HISTORICAL ECOLOGY
OF THE
SUSCOL CREEK WATERSHED

Part 2

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Introduction
Historical ecology is an emerging science which utilizes careful analysis of a wide range of sources to understand the processes and changes to the local landscape through time. Although the focus is on the past, historical ecology provides valuable insight into both the current trajectory of the ecosystem and critical information about the historic processes and components needed for restoration. By studying our local history, we can better understand how and why the landscape has changed and determine a practical framework for restoring impaired or damaged ecosystems. It is hoped that this work will provide a useful foundation for future stewardship projects within and adjoining the Suscol Creek watershed.

A historical ecology report for the Suscol Creek watershed was prepared in 2005 for the Institute for Conservation Advocacy, Research and Education's Suscol Creek Collaborative Partnership and Restoration Project. Part one of this report led to additional questions about changes that may have taken place over the last 200 years within the watershed. This report is the result of supplementary research undertaken during the last quarter of 2006 to attempt to better understand the local landscape. Additional sources will likely surface as time goes on; providing greater insight.

Methods
Historical data for this report was collected from a number of local and regional archives. Important sources include historical texts and early accounts, early newspapers, land grant court case transcripts and maps, archeological reports, Napa County Assessor records, resource agency reports, environmental impact reports, Jepson's field notes, and personal communication with local experts.

The landscape prior to 1800

Historic plant communities
Most of the historic plant communities are still present within the Suscol Creek watershed, though all of them have been impacted in various ways and to varying degrees over the past two centuries. Changes are due to intensive grazing, logging, fire suppression, conversion to agriculture, grading for roads, water usage and diversions, removal of large predators (which allowed rodent and deer populations to skyrocket, increasing grazing pressure) and the introduction of non-native species. Many of these impacts had occurred even before the earliest land surveys and botanist explorations.

Tule marsh
The extent of the original tule marsh is fairly well documented in early records, often listed on early surveys as 'swamp and overflowed lands' or simply "tule" (see map on next page). While camped at Suscol Creek in October of 1861, surveyor William H. Brewer wrote: "The swamps bordering all the rivers, bays, or lakes, are covered with a tall rush, ten or twelve feet high, called 'tule' (tu'-lee), which dries up where it joins arable land."

Wet meadow/freshwater marsh
Suscol Creek historically spread out over a wide area, forming a "morass" before finding its way into the tidal marsh of the Napa River. When the creek was diverted in 1852, this area was

converted to orchards and farmland, then to pastureland, and presently is occupied by the water treatment facility. The approximate area of this "morass" is circled on the map below.

