

PERTURBING MYSTERY



So, THIS was the Wildergarten? People do like “before” pictures, but unfortunately, most of it was so thick that it was virtually impossible to photograph. This is what our land *used* to look like, except that ours was worse. Like this, most of it was overgrown oak/madrone forest infested with French Broom being invaded by conifers. Yet in addition to these problems are those one cannot see.

What were the original native uses of the area such that one knows which plant communities are likely to develop and which successional processes are likely to develop after disturbance? What were the historic uses with which to guess which weeds are lying dormant in the soil? What minerals were lost from the topsoil? Why does the winter runoff take the path it does? How much forest was once grassland or chaparral and where? The site history informs us of how the land got to the condition one is facing.

One would correctly think we should begin a site history with 'how things were before the white man came.' Yet there are errant presumptions underlying most people's beliefs about that time, arising from "Enlightened" ideas about what constitutes "Natural." We tend to think in terms of a steady state that would not have existed but for the intentions of people.

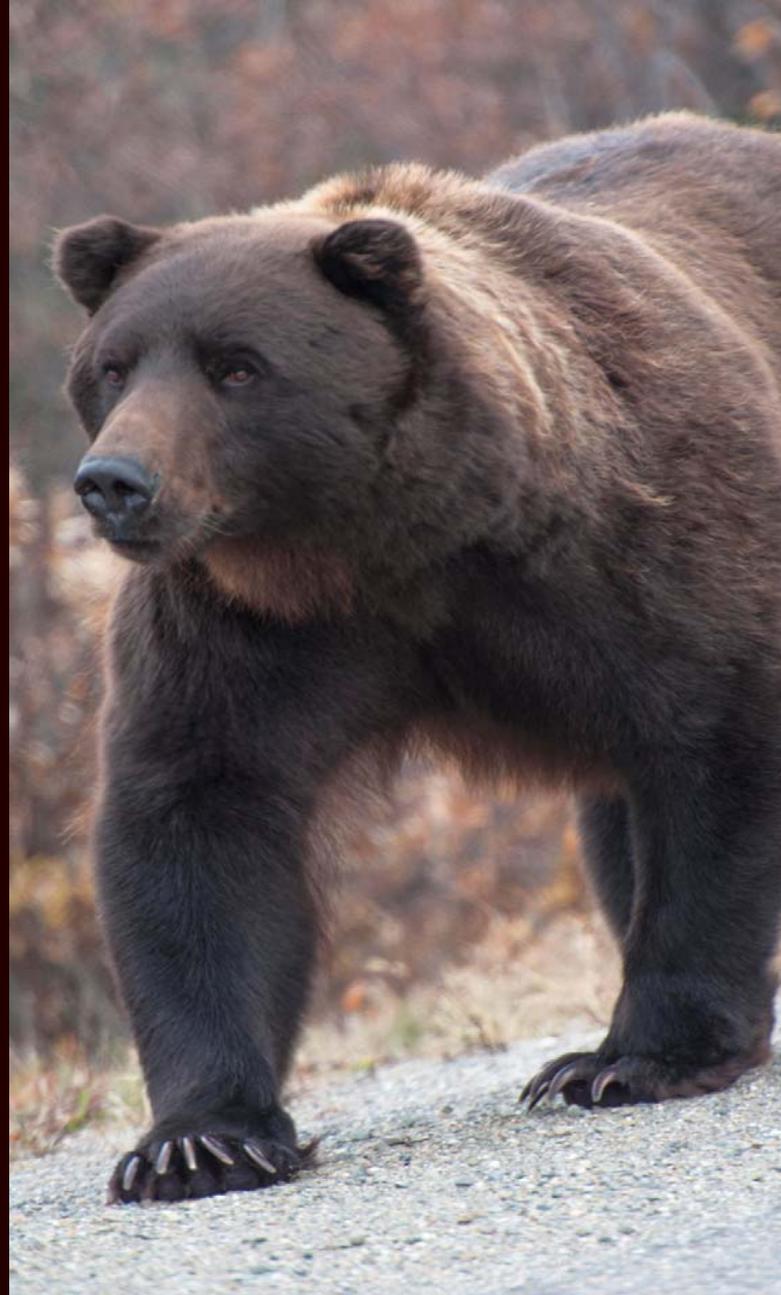
One such false idea is the belief that Indians "lived lightly upon the land" exerting relatively little influence upon its Natural condition. It makes for a nice story given the beliefs cited above, but it is just not true. Eurasians invaded a late-Pleistocene North America that was largely barren where the glaciers had retreated. These new arrivals were very proficient hunters, quickly extirpating some 31 of the 44 large-bodied animal species in the hemisphere, including some that had considerable domestic potential (such as mastadons, horses, oxen, and camels) to their own great detriment later on. Indians were such proficient hunters that in most of North America, early explorers describe a landscape nearly bereft of game. Lewis & Clark went some 18 days without seeing a single large bodied animal, finding adequate game only in war zones between tribes.

Coastal California Indians were every bit the proficient hunters as Indians elsewhere in America, but unlike the rest of the country they had an intractable, intelligent, powerful, and social competitor: the Grizzly Bear. Yes, grizzlies once ranged over most of the temperate continent, but in most of those temperate regions grizzly bears hibernate, making them possible but still not easy for Indians to kill. The following account is directly from the last surviving Yahi Indian, Ishi in *Two Worlds* (p195):

A grizzly bear is not game that a lone man armed with only bow and arrow seeks out. The Yahi hunted a grizzly **if it was hibernating and only if there were several men together**, enough to surround it with a circle of burning brush before it was fully awake.

The account goes on to say that even then, it was often quite a fight. It was not easy to kill a grizzly, but at least it was possible to kill one that was hibernating. To take one on that was fully awake while alone would have been suicidal.

In coastal California, grizzly bears had no need to hibernate. The impact upon the resulting distribution of vegetation was profound, but before going there we need to develop a few more ideas.



Grizzly Bear;, by Denali National Park and Preserve.
Uploaded by Albert Herring via Wikimedia Commons

Another popular theory among current students of archaeology and ecology is that infectious European crowd diseases such as smallpox, influenza, and measles took down Indian populations so rapidly, early, and to such an extent that their numbers were greatly depleted before European settlers actually made contact with them. The theory holds that by the time the Spanish arrived over two hundred of years later these epidemics had allowed a recovery in the numbers of game animals and thereafter the Indians. Although this appears true to a degree in most of North America, in my opinion, the degree to which this scenario is true in California is spatially and temporally variable, both for epidemiological, demographic, and historic reasons.

The first extended observations of California by Juan Cabrillo in 1542 were of the Chumash tribe in the Channel Islands off Santa Barbara. Cabrillo described them as healthy and prosperous along the entire coast, hardly depleted by disease. The Chumash was one of the most powerful and “urban” tribes in California, thus ripe for highly contagious European crowd diseases. Smallpox, measles, influenza have short incubation periods followed quickly by intense, disabling, and usually fatal fevers. It is doubtful that these diseases could have spread 1,800 miles north across a desert, killed off large numbers of Indians and then the tribe recover its numbers only 20 years after Cortez had made his conquests in central Mexico. Cabrillo stayed with the Chumash for almost three months, so it is almost impossible for the Spanish not to have noticed such familiar plagues were they taking down “the heathen,” but such was never noted in the record.

Sir Francis Drake’s landing in 1579 in what is now Point Reyes National Seashore across the Golden Gate 400 miles to the north of Santa Barbara was almost 40 years after Cabrillo. He and his men stayed with a Miwok or Pomo tribe for about five weeks, barely long enough for a full blown plague to get started, but likely noticeable to a perceptive observer. In this latter case, It is possible to infer from the description of Indian behavior found in the log that there *might* have been just such an incipient plague:

“And now, as the time of our departure was perceiued by them to draw nigh, so did the sorrowes and miseries of this people, seeme to themselues to increase vpon them; and the more certaine they were of our going away, the more doubtfull they shewed themselues, what they might doe; so that we might easily iudge that that ioy (being exceeding great) wherewith they receiued vs at our first arriuall, was cleane drowned in their excessiue sorrow for our departing: For they did not onely loose on a sudden all mirth, ioy, glad countenance, pleasant speeches, agility of body, familiar reioycing one with another, and all pleasure what euer flesh and blood might bee delighted in, but with sighes and sorrowings, with heauy hearts and grieved minds, they powred out wofull complaints and moanes, with bitter teares and wringing of their hands, tormenting themselues.”

[\(Source link\)](#)

