SUMMER 2008

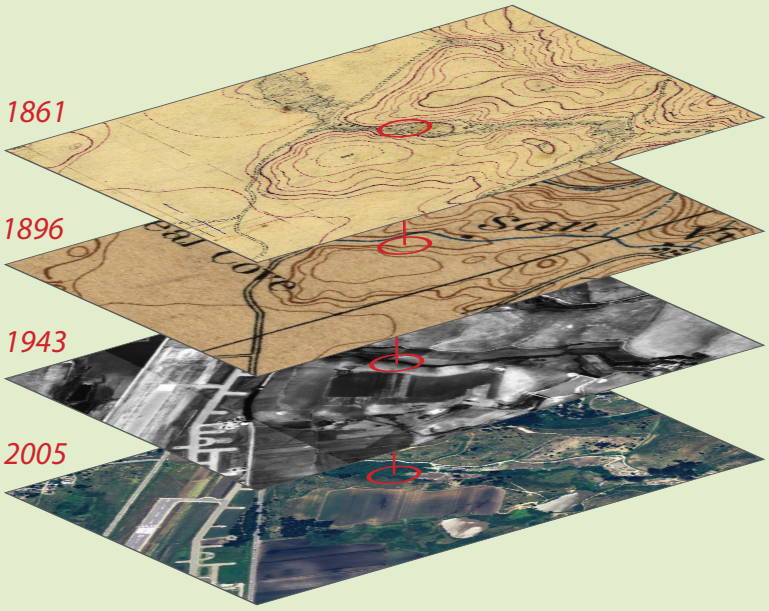
THE HISTORICAL ECOLOGY OF NAPA VALLEY: *An Introduction*

Old Adobe House, Soscol Ave., Napa.

Over the past several years, a team of researchers has assembled thousands of pieces of evidence about how the Napa Valley functioned under more natural conditions. Previewed for the first time here, this information can help us understand how the local landscape has changed through time and help us develop strategies to improve its health in the future.

Photograph courtesy of The Bancroft Library, UC Berkeley.

DATA COLLECTION • Research begins with the acquisition of historical materials from a broad range of institutions, including local museums and historical societies, city and county archives, and regional libraries. Journals, diaries, and newspaper articles about the landscape and notable environmental features document historical conditions. Early maps, surveys, and aerial photography provide the locations of historical features, such as streams, wetlands, and plant communities, as well as remaining property boundaries and roads that are valuable links to the contemporary landscape. Other important sources include landscape photography, sketches, and paintings.



DATA COMPILATION • Sources are drawn together for synthesis and analysis along the themes of historical vegetation types, channel geometry, seasonality, and land use. We georeference early maps and aerial photography in a geographic information system (GIS), which allows historical evidence to be compared to modern conditions. We also extract and organize pertinent quotes from early land surveys and narrative sources and, where possible, place them on maps of the past and present. This process of comparing multiple, independent sources of historical and modern information facilitates a detailed and accurate depiction of environmental change.

SYNTHESIS AND ANALYSIS • We rely heavily on GIS to synthesize the data into layers that represent historical landscape characteristics. Mapped features may include channels, perennial and seasonal wetlands, coastal features, woodlands and savanna, and other habitats — each coded independently with their supporting sources and relative certainty level. A variety of methods are used to compare past and present landscapes, describing changes in habitat form and distribution. These depictions of habitat change are used by ecologists and other environmental scientists to describe changes in ecological functions, such as wildlife support. As a reliable map of the pre-modification landscape is developed, it begins to reveal the relationships between native habitats and physical gradients such as topography, salinity, and hydrology, providing a basis for identifying adaptive restoration and management strategies for the contemporary landscape.

REPORTS, GRAPHICS, AND PRESENTATIONS • The analysis is brought together into broadly accessible tools, including illustrated reports, websites (such as wetlandtracker.org), and maps. These present trends in habitat types and extent, discuss conceptual models and areas of interest for future environmental improvements, and provide direct access to many of the most significant historical data sources.

APPLICATIONS • Understanding the historical landscape and how it has changed over time can help address many of the challenges associated with managing and planning for the future of local watersheds. Historical ecology can help set priorities for restoring natural functions to local creeks, identify natural ways to reduce flood hazards, and reveal previously unrecognized conservation opportunities. The historical analysis often reveals ways to restore native habitats within our developed landscape for recreational benefits as well as wildlife conservation. Historical ecology can also reveal management constraints resulting from historical landscape changes, providing a more realistic basis for planning the future.

