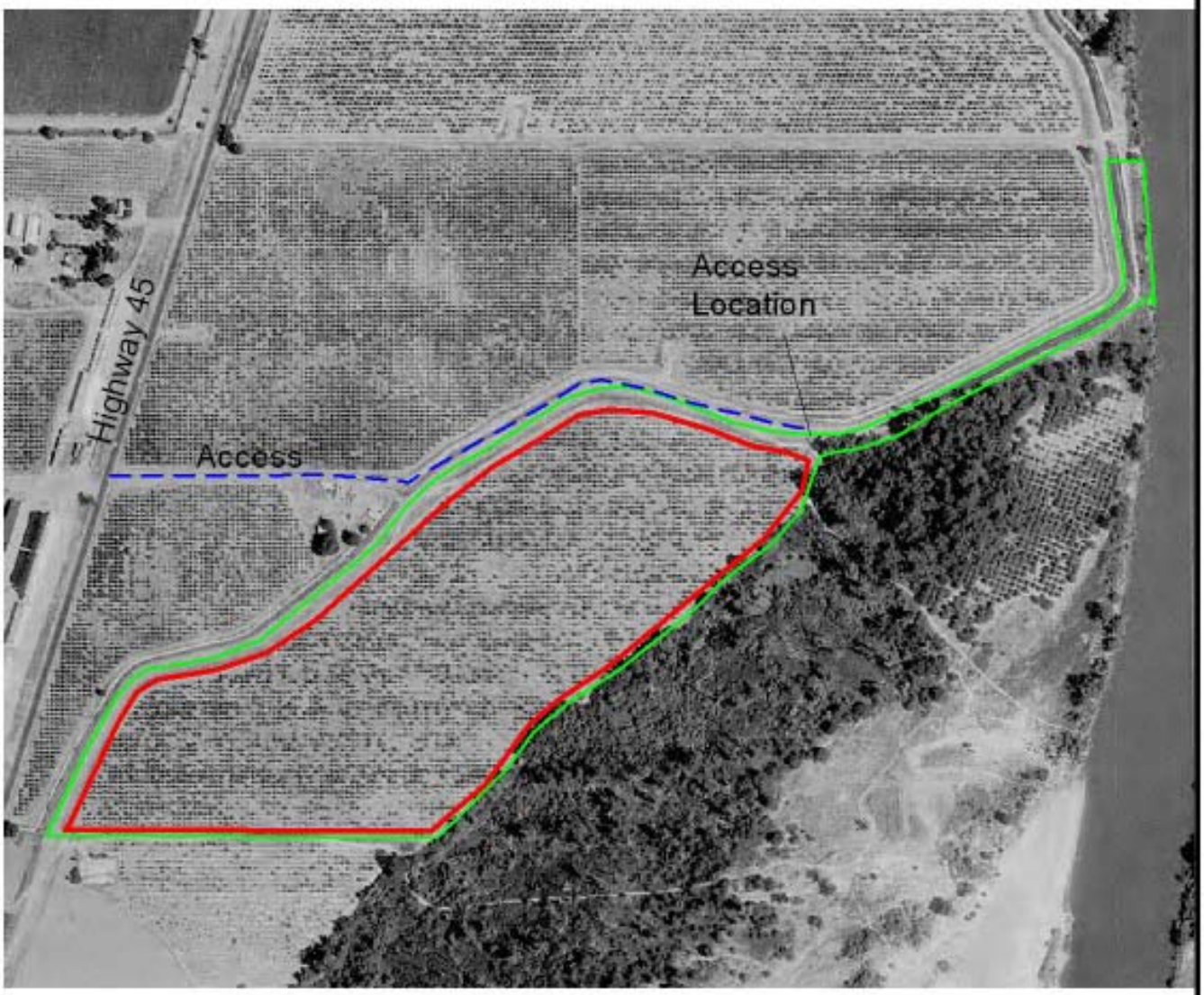


0.2 0 0.2 0.4 Miles

Property Boundary
Analysis Area

N
W E
S

1000 Acre Tract



0.2 0 0.2 0.4 Miles

Property Boundary
Analysis Area

N
W E
S

Stegeman Tract

0.2 0 0.2 0.4 Miles

Property Boundary
Analysis Area

N
W E
S

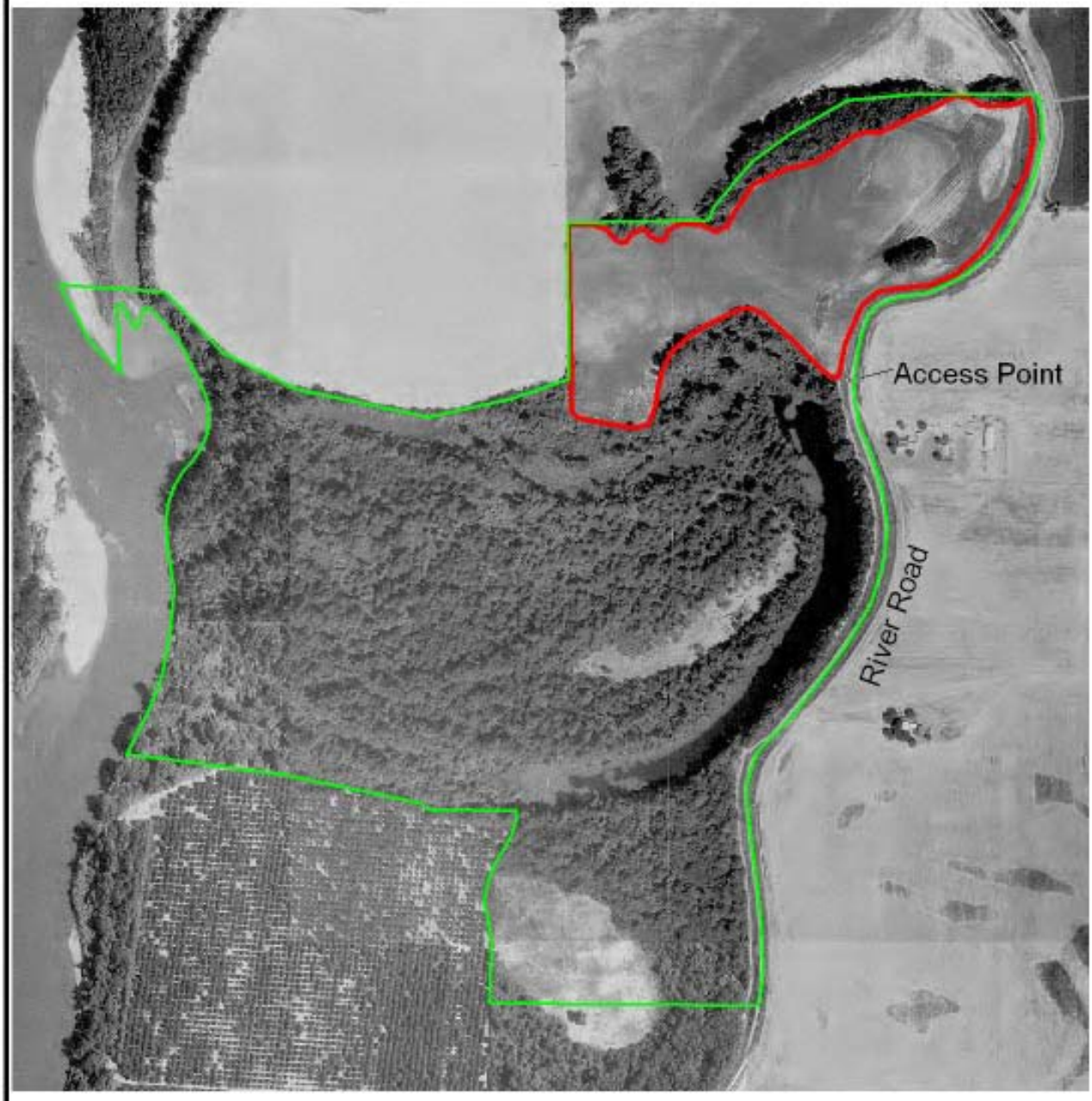
Jensen Tract

0.2 0 0.2 0.4 Miles

Property Boundary
Analysis Area

N
W E
S

Womble Tract



0.3 0 0.3 0.6 Miles

N
W E
S

Property Boundary
Analysis Area

CONFIDENTIAL APPENDIX B:

RECORDS SEARCH RESULTS (BOUND SEPARATELY)

Note: Confidential Appendices contain information that is restricted from public distribution, such as archaeological site location maps, site records, and personal addresses and phone numbers of Native American individuals and organizations.

CONFIDENTIAL APPENDIX C:

CONTACT INFORMATION FOR NATIVE AMERICAN CONSULTATION (BOUND SEPARATELY)

Note: Confidential Appendices contain information that is restricted from public distribution, such as archaeological site location maps, site records, and personal addresses and phone numbers of Native American individuals and organizations.

CONFIDENTIAL APPENDIX D:

LOCATION OF POSSIBLE MIDDEN DEPOSIT, REQUIRING MONITORING (BOUND SEPARATELY)

Note: Confidential Appendices contain information that is restricted from public distribution, such as archaeological site location maps, site records, and personal addresses and phone numbers of Native American individuals and organizations.