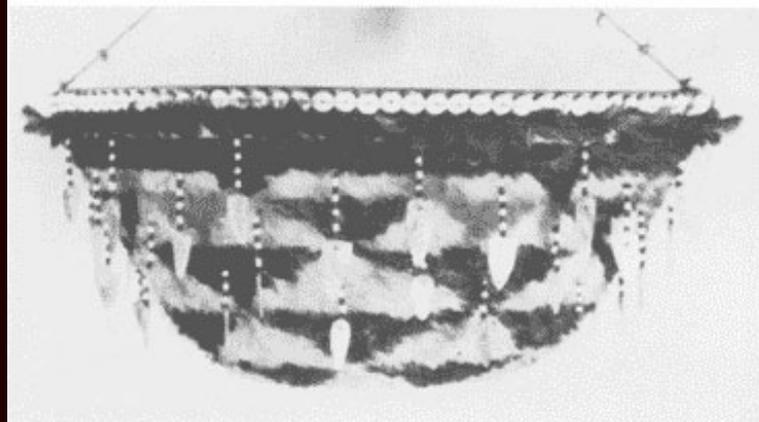
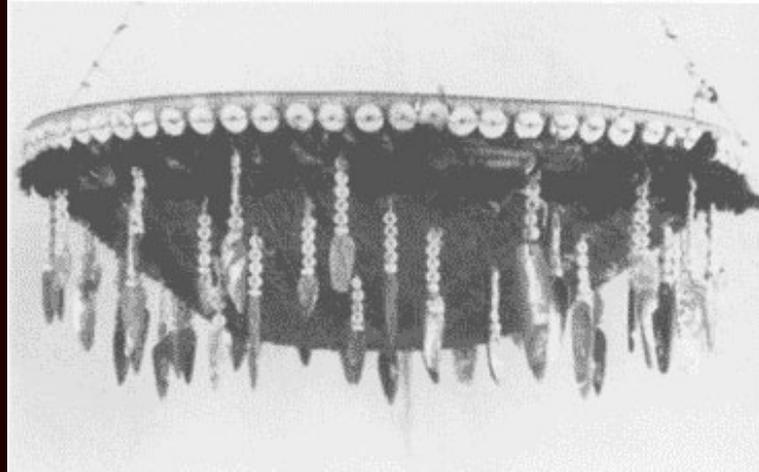
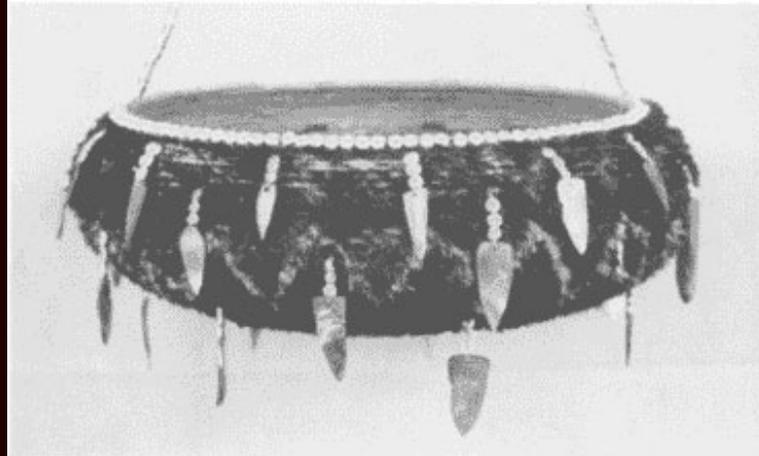
That’s all you get. Importantly, the log *does* note the presence of ample game : “*infinite was the company of very large and fat Deere* (probably elk), *which there we sawe by thousands.*” Yet when the Indians made offerings to the English, which were ample, **there was no red meat**. They gave them artifacts, fish, intricate decorated baskets, bread, and roots, but no elk, dried or otherwise. The Indian king’s robe was made of the skins of small animals, not elk. His seconds wore robes of feathers. If these Indians were such successful hunters and raised the ungulates for game, where was the evidence of such quantity in the materials they used? It is quite cool and windy in Point Reyes in the summer yet most of the men were naked and the women wore rushes. With ‘*thousands of deere*’ around, why were they not wearing skins?

The first Spanish land expedition 210 years later was that of Gaspar de Portolá recorded in the diaries of Crespi, Costansó, and Fages. They report that the Chumash were still numerous and prosperous, involved more in wars than with mere survival. The Indians received the Spanish gratefully (possibly as allies) and gave them massive amounts of fish, yet not once did they make a similar offering of red meat. Game never goes unmarked in explorers' diaries, as it was a critical source of food for their journeys. Yet this dearth of red meat repeats in every one of the early Spanish accounts all the way up the coast. The lack eventually became so serious they were forced to slaughter mules on the return trip, despite that they were surrounded by herds of elk, deer, and antelope. They were apparently unable to hunt them because the animals were sufficiently wary of people as to stay out of range. A Spanish "escopeta" musket shoves a .69 caliber ball out a smooth "bell mouthed" bore, thus exiting with the trajectory of a knuckle ball. It has a lot of knock-down power, but is so inaccurate that it was not so useful for hunting at more than 50 yards.

But if game was so plentiful, why weren't the Indians hunting animals down to minimal numbers, just as they were everywhere else in North America?

In California, all of the diaries of the Spanish land expeditions recount incidents with "a large number of bears," particularly in the region north of the Santa Ynez Mountains to the Santa Lucia Range (some 90 miles) with corresponding reports of very poor and entirely nomadic Indian bands subsisting primarily off of gathered seeds, not meat. They also told of "many bears" in La Puente, the San Andreas Valley, the Coyote Valley, and north Berkeley into Richmond. Crespi, Fages, and Costansó all recount that bears showed no fear in a direct attack even upon soldiers on horseback, and entered the camp of sixty soldiers and as many mules at night, obviously close enough to shoot... more than once requiring **seven or eight** of said "lot of knock-down power" .69 caliber musket balls at close range. You can bet news of that feat of Spanish arms traveled faster than Spanish pack mules, especially nursing so many men with scurvy. In every subsequent meeting with the tribes, the visitors were greeted with either blind fear (at Pajaro) or open arms. As it turned out, besides geese, bears were the only game upon which the Spanish believed they could rely for the return trip. They were easy to hunt because they showed no fear of people.

Right: *Pomo Indian feathered baskets with clamshell disk beads and abalone pendants.* The Project Gutenberg eBook of *Francis Drake and the California Indians, 1579*, by Robert F. Heizer.





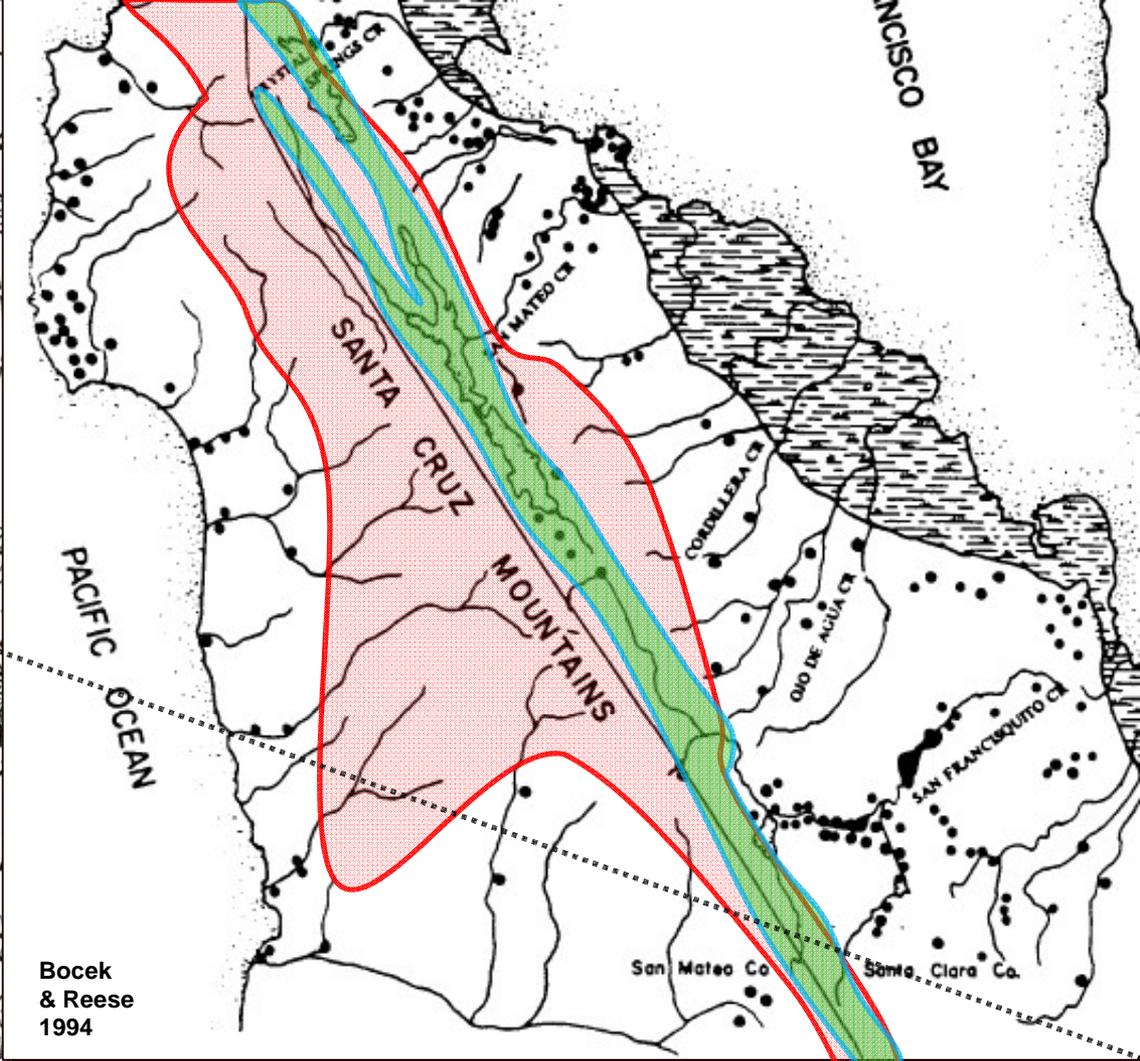
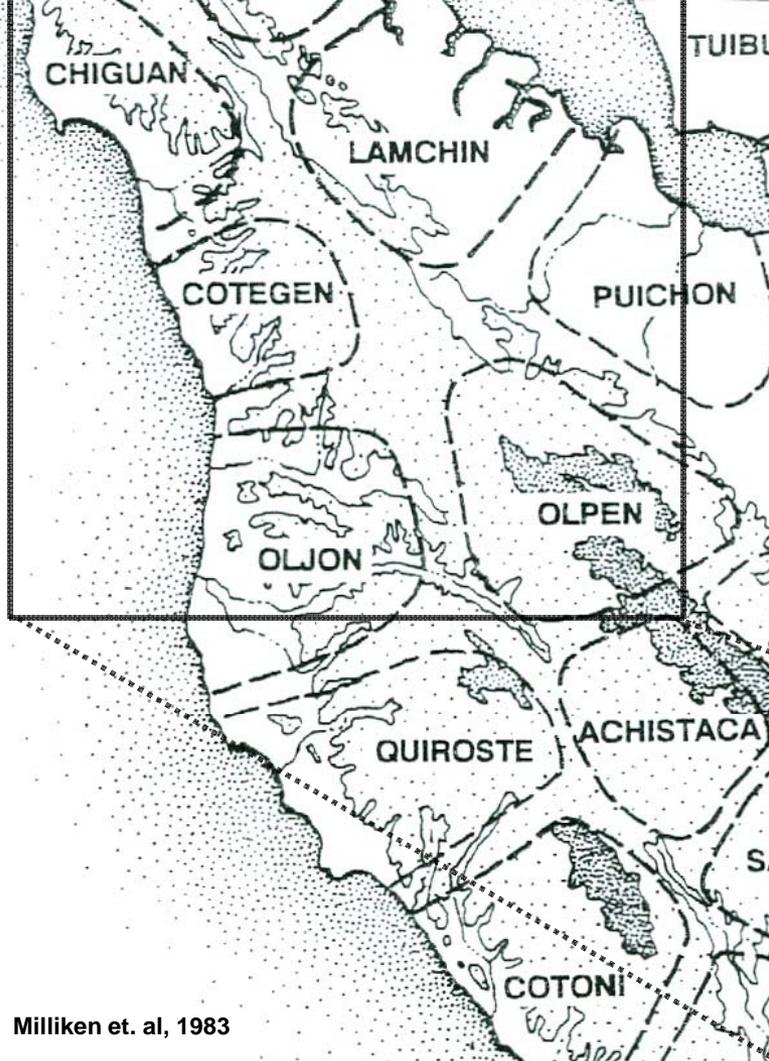
Postcard 1910; Source Wikimedia Commons

