Be Our Guest…

November 1991 – Jute mat and exotic brome grass, as required.
The hillside above is all French broom.

July 2019 – More shade from fewer trees

Most people don't have the time or money to visit the *Wildergarten* or don't know why or whether they should want to. So this chapter is, in part, a way to sate the curiosity for what you would likely see. It is an amazingly varied place, but only because somebody did something about weeds and the steady progress of succession. Wait long enough and it would be uniformly redwood forest with nothing else alive on the ground.

As the site history details, when the Indians managed this area, the combination of regular fire and almost constant herbivory assured that there were very few if any trees up on this ridge. There is a chapter in the forestry section that maps my guess as to what grew where and when.

This chapter consists of repeat photographs (left), images taken in about the same places repeated after a decade or more by which to learn how things have changed because of what was done (or not). In a way, this is learning about what *can* be done and what that might portend for how it will change over time should these processes continue. In fact, it was this very exercise of taking repeat photos that showed me the need in more than one instance to cull trees yet again.

A guided tour of here involves seeing things up close in far more detail than one could see just passing through looking at things on a landscape scale. Yet showing all that detail over 14 acres of rugged ground when things bloom or germinate at various and specific times is impossible with current technology. Instead, one must sample specific areas to show what they look like up close. For that we have the next chapter.

Occasionally, you will see an orange **X** on a repeat set (left) that indicate trees in an original image to be removed and where they once were in the repeat photo. To know where each photo set was taken, there is a map soon to come.

… In Time -Travel

The previous chapters covered several principles and corollaries:

1. A history teaches us what produced the conditions we encounter with which to anticipate how a system is likely to respond to an input.
   a. Aboriginal management over millennia used disturbance (in California primarily fire, hunting, and harvesting) to direct plant behavior, to which all land-based life systems adapted.
   b. Anthropogenic introductions or relocations were commonplace. Productive species were managed for a *lack* of dominance. They may or may not survive or reproduce well without the management processes aboriginal humans once employed.
2. Eliminate these disturbance processes and, unless someone takes compensatory measures, vegetative succession will progress uninhibited.
3. Aggressive exotics are usually dominant after a disturbance, becoming more so after subsequent disturbance cycles. They must be killed and/or removed for natives to express and reproduce.
   a. It has been so long since post-disturbance native plants have reproduced that their dormant seed in the soil is going bad. Their insect and fungal cohorts disappear with them.
4. That means somebody has to DO something to regenerate the components of these systems, an idea to which the entire cultural paradigm of “Nature” as self-optimizing is philosophically unsuited.
5. For the most part, processes to accomplish this are poorly developed or unknown.
6. Invasive and successional processes can happen very rapidly, while people tend to project a sense of permanence onto a landscape. We need a way to recognize change objectively because “fast” doesn’t stop.

Getting a grip on “fast” is more easily comprehended via periodic repeat photography.

Wildergarten 6.0

This book was originally produced under the name *The Responsible Party* for which there were two revisions, 1.0 & 2.0. Major revisions are for complete rewrites. Decimal revisions are for revised chapters or navigational changes and are not archived. Back revs are viewable by the numbered links below.

Revision History 1.0 2.0 3.0 3.1 3.2 3.3 3.4 3.5 4.0 4.1 4.2 4.6 4.7 5.2 5.4 5.8 6.0

Vande Pol, Mark Edward, 1954 –

Other writings by Mark Edward Vande Pol**:**

Natural Process: That Environmental Laws May Serve the Laws of Nature, ©Wildergarten Press, 2001, 454pp, ISBN: 0-9711793-0-1, LOC Control #2001092201.

*Shemitta: For the Land is Mine***:** ©Wildergarten Press, 2009. Contains**:** 217pp text, 980pp overall, 14 picture books, 2 tables, 963 photographs, 9 maps, 2 drawings, 2 charts, 145 footnotes, 358 citations, and 216 other source references, not including external Internet links. ISBN 978-0-9711793-1-8

Articles at Wildergarten Press**:** collected writings on Constitutional history and regulatory racketeering by tax-exempt “charitable” foundations

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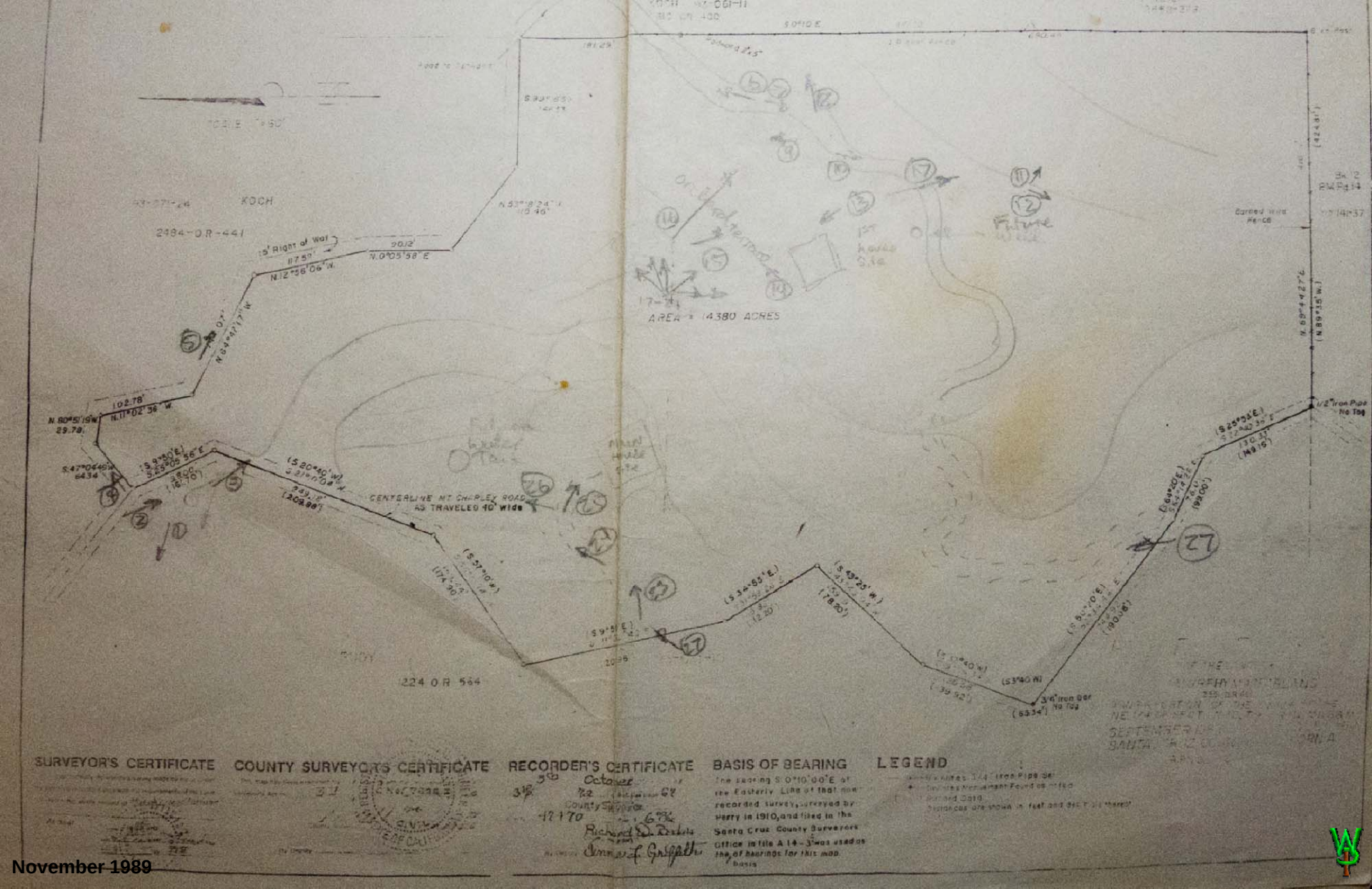
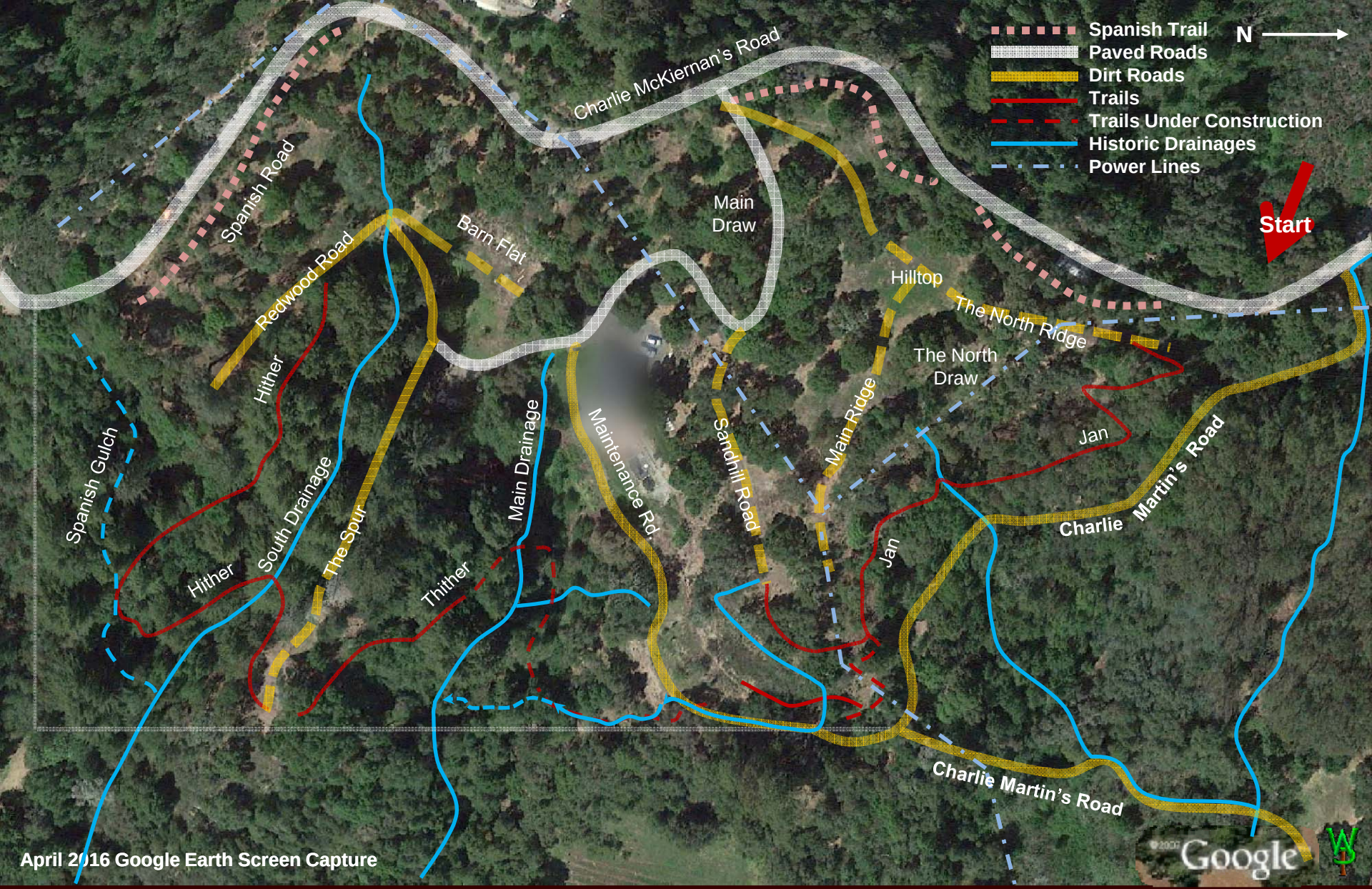
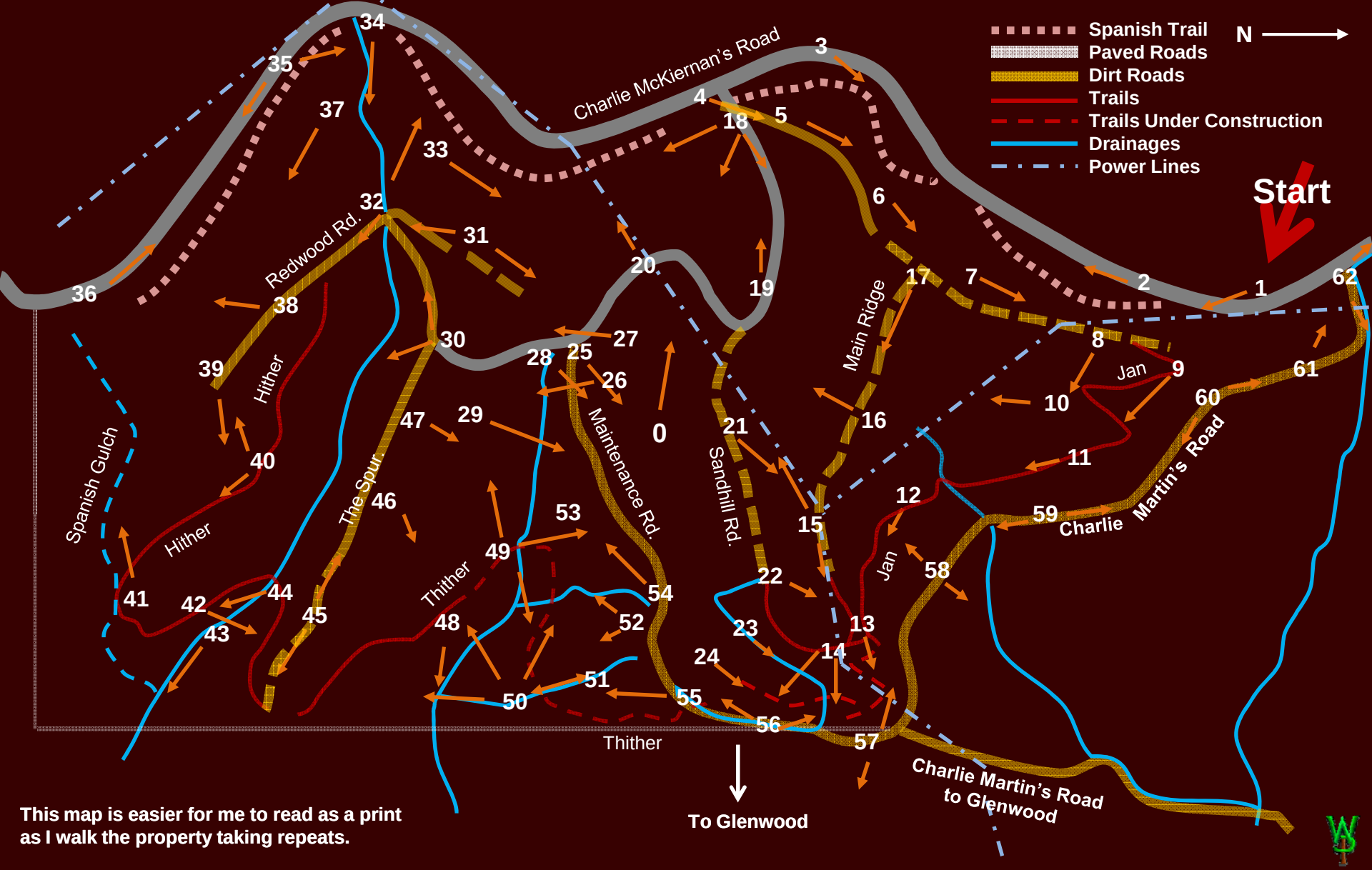


