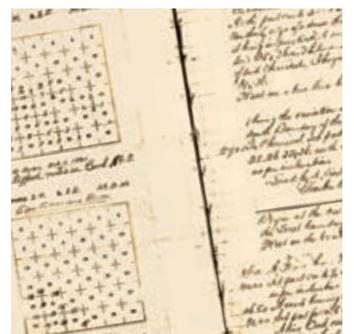
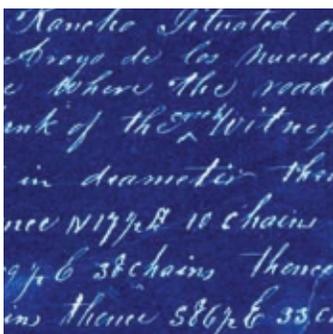
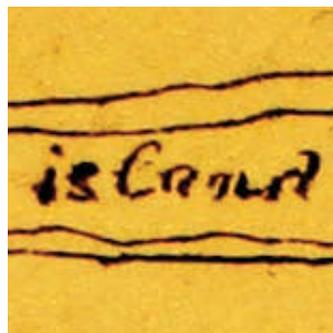




THE HISTORICAL ECOLOGY OF CONTRA COSTA COUNTY

AN ILLUSTRATED PREVIEW AND GUIDE

Contra Costa County and the Contra Costa Watershed Forum are collaborating with the San Francisco Estuary Institute to conduct a historical ecology assessment of natural resources in the County. Over the next two years, the team will collect and synthesize a wide range of data to develop a practical understanding of terrestrial, fluvial, riparian, and wetland resources prior to significant Euro-American modification. While the larger historical ecology project is just beginning its initial stages, this publication provides a preview to the project. The following pages explore potential sources of historical information and discuss what may be discovered through our investigations.



The study of historical landscapes is not just about understanding the past. It also helps us understand the contemporary landscape and its potential for restoration.

What changes has a place undergone over time? Early maps, photographs, and texts can provide a rich and complex picture of how Contra Costa's hills and valleys have changed, shaped by both natural processes and the people that inhabited them.

This publication explores how we will use clues left behind by previous generations to piece together how the native landscape of the past became the contemporary landscape we know today.

Understanding our watersheds

ON THE EDGE OF THE BAY



Map courtesy Elise Brewster and SFEI

San Pablo and Wildcat Creeks

Circa 1800



This detail from a map recreating lower San Pablo and Wildcat Creeks around the time of Spanish colonization (ca. 1800) displays abundant evidence of the previous three to four thousand years of indigenous presence. Numerous shellmounds mark areas of extensive human activity. Well-worn trails cross the alluvial plain, connecting shellmounds, landings, and sources of freshwater, such as the laguna (lake or pond) located between San Pablo and Wildcat Creeks. On the same map to the west of this inset (not shown), vast marshlands and mudflats provided rich natural resources, supporting a relatively dense indigenous population. Tidal sloughs running through the marshes led to natural landings, where the Huchiun (a local group of the Ohlone) launched tule canoes to fish the bay.

Recipe for a HISTORICAL ECOLOGY Project



1 DATA COLLECTION • We are collecting a wide range of historical material from local museums and historical societies, The Bancroft Library, and city and county archives. We look for early journals, diaries, and newspaper accounts that describe the ecology of the area; historical maps, surveys and aerial photographs that show where early features were located; and historical landscape photographs, drawings, and paintings that help us understand the vegetation, channel depth, and hillside vegetation.



2 DATA COMPILATION • Once the raw historical sources are collected, the data is compiled into usable formats for analysis and synthesis. We extract and organize pertinent quotes from historical narrative sources, and we also georeference selected maps, a process that ties historical maps and aerial photography to their real world map coordinates, so that they spatially match up and can be compared with contemporary sources.



3 SYNTHESIS AND ANALYSIS • After compiling data, we will synthesize historical sources into geographic information system (GIS) layers describing the historical landscape and channel alignments. Habitats to be mapped in Contra Costa may include lagoons, wetlands, vernal pools, oak savanna, chaparral, grassland, alkali meadow, riparian forest, and riparian habitat types. Once in the GIS, we can make comparisons between past and present landscapes, analyzing loss of habitat type, stream modifications, and changes in variability.



4 REPORTS, GRAPHICS, AND PRESENTATIONS • The final report will be a well-illustrated guide to applying understanding of historical conditions to present-day conservation challenges. The report will summarize methods and discuss results, including changes in habitat area and type, riparian conversion, channel incision/aggradation and other trends. Restoration opportunities will be discussed, with habitat remnants highlighted for conservation prioritization.