This separation between areas controlled by people versus those controlled by grizzly bears would have a profound effect upon the distribution of vegetation, both because of annual burning and the foraging and rooting of the bears (which is why you are getting this history). Hold on for a bit, and you will start to see just how complex, subtle, and impressive the cumulative effects can be over thousands of years. It is our beliefs that distort what we see.

Crespi's diary describes bear scat all the way down to San Francisco Bay. At the time (November 7-10, 1769), the Portolá expedition was camped near the "Palo Alto" ("high tree" - left) along San Francisquito Creek. This was adjacent to the largest concentration of Indians on the entire San Francisco Peninsula. This proximity of bear scat indicates how little fear bears showed for Indians. The expedition rarely if ever encountered Indians hunting, fishing, or traveling alone. Although some Indians did wear skins, the diaries describe them as unusual and often from small animals. Even in cases where Indians fled the expedition, they did so in groups. One has every reason to suspect fear of bears being involved.

When salmon and steelhead spawning season arrived, predators of all sorts, seals, bears, and people, coveted those fish. Yet with the exception of Drake and only in passing, nowhere in the area did these explorers' accounts mention seals or sea lions. With grizzlies and humans competing for food, clearly the pinnipeds had lost in all but locations inaccessible to land animals.

This apparent spatial competition among "apex predators" (humans and bears) suggests why the vegetation might have been distributed as described. The Spanish explorers recorded areas that were obviously burned annually, particularly around villages, "with not a tree or shrub to be seen." Such would serve agricultural purposes to produce annual plants with harvestable seed but it would also create a defensive perimeter, areas bereft of food for bears, burned annually so that one could see either bears or any other enemy attempting an undetected approach. People would site their villages to stake a defensible territory adjacent to the salmon weirs and with adequate sight-lines, just as they would put them near stone appropriate for mortars to reduce transportation costs. In areas between villages, fire was apparently less frequent, with the Spanish describing "lush" brush and tree cover. These possible "bear zones" between villages might have been avoided by Indians unless in a larger hunting or trading party. These were the locations where the Spanish more often described game.



As an example, the map at left describes a rough outline of tribal territories at the time of European intrusion. Note that this is not the pattern of actual settlements but a rough estimate of the areas under tribal control. The map at right shows the distribution of archaeological sites spanning a very long period (including long droughts and other climate variations) with the area showing relatively few archaeological sites in pink. The “pink area” is similar in shape to the unoccupied area at left.

Note the dense population along San Francisquito Creek (lower right) that just ends where the stream penetrates a range of hills along the eastern side the San Andreas Valley (green). From what I can tell, parts of the San Andreas Valley possibly constituted a “no go” bear zone. The mountains above may have also been hostile to humans but for different reasons in that the grades are very steep and less suitable for either agriculture or acorn “orcharding,” also having scarce water resources in summer and early fall.



© Anne Thierman

Part of a Mural (Courtesy of Anne Thierman) in the UC Santa Cruz Ethnic Studies Building. It depicts the Quiroste village (map prior page) as described by Juan Crespi in his diary entry from the 23rd of October, 1769. Click anywhere for a full pdf of the image.

So the model suggests that we have a bifurcated landscape: areas where humans burned annually in which Crespi reports “not a tree or shrub was to be seen” and “bear zones” with less fire frequency where succession could proceed. Fire-scars on conifers show burning was less frequent than around villages and the Spanish saw lakes, aquatic birds, fruit bearing shrubs, and herds of game but rarely Indians. Burning around village sites for thousands of years would mean that there were no perennials except along streams because fire kills seedlings. There were probably also areas that were under either dominion on a seasonal basis, such as if the Indians went to gather acorns and grind seasonally and in groups. It’s a model, reality surely being more complex.

If the bears did provide ungulates refuge from Indian hunting, it would explain why there was so little meat despite ample numbers of animals bunched into substantial herds, a typical response to predatory pressure. Apparently the ungulates preferred to take their chances with bears and mountain lions rather than the Indians, which fits with the lack of game elsewhere on the continent where bears hibernate and Indians are undisputed apex predators.

Crespi’s measurements showed ample stream flows at the end of the dry season. Burning uplands ironically reduces vegetative water competition such that late season riparian vegetation might well be “lush” as described. These would be areas that could function as animal refugia from Indian hunting fires, places that would not burn in all but unusually dry conditions with accumulated fuel loads; hence redwood forests. Today, without burning or grazing, vegetative competition for moisture renders most of those streams dry in late season (right). Yet there is another explanation for the difference, this expedition was during the Little Ice Age. Crespi recorded the Indians in the San Antonio River valley (elevation 780’) 100 miles south of here indicating about snow accumulations of 2-1/2 FEET while Costansó details snow in the mountains above San Diego in April.



June 2002





Sedges

Pink Cudweed

(dry) Blue Curls



Verbena

Blue Curls

Sedges

Blue Curls

Verbena

September 2014



Yet it *is* possible to grow large “lush” annual plants well into dry late-summer California. Here at the Wildergarten, we have blue curls (*Trichostema lanceolatum*) and pink cudweed (*Gnaphalium ramosissimum*) in mid September, both annuals (the dry ground-cover is perennial *Verbena lasiostachys*). The blue curls are 1-2 feet high, while the cudweed reaches four feet. Neither has received any water since April. Neither germinates well in competition with brome or rye grasses. The piles and hose are for composting weeds.



Mission Santa Cruz, by Léon Trousset, oil on canvas, 1876

The Franciscans gathered the Indians to build the missions, housing them in close quarters, and occasionally mixing with the dregs of Spanish soldiers from the nearby Presidio at Branciforte. Indian escapees carried European diseases back to their tribes, notably syphilis and tuberculosis. The missions brought in cattle from Spain as hides were to be their main cash export. With them came “slender oat” (*Avena barbata*). They Spanish also banned Indian burning to maintain more dry season forage. Although bears were a growing problem, cattle and especially horses traveled and fed wherever they wanted, sowing their “wild oats” wherever they went. After eighty years of rampant population growth (and therefore overgrazing), the landscape changed completely, transforming the soil in the process. They did the best they could to both elevate the Indians (in their estimation) and grow the mission program with what little they had and knew about the land. I suspect that in many respects the Indians appreciated the gift of oats, horses, and cattle.

Nobody knew what was going to happen, as the rapid introduction of alien plant species was a relatively new thing in the world. Reverend T. Starr King, an itinerant preacher from the American East, recorded his impressions of the Bay Area in 1859. I am reproducing them here in full so that you can get a sense of a landscape in change, how change has progressed since that time, and what that portends for the future. After this quote, I will discuss the technical conclusions from Reverend King's observations and then get back to pictures covering what has since transpired. I wish I could offer a photo to show you how things might have looked to Rev. King back then, but sadly, I know of no place where this is possible. His words, I think, are adequate.

"AROUND THE BAY" IN THE SEASON OF FLOWERS ([source link](#))

In the early part of May, a week after my arrival in California, I was invited by a very intelligent gentleman in San Francisco, to take a seat in his carriage for a "drive around the bay." This means around the Bay of San Francisco, which extends southerly about fifty miles from the Golden Gate, where the tides of the Pacific force their way inland. The bay is, therefore, a large salt-water lake, about eight miles broad and six times as long. It is dotted with islands, and lies placid in the embrace of some of the richest lands of California. In making the tour around it, we drive down along the narrow county of San Mateo, whose hills divide the dreamy bay from the billows of the Pacific, then across the county of Santa Clara, and up, on the eastern side, through Alameda county to Oakland, where the ferry-boat returns us to the metropolis of wind and fog, whose climate in summer is exhaustively stated in the phrase, "gust and dust" [*at that time, much of what now comprises San Francisco was then open sand dunes – ed.*].

Early in May is the true time to make this excursion, for then the country is at the height of its brief bloom. California has often been compared with Palestine and Syria for scenery. The passages in the Psalms and the New Testament which describe the fleeting beauty of the flowers and the grass, are certainly applicable here. "For the sun is no sooner risen with a burning heat, than it withereth the grass, and the flower thereof falleth, and the grace of the fashion of it perisheth" [*James 1:10-11*]. Indeed, there is no grass, properly speaking, native to the landscape. The green of early May on the uncultivated plains and slopes is mostly that of the wild oats. As the summer sun rises, and the rains cease, they ripen into a golden tinge, which, at a distance, is the hue of sand, and their seed drops into the parched and crackling ground for new crops when the rain returns. By the middle of June all the wild fields that are destitute of trees, look sandy with this harvest of indigenous and self-sowed grain; and it is only in May that the plains and hill-sides which the plowshare has not broken are clad in their vesture of embroidered green [*this is how much of California looks to this day, indicating how early, rapid, and complete was the change wrought by the early Spanish introduction of exotic wild oats*].