November 1989

In 2020, I fell upon this long-forgotten record of the first photo shoot of this property including prints scanned for Revision 6.0. What is striking to me is that I had used exactly the same method of annotating a map to show the photo locations and directions as you will see on the succeeding two pages (I guess we forget less than we realize). The importance of it to me was that I was finally able to resolve where some of these few “before” pictures were taken! I guess we forget more than we realize, but then, when we moved up here, we were rather pressed for time. Land loans were a brutal 14% interest rate, with 6 points up front for an annual renewal.

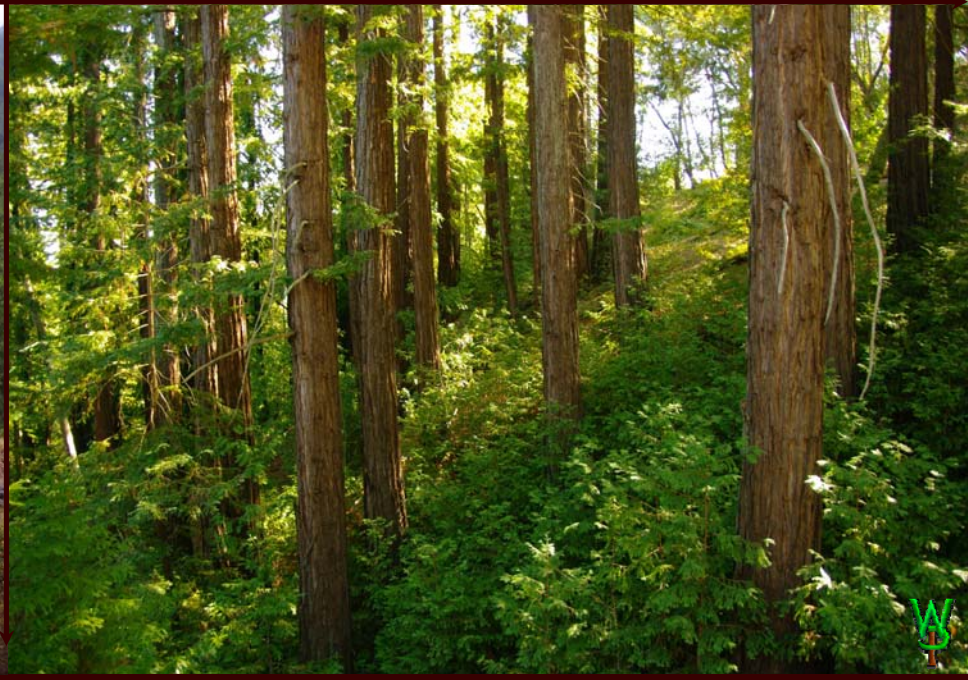


This map and the next show all the roads, walking trails, drainages, and power lines on and immediately around the parcel. This first plate places the infrastructure on a satellite image to give you a global sense of how those features relate to topography and vegetation. The next plate shows where each numbered photograph was taken and in what direction in relation to those installed features, much as if you had it with you during a walking tour. There is a separate file of these two maps if you wish to do the same.



Each number on this map refers to the photo-point from which the image was taken showing a corresponding number on the upper right corner of the page. The orange arrows indicate the direction(s) of the photo(s) taken at each photo-point. As I continue to make major changes in vegetation, tree and shrub growth can block into the view at the exact photo point, while removals can induce confusion about orientation. Taking repeat photos can therefore be tricky. They were enumerated to help me find them again years later for finding retakes and remembering to get them all. They are not discussed in order in this chapter.



This is a very long chapter, not because of text but because the place is so varied (all 4 of photos above are within 300ft of the house), but because it will grow over time as more repeat photos become necessary with which to document changes made here. You will see many of these images elsewhere in the book. So think of it as a “guided tour” through time and in introduction to the many types of habitat sustained here, a way to get a sense of their spatial distribution and how they have changed.

From the house in March 1992 – “Blando Brome” grass, French broom, and oak leaf litter under trees dominate the surface

I’ll never forget hearing from a friend how he had reacted when he first saw this place in 1993. He was experienced in “restoration” landscaping work for very wealthy clients and had already heard about my ambitions for this place. So one day when he was in the neighborhood, he stopped by for a look-see while Diane and I were at work. As it happened, this was just after I had sprayed acres of 3-foot tall French broom. Years later told me what he’d muttered as he crept down the driveway, “Oh Mark, what have you done?”

Having thinned much more forest than is usual for a construction project and then taken down the French broom, what began as the simple desire to “save a little piece of California” morphed into a project that has consumed the bulk of a working lifetime. From project, to artifact, to laboratory, each of its aspects was an extension of the prior. So with that, let’s go to the starting point of our tour so that you can get a sense of what this is about!

In 1987, a young man speculating in real estate bought this place and cleared the broom off the hilltop near the road for a “house site.” In November 1989 he showed it to us. This is from the north looking toward that hilltop that day. Note that other than along the road, the groundcovers disappear from the surface. It was too dark under that forest to support groundcover vegetation.

This area has been thinned three times now. Yet nobody would argue that this is no longer a forest. Obviously, I cut a lot of trees (here probably 20-30), with those remaining being tall and slender with long trunks. This works fine to reduce fire hazards but they are more unstable. There are power lines overhead under which I prefer to grow shrubs like buckeye. If we can move the power pole to the end of the ridge, there would be room for a forest between the road and the ridge with younger trees that have a chance at decent structure (more on that later). From here we will go down the road to the south, after some temporal orientation.

March 2016 – The slide had crossed the road.
The "homeowner" dug it out and hauled it away to be put to use.

Looking back toward where we started, the original Spanish road (see site history) from Mission Santa Clara to Mission Santa Cruz ran atop of this slope. It once had an inside drainage ditch now filled with spongy organic matter that saturated the slope every winter. The County road was graded in underneath it, guaranteeing an eventual failure. Several heavy trees increased the load on the edge. Then the County undermined the slope by widening the drainage ditch to 2 feet which triggered the failure within two years. I removed the trees to reduce the load and undertook a major grading job to reshape the slope. This project is described in the chapter on roads.