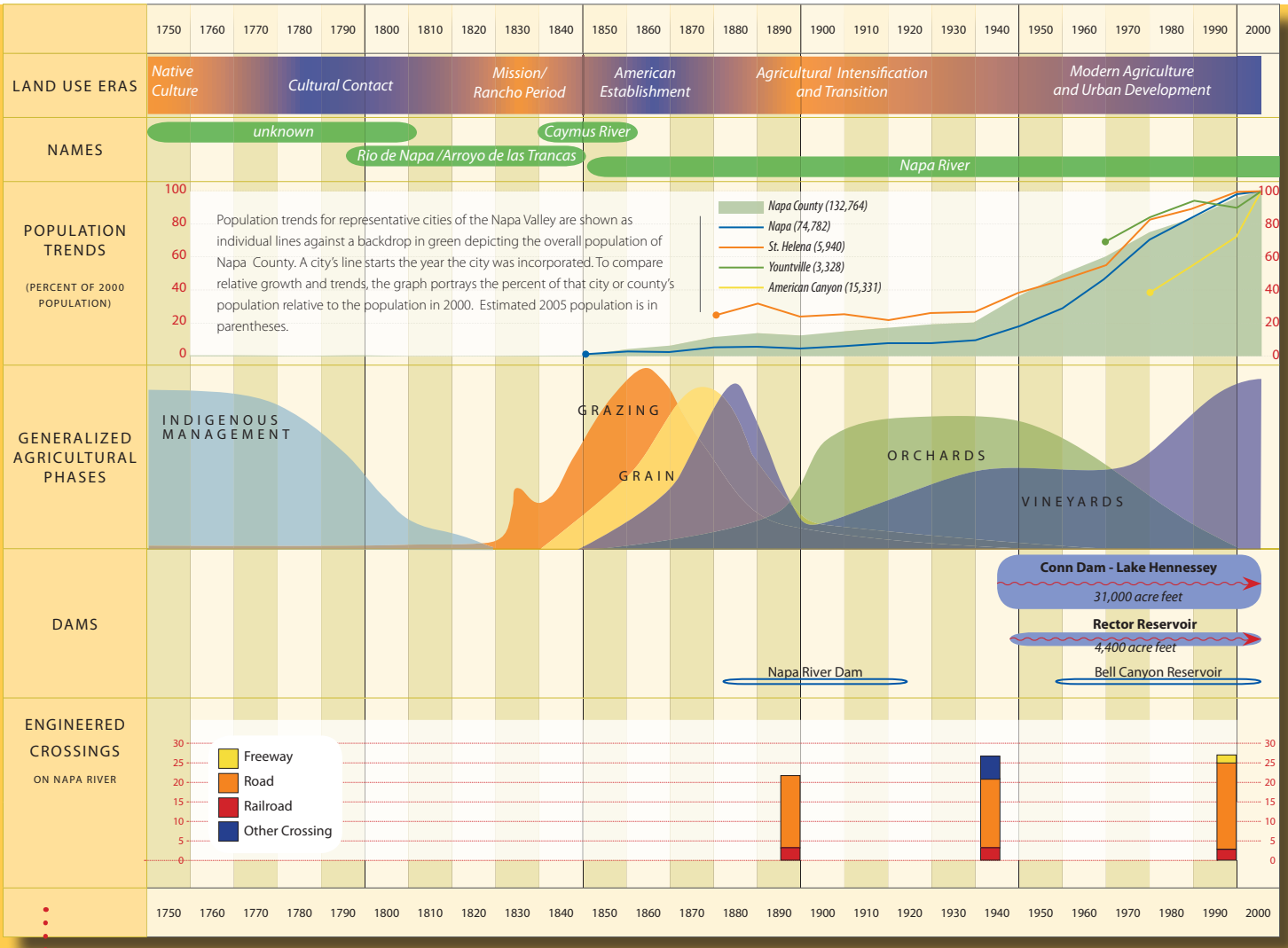
Napa Valley in the RECENT PAST

HISTORICAL RECORDS paint a picture of a moist Napa Valley that naturally stored water for the long summer drought. In the lowlands, there were thousands of acres of seasonally wet meadows surrounding pockets of tall tule marsh. The river bed was not much lower than the valley floor, and flood water spread into sloughs and wetlands. The river divided and reunited, creating natural islands hundreds of acres in size. Many of the tributaries did not connect directly to the Napa River, but dissipated into valley wetlands, recharging groundwater. As the rest of the valley dried in the summer months, the wetlands released water to the river, which helped maintain its flow.