But the beauty is as captivating as it is evanescent. Some travelers have written of the marvelous effect of the air of California on the spirits. Bayard Taylor tells us that, on this very drive, he felt in breathing the air like Julius Caesar, Milo of Crotona and General Jackson rolled into one. I cannot honestly say that the vivifying quality was any greater than I have experienced in the Pinkham woods, or the forests of Mount Adams, or on the heights of Randolph. Oxygen is oxygen, and will General Jacksonize a man as quickly in Coos county, New Hampshire, as when it blows over the coast range of



California, fresh from the Pacific. But there was a great exhilaration in the first acquaintance with the scenery of a strange land, especially when made in a luxurious carriage and with the accompaniment of pleasant companions and a very spirited team.

The first thing that arrested attention after leaving the sandy shores of San Francisco was the flowers. Early in May, in New England, people hunt for flowers. A bunch of violets, or a sprig or two of brilliant color, intermixed with green, is a sufficient trophy of a tramp that chills you, damps your feet, and possibly leaves the seed of consumption. Here they have flowers in May, not shy, but rampant, as if nothing else had the right to be; flowers by the acre, flowers by the square mile, flowers as the visible carpet of an immense mountain wall. You can gather them in clumps, a dozen varieties at one pull. You can fill a bushel-basket in five minutes. You can reap them into mounds. And the colors are as charming as the numbers are profuse. Yellow, purple, violet, pink and pied, are spread around you, now in separate level masses, now two or three combined in a swelling knoll, now intermixed in gorgeous confusion. Imagine yourself looking across a hundred acres of wild meadow, stretching to the base of hills nearly two thousand feet high the whole expanse swarming with little straw-colored wild sun-flowers, orange poppies, squadrons of purple beauties, battalions of pink and then the mountain, unbroken by a tree or a rock, glowing with the investiture of all these hues, softened and kneaded by distance. This is what I saw on the road to San Mateo.

The orange and purple seemed to predominate in the mountain robe. But on the lower slopes, and reaching midway its height, was a strange sprinkling of blue, gathered here and there into intenser stripes, and running now and then into sharp points, as if over the general basis of purple, orange and yellow, there had fallen a violet snow, which lay tenderly around the base, but in a few places on the side had been blown into drifts and points.

The wild poppy of California, in May, is the most fascinating of all the flowers. It does not have a striped or spotty leaf, but is stained with a color which is a compromise between a tea-rose and an orange, and is as delicately flushed and graduated in hue as a perfect rose. I never tire in studying their color, in masses or singly. While driving to San Mateo, we came upon little clumps of them, springing out of the rocks on the edge of the road that overhangs the bay, and their vivid orange, upheld on graceful stems, and contrasted with the grey stones and the blue of the bay, gave me a joy which comes up as fresh while I write as when I saw it first. Another piece of cheer intrudes itself between my eyes and the paper, and insists that a pote shall be made of it. I mean a California blackbird, perched on a mustard stalk ten feet high. The wild mustard [*also introduced*] grows luxuriantly on the lands at the foot of the bay. It is a great trouble to the farmers, for if the cows eat even a little of it and they seem to like it for seasoning it gives a pungent flavor to the milk and makes the butter bite. But a field of it in brilliant yellow is decidedly a pleasing condiment to the general feast of colors. And when a blackbird with a large spot of scarlet on each wing flutters over a tall spear of it and then alights with a cheery twitter, one has a picture before him which gives two-fold delight by making him repeat the couplet of Holmes:

The crack-brained bobolink courts his crazy mate,
Poised on a bulrush tipsy with his weight.



If I quote wrongly, may the genial and always accurate Professor forgive me. I repeat from memory, and must wait till the Mameluke arrives from Boston with my books, before I can verify a dozen passages of his, which the Californian scenery sets to music again in my brain.

And yet the old Californians, " forty-niners," sigh when you speak in praise of the May-luxuriance around the bay. They say that the glory is over now. "Ichabod" is written on the landscape. They rode over the same districts when there were no roads, or ranches, or fences, between San Francisco and San Jose, and when the horses wallowed and galloped through an ocean of floral splendor [*already covered in oat grasses as described above*]. The visitor cannot help noticing, when he leaves the base of the mountains, and comes to the farms, how civilization has tamed the land. The barley and wheat, and bearded sweeps of simple green, look cool and unromantic in contrast with the natural coat of many colors which the unploughed districts wear. The brindled leopard has taken the hue of the cat. It is only when, here and there, we come upon a garden, and see the blaze of roses which bloom the year through, that we see how superior art is to nature.

OK, anyone familiar with the current appearance of northern California should be seriously circumspect, in that the lands "our" open space districts, parks, and conservancies are currently "protecting" bears no botanical resemblance whatsoever to what was "Natural" when white explorers first beheld the Bay Area. So if this was May and these were seed crops, the "sunflowers" were probably tarweeds (*Madia spp.*) and mule's ears (*Wyethia spp.*), the purple and blue maybe gilia, lupine, or bulbs such as *Brodiaea elegans*, *Tritelaea laxa*, and *Dichelostema capitatum*. The pink and white might be buckwheat (*Eriogonum spp.*)...

Wildflowers are primarily post-disturbance annual plants. King's account suggests that the populated area around the Bay had been burned annually as Crespi and the other Spanish diarists had noted. Accordingly, this was NOT a "Natural" landscape, but a garden, regularly and heavily impacted by the people who lived here and depended upon it for food, building materials, and craft goods. It has been variously estimated that the Bay Area had a population of between 15,000 and 30,000 Indians. Hence, the burned flatlands and low hills were dominated by flowering plants harvested for seed. My experience here suggests that native perennial grasses (which bear very poor grain) would have taken over even if the oats had not been introduced. So why it was still in flowers is something of a mystery to me. Perhaps it was simply a lack of seed where it had been burned for so long. Many of those hills are steep, and would be avoided by grazers with better alternatives available.

We cannot go back to what it was. We cannot burn the landscape annually. We do not harvest tiny seeds as staples. We do not dig bulbs for food. Yet we still have the responsibility to keep the genetic constituents of this biological system reproducing; else we will lack the means with which to increase production of those plants and insects should that become economically and technically achievable or desired. The Wildergarten is the first project ever to achieve at least a substantial fraction of that initial goal. We have proven that restoring a native plant landscape is at least technically possible, one with meadows including large numbers of native annuals but still dominated by grasses. We are maintaining reproducing cohorts of post-disturbance annual plant systems and we are cleansing the seed bank such that, in many locations if it does burn it does come up native. We do not have all the plants that once grew here, nor are they distributed as they probably once were. So now that we have proven that restoration is technically possible, we are improving our processes to render the results financially affordable.





Photo courtesy of Tejon Ranch Company

Remnants of what King described can still be found, although degraded from their original magnitude and variety. Like regular Indian burning around San Francisco Bay, this landscape in Tejon Ranch in southern California is maintained in an early successional stage by regular disturbance: periodic cattle grazing. Hopefully, a way can be found to maintain these unbroken views under the financial pressure to seek more profitable alternative land uses. The weeds will win unless somebody cares for it.



June 2014



This is what most of that invasion in King's description looks like today. These are "wild oats" (*Avena barbata*) and not much else.

IF WE KNEW WHAT WE *WERE* DOING...

OK, that should leave you thinking seriously about how little we know when it comes to the goals of “restoration” in the temporal sense of a particular arrangement or stasis. Hence, the first attainment target of our project was to develop working processes among cohorts of native plants. Then we move on to their animal symbiotes, with particular focus upon maintaining the post-disturbance successional system. In parallel with that is learning more about how to integrate people into the system in such a way as to facilitate .

Nobody knows how these native annual plants work together as systems, nor is anybody going to know unless we develop numerous sites, each fully populated purely with native plants and then run trials over a wide range of soil and micro-climate conditions over a considerable time under a variety of treatments. Our project is a preliminary exercise in asking the questions to develop those methods and tools while stirring things up and observing how these systems work. Simply learning what it takes to create functional native plant habitat is useful knowledge. Another goal is to provide a refuge for producing native seed, which is critical. The stock of remaining viable native annual seeds is severely depleted.

Observations here suggest that the way the land not under cultivation might have worked was in response to patterns of frequent disturbance, usually fire set by Indians, intentionally or otherwise. If the patch was something the Indians liked, they'd tend and extend as appropriate to what they wanted to harvest. There may have been successive crops taken from the same patches (what I call “layered harvesting”), such as bulbs first, then grasses, with tarweeds after an early fall burn, and acorns after that. After harvesting, whatever colonized first successfully went through a decadence and succession process until the next disturbance. Fires farther from settlements (in “bear zones”) were therefore also patchy.

Generally speaking, meadows were more common on ridges and wet bottomland, with chaparral on the top slopes succeeding downhill to oak woodland and then redwood in the gullies (or below wherever there was a spring, of which these mountains have many, even on ridges). The meadows and chaparral were probably patchy too because they'd burn off when a sufficient fuel load met a hot enough fire. It's almost impossible to kill a mature redwood except by hard freezing, but seedlings are susceptible to fire. Burn annually for thousands of years and there would be no trees.

Neither the Spanish journals nor Indian middens have demonstrated that California Indians depended heavily upon red meat. A few records do mention them wearing skins with some noting that they were from small animals. There are LOTS of shells in middens from snails and bivalves. My guess is that because of the grizzly hazard, hunting was communal and infrequent despite plentiful game, with the harvest being distributed as soon as practicable. Such practices are not unusual among hunter gatherers today with great prestige and better mates going to generous providers.

More to the point: Even if we did know how things once were, there is still a more important question as regards “sustainability”: **Is what the Indians did the best that could have been done?** I doubt it, at least around here. The tribes didn't have good animals with which to build deep organic soils. They burned so often that on steep ground like this,



...WE WOULDN'T NEED RE-SEARCH

most nutrients would wash off in heavy rains (depending upon if the resulting surface went hydrophobic or was hot enough to be hydrophilic). The plants they used for food required VERY time and energy intensive harvesting and processing techniques. Having extirpated so many large bodied animal species after the Pleistocene, the tribes had a very limited array of options compared to an industrialized society.