The earlier on the successional curve one is, the faster is the appearance of the rate of change. Two and a half years (three winters) after grading it, the *Eriodictyon* shrubs here are 6-8 feet, already displacing native grasses. This is how fast "fast" can be. But it is still a weed battle here as compared to the next photo-point, probably because it got a later start the first winter which inhibited nodes of wild peas and grasses that were in the topsoil slurry I spread here with a rake and shovel. There is also more summer and less winter sun here. The intent is to grow more buckeye and fruit-bearing shrubs such as coffeeberry, elderberry, toyon, and manzanita near the top.

This corner received a similar treatment the same year. It was sloped to provide better visibility to drivers after I had seen a young man on a bicycle hit by a car here. As a former serious bike-rider, seeing him writhing on the ground had made a lasting impression. Two trees were removed and the stumps ground, it was coated it with topsoil and some groundcovers relocated to it (grass nodes, iris, yerba buena, and yarrow) before it was covered the for first winter with a special “mini-greenhouse” system of my own design.

Here it is again after only four winters. As prior location suggested, this embankment was almost entirely successful in developing native cover rapidly. I count 15-20 “groundcover” species here (depending upon how the term is defined) and there are few weeds. The difference between these two sites suggests that a native soil full of perennial nodes needs warmth and moisture to stay alive (duh). This got both because of the mini-greenhouse design and that it was completed in October (instead of the end of November). This spot also has afternoon winter sun while the other is in shade all day when the solar arc is low. That I could only work so fast was the difference for which I will have to pay with a weed battle on the other project for several more years until I can get a groundcover going.

Continuing south, this was to become the main entry. We will follow the cleared path northeastward toward the hilltop. Even though it was a cloudy day with low contrast, it was impossible to photograph the forest at right (too dark), so thick with brush and scraggly trees I had to crawl through it, leaving survey tape tied to branches to find my way. I got lost anyway within 20 feet of the County road, finally realizing where I was when I heard a car. It was a disaster. It was for sale. The moment we saw it, we were in love.

Love accomplished a lot. The stand on the left was thinned three times, removing about 20 trees to keep them away from the County road, develop groundcover, and improve remaining trees. A black oak was added *(Quercus kelloggii)* next to a *Ceanothus papillosus*, the first to appear here. There are now a few young trees ready to replace their larger misshapen cohorts in coming years. Trees are a long, seemingly slow, and uncertain process. The meadow up the center is heavy with small native forbs, being invaded by native grasses. But this doesn't mean we are done with weeds. The last irruption of nit grass *(Gastridium phleoides)* here was in 2017.

July 2019 – Trees marked with a Green X are juveniles planned for future prominence

Plant too soon in the thinning process and the trees grow gangly. Plant too late and there are more weeds. The *Ceanothus* was removed after 20 years to allow the weed bank ito express such that it could be cleansed. What looks like a road running up the slope goes to an emergency helicopter landing site on the hilltop for medical evacuation. Note the canopy density of the oak at right.

This is how thin it that canopy once was. This forest had been crowding itself into oblivion. Once the excess is removed, the remains look pretty scraggly. Remove the canopy too fast and the trees can die, literally of a sunburn! I saved this forest by cutting trees in early winter. Had I not done so, it would be mostly Douglas fir by now. On the next image you will see how this canopy closed.

In general, I prefer to plant black oak. It is nowhere near as profligate in producing seedlings as are the live oaks. It also allows more groundcover because of winter sun and its leaves decay more rapidly. This one will soon be ready to have some lower limbs removed. A forester at UC Berkeley advised me to put 25 feet between planted oaks. I’ve since learned it should be 50-60.

Lots of stumps. We cleared this draw in the winter. We had some monster burn piles in here. The one in the foreground was broom, piled 60 feet long by 20 wide by 6-8 feet high, made by a bulldozer 8-10 years prior. The hillside behind is all broom sprouts. It had been cleared the prior summer and the seeds had germinated in the fall. Now, here comes a shock! Look at the sky.

The tree in the foreground (next to the sign) was obviously not in the previous picture. It is 14" in diameter, and forty feet tall. It grew from a seed in 1990, to this size in 29 years and I plan to remove it soon. This is all about canopy management.

The first order of business was reducing that potentially fatal fuel load before it blew up into a total catastrophe. Just clearing the house site and thinning 2 acres thereabout generated 35 cords of firewood and the equivalent of thirty dump trucks worth of tree tops. **Note that there is no groundcover here other than French broom sprouts.** We gave away 33 cords of firewood and burned most of the trimmings in some truly spectacular piles (one of which took a week for the coals to burn out). The fire captains of that time were more tolerant of such behavior. Thank you Hank Epling, Steve Beechman, and Mike Biddle (all since retired).

It is hard to tell, but there is a great deal more groundcover on both sides of this road than there was only a few years prior, effected primarily with the removal of but two trees. That will accelerate greatly with the removal of one more on the right here.

Back to the top of the driveway, panning to the right. This is what I will call a “Phase 1 thinning” in which I am simply making the area passable. It was still too dark to support groundcovers. This stand had encroaching conifers and very few decent oaks left. The fir tree had a split top some 40 feet in length with a rotting crotch immediately adjacent to high voltage power transmission lines.

In 2013 this was thinned the third time, removing the last conifers. Here you see recovering groundcovers and shrubs along with a young oak I'm trying to save, recovering from "sun scald" due to thinning. Deciduous oak seedlings have been planted in baskets.

Four years. And this is mid summer, not spring. The scalded oak has recovered. The seedlings didn't take because of drought.

This is looking up the power line right of way (last image) after I had thinned the stand to the left and just before thinning to the right.

Five years, and I didn't plant a thing. This right of way experiment will be discussed in detail in the chapter on phased hardwood forestry.

Back to the slope up to the hilltop. The green plants on the ground are French Broom seedlings; there was little other groundcover. Note how the trees lean into the opening for light. About ten years earlier, it had been the “future driveway” to the hilltop, graded off to try to sell the place. There were rotting piles of French broom all down the ridge the bulldozer had shoved to the side off the hilltop.

Here it is in 2010. No broom, native grasses, deer-weed (on the left), lotuses, clovers, sedges, iris, grand mountain dandelions…

This photo is from in front of the water tank in the prior photo. The reason the hilltop was cleared was to make a helicopter landing spot for emergency evacuations. In six months, these broom seedlings were 3 feet tall. Some were 4 feet. The fir trees were removed because there is a high voltage distribution line running across the slope just below them.

May 2015 – with only 9” of rain since December

The emergency evacuation helipad has never been used because the government doubled the size of the helicopters for which the quarter-acre pad became “too small.” They have since changed their minds again so it’s back on the list.

November 1989 – The “groundcover“ in the foreground is all broom. In six months it was 3-4 feet tall.

From the hilltop looking north (to the left of the prior image), note how the forest totally lacks groundcover other than broom. In the foreground the broom is cut, but remains standing in the right-background. The downed tree to the right is an exotic acacia. Note also the fir trunk in the center. Conifers were invading the entire top half of the property. On this ridge, they were the third thing to go.

July 2019

The forest on both sides of this ridge were thinned for the third time in the fall of 2013 with steady individual removals for the power line right of way. The foreground cover is native needle grasses. The ridge in the background is being invaded by deer-weed.

On the north ridge. The reshaped embankment at photo point 2 is to the left. The hope is that PG&E will relocate the power pole to the end of this ridge, which would reduce tree work and allow me to grow forests in two places where it is too narrow to do so now. Allowing forest in these areas will reduce the likelihood that the surface will convert to grassland, which is much harder to maintain. Distribution line rights of way will be discussed in the chapter on hardwood forestry. The next photo is to the right from the pole.

This is what we call “The North Draw” as viewed east from near the pre-existing pole. Once 8 feet deep in French Broom, this is now one of our favorite places. The soil here is terribly poor. So as it improves, up come the weeds! We’ll follow “Jan’s trail.”

From the northwest corner one can discern yet another set of terraces from the apple orchard that once stood here. After removing the broom, it went straight to perennial groundcovers, particularly yerba buena *(Satureja douglasii).* That was quickly ruined as exotic hedge parsley and what I (then) accepted as supposedly native bedstraw (*G. aparine)* took over. It broke my heart, but I had no choice but to kill everything to save it from the weeds, but three years later the natives were back. Getting rid of the exotics continues, 17 years later.

End of May 2015 – Getting the wood out of here was no fun

The power line right of way traverses the south wall of the draw. Atop this steep north-facing slope, a dense stand of trees all leaned out for light *toward* the power lines. There should be **no** trees with any likelihood of dropping on the lines. So down they came. The plan is larger shrubs above the lines that both feed birds and don't get so tall, such as toyon, coffeeberry, elderberry, and buckeye.

Note the grasses in front of the tree at center. There were none in this draw without the additional light from thinning in 2012 and from then to 2019 when we had those cool winter rains. The thing that is miraculous is that this draw was 8-feet high in broom. After getting rid of sprouts, hedge parsley, bedstraw, and *Cardamine*, the first grasses to come up were ALL native!! No oats, no rip gut, no rat tail.

At the bottom of the draw, I have forestry to do, as many of these trees are near life's end. We may also be rerouting the power line corridor across the draw where it is safer above the trees. There are several Acacias on the left I just haven't got to. Why? It's hard to get the tools in here. Since 2016 when I added the roads and trails, it is easier, but there remain heavy priorities, particularly finishing the truck I would need to get in here efficiently. So it sits and waits, with the only two remaining coffeeberry shrubs left alive on the property not in good health. Yes, I've tried to propagate them, and almost succeeded, but there are limits to what I can do.

July 2019

Leaving the draw heading east, to our right is a lush slope of perennial cover that came up after thinning**:** California tea, honeysuckle, blackberry, snowberry, ferns, yerba buena, roses, and at the top, a mix of golden yarrow and globe lilies. Unfortunately, if I reroute the power lines over it, there will be more light and things may change. It's the real price of making improvements. If the character of the vegetation is any indication, with more light, we'll probably see more oak seedlings forming small trees that will then need to be culled.

September 2106

Looking ahead over a rise in the trail, the stand was thinned once in 1998 and again in 2012. This photo was taken while cutting in this trail with a small excavator. To slope it for drainage, I cut off the upside shoulder with a pick, moved the dirt in buckets, crunched the pieces with a rammer, raked it out, trucked water to the ridge above, ran 200 feet of hose, and consolidated it with a plate compactor. I'll be starting a replacement tree or two for the oak, as it is top heavy, while the fill will eventually take its toll on the root crown.