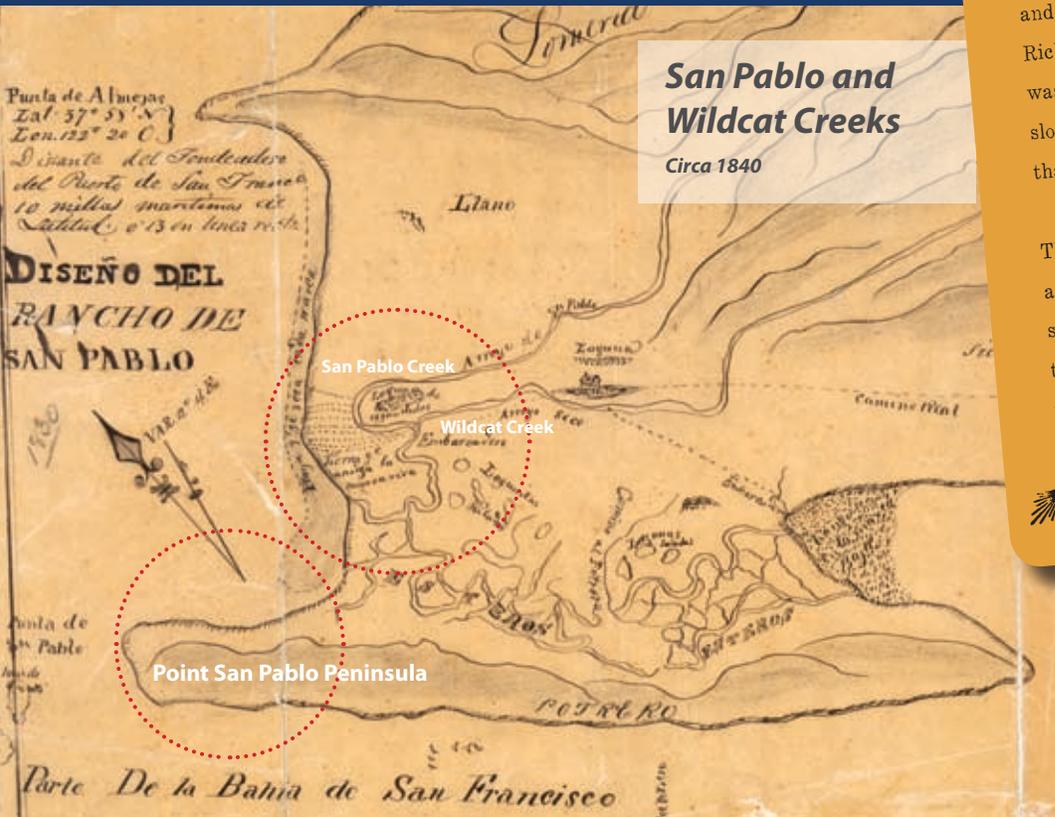
SONG SPARROW

Louise Kellogg recorded field notes about her observations of tidal marsh vegetation and song sparrows near San Pablo and Richmond in the spring of 1909 (below).

MISS ALEXANDER AND I TOOK THE ELECTRIC CAR as far as San Pablo and then walked about a mile and a half down onto the marsh which lies between Richmond and San Pablo and while the walking was soft and muddy from the recent rains, the sloughs in that part of the marsh were so small that we got around without any difficulty...

The marsh, for the most part, was covered with a low shrub about six inches high but near the shore there was a belt of short tule and in that the Song Sparrows were abundant but not to be reached. I saw one Yellow Throat.