That doesn't mean Europeans have done such a hot job. We have yet to deal with the legacy of resource extraction, exotic introductions (witless and otherwise), topsoil losses, abandonment of marginal sites (such as ours), and subsequent neglect. We do have better tools. Indians would have killed for a chainsaw or a good shovel, never mind a D8 cat, herds of horses, cows (bison), sheep (bighorn), and goats (antelope, each in parentheses being a controllable variety of the former). Tools facilitate vegetation management, which once played a significant role in shaping these mountains and should consciously do so once again, instead of pretending this will all will fix itself. Then there is the not insignificant matter of keeping it all going under the continuing onslaught of weeds.

Native post-disturbance forbs are critical to insect life upon which birds and pollination depend. They are a critical source of protein in the animal food chain. We cannot simply ignore their lack, plant native perennials, and call it 'restoration.' Yes, it is difficult to reestablish native post-disturbance annual cover, but it must be done or we will lose the foundation of the successional system, particularly insofar as soil microflora and insects are concerned. So for now, I believe that the best we can do as an attainable goal is to develop an array of remnant "postage stamps," small properties developing cohorts of locally adapted plants with which to produce fresh seed and learn how those systems work, and what might be done with them. In my opinion, these huge landscapes for large predators, popular with environmental groups, are a disastrous policy of ill-informed and wishful thinking. No animal survives without food. For the food system to work it needs a foundation, the base of the biological food pyramid upon which predators depend too. That starts with bacterial relationships in soil among post disturbance forbs, herbivores, and insect life. Large predators such as bears and wolves come later, **after you have a food chain that works**. Meanwhile, there is little a predator will do that hunters will not *pay* to do. Large predators make the job of restoration unnecessarily hazardous, both for people and for the animals that can help pay for the work.

Yes, predators can be useful, particularly in rugged and remote locations where anthropogenic animal management is more costly. Yet from crows eating eggs of threatened sage grouse, bull frogs eating endangered red-legged frogs, sea lions snarling down endangered salmon, coyotes and mountain lions hammering big horned sheep, striped bass eating Delta Smelt, and goodness knows how many other similar cases, it is predation run amok under the watchful eye of complicit government agencies that has driven many endangered species to the brink, possibly more so than destruction of habitat by human development. All it takes to understand that is to look down next time you fly over the American West to see how little of it has been developed. As you will see next in this book, many areas thought to be undeveloped once were under intensive use and have since been abandoned. We've been had, deliberately misinformed by those with everything to gain.



DISTURBING HISTORY

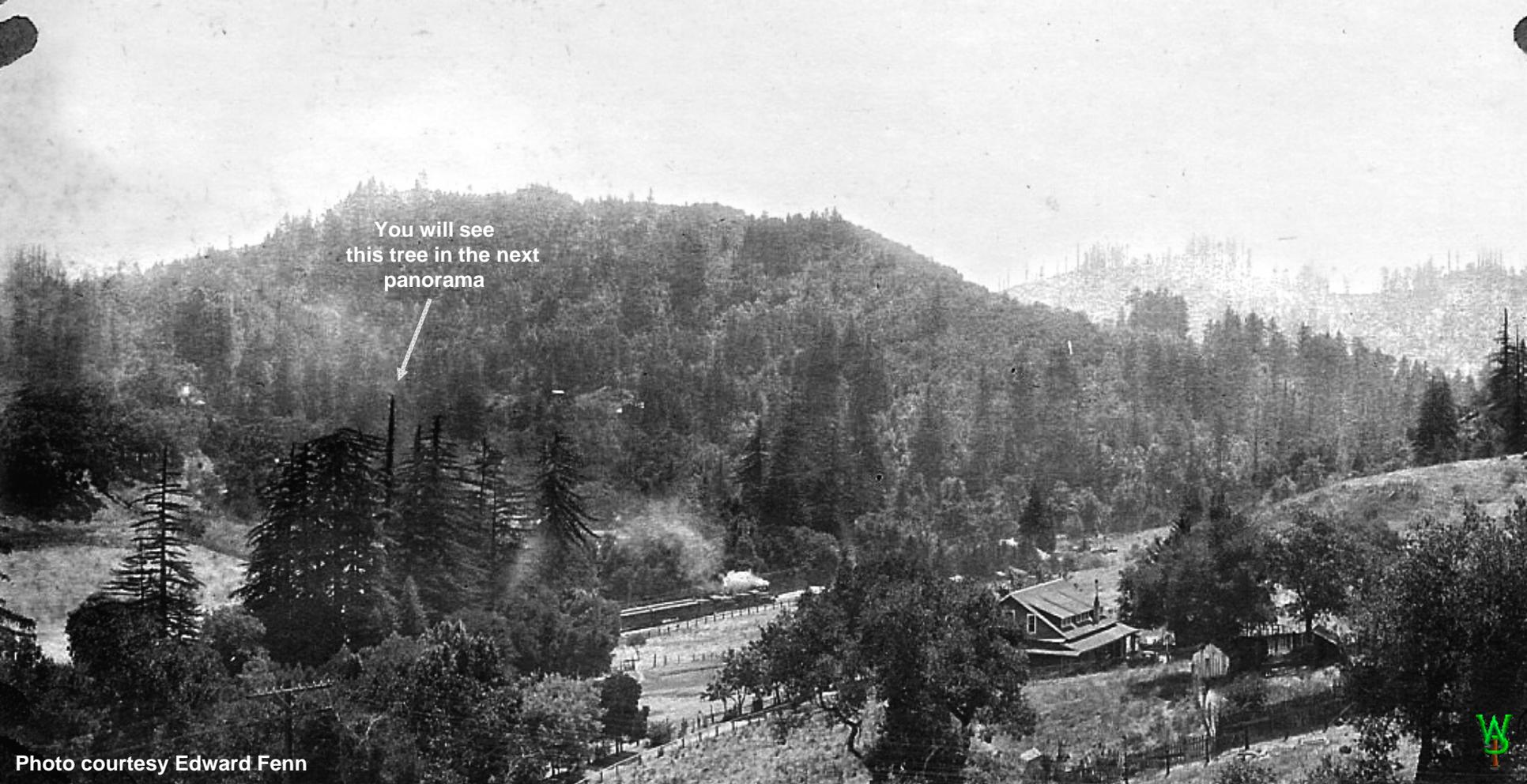
Our property adjoins what was originally a trade route of the Sayante Indian tribe between what are now the cities of Scotts Valley to the south and Los Gatos in the Santa Clara Valley to the north. The area is beautiful, but has always been steep and erosive with very poor soil, making even temporary survival along this ridge a challenge even for the aboriginal tribes.

In 1791, the Spanish Franciscans at Mission Santa Clara conscripted 500 Indians to improve the trail to supply the new mission in Santa Cruz. That August, they brought oxen, sheep, horses, and cattle over the trail, and the weeds came with them. For over 60 years, the road remained the principal commercial transport route between Santa Clara and Santa Cruz. Since that time, the region has endured a tumultuous botanical history.

The rate of change accelerated in 1850 when Charles McKiernan homesteaded here. He blasted and graded the trail into a road. It was traveled by James Brewer of the US Geological Survey in 1861. He rhapsodized about it in his diary *Up and Down California* as “the most picturesque road we have yet driven.” He went on at some length about the scenery, which was quite different than what we see today.

Development sprang up alongside the road, both to facilitate transportation and to take advantage of it. Our place was used for harness repair, manufacturing redwood moldings, even an apple orchard (the eroded terraces and trashed equipment are still visible). To slow the resulting erosion they tossed that trash into the gullies (including a car). It was logged and burned some time around 1900. There are also signs of sand quarrying. It even sheltered hippies growing marijuana nearby, during which time the cabin on the property burned down in 1979.





You will see
this tree in the next
panorama



Photo courtesy Edward Fenn

In 1853, the valley below was homesteaded by Charlie Martin. He founded what became the **town** of Glenwood (yes, “**TOWN**” for all of you who think development in these mountains is “threatening an undisturbed Natural landscape”). Here was a train station (there is a train in the picture), three hotels, a lumber mill, a winery, a general store, a dance hall, a post office, stables, campground, and over 20 cabins with which to house visitors. This photo was taken in 1922. By then there were labor camps for the Chinese workers who built the tunnels through the adjacent ridges for the rail line along with animal handlers, craftsmen, cleaning women, cooks, and other workers that lived here too. There was also electrical power and telephone service (note the pole in the left foreground). I have enhanced the sharpness and contrast so that you can see individual trees. Note the pointed tops of the redwoods in the background, indicating that they are growing rapidly and therefore younger than the old trees in the left foreground. The background gully was probably logged. It is likely that the logging was relatively insignificant in that you see both old trees and few wads of young trees regenerating off stumps (in 30 years, crown-sprouted redwoods would be over 50 feet tall). Although they did log up the draws, both Charlies, Martin and McKiernan, retained their finest specimens for their customers to enjoy.