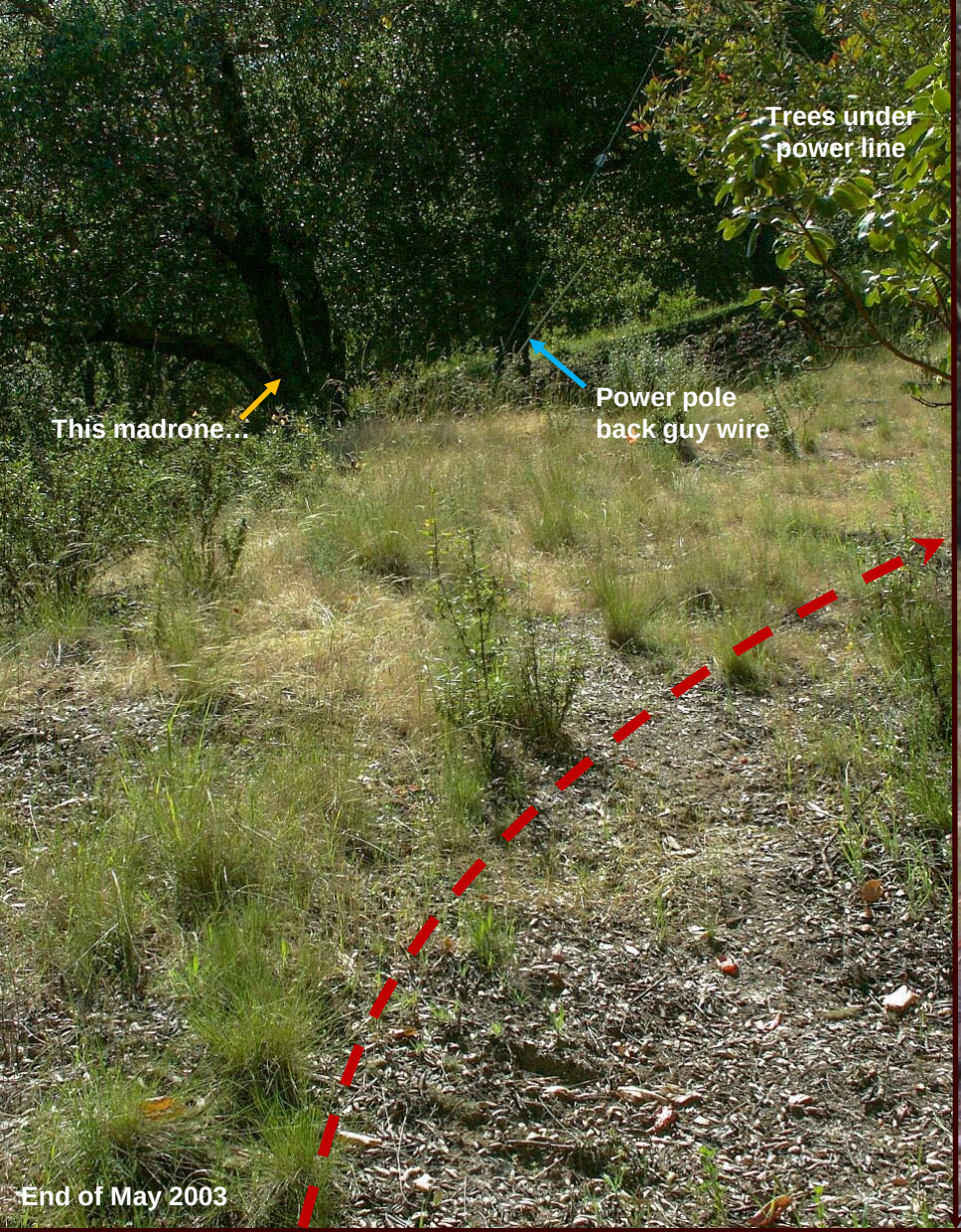
Three years. The groundcover below the trail is principally snowberry *(Symphoricarpos mollis*) which spreads by rhizomes. It is becoming increasingly evident that palatable grass on a trail attracts gophers. Selection of cover species then becomes tricky.

This is from a trail junction, looking down the spine of the ridge along the path of a future trail (the flags on the ground). This was once all dying *Ceanothus cuneatus*, most of which I chopped up to rot, with about 20% dedicated to quail nesting cover. Yet this is also a power line right of way. Hence, there is a trade-off between the value of the bird habitat versus the mass of accumulated fuel, which still presents a significant hazard to the lines if there is a fire. A taller pole would help here, but there is no easy answer yet. The shrubs are monkey flower, and the cover is needle grasses *(Stipa spp.)*, blue wild rye *(Elymus glaucus)*, and Alaska onion grass *(Melica subulata)*.

July 2019

The other side of the ridge represents a managed transition. Only a few years ago, this was a grassland. As I develop burning capability, it may so become again. For now, this stand of monkey flower *(Diplacus aurantiacus)* is being invaded by trees. The advantage of allowing the brush is that it forces the trees to develop a central stem while protecting them from being browsed by deer (monkey flower is unpalatable). Here, I went through the stand and removed all of the coyote brush and most of the trees, such that they can eventually shade out the monkey flower without being so thick that they start to bolt into the skinny unstable trees we have elsewhere.

Climbing up the ridge trail and looking back, the forest on the left side was thinned for the third time in the fall of 2013. This ridge is a road for forest maintenance, access to dump loads of brush to the right to burn the “new sand hill,” and also a power line right of way To get there with a load in back, I have to back down blind because there is no room to turn around. With the size of loads I carry, mirrors are useless. That can be dangerous. It was graded in 2016 to be a bit less steep, wider, and straighter across the ridge.



Looking up the road, the left foreground cover was native needle grass infested with 'rat-tail' *(Vulpia myuros)*. I now suspect the grass invasion was due to added fertilizer, as it has since waned. We lost much of it eliminating cat's ear back in 2002-4 but it didn't come back. Since then we had waves of various forbs and an awful battle with exotic *Filago gallica* that went for years. Trees under the power line were removed. Then I graded it in 2016 to make it safe for my truck and we're back to forbs and battling with native deer weed *(Acmispon glabrosa)*. In 2020 I burned it. The grasses are *Bromus carinatus*, *Elymus glaucus*, and *Trisetum cernuum*.

Farther up the ridge looking south, the groundcover was French broom. By February, with the addition of new seedlings, the broom had made an 18” thick carpet. By May, that carpet was three feet tall. This seemingly obvious tree was hard to find again for a repeat photograph, but for the fact that I such strong memories of that little branch. Over 26 years, things had changed a bit.

May 2015

Without that branch I was honestly unsure it was the same tree, even though it was seemingly in an obvious location.
The tree had grown and the area had changed so much that for the first three major revisions of this book, I didn't notice that the scan of the original negative was backwards!

November 2013

Yet I had done something “clever” when I removed that branch by leaving it there. It had bugged me for a long time as being typical of the kind of horrible pruning done by the guy who cleared the land before me and the guilt that I hadn’t fixed it yet. Year after year, I’d see it, while whacking or spraying broom, but I didn’t have a saw at the moment and it wasn’t an urgent matter. It had taken me so long to get a chainsaw up there that when I finally did the job the cut was tricky because the “wound-wood” went so deep. When finally I got it out, it was a ***very*** pleasurable moment. So I left it there as a memento, the kind of thing that would mean nothing to anyone else.

November 198 – From the evacuation helipad at the top of the hill

Within four months the French broom would become far denser and 2-3 feet tall (3 feet in six months when I whacked it). Note the higher density of seedlings around the edges of the burn spot. This is a typical fire response for French broom. Please imagine what it would look like a year later, with the broom 6-10 feet tall. That is what weeds can do, and why I became such a zealot for killing them. The process of getting control of broom and initial forest thinning took a decade, and getting control of the weeds that followed it took another. Sometimes it is hard to recognize the same spot after 20 years, but this is an easy one. Sort of.

I had already removed a few trees in the background, but one couldn't tell that from this photo. Instead of broom, the foreground is primarily Spanish lotus *(L. purshianus)* and needle grass started from plugs *(Stipas pulchra and lepida)*. The grass was harvested, and the straw with seed still on it was spread on top of a patch of small-flowered lotus *(Acmispon parviflorus)* in the mid-ground.

When you do repeat photography, you have no choice but to notice how much things have changed. In 2010, I noticed that grassland had been disappearing before my eyes. So, I cut trees, taking two or three on the right with a substantial thinning on the slope to the left above the power line right-of-way (10). The flags in the foreground are part of a grassland soils experiment discussed in Part II. Removal of those trees resulted in a predictable irruption of weeds, that continues even after 20 years, starting with broom.

This is the last area the seller had cleared before we bought the land. Once the broom had been removed, there wasn't much left but for the ashes in the middle. This became our "sand hill," now the most diverse place on the property. From the breaks at the top and bottom of the slope on the left there is evidence that this was once quarried for sand or fill, perhaps why there are so few trees here. This pathway became a road with which to protect the house below from the drainage off this ridge.

The area looks smaller because the trees are bigger. The road (red line) was not optional; it protects the house from runoff, is backup drainage for the driveway in case a culvert plugs, and to also a way to haul in brush for burning. It is one of the most species-rich and complex parts of the property, supporting many plants that one would prefer not to have elsewhere. One wouldn't call it picturesque, but as you will learn, close up it is amazing. Take a close look at the brush below the road.

July 2019

Note the rate of succession at right on the slope below the road. It now needs thinning oak tree seedlings 4-6 feet tall. On the left, much of the yerba santa has been removed, but deerweed and monkey flower are always encroaching. I burn a lot of brush here.

February 2011 – I love our new puppy, but I still miss this dog

This is the “new sand hill.” In 2010, this slope was covered with monkey flower shrubs *(Diplacus aurantiacus)*. I had so tired of trees and brush invading the slope in back of the “old sand hill” (**20**), that I “made” this “sand hill” behind the tree in the prior slide, tearing out the shrubs and burning the hell out of it repeatedly. Yet the annual vegetation developed into an entirely different cohort while the invading native grasses are the same. It has since been burned twice since. Now grasses are starting to invade again, and…

February 2017 – She always watched over me here from the same spot

Six years later, it looks about the same but with a lot more native filago *(Logfia flaginoides)*. Why? It's had burn piles here three times in that interval. Unfortunately, burning must be done during the growing season because it is too dangerous to burn June-October (the correct time for this type of cover). Can't burn the monkey flower that returned at the top until I whack it. Too close to power lines.

Beyond the end of the “new sand hill” toward photo point 13, this grassland was *planned* as a fire break in order to keep shrubs below it in horizontal bands so as to reduce the build up of a draft in a fire. Plans, time, vegetative succession… ten years.

This was the clearest shot I could get AFTER removing seedling trees and 6-foot tall coyote brush the previous year. The reason the oak grew so fast is that I thinned the area around it. This spot changed so quickly it got its own photo series in the chapter on stabilizing succession. Interestingly, there is still needle grass growing in this scrub patch, once an acacia forest behind an old cabin.