April Showers, Napa Valley by Jules Tavernier, ca. 1880. Courtesy of California Historical Society.

On the well-drained tributary fans, sloping gently between the valley bottom and the adjacent hills, grand valley oaks flourished. Able to reach the seasonally receding groundwater table, these majestic trees dominated the drier parts of the valley. Further downstream where the river met the Bay, it spread into a vast area of tidal marshland.

During the last two centuries, the river and its valley have been extensively modified. Memories of the native landscape and the history of modification have faded. Yet many of the most basic physical and ecological characteristics persist. The historical landscape provides a template for strategically recovering selected ecological functions. Historical ecology can help us decide the next steps toward better ecological health.



Above, this series of timelines encapsulates the history of Napa Valley land use, from indigenous land management to Mission/Rancho-era ranching to American farming, viticulture, and residential expansion.

NAPA VALLEY circa 1830

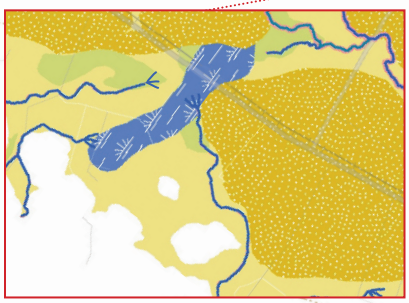
THIS MAP SHOWS THE HABITATS AND DRAINAGE PATTERNS of the Napa Valley before significant modification by Spanish and American settlers. It is based upon hundreds of historical records – including early surveys, photographs, and written accounts – which have been integrated into an annotated, composite map.

Photo courtesy of Sharon Cisco Graham

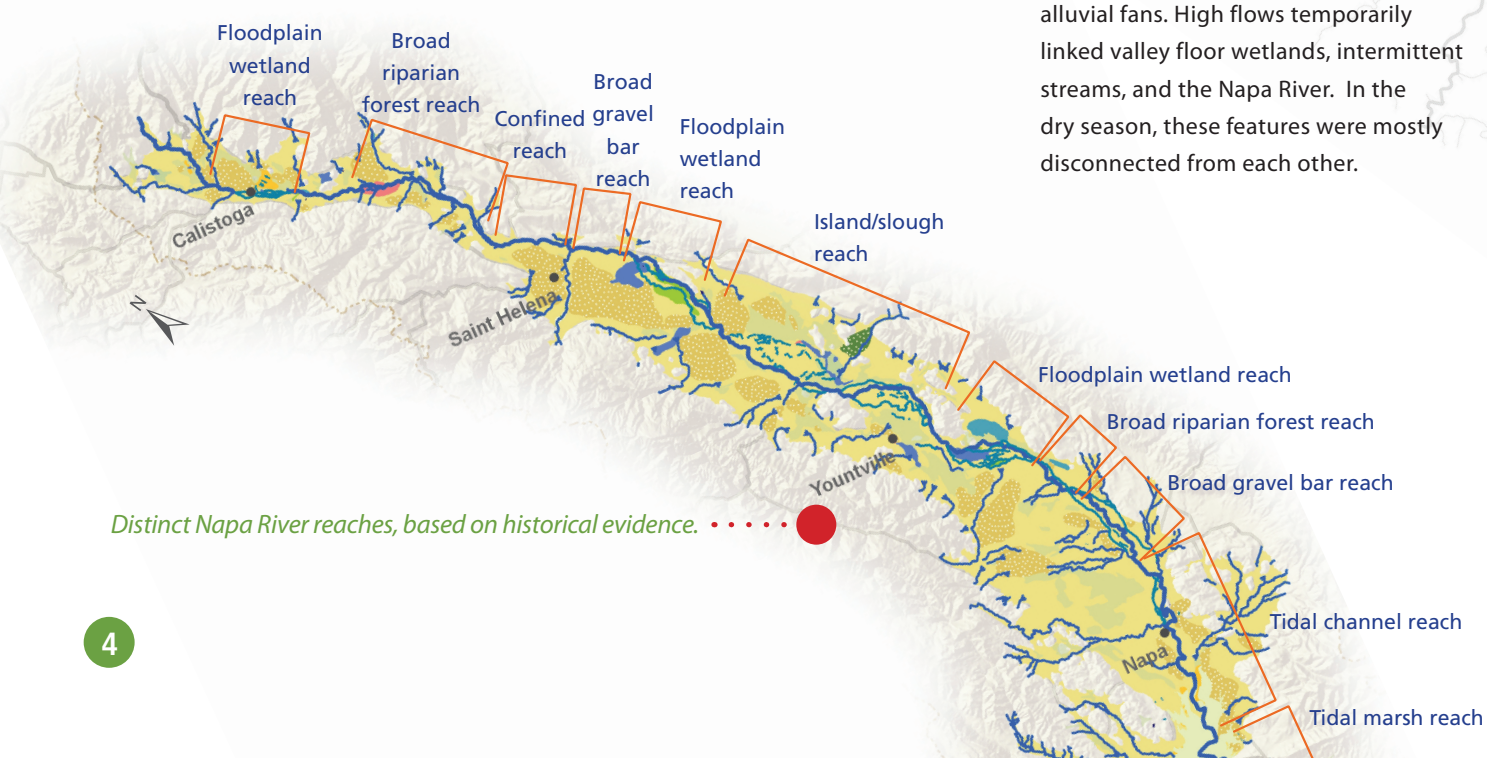
The broad gravel bars formerly common along Napa River are now relatively rare. As the channel has cut down, these areas have received less frequent scour and are now often invaded by dense riparian vegetation.