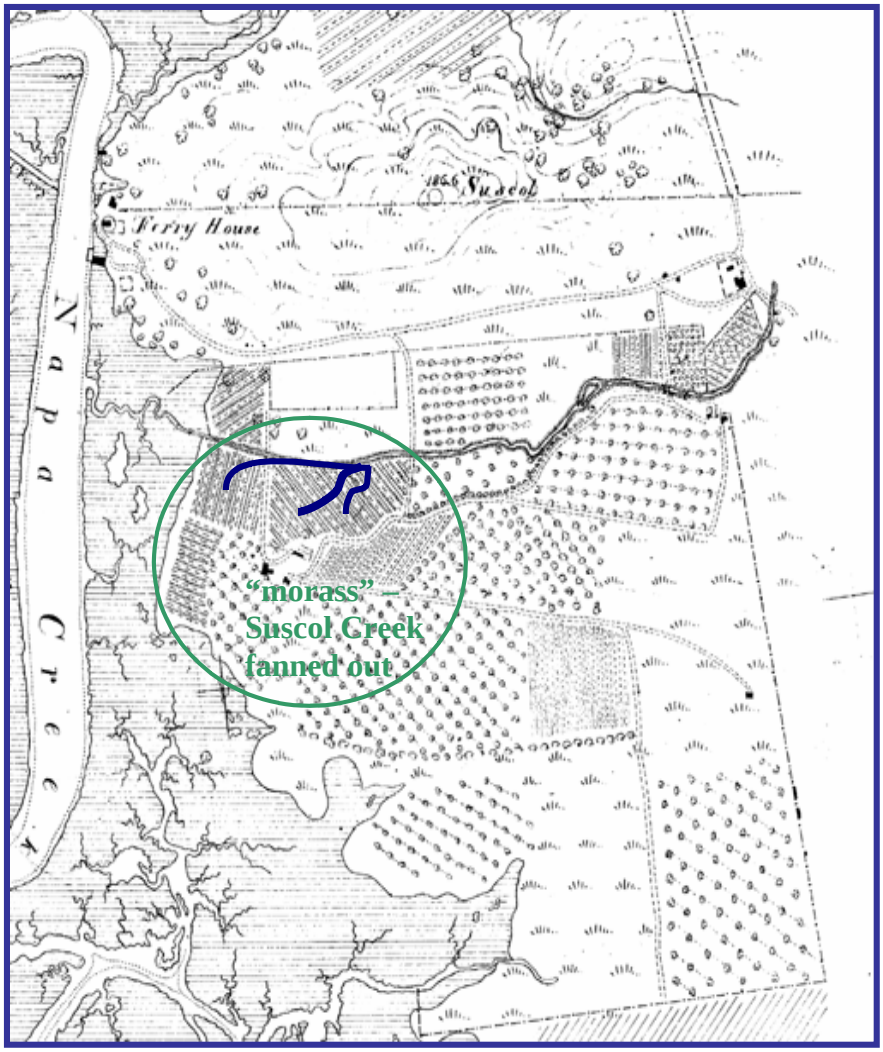


Figure 4: United States Coast Survey, 1858. Napa Creek and Napa City California, Plane Table Sheet XXXII, Register No. T777. This survey shows lower Suscol Creek, Suscol Ferry, the orchards and other crops at Thompson's Gardens, grassland, oaks, and wetlands. Prior to this survey, the Thompson brothers channelized Suscol Creek, and planted orchards in the fertile land.

Grassland

Very early on in the 19th century, non-native oats were introduced in the Napa Valley. Likely spread in the hides and manure of mission cattle brought here to graze, and possibly spread here even earlier by birds; weedy annuals such as oats quickly replaced the native perennial grasses that once flourished here. Prior to 1800, the grassland community, composed of native bunch grasses and wildflowers including lupines, goldfields, buttercups, harvest brodiaea, mule ears, and many others, spread across low west and south facing foothills and graded into oak savannah in the valley.

Vernal pool
Vernal pools are areas of seasonal shallow pools or meandering swales with an underlying impervious clay or rock layer. These areas are dominated by obligate wetland species which germinate in standing water and bloom as the water evaporates. Local botany expert Jake Ruygt surveyed and described several of these communities in the Suscol area during the 1980's and 90's, and additional pool areas may have existed in the region historically. Ruygt described a 40 acre area on the Suscol plain in 1981 as having a few small pools and drainage meanders in open grassland, with a few valley oaks on low rocky rises, and swales that are seasonally inundated. Part of the site was historically tidal marsh, which had since been diked. The area was developed into an industrial park in 1983.

A second 40-50 acre site exists on Suscol ridge across highway 29/121 from the historic Suscol town site. Approximately 15 pools are located along meandering drainages and on flat areas, and support several endangered plant species. This area was used as pastureland until 1997 when the surrounding land was converted to vineyard.

Valley oak savannah and oak woodland
Historically oak savannah and oak woodland associations covered much of the plains and rolling hills; with valley oaks scattered and in clusters on the valley floor in fields of native bunchgrasses and wildflowers; coast live oak woodlands on the hills; blue oak occupying drier sites. Prior to Spanish and Anglo settlement, these plant communities were affected by the Patwin as they harvested acorns and burned the hills to suppress brush, improve habitat for game, and clear the ground for easier acorn collection. Deer and elk were abundant, and browsed leaves and new oaks. Bears also gorged on acorns.

Riparian woodland
Suscol Creek benefits to this day from a mature growth of riparian trees including alder, bay and coast live oak. Willow groves were more extensive on the valley floor; several are noted on early surveys near the village of Suscol. Today the understory is overrun with Himalayan blackberry in places throughout the watershed.