Downhill about 100 feet, this was the old cabin site, reportedly burned down by careless hippies in 1979 (the acacia forest in back at upper left). The house fire ignited the eucalyptus and acacia. Australia being a fire adapted continent, it is no surprise the process germinated new trees, as exotics typically increase their dominance after disturbance. Half a dozen of the eucalyptus (not shown here) were four-foot diameter monsters requiring expensive removal with heavy equipment. The timbers on the right cover an old 30' dug well that still produces water most of the summer. I may clean it out and put a hand pump on it someday. One of those projects…

July 2014

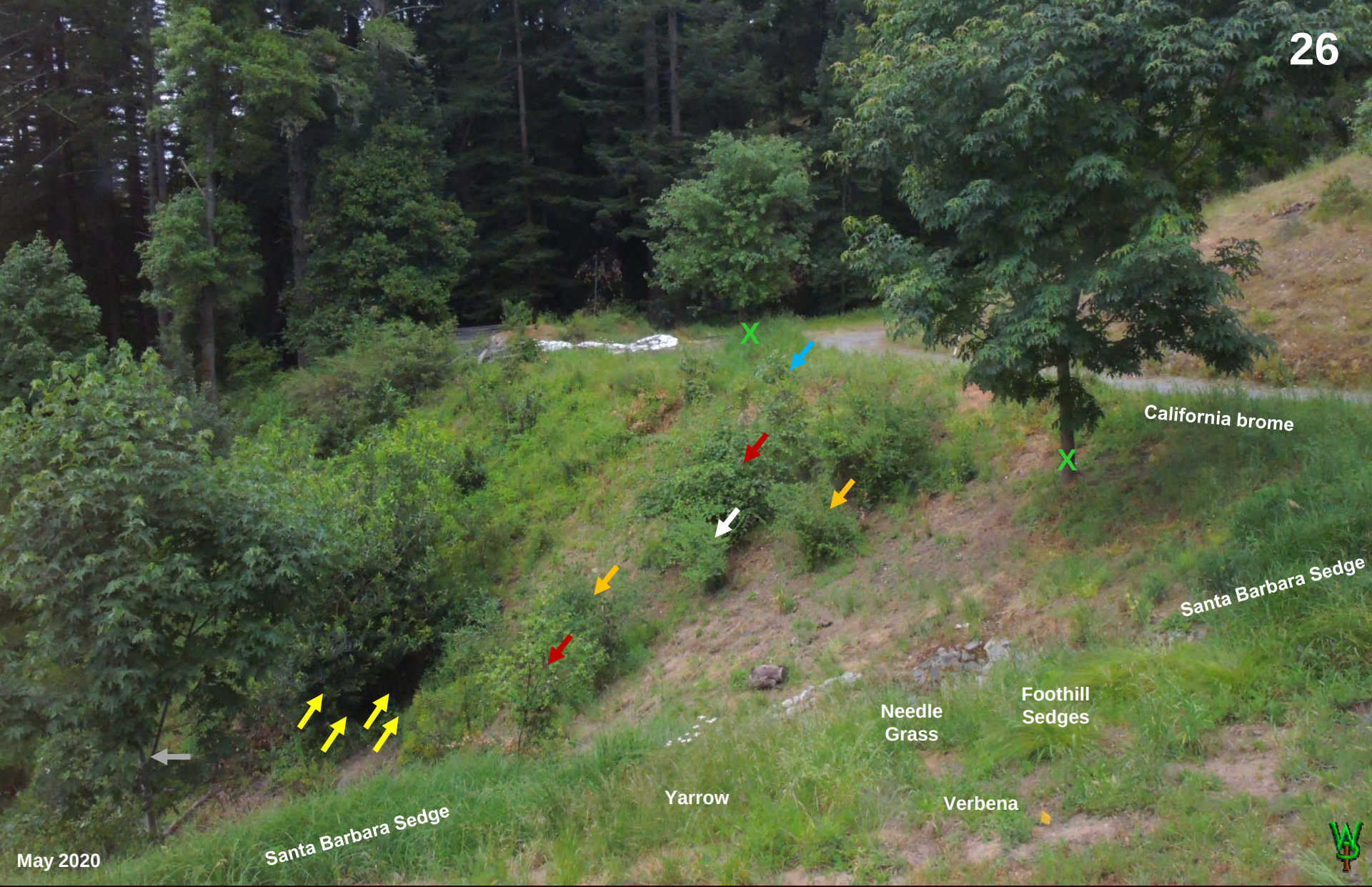
The drainage channel cut into the left side transits water that comes down a concrete chute from the Sand Hill Road above, thus bypassing a backfill retiring an eroding ramp that once ran up to this house site. Although I have to dig out the sediment every 20 years, it has required no other maintenance beyond weed irruptions from the seed bank in addition to Asteraceae seed blown from our neighbors (*Erigeron canadensis* in particular is a threat in a sunny spot like this). The native groundcovers started as stonecrop, succeeded to *Navarretia spp*, *Calandrinia ciliata*, and *Trichostema lanceolatum.* Now the grasses are coming in.

In 2020, I fell upon my long-forgotten records of the first photo shoot of this property. Without them, I would never have known from where this was taken (“13” on the original map). When we started clearing, the seller had bush-whacked the hilltop bulldozed in 1983 and immediately below it. Other than around where the old cabin had been, the rest of the place was almost entirely forested. Redwood was a monoculture. Hardwoods were impacted with French broom. There were virtually no groundcovers left except for a little blackberry. The poison oak and honeysuckle had long since taken to the trees. I removed ALL of these trees. Why?

It was to be the patio behind the house. Yes, this is the same area. Perhaps you'll recall this image from the chapter discussing 'why native plants.' The grass is almost all various annual fescues *(Vulpia spp.)* and "Blando Brome *(B. mollis)* required as an erosion control. The fore mentioned horseweed *(Conyza canadensis)* was a horror in here in the early '90s once broom had subsided a bit.

That was June 1997. This is July 2019. There is no irrigation here but for the yard plants. The difference native plants can make really can be this impressive. The pile in the middle is composting weeds.

This incised gully in front of the house received an enormously difficult rehabilitation job discussed in the chapter on drainage. For many years, it was overshadowed by a line of bay trees. This and another cluster in a deeply forested area further down the spur to the left were coppiced to the ground by the fire of 1941. Additional shade came from an oak in a well that protected the maple (X) yet to be planted on the finished grade. The bays long remained a fire hazard to the house. In the fall of 2017 they were coppiced again (by me) and the oak was removed, the well to be filled from a nearby pile of fill dirt saved for that purpose.



The response was both impressive and as expected, because so much has been learned about how weeds behave after a disturbance like this coppicing job. Here we are with annual and perennial cover including shrubs of "ocean spray" *(Holodiscus discolor)* and hazelnut after only two winters. The keys were prepositioning the shrubs for 10 years, while and learning the timing of weed maturity so that I could anticipate the response to the additional sunlight. This year, weeds were controlled by a combination of propane burning and hand work. The maple on the left is a volunteer. The future hassle (in the mid-ground) will be oak seedlings.

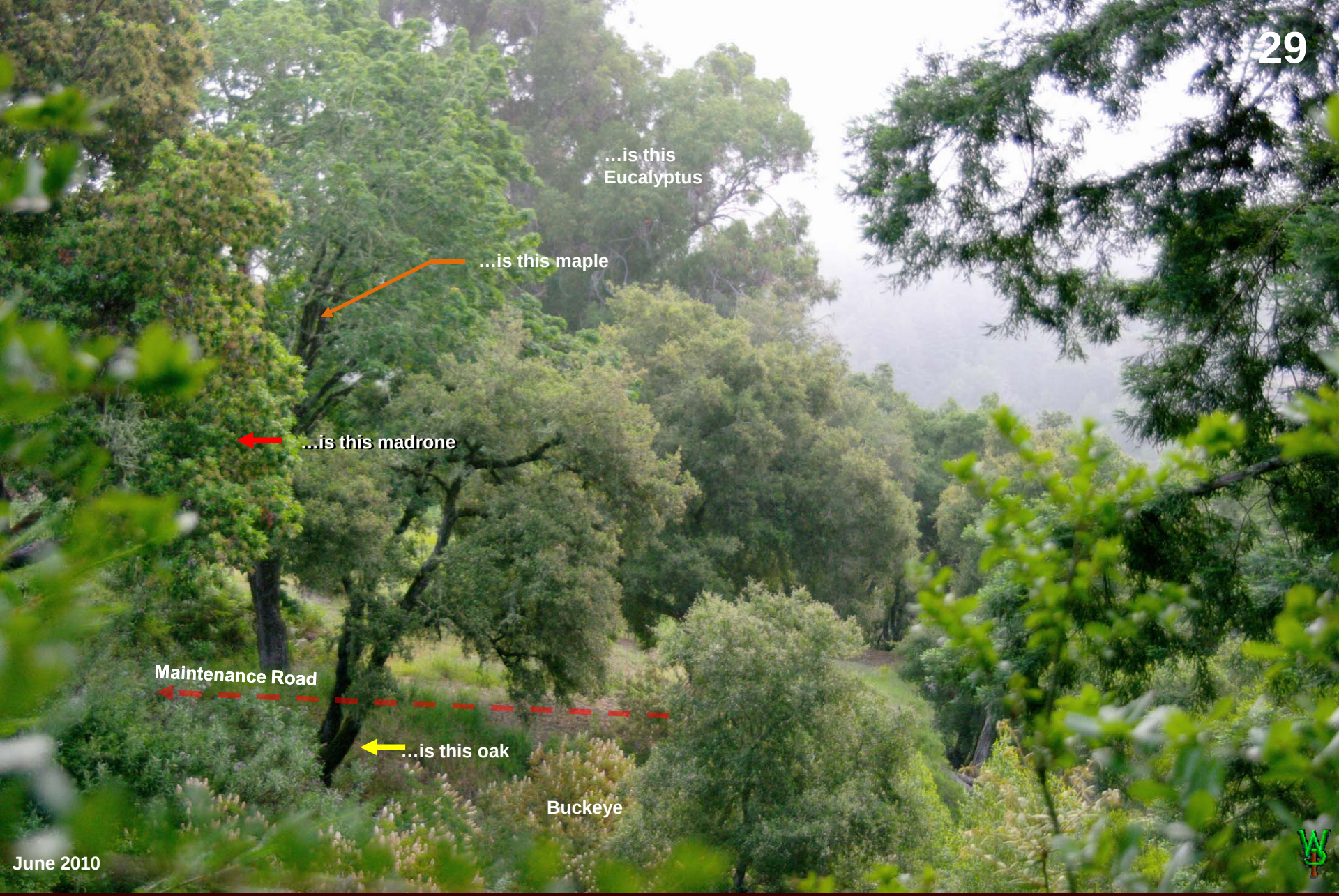
Said incised gully goes down to the left. The red line represents a rather radical change a couple years later that supplied the material to fix it. The ridge above the line was graded into a flat, used to provide material to repair the channel incision.