IN EARLIER TIMES there were various river reaches (see figure below) with differing functions for fish and wildlife habitat, sediment transport or storage, and flood conveyance. The river spread into floodplain wetlands where the valley was wide, narrowed and steepened at confining topographic and geologic barriers, and picked up sediment and water at major tributary confluences. In contrast, today's Napa River is relatively homogenous, generally occupying a single thread channel with a narrow adjacent riparian corridor.

The topography that controlled the river has not much changed, suggesting that a variety of river reaches and functions can be restored.



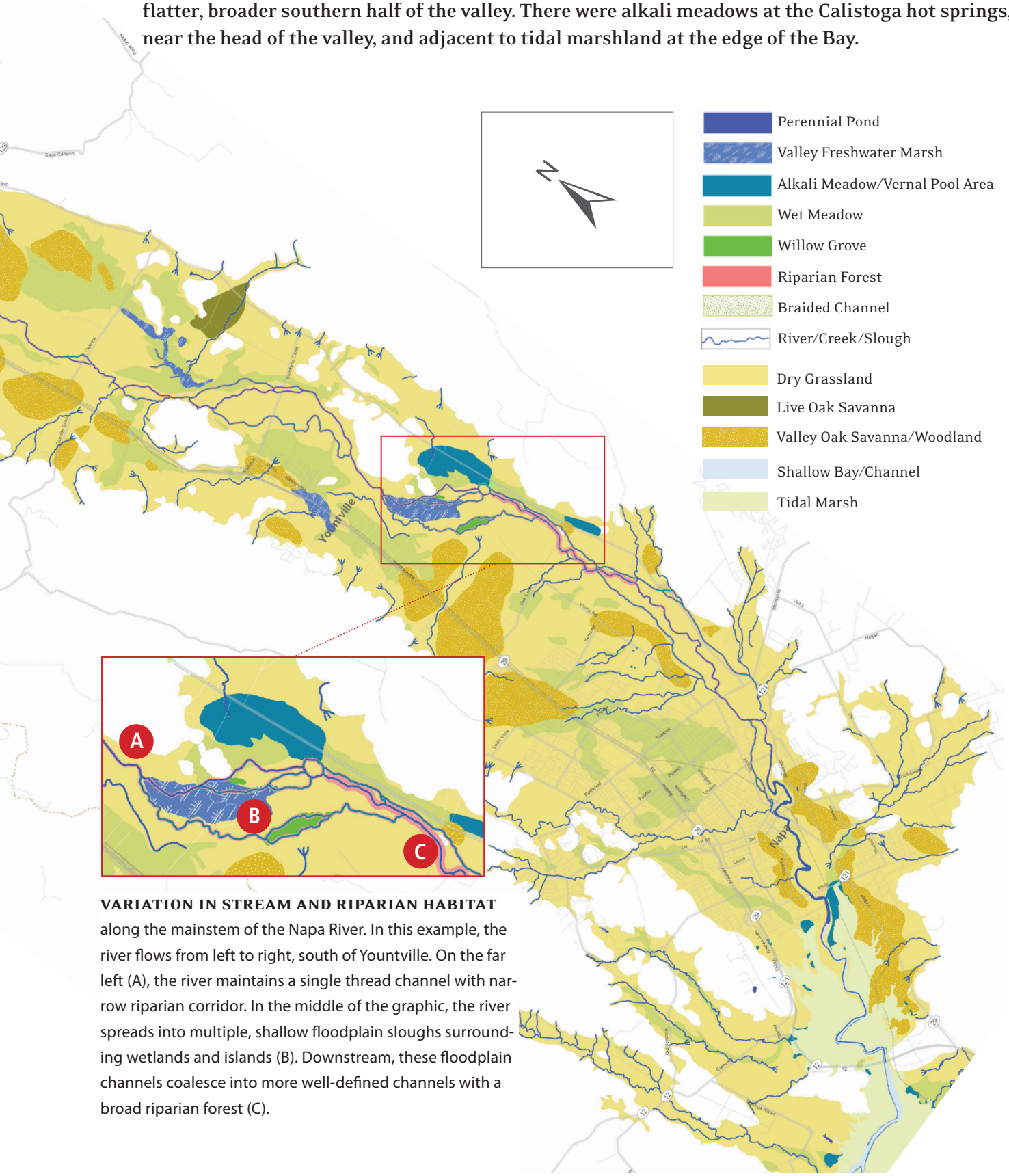
MANY OF NAPA VALLEY'S CREEKS dissipated on the valley bottom or lower alluvial fans. High flows temporarily linked valley floor wetlands, intermittent streams, and the Napa River. In the dry season, these features were mostly disconnected from each other.