- LOUISE KELLOGG, MARCH 3, 1909

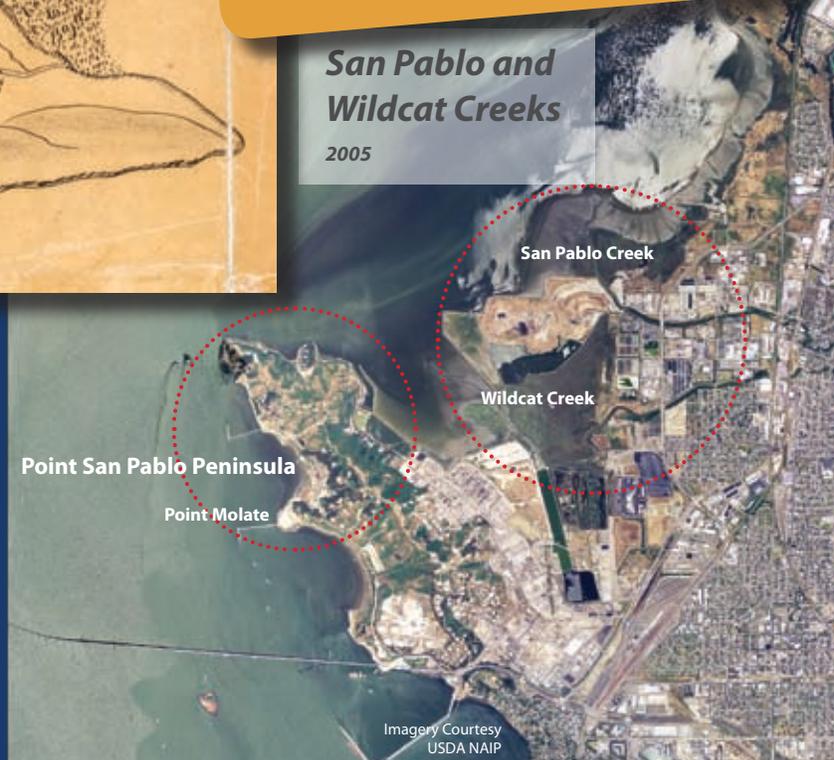


San Pablo and Wildcat Creeks

Circa 1840

San Pablo and Wildcat Creeks

2005



Map courtesy The Bancroft Library, UC Berkeley

A land grant map of the Rancho de San Pablo, circa 1840 (above), shows the same area about forty years later. In the place of Huchiun trails, Mexican roads such as the *Camino Real* (the royal road) and the *Camino al Potrero* (road to the pasture) crisscross the area, connecting this era's *embarcaderos* (landings), dwellings, and fields. The *laguna de agua dulce* (freshwater lake) between San Pablo and Wildcat Creeks is shown just before the confluence of the two creeks. The rich natural resources of the area's marshlands and mudflats are likely still actively used at the time of the land grant, as indicated by the *Punta de Almejas* (Clam Point) shown near the top of the map.

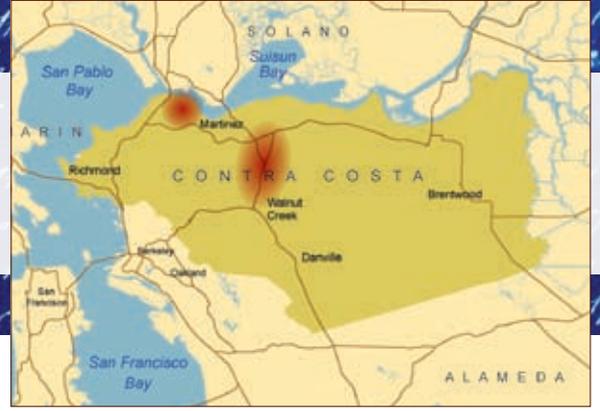
Photograph courtesy The Bancroft Library, UC Berkeley



Point San Pablo Peninsula was originally inhabited by the *Huchiun Ohlone* group. Point Molate was subsequently established as a Chinese shrimping camp in the 1870s (shown at left). Despite a diverse history of settlement and ownership, the area is one of the last remaining regions of relatively undeveloped shoreline in the East Bay. Understanding the historic conditions and the transformation of the area can help focus future land use planning.