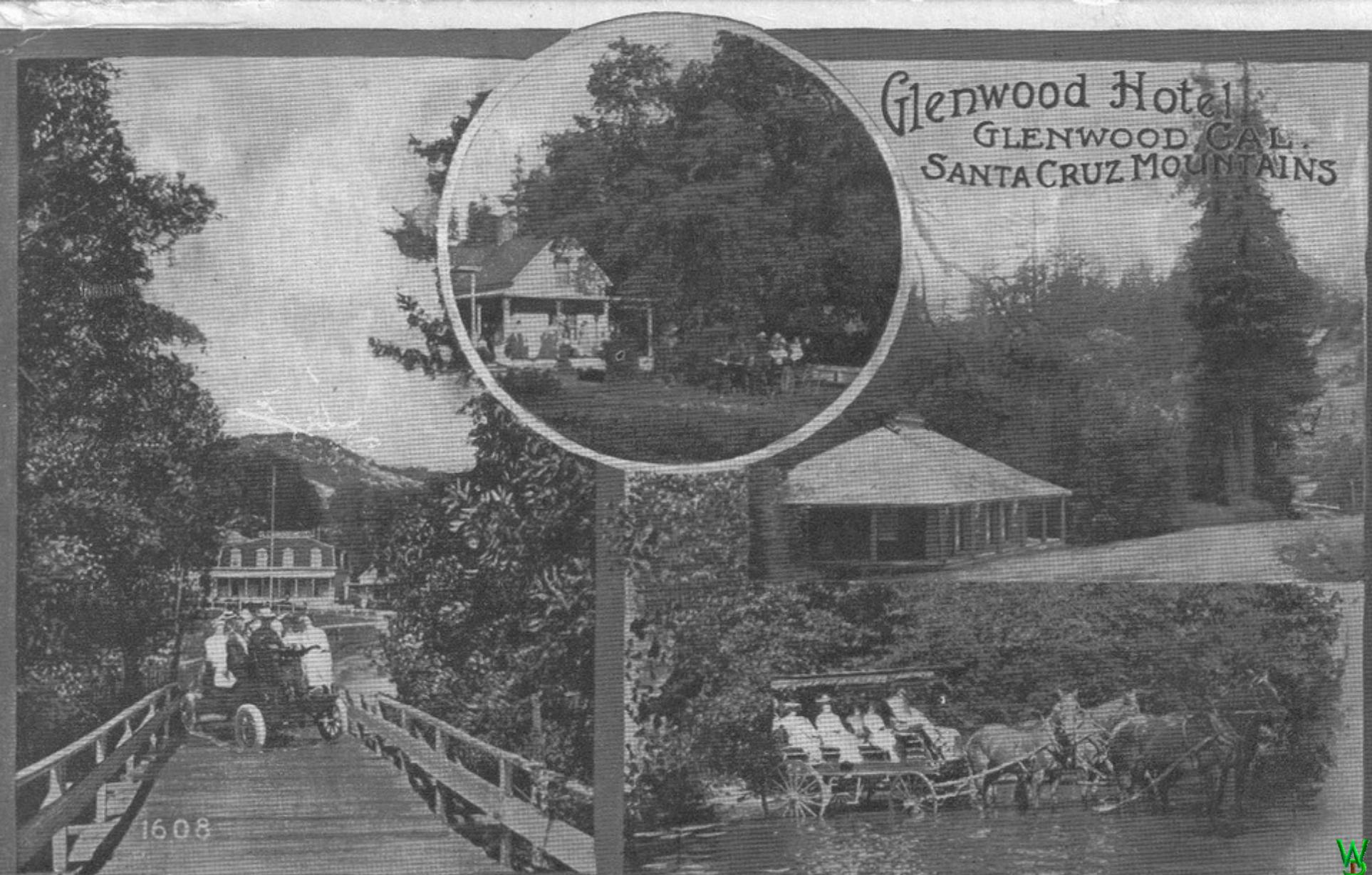


Image courtesy Edward Fenn, Source unknown

This was Charlie Martin's idea of a private "park." There was a hotel, a campground, cabins, picnic facilities, and a swimming pool. An ad in the San Francisco Call, July 1909 read, "GLENWOOD HOTEL, Among the redwoods of Santa Cruz Mts. On the new short line, 2 hours from S. F. Write for circular. WM. MARTIN, Glenwood. Santa Cruz county, Cal."



The town added a dance hall, a bowling alley, a billiard room, a smoking room, and a conference center capable of serving 250 guests, and yes, there was even electric lighting. This was a busy community built around the Glenwood Hotel which soon had a pair of competitors. The town's permanent population reached 500 residents. This town was a product of grand ambition, vision, love of place, and an enormous amount of hard work.



Image courtesy Derek Whaley, Source unknown but probably the Margaret Koch Collection of the Santa Cruz Museum of Art & History

A train ran through the valley with a station at Glenwood. Yes, there was efficient (and private) rail mass-transit!
The two hours to get here by train from San Francisco is not much longer than it takes today (at best).





Photo taken in Glenwood just south of the station ca1890s from santacruztrains.com

It was called, "The Picnic Train." In the early 1890s, hundreds of people **per day** debarked the train to visit Glenwood and enjoy the lands thereabout. They had their choice of resorts: Glenwood Magnetic Springs, Summer Home Farm, or Villa Fontaney. Note how many fewer redwoods there are than in the prior panorama. This is just after it was logged.





The State proposed to build a highway through the Santa Cruz Mountains. Charlie Martin had already paid for a survey suggesting the “best” possible route (at least he thought so). He offered it to the State for free. Said route just so happened to pass right through his town. The Glenwood Highway opened in 1916, and was paved with concrete three years later, complete with curbs (left).

But alas, the gravy train for Glenwood was not to last. The construction of the highway and the falling prices of mass-produced automobiles and gasoline started diverting passengers away from train travel. With fewer rail passengers, ticket prices rose and customers chose. Drivers passed through Glenwood on the way to bigger resorts at the beach in Santa Cruz (where it is cooler in summer). The hotel closed but five years later.

The State of California opened State Highway 17 from Los Gatos to Santa Cruz in 1934. The new “best” route bypassed Glenwood by about half a mile. Charlie Martin’s gas station and store closed the same year. The Picnic Train ran for the last time in 1940. Much of the route near Los Gatos lies under a reservoir today. People were driving to the beach on weekends, a weekly traffic jam that continues to this day.

After the War, the State opened Henry Cowell Redwoods State Park not far down State Highway 9 from the end of State Highway 17. The option offered both effectively “Free!” access and use of public campgrounds. The State pays nothing for liability insurance and has unlimited legal resources. The days of the large private land entertainment resort were doomed.

Within 15 years Glenwood had gone from boom to bust. Socialized roads and recreational land use had killed early 20th Century ecotourism by rail. Political influence on land use had played a role just as critical in the end of Glenwood as the Homestead Act had played in its beginning.

The hotel was torn down in 1970 and the land donated to the only organization at the time that could afford to keep it.





June 2014



Glenwood became “Marywood,” a vacation spot for nuns it remains to this day. The Catholic Church doesn’t pay property taxes but it does preserve the view. Local residents like it that way (including me). The grassland has no productive use; it feeds no large animals; it no longer makes hay. Instead, it is mowed to reduce the fire hazard. Unfortunately, the punch line for that story will have wait.



Logged gully

This tree



Photo ca1922 courtesy Edward Fenn

This photo, also of Glenwood, was taken the same day in 1922 but from above and to the north to where the last panoramic image was taken. It shows the farms and outbuildings that supported the town. Obviously the area in grassland is a significant fraction of the overall landscape, but hopefully by now you recognize that this does not represent a 'landscape denuded by the white man.' In fact, there were once far fewer trees and certainly less brush due to the Indian preference for frequent burning. Note the spacing and shape of the redwoods on the slope of the gully on the upper right as compared to the old growth trees in the foreground. The gully had been logged about 30 years prior. The pointed tops there indicate the rapid growth of young trees compared to those in the foreground. After 30 years they would have crown-sprouted, grown to about 50' feet, and are therefore observable in this image. Hence the stand density in the gully probably consists of crown sprouts and young trees from seed, and is therefore a much higher stand density than originally. There were probably no other redwoods in the area unless their stumps had been blown up with dynamite and cleared repeatedly to kill the sprouts. In other words, there simply were not many redwoods here before the area was settled by Charlie Martin. The rectangular hay field is the same as in the prior photo at the lower right. From the look of it, appears somebody got really energetic grading off the hillside to flatten it for mowing, bailing, and hauling hay. My thanks to the former owner of our property, Mr. Edward Fenn, for his contribution of most of these old photographs. In 2011, he was 102 years old.



April 2012

This repeat photo was taken from about 400 yards to the south of where the prior photos were taken (there is an abandoned Christmas tree farm up there now with fir and pine trees 100' tall). What was a grassy hillside in the prior photo now shows no grassland at all, nor has there been for many years. There are many more redwood trees in the gully and elsewhere. The little grass that you do see at the lower right was the hayfield that is still mowed annually. This is primary succession run amok. So let's take a look at where that goes in terms of both biodiversity and primary productivity.



This second-growth redwood stand on our property is a good example of what happens when redwood stand density increases to the point of exclusion: there were no groundcovers here when we bought it. Note how these trees grow singly and not in clusters. This stand was burned after the initial logging about 125-135 years ago (1880-1900). Burning slash killed the stump buds and forced new trees to come up from the roots or seed in bare soil. I logged 50% of the trees here in 1990 (next image), about 25% of the standing volume. In the process, I also cut the “old growth” stumps flush to the ground. Now, this is going to be hard for some to absorb: **NONE** of the “old” stumps were larger than 24” across, meaning that **NONE** of the trees in this stand logged in 1880 was over 50 years old, suggesting that **there were NO redwoods here in 1791 when the Spanish first arrived**. There are simply a great many wildly errant presumptions made about the pre-Columbian prevalence of redwood.

Why would redwoods have suddenly invaded this upland during the Spanish colonial period before the Americans arrived? We’ll get to that. It turns out that the trees that seeded the trees that became the “old growth” stumps here were not so “old” either!

This forest went from grassland to a redwood monoculture in less than 200 years. That’s how fast this successional system can change when anthropogenic disturbance is removed. The process kills biodiversity by displacing the plants the start successional processes in soil. There are no shrubs making berries. There are no forbs for animals to forage. There is no seed for rodents that feed raptors. There is minimal habitat for insect life. It’s even too dense for birds to fly in to build a nest.





June 2010

Here is that stand today from another angle. I removed about 50% of the trees but 25% of the standing volume. I left the bigger trees and a few saplings, as I prefer fine-grained timber, both as lumber and as stronger trees resistant to wind damage (the fir is maintained on the outsides of the stand to protect the redwood). I do wish there was a good way to inhibit crown-sprouting but at least the remaining trees have room for branches to grow and the band-tails and owls have room to fly. Although you can't see it here, there is a developing groundcover in a few places. Burning it would help remove the duff and stimulate germination.



June 2014

These trees at the bottom of our property are now 180' tall and 4-5 feet in diameter. They started from four stumps that had been logged and burned, probably by Charlie Martin. **Yet not one of the four original stumps is as big as these trees that grew from them.** I estimate that the original stumps were no more than 100 years old when they were logged, probably less, as there was less competition then than there is now. This means that if there were any pre-colonial redwoods on our land, they were very few.