Distinct Napa River reaches, based on historical evidence.

NATURAL VARIATIONS IN FORM AND FUNCTION

The Napa Valley of the 19th-century supported varied habitats within a relatively small area. Dryland habitats such as oak savanna and grasslands were found not far from perennially wet marshes. Seasonally flooded wet meadows covered large areas of the valley floor, especially in the flatter, broader southern half of the valley. There were alkali meadows at the Calistoga hot springs, near the head of the valley, and adjacent to tidal marshland at the edge of the Bay.



VARIATION IN STREAM AND RIPARIAN HABITAT along the mainstem of the Napa River. In this example, the river flows from left to right, south of Yountville. On the far left (A), the river maintains a single thread channel with narrow riparian corridor. In the middle of the graphic, the river spreads into multiple, shallow floodplain sloughs surrounding wetlands and islands (B). Downstream, these floodplain channels coalesce into more well-defined channels with a broad riparian forest (C).

WETLAND MOSAICS: *Wildlife Habitat, Surface Water Storage, and Groundwater Recharge*

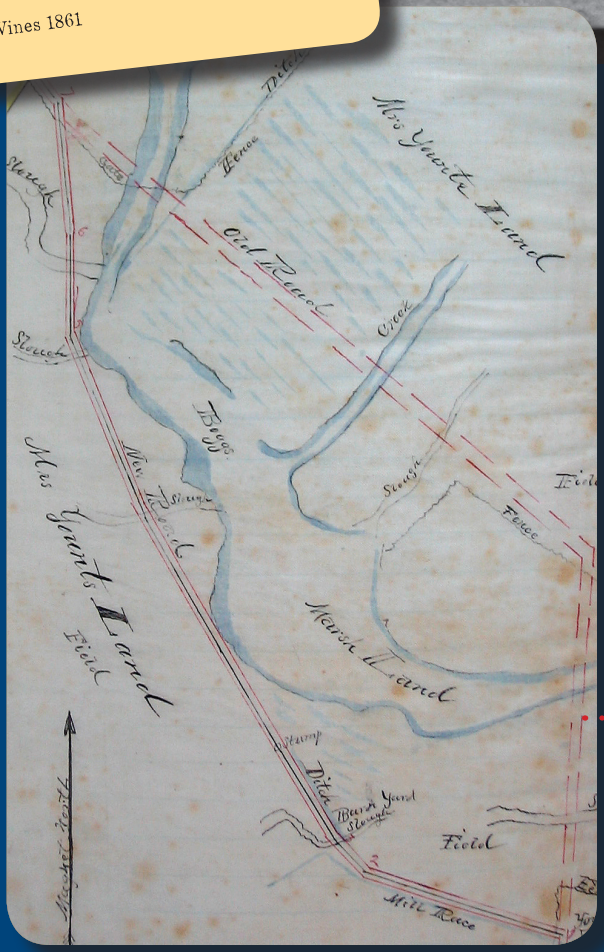
CALISTOGA HOT SPRINGS circa 1880

FRESHWATER WETLANDS IN NAPA VALLEY OCCURRED IN SEVERAL DISTINCT PATTERNS. Large wet meadows were common at the base of alluvial fans and behind the natural levees of the Napa River. Perennial freshwater "tule marshes" were associated with distinct topographic basins on the valley floor. There were also vernal pool areas, alkali meadows, and willow groves. These habitats generally occurred in association with each other, forming larger mosaics of wetlands along gradients in topography and hydrology.