Understanding our watersheds

PERSISTENCE AND CHANGE OVER TIME



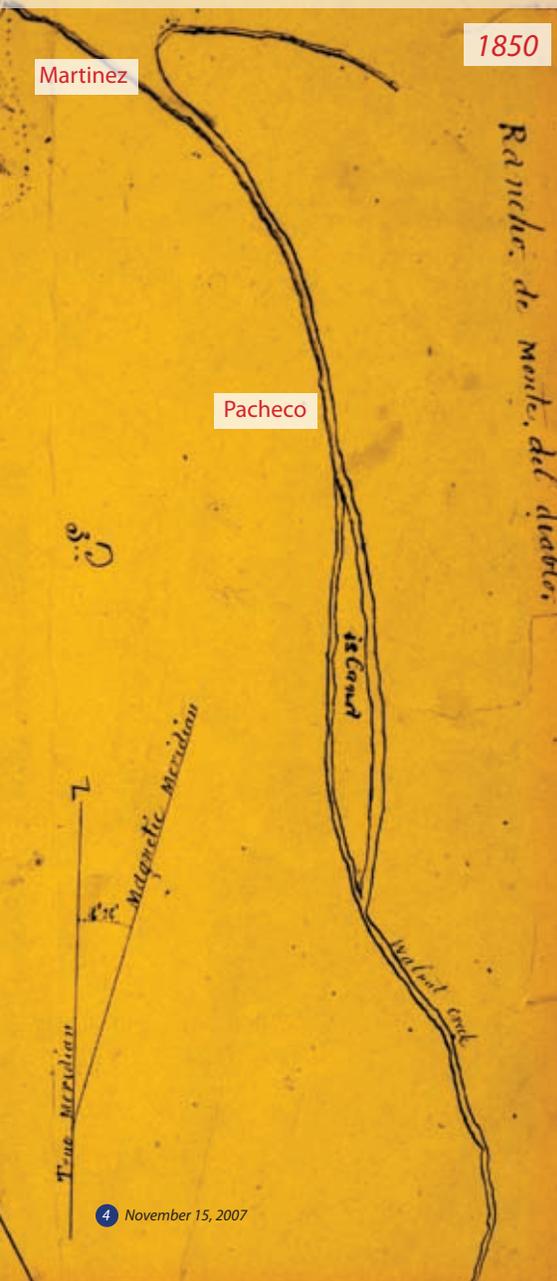
Historical ecologists often track the persistence and change of features in the landscape. Two examples from the Ygnacio Valley area (where the Contra Costa County Creek and Watershed Symposium is being held), and one example from Port Costa, illustrate this strategy.

The Lost Island of Pacheco highlights dramatic changes in the landscape, while **The Lake at Heather Farm** demonstrates surprising persistence. **Rephotography at Port Costa** illustrates both persistence and change. Understanding both what remains and what has changed can be potentially useful in restoration planning.

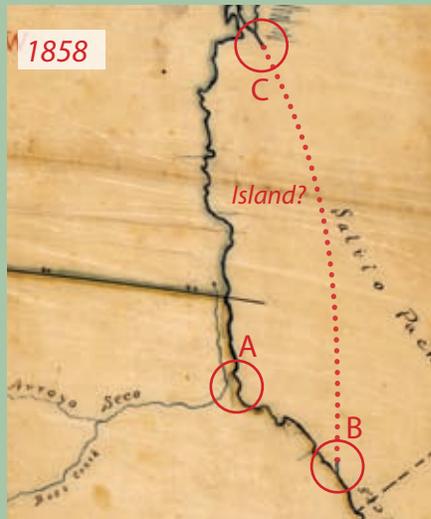


Imagery Courtesy USDA NAIP

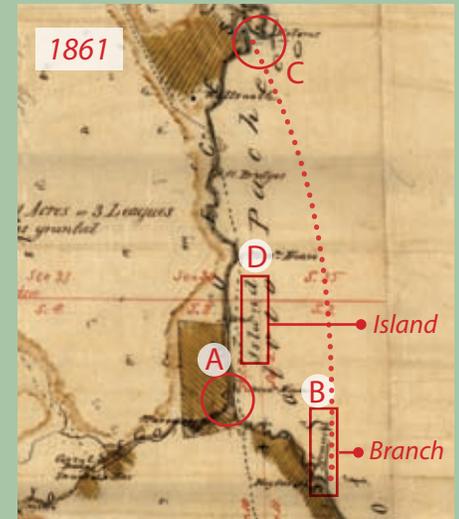
1 CHANGE: The Lost Island of Pacheco at Walnut and Grayson Creeks



A surveyor drew a large island—2 to 3 miles long—on Walnut Creek just south of the town of Pacheco on this 1850s map (at left). No island exists there now. What happened to this island over time? Did it disappear due to natural or human-induced changes in Walnut Creek? Or did some surveyors just stop mapping it? While no single map provides a conclusive explanation, together, the maps below (drawn between 1850 and 1900) offer valuable insights into the history of change on Walnut Creek.



A plat map from 1858 shows Arroyo Seco (probably Grayson Creek) veering sharply north to parallel north-flowing Walnut Creek. It appears to be connected to Walnut Creek only by a series of thin channels (A). Though the island is not shown, small side channels off Walnut Creek may indicate its boundaries (B and C).