Thusly. Note the drainage path on the pavement. That is designed to be an emergency backup in case the culvert feeding the channel or the rocked channel below it develop a problem. The project got its own photo series in the forestry chapter on drainage.

Due to succession and fire suppression, there were quite a few medium and a few large Douglas firs. We removed them on steep slopes, in oak forest, and on higher ridges. We kept them on the edges of redwood stands. At least three of the larger fir trees had double trunks over 30 feet long immediately adjacent to power lines (the power company does not trim more than ten feet away from wires). "Forked top" trees eventually break and the tops could then fall on the lines (disastrous in summer). This area doesn't look terribly steep, does it? Keep that in mind noting how dense that vegetation is on the right, as you look at the next photo.

Yes, this is the same area! The prior photo axis is the big red arrow (the house precludes repeating this photo). The dense cover you saw was just below the “maintenance road.” The slopes uphill to the left average 15-25% (rise over run), but to the right of the road, it drops off at over 100% (1:1, or 45°) with a bluff below that. The burn piles in the background were the third or fourth round that winter.

It gets just a bit steeper as you move down the slope (this photo was taken from about a 100' to the right of that prior). That dense cover (mostly fir and acacia) went all the way down the hill, all of it over 45°. Some of it is a vertical sandstone wall about 8-20' tall. Imagine the kind of fire that would have come up this slope with that much fuel (I don't want to). The 160 foot tall eucalyptus just to the right of the text is now gone, as you will see in a few more slides. We lived in the trailer while building the house.



There are so many sapling trees and shrubs on the ridge from which this was taken that I had to thin it again a few years later to get a better retake. The remaining Eucalyptus belonging to a neighbor, is on the property line. They were originally planted to hold up the road and still do a good job of that. Note the buckeye that moved in (in flower at the bottom). They too hold soil, don't get too big, store water in their tissue, lack fuel value, and shade out grasses while still allowing for dense groundcovers.

Now that the trees on the ridge from which we are viewing are back under control, one can get a decent retake. Note the propagation of what the local Indians call “white root sedge” *(Carex barbarae)*, from which they made baskets with the roots. Two of the three patches you see were planted, part of the one on the far right being the original patch. They are easy to propagate and form an erosion control blanket with very low fire hazards. I wish I’d gone faster with that project. They aren’t terribly diverse, but they stay green all summer, are easy to care for, and when combined with burning resist weeds effectively. Behind us…

July 2014

…looking south is our largest redwood stand which dominates the view from the south side of the house. It doesn't change much, not because nothing grows but because I take down the crown sprouts upon occasion. It can only be done in winter because forest yellow jackets *(Vespula acadica)* make the job rather unpleasant. These are nasty compared to the usual found at picnic grounds.

This project was to recover the use of a pre-existing road that wrapped around the redwood stand to the left. We also cut in a flat on the right under the madrone for a future combined small goat barn and pen along with a chicken coop for flies I still hope to build.

This is classical road construction, with hipped-in drainage channels that fill and culverts to carry all the runoff, then to erode the slope below the discharge. Note the many trees yet to be taken and ask yourself on the next slide, is there that much less tree cover?

This repeat is obscure because so much happened here. I added fill and moved the drain along the base of the slope on the right because I never liked the notch or the drainage; I wanted a blend. That took another 60 yards of fill on the road to make it slope outward to promote surface drainage. The road surface is dominated by “wiregrass” rushes (Juncus patens), which can actually be a bit of a pain. The double madrone died in 2000 of an exotic fungus that then killed the madrone on the flat above in 2014.

July 2014

This was the madrone in photo point 29. The trunk is rotten due to an exotic fungal pathogen *(Botryosphaeria ribis)*. Photo point 30 actually represents various places on this flat. I had graded the road to it in 1992 and finished the grade in 2003 to make a spot for a small barn with which to host animals for brush control and grazing experiments. There is a water line just down the slope.

This flat has been a battleground between exotic hop clover *Trifolium dubium*, and native clovers *T. gracilentum* and *T. barbigerum*, with the biggest challenges coming successively from silver hair grass *(Aria caryophillea)*, the infamous bitter cress *(Cardamine hirsuta),* and now narrowleaf cudweed *(Pseudognaphalium calviceps)*. The rocky slope has also suffered from wall bedstraw *(Galium parisiense)* and narrowleaf filago *(Logfilia gallica)* but gets amazing crops of *Madia exigua*. The sluff along the bottom of the wall has supported our first new colonization of California's native wild oat *(Danthonia californica!!!)*, once a dominant grass in this State.

Looking east is the area that got leveled into a small flat in photo point 26. “Flat” is relatively rare around here, and is thus extremely valuable for turning the truck around, guest parking, processing firewood, making biochar, decking logs, storing lumber, burning slash piles, storing stockpiles of fill dirt, and transiting runoff both from the slopes directly above and as a backup to the adjacent drainage traversed by our driveway (see map) in case the main culvert plugs or in the unlikely event that the drainage armor requires servicing.

You are looking down the same slope, which has borne some spectacular crops of clover yielding to a small tarweed, *Madia exigua*. This has been a lousy year for clovers, which took a hit in the battle against “bitter cress” (long thought to be a native but found in 2014 to be an aggressive exotic). Since the gophers moved in, they occasionally bury fertile pods of the offending plant, making ultimate control questionable unless the rodents are somehow controlled. The flat below was graded in as described in the discussion of photo point 26. The dirt pile came from the embankment project of photo point 2 to be dedicated to top of the road you see below. Bunch grasses appeared there that keyed to *Calamagrostis nutkaensis*, a species long thought to be extinct in this area.

Up the road at the turn around the end of the redwood stand, this series at photo-point 32 will be discussed in more detail in the chapter on phased forestry. It's a lot of skinny trees in one place, typical of what was here when we first arrived, but since having had twenty years longer to grow straight up because it took me so long to get here to do something about the overstocking. This is how poor forage conditions typically are in these mountains. There is nothing for an animal to eat here until the acorn drop once a year, which obviously doesn't keep them going year round. The one solid tree with a chance is in the middle.

Those straight skinny oak logs accumulate duff on the ground even though there are fewer trees supplying it. Of the five trees in a line at the top, the middle one stays, but I haven't decided which. Until then, they keep the groundcover from responding too rapidly by shading the afternoon sun. By now you won't have to guess what will happen to the north of where this was taken when I take out that screen. To the right and the hedge along the road above, toyon and *Ceanothus* are doing well, and I hope to add coffeeberry.

April 2020

Again, this is one of the few oaks on this property with the usual traditional structure as Indians originally shaped them for harvesting acorns. This one was accidental, it got smacked by a diseased madrone I was dropping that broke unpredictably. With a little help, it has regained its former general outline. As it grows it will need to be limbed up a bit to protect it from a ground fire and I will remove the trees along the road. This is one of the older small openings on the property; the hedge of shrubs I planted along the road on the left will soon beg for either replacement or a rotational coppicing program discussed in the chapter on hardwood forest understory.

September 2002

The project is also in the forestry chapter on drainage. A County culvert had blown out here. The County provided backfill from ditch cleanings to replace what had been lost. Hence, this fill is MASSIVELY contaminated with every weed imaginable. Eighteen years later, I'm still dealing with them. This side-outlet drain was made from broken sidewalk concrete. It doubles as a stairway.

Beyond weed management and digging out the drainage along the berm at the top every year, there is other work required here. I planted *Ceanothus cuneatus* below the berm as a visual screen and to focus animal entry behind it, putting it far enough down that drivers could see around the corner. Looks like they could use a trim. There is a pile of dirt on a tarp behind them, meant to address the ongoing process to be covered in the next two slides.

October 2002

The drainage below this dual outlet was an incised channel cut 4 feet deep. I filled it with dirt chocked with wood to keep it from washing away. Then I planted root nodes of Santa Barbara sedge to hold the surface. The drain outlet slab was finished humped so that I could turn the water to the right or left with a piece of wood, thus giving each side an occasional rest for the sedges to fill in.

I knew the wood would rot and the surface would sink, so the dirt pile I mentioned in the last slide is to refill it. Almost eighteen years later and it's dropped a good 8-10 inches at the top. Bringing it back up to grade is a job best performed when the soil is damp for compaction of the sub-grade fill and to help the sedges get rooted again. Technically, such disturbances are prohibited because the job might release sediment, despite that I have *reduced* sedimentation from channel incision with this project.

Wire grass rushes are down below performing a similar function to both retain soil and filter sediment.

On the right is a neighbor's property. 20 years ago it was the principal launching point for airborne weed seeds and a source of burs carried by animals from the west and south. Control this strip of land and my place would be protected. It was an ideal buffer because the surrounding area is forest so dense that it cannot support those weeds. I spent that 20 years cleaning it up, with rare native plants starting to reappear. And then a new owner comes in and tore the whole thing up making the disturbed area double the size, burying much of the exotic seed, and thus making the problem much worse than it had ever been. He had big problems with herbicides despite that most of the weeds he is growing are VASTLY more toxic than anything the government allows the public to use to kill them. He could have had world-class landscaping for free, but now he has a toxic weed patch that may get him sued.

Looking the other way from down the road, there had been a substantial berm on the right that increased the collection area for runoff channeling down the road to the drain at the corner. I wanted it to sheet the runoff to percolate into the forest at right instead. So, I got a trusty shovel and took off the berm, slope the shoulder off to the side, and planted various shrubs under these burlap teepees to form a sort of hedge that would force game to cross the road at the corner where there is better visibility to traffic from both directions as well as to concentrate where the burs would appear for easier detection and treatment.

The shrubs grew and here's the hedge. In hindsight, they were placed 2-3 feet too close to the road, as here they grow far enough to the left as to require an occasional trim. But as a way to restrict invasion by burs on animals and to knock down and thus concentrate airborne seed for treatment, it has worked very well. I weave poison oak into it to give it some fall color. It does have the disadvantage of sprouting oaks from underneath which I then must cull. Tree roots this close to the road are damaging to the pavement.

This is the second year after Indian potatoes (aka “blue dicks,” *Dichelostemma capitatum*) first appeared en masse just above a long line of soap lilies *(Chlorogalum pomerindianum)*. The pathway to the old Spanish road (and therefore the Sayante tribal trail that preceded it) runs parallel to the slope about 60 feet to the right.

April 2020

As grasses invaded, the blue dicks have faded in all but the wettest years. We have also had an invasion of gophers seeking those roots. The soap lilies seem to have held their own. I enlarged this opening considerably toward the end from which this was taken around 2013, for the purpose of seeing if these root plants would appear at larger scale, thus indicating the size of the original aboriginal patch. From here we go back to where the drainage crosses the “Redwood road” at the foot of this slope.