Some of the areas of historical wetlands remain flood-prone and difficult to farm. These areas may provide some of the best opportunities for restoring wildlife habitats and, at the same time, reducing downstream flood hazards.

Turrill and Miller, n.d [circa 1880].
Courtesy of California Historical Society.

THE MARSHY LAND can be made tillable land by drainage – with present condition it cannot be cultivated.
– Vines 1861



Courtesy of Napa County.

Steam spouts show the wetlands associated with Calistoga Hot Springs (note standing water to the right of the row of white houses). The thermal springs and surrounding area were described by Bartlett in the mid-1850s: "[the springs] are in a plane near the base of a small hill of conglomerate rock; but owing to the wet and boggy condition of the valley, we were unable to approach within thirty feet of them. Columns of steam were rising from them on all sides" (Bartlett 1854).

This County survey shows "Marsh Land" and "Sloughs" north of Yount's Mill in the 1870s. Wetlands like these occupied natural flood basins receiving overflow from the Napa River and tributaries, providing foraging habitat and high flow refuge for native fish, including salmon.

The Future of the VALLEY'S GREAT OAKS

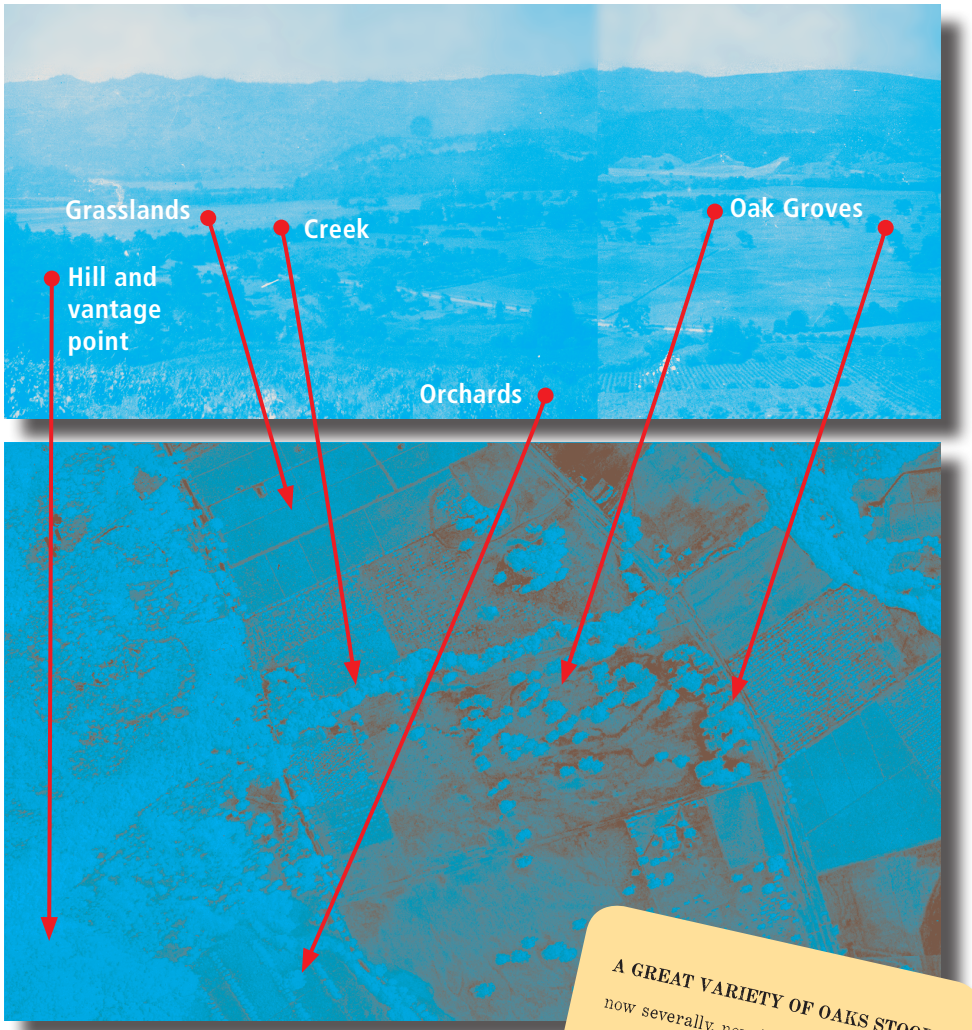
Stately valley oak trees are emblematic of the Napa Valley, perhaps its most celebrated attribute in early accounts.