In 1861, Arroyo Seco now appears to only briefly parallel Walnut Creek before merging with it downstream (A). While the island is not fully depicted (this is a map of Rancho de las Juntas, while the island was on neighboring Rancho Arroyo de las Nueces y Bolbones), the island (D) and the eastern branch of the channel (B) which appears to define the island are both labeled.

2 PERSISTENCE AND CHANGE: Rephotography at Port Costa

Returning to rephotograph an area can show subtle changes in land cover and land use. Whenever possible, photographs are taken from the same vantage point at the same time of year, though the oak without foliage in the 1910 photo shows the image was probably taken during the winter, while the photograph in 2004 was taken in the spring.

1910 Port Costa is a busy landing for the Central Pacific railroad ferry between Benicia and Port Costa in 1910. The town's growing population lives in the houses clustered on the grass-covered hillside overlooking the San Pablo Bay.

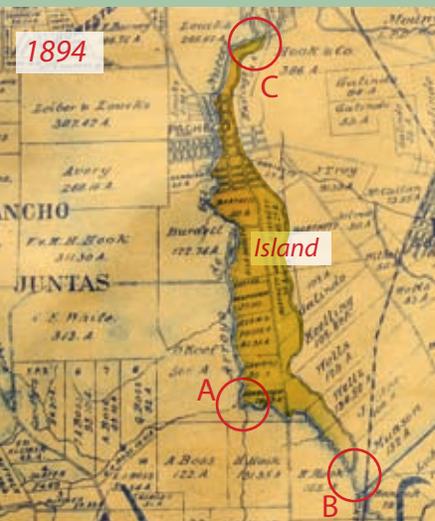


Photograph courtesy Contra Costa County Historical Society

2004 The same spot almost 100 years later looks relatively similar (in contrast to Solano County, across the Carquinez Strait), but trees and shrubs are more abundant on the hillside. The economic base of the town shifted when the railroad ferry crossing was replaced by a railroad bridge at Martinez in 1930.



Photograph courtesy The Andrew Martin Collection



This 1894 property ownership map shows the full extent of the island, with the eastern channel branching off in the same place as on the 1861 map (B). It shows the eastern branch of the creek rejoining the mainstem Walnut Creek just north of Pacheco (C). Here, Grayson Creek is shown as a tributary to Walnut Creek (A).



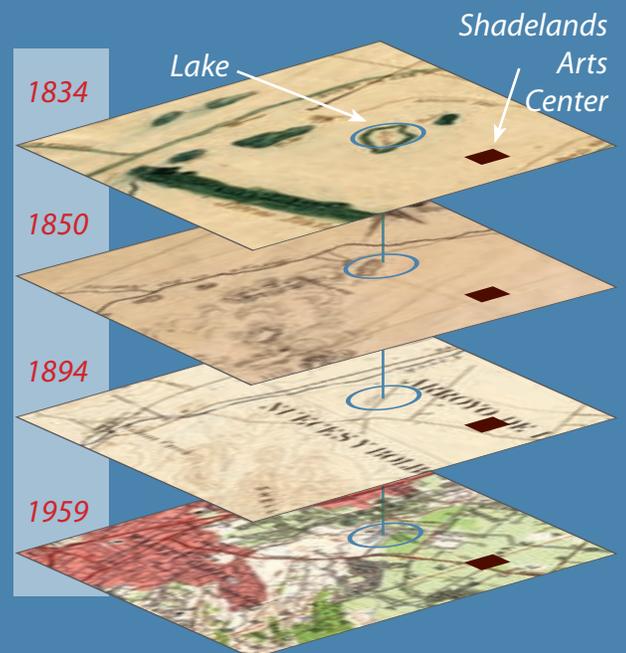
Large changes are shown on this 1897 USGS map. The eastern side channel is labeled as Walnut Creek (B), while what used to be mainstem Walnut Creek is either not shown at all or is labeled as Grayson Creek (A). Why did the main Walnut Creek channel change? Did the island really disappear between 1894 and 1897? Further research should help us answer these questions.

map from 1897 courtesy the Earth Science & Map Library, UC Berkeley

3 PERSISTENCE: The Lake at Heather Farm

Historical ecology can be a powerful way to track and analyze change. But it can also resemble a treasure hunt—a process of uncovering persistent, yet previously unnoticed, historical features in the landscape. Below is a series of images which track a lake through time. The lake is about a mile from this Watershed Symposium, in Heather Farm Park.