Chamisal
The term 'chamisal' is used to refer to brushy communities composed primarily of chamise with other species present including ceanothus, scrub oak, manzanita, and toyon. Chamisal typically is found on drier, southern and western facing slopes and areas of thin, rocky, well-drained soils, on areas where soil moisture is too deficient for tree cover, and on areas subject to repeated fires.

Human Habitation and Impacts

Native land management
People first found their way to the Napa region some 10-12,000 years ago. The Suscol area was inhabited by and named after a tribelet of Patwin, or Southern Wintun people. These Penutian-speaking people also lived in the Sacramento Valley west of the Sacramento River up to Shasta. The Patwin were skilled fishermen, using long spears and nets to harvest anadromous fish during spawning season. Acorns were a staple, and were stored in granaries, as large as three feet by

eight feet. Bay leaves were added to the stores, and pitch was spread on the granary supports to repel squirrels and insects. Individuals or families within a tribe had claims, determined by the chief, to specific oak trees, and no one else in the tribe was permitted to collect acorns from that tree. The Patwin people influenced the landscape with selective harvest of plants, hunting of game and seasonal burning. Intentionally set fires were used to improve plant growth for the natives and for game animals. These fires were low-intensity because they were set frequently; keeping fuels from building up. A low intensity fire will sweep through an oak savannah or oak woodland, removing competing plants, freeing up mineral nutrients, and killing off (temporarily) insect pests. Oak seedlings and saplings are able to send up new shoots after a fire, and growth is vigorous.

Tragically, due primarily to rampant disease brought by Spanish and Euro-American settlers, the Patwin population plummeted in the early 1830's. The historic population of Patwin in the Suscol area is uncertain. The village at Suscol was vacant by 1835, and as a result little is known about Suscol's earliest residents.

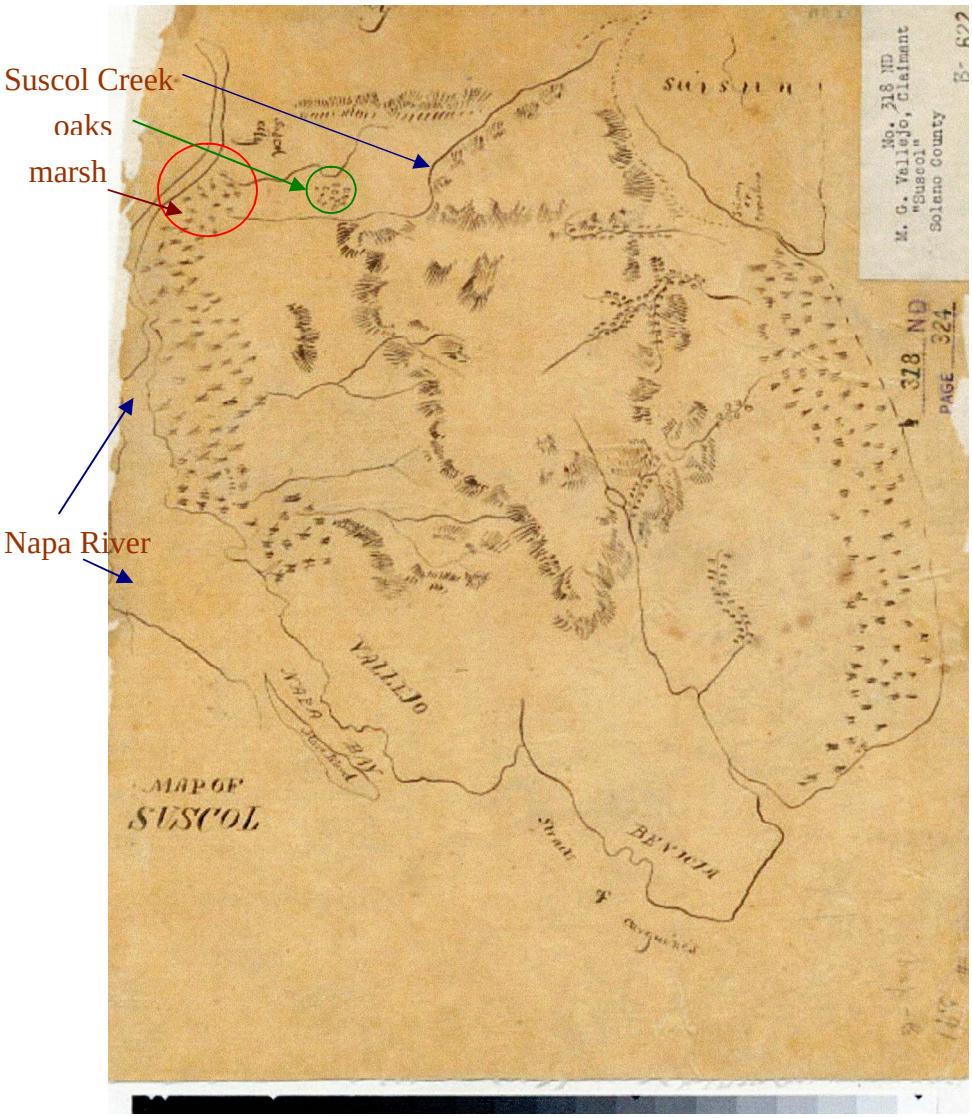
Archaeological sites adjacent to Suscol Creek