"The magnificent oaks are one great secret of Napa's beauty. Their rustling leaves and finely formed tops are the glory of the landscape scenery…"

– Smith and Elliott 1878

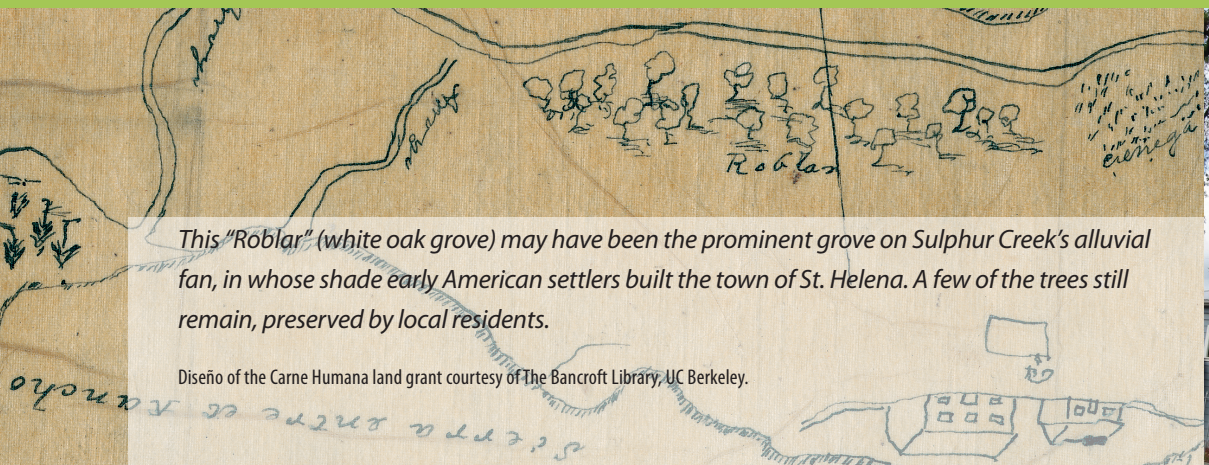
The photographs on the right provide complementary views of a typical historic oak savanna — this one occupying the Mill Creek alluvial fan between Calistoga and St. Helena. The trees formed a relatively dispersed, open pattern of light and shade that dominated large areas of the valley landscape. Traveler John Bartlett noted that the valley was "studded with gigantic oaks...though not so close together as to render it necessary to cut away to prepare the land for cultivation" (Bartlett 1854).

While the old oak savannas are nearly gone, naturalistic patterns of valley oaks could be created, even in urban areas. Trees could be strategically reintroduced along roads, fence lines, and public spaces. These efforts would build on a surprising number of surviving trees that have been maintained as landscape elements in vineyards and private residences, and reverse the long-term decline in valley oaks.