Each map shows the lake persisting even as its surroundings change. In 1834, the lake was situated in the midst of tule groves. The lake is shown next to a “warm sulfur spring” in 1850. The USGS topographic map of 1894 shows the lake against the contour lines of the hills to the west and newly developed roads. By 1959, the lake is either next to or part of a filtration plant.



Below, Juan Crespi's description of the Ygnacio Valley area in spring.

The arroyo crossed, we entered a beautiful plain or valley, about three leagues in extent in all directions, of level land, black loose soil well covered with grass, and grown with oaks and live oaks. In this valley, which reaches the estuary, we saw some lagoons.

— Crespi, March 30, 1772

Understanding our watersheds

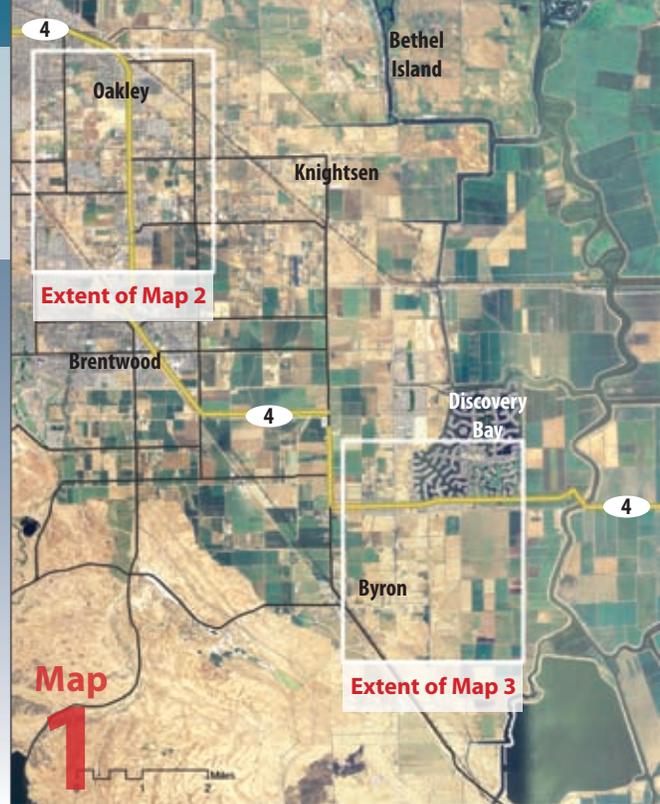
ON THE EDGE OF THE DELTA



Ecosystem characteristics and boundaries can often be corroborated through the use of multiple sources. Taken together, maps and surveys from different eras and cartographers provide details

that allow us to understand the appearance and function of the historical landscape. This can be done in a geographic information system (GIS), mapping software that helps us look at the relationships and patterns between multiple sources.

The maps at right are an example of this process from the Los Meganos (meaning “sand dunes”) land grant, a tract that now includes the cities of Brentwood and Oakley, the communities of Byron, Discovery Bay, and Knightsen, and surrounding agricultural land. Ecological information from both *diseños* and Public Land Survey notes (described below) help place the historic extent of various wetland ecosystems within the land grant. These two sources, as well as other sources such as aerial photography, provide valuable insight for conservation strategies.



Imagery courtesy USDA NAIP

The following three images provide an example of using multiple sources to understand landscape change. **Map 1**, a 2005 satellite image of the area surrounding Brentwood and Oakley, shows modified channels of the San Joaquin Delta, and a growing road and city infrastructure amidst rectangular agricultural fields. **Maps 2 and 3** are insets from the Los Meganos land grant *diseño* (ca. 1853, pictured below at left) with Public Land Survey points superimposed on top using a GIS.



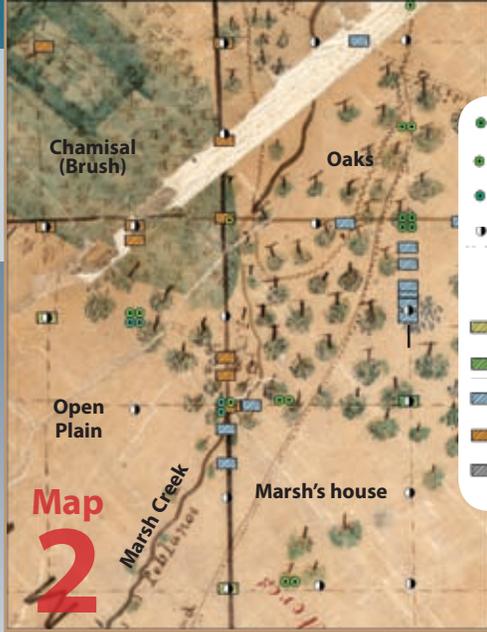
Diseños are property maps that were required by the Mexican government in the 1800s to establish a privately owned *rancho*. They are some of the earliest maps available. The *diseños* roughly located the boundaries of a *rancho*, using natural features for landmarks, and were often not to scale. Sometimes the boundaries of *ranchos* overlapped, but that imprecision never presented a problem when land was plentiful. Rather than showing us precise locations, *diseños* show us the relationships between features. Through careful interpretation using additional resources, the early landscape is revealed through natural features on the map.