Number	location	details
Nap-15	north bank of Suscol Creek west of highway (100 ft. diameter)	Historic Patwin village "Soscol". Midden. Historic burials and artifacts
Nap-15a	directly across from Nap-15 on southern bank of Suscol Creek	Extension of Nap-15
Nap-16	Suscol Mound. On south bank of Suscol Creek, east of highway	Shell, beads, obsidian points and chips. Elk bones abundant. Burials and mortars. (195 ft EW, 135 ft NS, 80" deep) Excavated 1945
Nap-17	north side of Suscol Creek east of the Napa Vallejo Highway	Habitation site (300 ft. diameter, 3 ft deep)
Nap-22	located on a low ridge directly across the creek from Nap-16 on north side of Suscol Creek east of the Napa Vallejo Highway	Village site (100 by 150 ft). Dark earth, Midden.
Nap-23	south side of Suscol Creek one mile east of the Napa Vallejo Highway.	Village site (200 ft diameter, 3 ft deep)
Nap-24	north side Suscol Creek 1 mile east of Napa Vallejo Highway.	Village site (100 ft by 30 ft, 2.5 ft deep)

180 years of landscape change

Grazing

Mission San Francisco de Solano was founded in 1823 in Sonoma in an effort to extend Mexico's control of the region and discourage expansion of Russian influence from Bodega and Ross. In 1833, the missions were secularized, providing for the transfer of land to Mexican (primarily) settlers. The 1820's to the 1850's marked a pastoral period with grazing (sometimes



Landgrant case No. 318 ND, M.G. Vallejo, claimant. From the Bancroft Library.
Though rough at best, this diseño map provides additional documentation that Suscol Creek fanned out into the marshland before entering into the Napa River (circled), rather than maintaining a distinct channel. Another feature of interest (also circled) is the group of oak trees adjacent to Suscol Creek on a map that depicts no other trees.

intensively) the primary land use. In 1835, General Mariano G. Vallejo was awarded *Rancho Nacional Soscol* by the Mexican government. From the 1830's through the 1850's, General Mariano Vallejo grazed thousands of cattle and horses on this tract of land; supplying first the Missions and the Mexican army, then the onslaught of settlers. The imported livestock unwittingly introduced seeds of non-native weedy annuals such as oats in their hides and manure; these invasive species quickly replaced the native perennial grasses that once flourished here. Also, livestock tend to prefer native herbaceous plants and grasses over the European species they brought with them, further aiding the establishment of introduced species of grasses and weeds.

Livestock grazing has continued in the Suscol watershed throughout the past nearly 200 years. The understory of perennial grasses associated with oaks provides good forage, and acorns provide a valuable source of protein during the time of year when forage is scarce. To some extent, moderate grazing under the oaks, like the frequent fires of earlier times, removes the competing grasses and shrubs, keeping the understory open and more favorable to seedlings. However, grazing has effects that are less desirable for oak trees, including soil compaction, trampling and eating seedlings and acorns, and browsing of foliage, which has been shown to stunt trees and keep them from reaching maturity. (Pavlick, et. al. p.123) As a result, oak regeneration is typically greatly diminished in grazed areas.