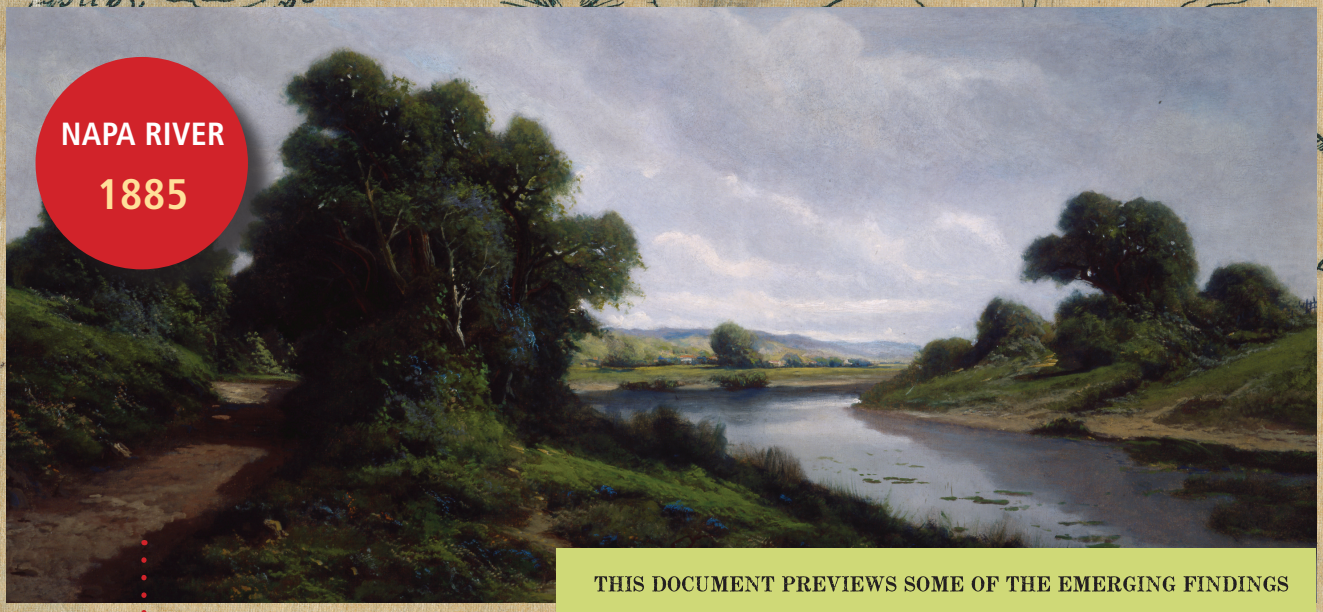
Top: Lyman Ranch/Mill Creek, ca. 1905. Courtesy of the Lyman family.
Bottom: 1942 aerial photograph of the same area. Courtesy of the Napa RCD.

A GREAT VARIETY OF OAKS STOOD, now severally, now in a becoming grove, among the fields and vineyards.
—STEVENSON 1883



This "Roblar" (white oak grove) may have been the prominent grove on Sulphur Creek's alluvial fan, in whose shade early American settlers built the town of St. Helena. A few of the trees still remain, preserved by local residents.

Diseño of the Carne Humana land grant courtesy of The Bancroft Library, UC Berkeley.



Napa River and Valley, 1885, by Manuel Valencia.
Collection of the Hearst Art Gallery,
St. Mary's College of California,
Gift of James J. Coyle and William T. Martinelli

THIS DOCUMENT PREVIEWS SOME OF THE EMERGING FINDINGS of the historical ecology component of the Napa Agricultural Water Quality Project. The full Napa Valley Historical Ecology Atlas is anticipated for release later in 2008. For more information about these projects, please see www.sfei.org.

The Napa River Watershed Historical Ecology Project has been developed by the San Francisco Estuary Institute, Friends of the Napa River, and the Napa County Resource Conservation District.

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FUNDERS: Napa Valley Vintners Association • Friends of the Napa River • California State Coastal Conservancy
CALFED Watershed Science Program • Giles W. and Elise G. Mead Foundation • Mennen Environmental Foundation
Watershed Information Center and Conservancy of Napa County
Proposition 40 Grant through the State Water Resources Control Board

THANKS TO: Josh Collins, Laurel Collins, Andy Collison, David Graves, Rainer Hoenicke, Bernhard Krevet, Ken Lajoie, Chris Malan, Lester McKee, Mike Napolitano, Sarah Pearce, Jake Ruygt, Leigh Sharp, and Betsy Wilson for assistance; and Sharon Cisco Graham, Napa County, The Bancroft Library, California Historical Society, St. Mary's College of California, and the Lyman family for images.

REFERENCES:

Bartlett, J.R. 1854. Personal narrative of explorations and incidents… Rio Grande Press, Chicago. 1965.
Smith and Elliot. 1878. Illustrations of Napa County California with historical sketch. Valley Publishers, Fresno. 1974.
Stevenson, R. L. 1883. The Silverado Squatters. Silverado Museum, St. Helena, CA.1974.
Vines, B. 1861. Testimony in the Caymus Land Grant Case.

FOR MORE INFORMATION: Please contact Friends of the Napa River at info@friendsofthenapariver.org

To learn more about historical ecology methods and resources, contact the San Francisco Estuary Institute at www.sfei.org/HEP

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