So, what the heck happened? Did the redwood forest suddenly expand its range? This hypothesis is a conflation of Indian behavior, fire, contagion, and grizzly bears. Indian tribes in California did conduct extensive trade. If grizzly bears were a significant hazard then the trading parties had to be larger for purposes of mutual defense. Trading would be therefore less frequent, an idea reinforced by the large differences found among the 135 California Indian dialects.

Smallpox, measles, and influenza are highly contagious and have short incubation periods; in Indians unaccustomed to crowd diseases they were quickly followed by death.

If these epidemics did hit California before the Spanish expeditions, I suspect they moved through any one village within a month or so killing virtually everyone, with the likelihood of a trading party visiting or leaving during that time being relatively small. It is thus likely some tribes were not infected at all while others lost whole villages but perhaps not the entire tribe, with the diseases moving from village to village much like a mosaic burn in a forest with irregular fuel loads. Larger villages or groups of settlements in close proximity would be hit harder etc. The diseases would flash through the State and possibly quit. This is why I believe that syphilis and tuberculosis were more devastating to the California Indian during the colonial period. The incubation period for both is protracted; they are still transmissible but not debilitating for months or even years. Such would allow these later diseases to spread virtually everywhere before anybody realized their seriousness much less the causative factors in their spread.

If the first waves of disease had a scattered spatial impact, the tribes would then consolidate. Their territories would contract and that of the bears and wildlife would enlarge. At that point, aboriginal management of the margins of their territories would be less intense and therefore the forest would therefore begin spreading and wildlife numbers rebound, as is reflected in the archaeological record, which shows increased consumption of higher ranked animals during this period between Columbus and Portolá. It is this condition that I believe is what the Spanish land parties encountered.



Grazing produces a bifurcation in vegetative distribution analogous in many respects to regular burning. Image from Google Earth.



The "King of the Forest," June 2014

It would be very interesting to core drill its nearby counterpart stump to analyze the burn scars.



Not far from our home is the [Mountain Charlie Tree](#), 18 feet in diameter. Mr. McKiernan learned from a similar specimen nearby how difficult it is to handle a log this big and decided to leave this one for posterity. THIS is inarguably an old growth tree. The few that were here before European influence were along the perennial creeks where young redwoods with thinner bark were less likely to burn. After all, Indians were burning long before this tree ever sprouted. Regular burning changes most everything because it kills seedlings. Our supposed "old growth" redwoods and most of the trees around this one probably sprouted after the arrival of the Spanish in 1791.



This poison oak is well over 125' tall. It died recently, probably of drought stress. We loved this plant, if only because it was amazing, without a single leaf for 100'. It was probably as old as the redwood it was climbing, starting when there was still other poison oak in this stand on the ground. There is none today.

It may be possible to reconstruct an understanding of the pre-colonial and possibly the pre-Columbian distribution of redwood by looking at sizes of trees and stumps in more remote places for a discontinuous age class distribution (in settled areas old stumps were removed with dynamite long ago). Genetics may also yield some information in that trees started from seed are probably less likely to be root clones than old growth trees. A sudden break in regular fire scars among older trees should be compared to the age classes of intermediate growth stands. The ring structure showing the early growth of old stumps can also suggest the degree of canopy present when those trees started.

Once the gross distribution of redwood is established, spacing might then suggest original understory composition. Compare that to the archaeological data on the distribution of tribal settlements including seasonal habitations along with the Spanish accounts and one might then be able to define the scope of "bear zones" versus areas that were burned more frequently.

I do not have the time or resources to pursue this hypothesis, but I do think it would make for more than one master's thesis. The study would best be a multidisciplinary team effort incorporating archaeology, botany, palynology, genetics, forestry, and soil analysis compared spatially to a detailed study of the Spanish diaries.

There is a long unresolved question as to how much of the landscape was dominated by grasses versus forbs, one that has vexed scientists for years. Archaeological remains from fire pits for cooking show predominately fire-parched grass seeds, possibly indicating a high percentage of grasses in food. I have become suspicious of the translation from Spanish of variants on the word "pasto" as "grass," when discussing feeding the mules. I suspect a better word would be "pasture" which would then include forbs. Visual descriptions such as King's show leafy forbs to be dominant. Without disturbance, grasses are dominant over forbs. Unlike grasses, harvested seed from forbs would be ground without need for burning off the chaff, thus leaving far fewer residues in archaeological remains. Other analyses, such as the "straw" found in mission bricks indicate fewer grasses despite their desirability in brick manufacturing. It remains an open question. The answer would reveal a great deal both about the impact burning might have had upon the landscape and what "should" be done with it from a systematic perspective. Forbs are a primary source of food for insects, birds, and mammals.





Sleepy Dog, "Snow Plant," and me.
Calaveras Big Trees State Park, June 1959

This study has been a revelation to me, resolving observations that have bugged me for decades. Yet I have no intention of mowing down my forests to "make it like it was" (although I might be a little braver in the distribution of successional stages). I have loved redwood, and sequoia forests since I was a child, pestering my parents to "go see the big trees" and weeping in the back of the car on the way home. So this is nothing other than the simple desire to help the forest heal as a *whole*, not just the trees, but in relation to grasslands, chaparral, and broadleaf systems. I want to learn how to manage crown sprouting and get an understory going free from the popular stupidity that makes cutting a few trees far more expensive than it should be. I want a place for birds, berries, and wildlife. I would like to be able to sell a few logs to finance that work, as there are more that need to be removed than I can use, much less afford to deal with.

There may be more redwood trees now than at any time since the early Holocene. In most places, there are now too many for the good of the forest. Go to Redwood National Park and look. No, not the Lady Bird Johnson Grove, go to "the back 40" of the Park along Highway 101 where it was logged back in the 1960s. There, a young, vigorous, and overstocked second growth forest is competing for water with the few ancient trees the loggers left behind. In my opinion, if you want to save those ancient living things, if you want those young trees to get big with native groundcovers thereabout, in other words, if you want to restore that "primeval forest," then, we must thin some of those second growth trees, learn how to control the crown sprouts, and let the logging pay for it. If we choose to wait for the forest to "thin itself" by attrition, then we stand a good chance of losing those surviving ancients when they would have otherwise been with us for centuries longer, to inspire our children and theirs.

I don't think anybody wants them to die prematurely. Please, we should at least learn *how* to do it should we finally learn that it is necessary. Should I live that long and find a way to afford it, this I will do, right here. This is the Wildergarten. My hope is that you will grow one too. OK, now back to the story...





Photo ca 1922 courtesy Edward Fenn

For 70 years, until the construction of State Highway 17, Mr. McKiernan's road was an important transportation route from the town of Los Gatos over the mountains to Scotts Valley. Every horse, ox, wagon, and work crew passing through deposited their contributions of seed from the valleys below, native or not. Meanwhile, Mr. Martin's Glenwood resort needed food Mr. Fenn was only too happy to grow and sell. Ed terraced this hillside with a tractor and planted apple trees. Either he, or the resort blew in a road over the ridge to the west with which to haul said apples and grapes to Glenwood alongside Bean Creek. We will discuss Fenn's road in more detail later in this picture book. Today, much of it is an impassable ditch.



November 1989, at which time this land was still grazed.
Charlie Martin's great grand-daughter still lived in this home.



When we moved here, the heirs of Charlie Martin lived in what was once his second home (above), all that remained of his original homestead. This property adjoins ours today. You will see more of what that means to our land later in the book, as the influence of this history is not minor. The "wild oat" infestation from which we protect ourselves today, was once the grazed forage you see here.

One can still see the terraces of Ed Fenn's apple orchard on the upper northeast-facing slopes of our property. In the area shown at right, there are about six or seven, of which five or six are visible in the photo. Orchards are usually tilled annually. One can only imagine how much sediment was lost on a 25-50% slope like this. Orchards are typically seeded with cover crops, in this case vetches that I weed every year. Vetch seed, being a legume, is capable of remaining dormant and viable in soil for over 100 years...

With the annual disturbance of disking the orchard, seeds brought in from the road found this tilled and fertilized soil to be a wonderful medium in which to establish. For decades, those weeds just kept right on multiplying and spreading.

Agricultural mechanization, truck transportation, and electrified irrigation in Santa Clara Valley ended widespread farming in these rugged mountains. The orchard was abandoned in the 1930s soon after the demise of the Glenwood Hotel and became overgrown.

In 1941, the property burned in a forest fire. Then brush started to take over. The heirs of Charlie Martin agreed to graze it to keep the brush down until a dispute arose. Because the land had been effectively tilled and fertilized, *everything* took off all at once.



May 2010



You are looking downward onto one of those terraces when we first bought the place. After the orchard was abandoned, the dominant brush species that invaded were native Ceanothus and manzanita. Fire-suppression allowed an unprecedented form of succession that progressed unimpeded for decades.

Oak and madrone trees sprang through the brush, but in a density only appropriate to an open area with small trees. They all bolted for light, many only a few feet apart, spindly and weak, leaning for light with included bark crotches.

In classic primary succession, then came Douglas fir, retaining massive dying branches all the way to the ground. After them, up came redwoods some 10 years before we got here.

It was a fire-bomb, land that did not know how to be the way it already was. Lacking a profitable use, the owners wanted to sell it. From time to time they cleared a "house site" on the top of the hill but without any takers ("the view" had a power pole in the middle of it). Some time around 1960, a bulldozer with French broom seed on it (*Genista monspessulanus*) was brought in to clear it. The weed took off at once and (with the exception of the redwood stands) and spread throughout the property.



November 1989 The berm at the bottom was pushed up by ditch grading along the County road.