Logging

The flood of settlers to Napa Valley and the Bay Area in the middle of the 19th century created a huge demand for oak wood. Untold numbers of oak trees were cut for various purposes including: firewood to warm homes locally and in San Francisco, charcoal, fuel for the steam locomotives, fuel for the furnaces of mercury and silver mines. On May 30, 1868 the Napa County Register shed some light on the extent of wood cutting, relating that the Napa Wood Company owned 6,070 hectares (about 15,000 acres) of hill and valley lands and had 36,246 cu. m. (10,000 cords) of firewood ready to be shipped to near and distant points. While no quantitative descriptions have surfaced describing wood cutting specifically in the Suscol Creek watershed, there is no reason to believe it would have been exempt. Leather tanning became a big industry in Napa in the mid 1800's through the early 1900's, using extracts from the bark of tanbark and coast live oak as a tanning agent. Bruce Pavlick states "The tanning industry would not reach its zenith in California until the late 19th century, with devastating consequences for tanbarks and oaks throughout the state. By the turn of the century, the rapacious harvest of tanbarks prompted some botanists to predict that the species would become extinct." Tanbarks were not likely present in the Suscol area, as they are usually associated with Douglas firs, though the coast live oaks in the area may have been cut for use in tanning hides.

Mining

The total recorded production of quicksilver in Napa County from 1863-1917 was valued at over $15,000,000. Cinnabar is roasted in a furnace made of brick and tile, and distilled through condensers to separate the mercury from the sulfides and ore. Originally, wood was burned to heat the cinnabar at an average rate of 1 cord of oak per day per furnace. Crude oil later replaced wood as fuel.

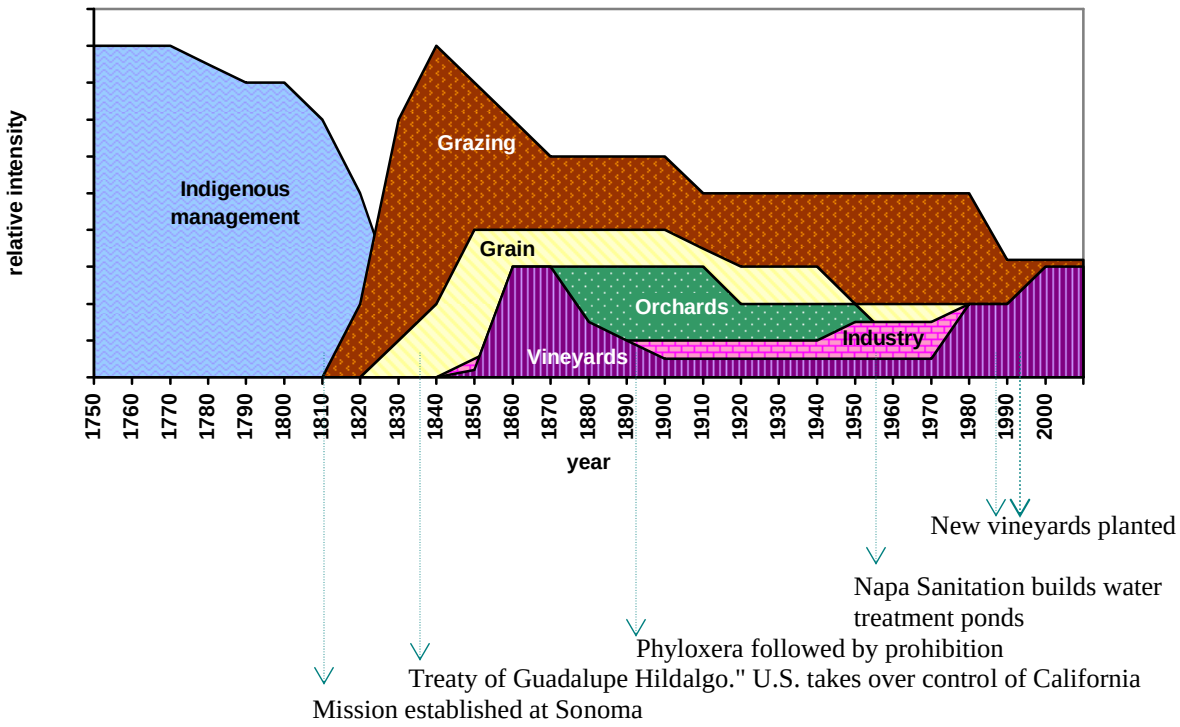
Mines were located throughout the area, as prospectors looked for cinnabar (for mercury) and other resources. There are no major mines documented in the Suscol area, though several successful quicksilver mines were located to the north in Pope Valley (Valley or Aetna mine) and to the south across Jameson Canyon in the 'Sulphur Springs Mountains' of Solano County (Brownlee, St. John's, and Hastings mines). Three small mercury kilns were located on a knoll northwest of Suscol Creek. These structures were found during preparations for the *'Robert Mondavi Vineyard Draft EIR'*. Further investigation found no indication that these structures were ever utilized, and no mercury mines were discovered in the immediate area.