Here you see what is as close to a remnant opening as was on the property when we got here. There was broom in the foreground, but it was just getting started. Why there were so few trees and brush here I do not know, but it might be fungal. I had hopes for the oak on the left but it later died due to competition from the redwood behind it to the south. There is no groundcover farther under the trees, although there were a few dead manzanita and LOTS of impenetrable *Ceanothus cuneatis* farther up the slope.

A decade later, the red dashed line indicates what I once called a “dark barrier” for purposes of weed control between the opening in the foreground and one behind it. I had repaired the road which had washed out many years prior. In doing so, I knew that the oak in the foreground would get root rot and die, but it was already old and we were able to enjoy it for many years. What was a surprise was that the rate of growth in the redwood behind was high enough to shade out the oak on the edge of the redwood stand.

By 1995 it was clear that the firs in this area were an artifact of fire-suppression, nor were they healthy. So all but two were gone by the time this photo was taken in 2012. I had yet to learn that redwood too was probably unprecedented at this elevation, yet it was obvious that the invading trees were killing the oaks and I wanted to keep both ecotypes. Here, I had taken one of the redwoods out to save that oak, but it was too late. This photo was taken before thinning out the rest of the stand in the background, killing the sprouting redwood stumps. By this time the oak in the foreground had a large *Tramete* at its foot. It fell in late 2014.

This represents the fifth time this area has been thinned, first to make it passable, second to get some groundcovers going, third to remove the fir, then I thinned to the upper right, then I took out the redwood, and the background in 2014 to which the groundcover response was tremendous. I left a few skinny oaks there to reduce the shock of a sudden increase in sunlight and planted black oak seedlings. I will take a few more to make room for thinning the redwood stand at left. Next is a look down the road.

This 2004 photo provides a sense of the interim in the prior series**:** What were very young redwoods when we arrived were becoming tall enough trees to be capable of shading out the oak that died. In the early 1990s, I had graded in this old road which had washed out many years prior with a grade that channeled the water. The skinny redwood logs on the ground in back were taken out thinning the understory of the stand at left. When this photo was taken, I had just reversed that grade to an out-sloped road, which reduced the flows down the channel and rendered a road which has required no maintenance since.

The two firs that remain to the south of the redwood will get enough sun to stay reasonably healthy as long as there isn't too much water competition with other trees. They are there to serve as "spar trees" to yard out the redwood and to shade it such that it grows with fewer knots in the wood. Not only is the groundcover amazingly varied, but the way the crowns of the hardwoods thicken and a few seedling trees rapidly becoming decently structured trees has been very satisfying. Further down the road and looking uphill…

Other than cleaning out the dead understory and removing 3 fir trees, this stand had been allowed to remain relatively untouched for longer than all but one other place on the property. Hence, these “leave trees” were the best in this stand, a crowded gaggle of long, skinny, misshapen, and unhealthy oaks and madrones. This was probably one of the most severe thinning jobs undertaken here.

Five years. No matter how many times I remind myself that vegetation needs light, differences like this in only five years still surprise me. Keeping the brush under control is absolutely critical to managing this transition until the remaining trees have thickened and spread out. There is a shade screen of trees at the top to slow that process down. I wish there was an easy way to get rid of the logs.

June 2002

This is just beyond the end the end of Redwood Road looking down to the left. The slope is at least 55°. This stand is a fuel bomb. This very large fir tree leans out more than to the right, curving upward, and is totally unstable. The goal was to convert it from fuel bomb to a “shaded fuel break” to keep a fire on the ground so as to protect the redwood stand to the left.

July 2019 – From 40’ to the left of the prior photo

I removed that monstrous unstable fir, burned the slash, and sent the log to the bottom in pieces to rot in the creek. I cable yarded out the diseased madrone and several bay trees on the upper half of the slope, trying to reduce the amount in the drainage. The total amount of fuel wood down there exceeds the rational limits to the sediment entrapment strategy. Hence, some of the remaining fir will be removed while thinning the redwood, funded by selling the higher value logs. Heading down the Hither trail…

July 2019

Down from the road via “Hither” (runs just below the big fir stump). We are looking down the lower half of the ‘shaded fuel break’ at the end of the redwood stand. Almost all the wood from this far down went down the hill into the drainage. There is no prior photo.

July 2019

We are farther down “Hither” looking along the fall-line of that leaner-fir into the mouth of the Spanish Gulch. The goal here is fewer conifer and bay trees and more maple, hazelnut, toyon, and coffeeberry with a lot more perennial groundcover. It is way too steep to manage annuals here, not to mention that they attract burrowing animals that destabilize such steep slopes.

July 2019 – One of those places I hope to get to again…

We are looking up “Spanish Gulch” from the turn in the trail, so named because it was probably *caused* by runoff from the Spanish road. Obviously this is a mess, with madrones failing due to that exotic fungus *(Botryosphaeria spp.)*, but believe it or not, it’s already been thinned once! The goal here is toyon and coffeeberry facing south on the right and hazelnut at the bottom. It’s so steep here that redwood and bay on the ridge should shade it enough to slow things down. On the right is a 36” fir tree we’ll keep.

July 2019

This is the south-facing side of the spur shaded by redwood in the drainage. Madrone and bay were at heavy density at the top of this ridge, with a few bays on the slope. Fir and redwood had started to invade soon before we got here. Today these conifers are substantial and I have begun to cull them for reasons of fire and to generate groundcovers on the slope below and in the drainage.

August 2006 – Those ears…

This is a channel discussed in the chapter on drainage, before the diversion across the water out of the channel and across the sedges. Note the vegetation in the far background. It was thinning atop the ridge there that made the groundcover you'll see next.

And after 10 years... Note the oak seedlings moving in. Clearly there has been some incision of the surface forming a new channel. I'm using wood to slow it down. The challenge is that once one is through the plane of the sedges, they get less light and there is no root bed there, at which point incision accelerates as the flow of water concentrates. There is a redwood planted at the bottom in the hope that the root mass will serve as a stopping point to that incision and help create a meander to get the flow to deposit sediment. More logs across the surface would accomplish the same, but the problem is there is no access for equipment to get them here, yet.

July 2016

Looking backward up “Hither” right after trail construction had been completed before covering it with litter.

A few words on clearing in principle are necessary. A lot of people believe forests should remain unbroken. Others argue that wildlife benefits from "edge effects," with chaparral cover near openings containing forbs as a source of food. With hardwood here, I belong to a different camp, preferring a forest/savannah of variable and continuous edges. There are a couple of related points I want to make about clearing this place, one of which is subtle to some people.

First, a substantial fraction of the forests when we arrived were exotic trees. You don't get your choice as to where those "clear cuts" will be.

Second, every system needs its full compliment of plant and insect constituents or it loses those species which historically responded to events, whether fire, flood, decadal drought, cataclysmic events (super-volcanoes, asteroid collisions…). Periodic clearings maintain the viability of those constituents by reproducing fresh seed.

Third, given the history of this site, the fuel all around it, and the weeds present, both surrounding it and in the seed bank, if anybody wants an original compliment of plant and insect life to continue to express itself, SOMEBODY familiar with it must disturb small areas periodically and weed them or those plants and insects will eventually go extinct. Guaranteed.

Thus, there is no "end" to this tree selection and weeding process, as is illustrated here. But it will slow down… someday.

June 2010

This is that same area in 2010 (from lower down to avoid the tree tops). The groundcovers on this ridge are all new (even more extensive behind the redwood sapling on the right), primarily native blackberry *(Rubus ursinus),* yerba buena *(Satureja douglasiana)*, Torrey's melic grass *(M. torreyana)*, *Melica imperfecta*, and poison oak *(Toxicodendron diversilobum;* it's fine here as long as it stays on the ground). The shrubs are occasional ferns, roses, pitcher sage, and hazelnuts, with the toyon and manzanita having large burls, indicating that this was once a site subject to occasional fires. Down the middle are mostly clovers and lotus. Although (now) very clean and seemingly remote, this site requires vigilance because it is so close to neighbors. If the Ceanothus on the end of this ridge burns, there would be no protection from blowing seed or wandering animals loaded with weedy burs. Note how the canopy is closing.

February 2015

This spur serves several purposes**:** It is a fuel break, a place to turn a log loader around, a safe place to burn, and a place to mill lumber. It is important therefore that it not become overpopulated with trees and the canopy stays open for a minimum width. So, given that (and that we must remove fir trees dying from beetle attack and fungal diseases), I needed room to fell the trees and process logs. So I opened it out in 2015 and 2017. I love this spot, despite that this is some of the worst soil on the whole property.

February 2020

I'd like my body to be buried here. Don't know why specifically, but it is a very spiritual place. Evidently the Indians thought so too.

This spur is between redwood stands with fir on the spine. The fir is being shaded out by the redwood, and has been succumbing to beetle attack and fungal diseases in dry years. Fir is far stronger than redwood, hence its presence on the spine helps break wind that might otherwise snap the redwood as it grows taller. Fir is also strong enough to facilitate yarding redwood logs in a thinning operation