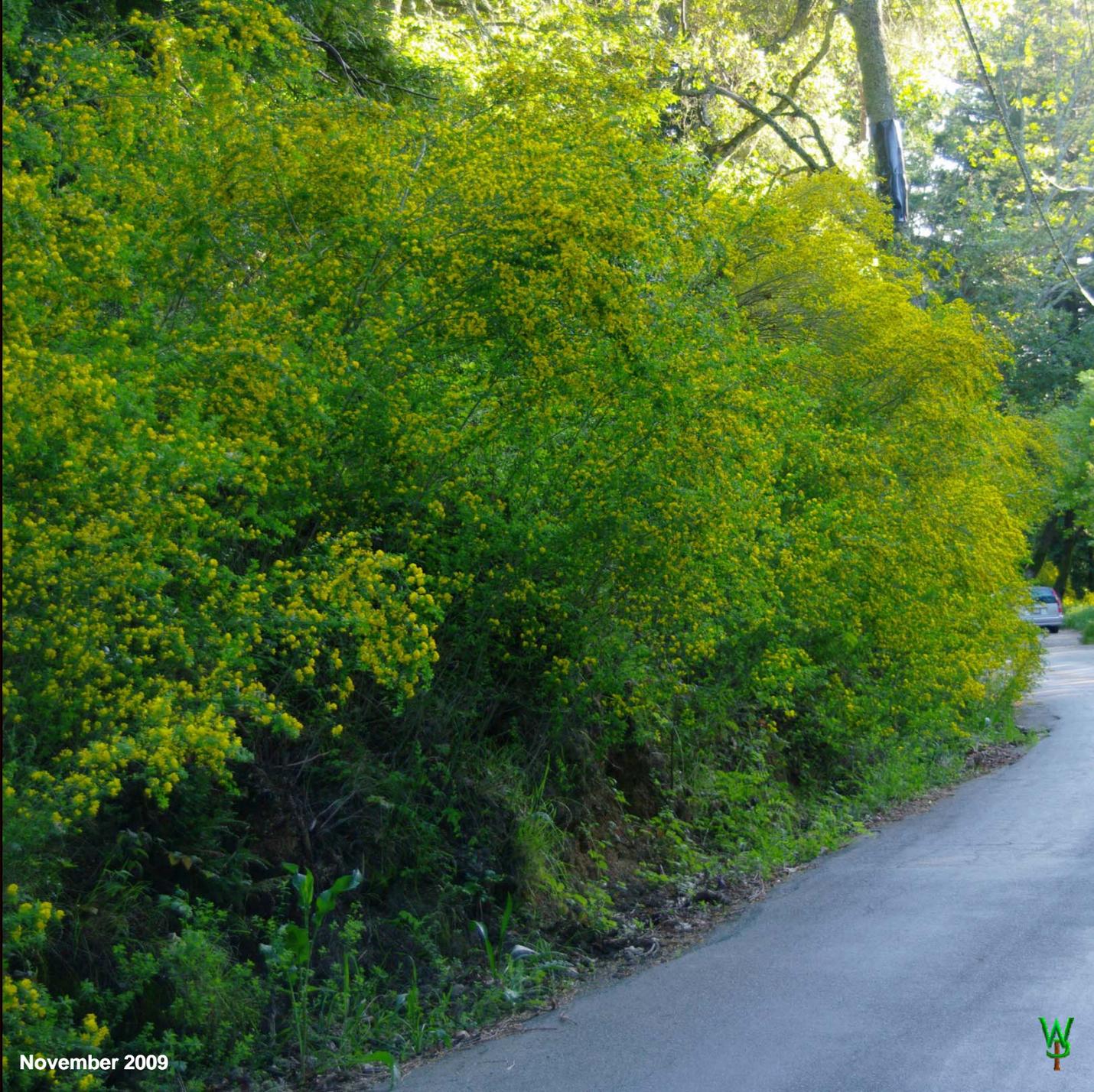


This is French broom along our County Road. What you see here represents less than two years' growth, twelve to fourteen feet tall. Now, imagine ten acres of it. Try to imagine forcing your body through it, for hundreds of yards (I had to crawl). Without heavy equipment, it takes a chainsaw or brush cutter to get through it for any distance.

I wish I could take a photograph of what it is like to be inside a French broom infestation, but I cannot. A camera lens cannot capture sufficient depth-of-field to focus on all the twigs. So I tell people to go find a dense bush and climb inside (if they can). "What would you see?"

Each flower produces about eight seeds that can last 100 years in soil. The seed is carried by mud, cars, boots, water, birds, rabbits, and heavy equipment. It grows so fast that it soon goes twiggy and decadent. After every cycle of disturbance it gets more dense. By 1987, what was to become our place was a choking mess of broom, accelerated erosion, broom, dead native brush, broom, dying trees, broom, and no groundcover. And then there was the broom.

November 2009

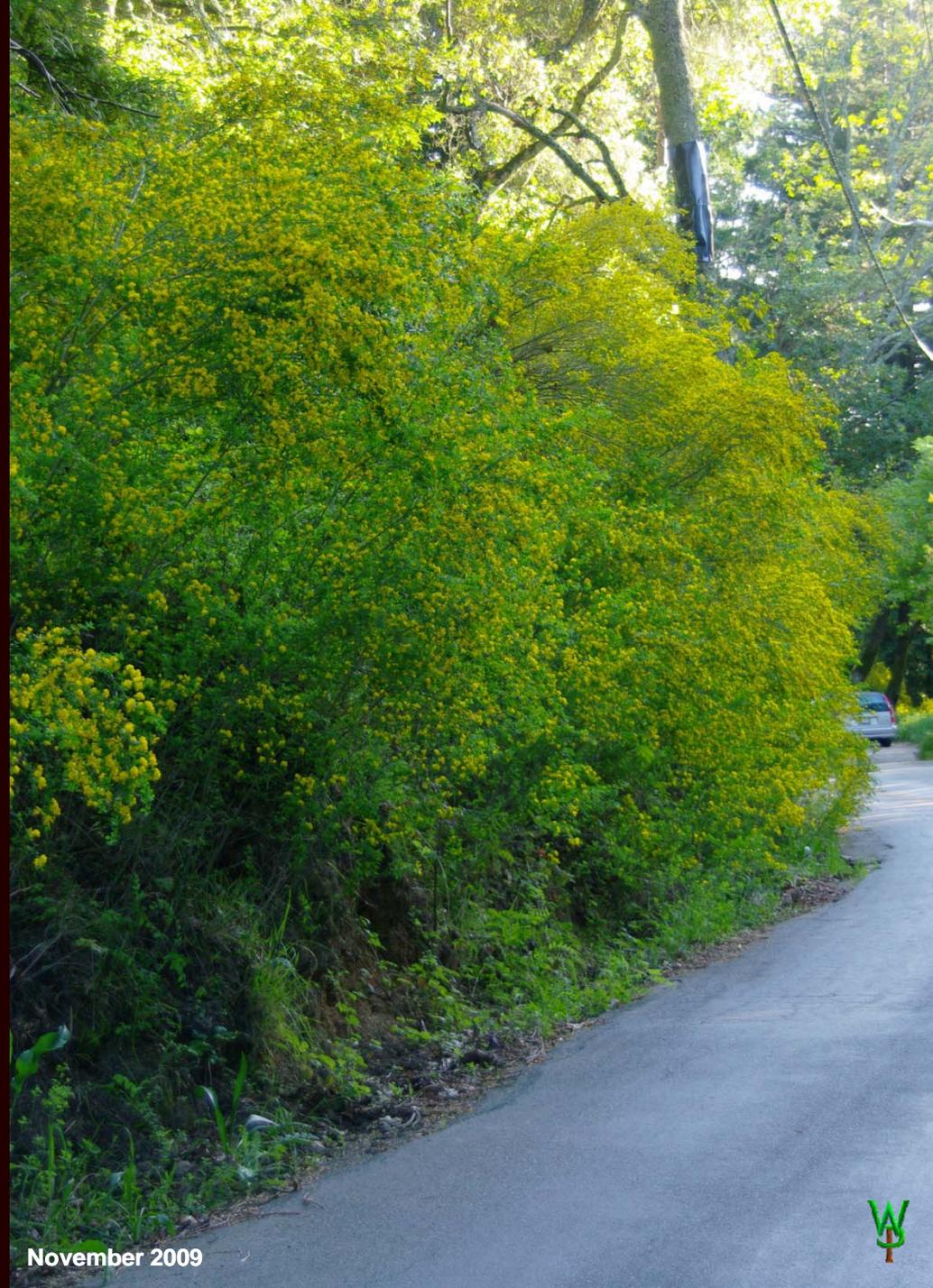


It all happened so fast. This landscape changed completely, from a grassland to an impacted forest full of weeds, within little more than the span of the immediate relations of a single lifetime. Glenwood was just getting started when my grandfather was born. By the time those old photos were taken, my Grandpa could have ridden a horse-drawn wagon or Model T down this road. Had I come up here as a kid, I might have seen cows grazing not 50 yards from here.

And yet that rate of change doesn't stop. The broom you see at right had not yet infested this spot when we first moved here. Yet somehow, when we see these things over time, we unconsciously think that they have always been that way. Then, when it changes radically, we act surprised, even though we knew what would happen with a fuel load like this. It's inevitable, just as inevitable as the belief that such a fire would be "Natural." Given the history, there's no such thing.

This is the power of myth to change the land, starting with the way our beliefs change how we see, then to change *what* we see, to which habit makes us blind. Many an expert has read those old Spanish diaries and not seen the implications. I didn't either, believing that the Indians once dominated the landscape totally, as they did elsewhere in America. It took a third reading for the alarm bells to go off. We know so little about the system response to disturbance, that the consensus scientific opinions about these plant and animal systems are totally out to lunch. Were we to introduce grizzlies on the landscapes we've built since, they would likely starve to death.

With the rate at which new weeds are coming in today and with succession continuing to catastrophic fuel levels, I hope that the prospects of policy driven by such beliefs (rather than by hard experimental data) is as alarming to you as it is to me. We simply have too much yet to learn to be making such massive decisions by defaulting upon our responsibilities. The land needs study, experiment, and development work. Else, mystery repeats itself.



California History References

Because this section is less cross-linked to the rest of my work, I have allowed to maintain a bibliography for this chapter here (I am not as averse to citations as I am to maintaining them among three or four cross-linked books, each in a state of constant discovery). Most of these sources are liable to remain stable because they are printed books, but several are so old that they are unlikely to be available unless obtained by inter-library loan. Some were recently rediscovered in the basement of an old bookstore; they might be available on Amazon. Others are only available as republications, but most of those are of absolutely horrible (unreadable) quality, much less capable of citation for purposes of research. Good luck with that.

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