Roads
The Suscol area was an important crossroads for travelers for hundreds, and likely thousands of years. Indian trails converged at Suscol from the south, from the east following Suscol Creek, and from Suscol up the east side of the Napa Valley to Calistoga. Californios, and later the American settlers followed the trails north into and up the Napa Valley, and these became Hwy 121 and the Silverado Trail. In the early 1970's, a freeway was constructed on Routes 29 and 121 with a high bridge over the Napa River. The 'Soscol Hill' provided a natural approach to the high level bridge, and the area was excavated from 175' to 110' to accommodate the Hwy 29/5th Avenue (Soscol) interchange. The thin soil mantle (2-12 inches) was removed from the existing rock and reserved, contour grading lowered the hill, and the soil was replaced. Excavation material from the site was used to build the embankment for the easterly approach to the Napa River Bridge.

Water use
Nominal amounts of water have been diverted from Suscol Creek historically, primarily for stock watering and irrigation. Several wells are also listed throughout the watershed, for residential and stock use. On the valley floor in the vicinity of Suscol Creek, fresh groundwater occurs in tuffaceous beds of the Sonoma volcanics beneath the alluvial deposits at depths from 20 to more than 100 feet. The deep fresh water in the Suscol area apparently is separated from the overlying shallow salty water by deposits of low permeability. A group of wells known as the 'Suscol wells', located north of Suscol Creek on the plains east of the Napa River, supplied the City of Vallejo with water from 1922-1925, yielding from 750,000 to 1.5 million gallons a day. C&H Sugar pumped and exported water from these wells to their facility in Crockett at an undisclosed rate (believed to be greater than two million gallons per day) from 1930 to 1932. A three year study in the 1930's on the water resources of the Napa Valley determined that heavy pumping of groundwater from the Suscol wells directly affects at least one well at the Napa State Hospital, a mile to the north. It has not been documented whether salty water may be drawn in to this water table by extensive pumping, nor is there any historic evidence of long term lowering of water tables (in this area) due to pumping (seasonal drawing down of water tables and winter recharge is documented). Pumping from these wells has been greatly reduced since 1950.

Fishing
Local landowners and California Department of Fish and Game wardens reported heavy fishing on Suscol Creek in the 1950's during the opening of fishing season. In 1949, one resident claimed that the stream is fished out in the first few days of trout season. Former Napa County Supervisor Mike Rippey reported fishing in Suscol Creek for "native rainbow trout" during trout season in the 1960's, and seeing some other fishermen catch steelhead. It is interesting to note that while the Department of Fish and Game never planted fish into Suscol Creek, many thousands of hatchery steelhead from other areas (Mad River, Rogue River, Russian River, etc.) were planted in the Napa River during the 1970's, 80's and 90's. The affect, if any, of these fish on the population in Suscol Creek is unknown. No records have been found to date to determine whether other salmonids (Coho or Chinook salmon) were historically present in Suscol Creek.

Landuse Patterns for the Suscol Watershed



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Dean Enderlin, geologist and local mining expert.
Sid Poe, hatchery manager, California Department of Fish and Game
Mike Rippey, former Napa County Supervisor
Jake Ruygt, local botany expert