Map courtesy The Bancroft Library, UC Berkeley

In sharp contrast to the rough boundaries of the *diseños*, the **U.S. Public Land Survey** imposed straight lines on the property, dividing land into 6-mile-square townships. Each township was further subdivided into 36-square-mile sections, each section containing 640 acres. Surveyors methodically followed straight township lines, noting up to four “bearing” trees at every mile and half-mile point, and recording the species, diameter, distance, and azimuth of each tree from a survey point. They also noted any natural obstructions such as thickets or lakes they encountered on survey lines, as well as general soil and land characteristics. The Public Land Survey reached the Los Meganos region in 1851.

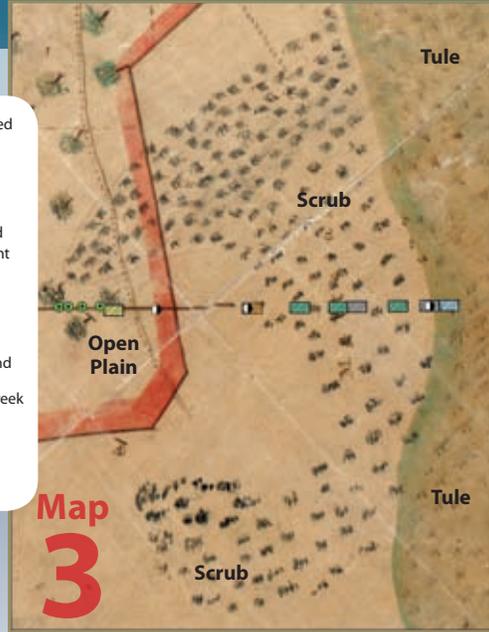
PLS notes courtesy USDI BLM





Map courtesy The Bancroft Library, UC Berkeley

- Oak, undefined
- Valley Oak
- Live Oak
- No tree found at survey point
- Dry Meadow
- Oak Woodland
- Creek, Dry Creek
- Scrub, Shrub
- Mud Flat



Map courtesy The Bancroft Library, UC Berkeley

On **Map 2**, encompassing part of present-day Brentwood and Oakley, the Public Land Survey notes help clarify the boundary between oaks and *chamisal* (brush) shown in the upper left in of map. (Since the original map was not oriented toward the north, the hand-drawn oak trees are now upside down.) Surveyor's notes describe a transition from a "sandy ridge" to an open plain where "brush and timber commence." While the *diseño* depicts a grove of trees southeast of the *chamisal*, the survey's detailed notes add the tree species and size and give a rough idea of spacing between the trees. Both the map and the Public Land Survey points indicate that to the south and west (the plains), trees are less abundant.

Map 3 shows an area near modern Byron, just south of Discovery Bay. This detail from the *diseño* indicates a boundary between scrub and tule. The survey notes also describe these habitat types, and while the transition line on the hand drawn *diseño* between scrub and tule does not exactly match the placement of the Public Land Survey scrub and tule, it does agree with the progression and general extent of both habitat types.



Photograph courtesy the Library of Congress

The grandeur of the Los Meganos area is captured in a panoramic watercolor by Edward Jump circa 1865 (across bottom of both pages). John Marsh's house is midway across the left hand page. Marsh Creek, also shown on **Map 2** above, dominates the painting. A photograph of Marsh's Stone House (above) shows the house in the valleys and hills northeast of Mount Diablo. Pioneer Edwin Bryant describes his walk with Marsh in 1847 (right), before the Stone House was built.

Watercolor below courtesy The Bancroft Library, UC Berkeley

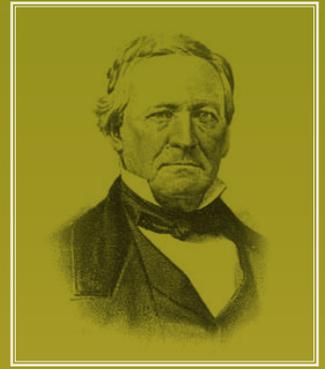


Photo courtesy Contra Costa County Historical Society

Human impact is also considered when assessing ecological change, as native people and immigrants affected the landscape through different land use practices. An influential figure in the history of the Meganos land grant is that of John Marsh (below), who bought over 13,000 acres in 1837 from José Noriega. He planted orchards, grew vegetables, and grazed cattle. Marsh's Stone House, completed in 1856, is the remaining prominent icon of that era (see photograph below and watercolor across both pages at bottom).



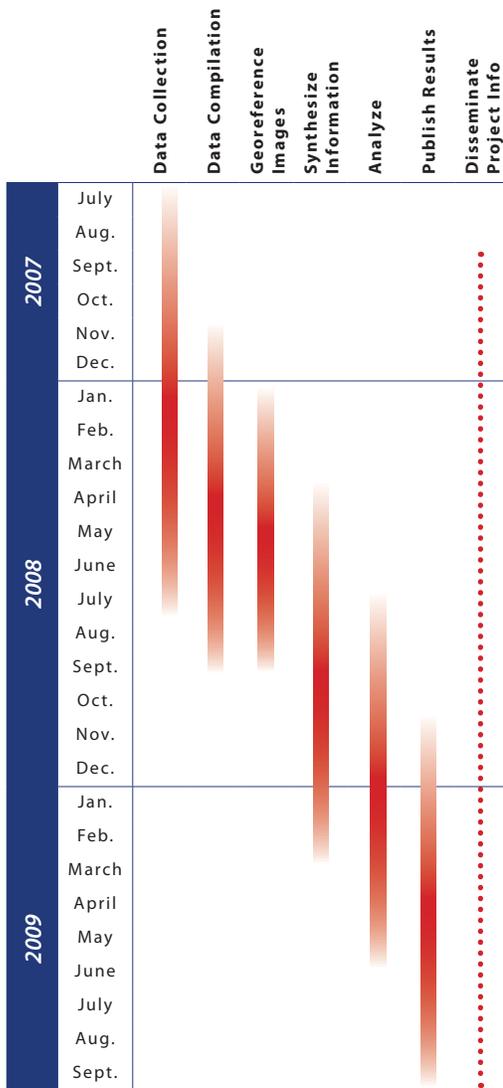
SEPTEMBER 17, 1847.

AFTER BREAKFAST I WALKED WITH DR. MARSH to the summit of a conical hill, about a mile distant from his house, from which the view of the plain on the north, south, and east, and the more broken and mountainous country on the west, is very extensive and highly picturesque. The hills and plains are ornamented with the evergreen oak, sometimes in clumps or groves, at others standing solitary.

- EDWIN BRYANT



HISTORICAL ECOLOGY OF CONTRA COSTA COUNTY PROJECT PLANS AND TIMELINE



GET INVOLVED!

Would you like to get involved with the Contra Costa County historical ecology assessment? The Contra Costa Watershed Forum has convened a subcommittee to provide input throughout the project. There may be opportunities to assist with the collection of historical documents, interpretation of resources and design of data presentation. If you are interested in joining the subcommittee, please contact Abby Fateman at afate@cd.cccounty.us or 925-335-1272.

This publication will be available electronically from the CCWF website: www.cocowaterweb.org and from the San Francisco Estuary Institute at www.sfei.org.

DESCRIPTIONS AND CREDITS FOR FRONT COVER IMAGES

	1. Watercolor of Los Meganos, ca. 1865, courtesy The Bancroft Library at UC Berkeley
	2. Port Costa, 1910, courtesy Andrew Martin Collection
	3. Portion of 1850 survey, courtesy the Contra Costa County Historical Society
	4. From the Los Meganos land grant map (ca. 1853), courtesy The Bancroft Library at UC Berkeley
	5. 2005 color imagery, courtesy USDA (National Agricultural Imagery Program)
	6. Surveyor's notes from 1850 map, courtesy the Contra Costa County Historical Society
	7. From the Los Meganos land grant map, ca. 1853, courtesy The Bancroft Library at UC Berkeley
	8. John Marsh's Stone House, ca. 1920, courtesy Library of Congress
	9. Public Land Survey notes, 1851, courtesy USDI Bureau of Land Management

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