May 2020

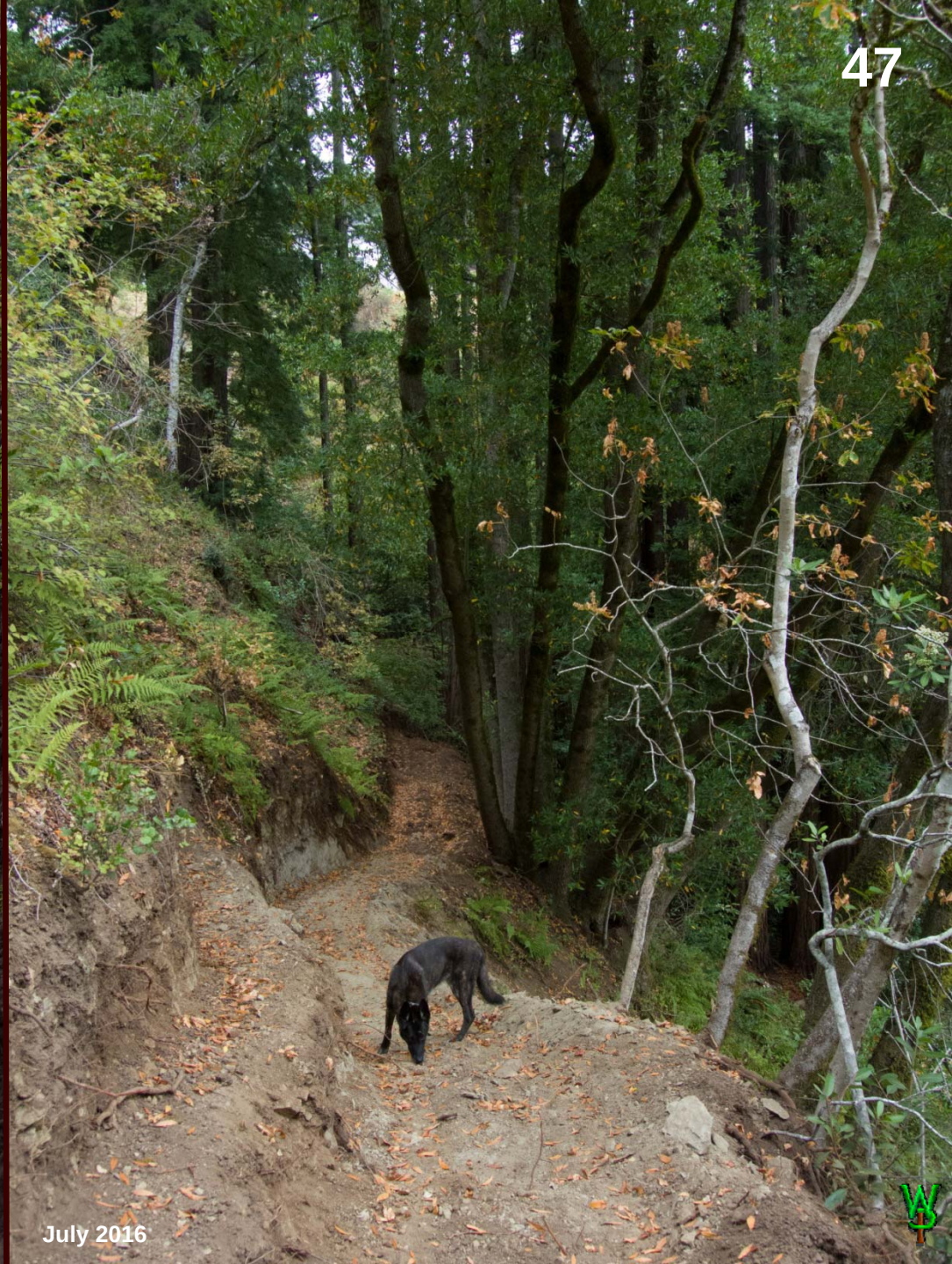
Further up the spur looking north, the cluster on the left has been logged; the one on the right has not. Which one has room for the trees to grow? Steep, isn't it? As you'll learn in the chapter on logging, it may have been trees that made it this steep. As to the full scope of how that might have happened, let's take a closer look from down below.

After going back down to the end of the spur, we head down “Hither” toward the bottom of the property where the redwoods you just saw are growing.

It ***is*** a steep slope, isn’t it?

The guy who cut this trail with an excavator won’t come down this way again to finish it. Too scary.

The guy who shaped it by hand gets to finish it.



July 2016

This image is meant to
make an impression.

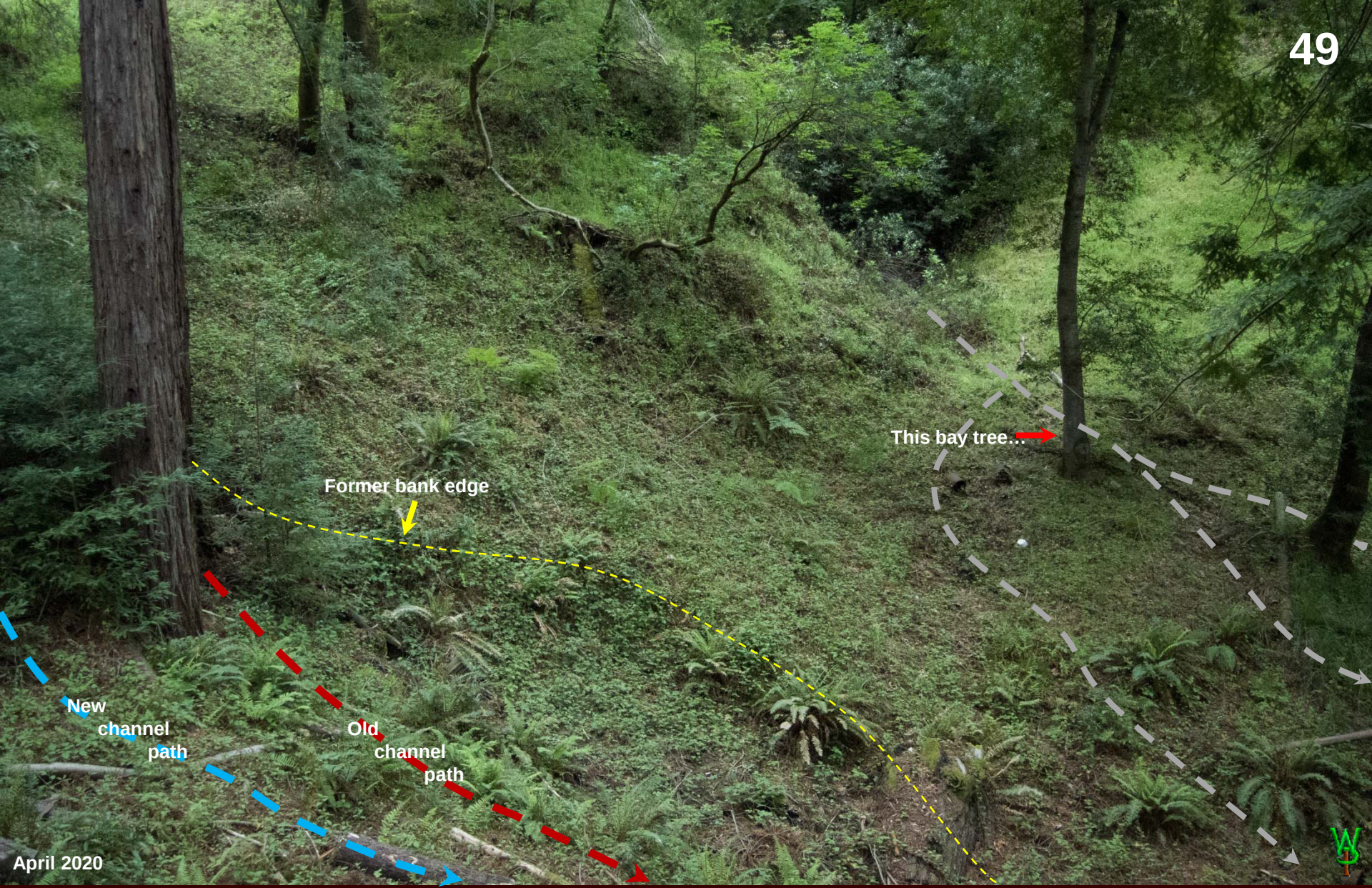
Before 2000

OK, so… where's the picture? This is one of those parts of the property where there I couldn't find any early photos. Why? It was **too dark** to take pictures that meant anything. There was nothing alive on the ground. The surface was lumpy sand with a little broom here and there with a 4-foot deep gully running down the middle. There was nothing of which one could take a meaningful picture. It sucked. Please keep that in mind when you see what letting light get to the ground did for this forest.

April 2020

Down “Thither” along the north side of the spur looking east, to me, this looks more like a forest. It received a heavy thinning in the fall of 2014. The buckeyes and hazelnuts are just starting to leaf out with many of the evergreen trees putting out new leaves as well. As with the other bay trees on this slope, the one at right was coppiced by the fire in 1941. I am hoping to get more hazelnuts in here.

On the north side of the spur this is a repeat of the ridiculously steep portion of the logging job Steve Liebenberg and I did in 2000. This slope represents a “rotational failure” which a later excavation at the bottom revealed may have been caused by a redwood tree too heavy for the slope to support. Younger trees then came up, two of which I removed out of concern for the same problem recurring.



This was the “dark” area of “lumpy sand … with a 4-foot deep gully running down the middle.” One can now walk across the channel easily. It used to run to the other side of the redwood which was undermining the whole cluster until I redirected it, using redwood roots to reduce incision and the crown sprouts from logging to slow the flow and filter sediment. The stream channel at right is from a waterfall just below photo-point 52. From time to time I steer that flow in various paths to erode the lump of alluvium under the bay and send the sediment into the main stream channel from the left which has been slowly filling in.

October 2009

The slope in the background is the base of what I call “The Wall”: a loose fill of alluvium, with a sandstone bluff underneath that peeks out in various places above. It is a LOT steeper than it looks; on much of it one cannot walk without need of hands. As an alluvium, with successive depositions and soil movement burying and exposing old seed, it takes a VERY long time to clean a weed bank. For 15 years, it has been a physically challenging, bordering dangerous place to weed because of the risk of falling (try it with a big crazy puppy on a leash!). Every year, with the exception of a few years, it starts covered with weeds, these days, mostly rip gut brome.

The good news is that things happen slower down here as the climate is cooler because it is below the usual inversion altitude and therefore more subject to marine influences. Up on top, I'm manically trying to get maturing annual weeds, but this area gets two pulses of weed irruption, first from the broadleaf annuals and then the grasses about a month later. As things are now, the two control processes are as close to broadcast spraying and burning as it gets here. I'm hoping to bring California fescue down this slope.

June 2015

From along the main channel looking at the north side of the spur toward its east end, this was two years after thinning out most of the California Bay cover on this slope, although there are two large coppices near the top. This being June, you can now easily see the hazelnuts, which have increased in number considerably since this began.

Down the channel, nearing the property line, when the thinning process started down here, there was a pile of dead branches four feet thick at the base of these redwoods (chopped them up in place with a saw). There were no ferns as there are now in profusion. There was one scraggly hazelnut. In general the tree cover was decadent. Behind this view to the right was an old valley oak *(Q. lobata),* several arching 24-30” madrones, and a couple of largish bay trees that still remain (although one is not long for this world).

This sword fern is the only ground plant that was originally here. Relatively little needs doing now. The groundcover is a mix of blackberries, strawberries, yerba buena, and hedge nettle (doesn't sting). As for weeds, a few *Oxalis pes capreae* come up here and there, hedge parsley, a few remnant patches of rip gut brome, especially on "The Wall" to the right, some crane's bill *(Geranium molle)*, and sticky chickweed *(Stellaria media)*. Then there is the occasional thistle. Yet if I left it alone, the *Oxalis* would eventually form a carpet. Note the insanely steep red arrow pointed up The Wall at the upper right. The photo points on top are only 60 feet from there.

June 2015

We've crossed the stream looking across the property line down from The Wall. If you look carefully near the end of the blue line, you will see how successful this program of using wood to capture sediment has been. Immediately thereafter, this drainage channel transforms from one across which one can walk to a gully 20 feet wide by 8 feet deep discussed in the forestry chapter on drainage.

At the crest of The Wall, I'm experimenting with said California fescue *(Festuca californica)* as a groundcover possibly capable of holding the slope under more shade than sedges will tolerate. It is doing well. We have had a few crops of miner's lettuce here *(Claytonia sp.)* but in a way it is a hindrance, as it does a good job of hiding the exotics underneath. For now depleting the rip-gut brome grass *(B. diandrus)* seed bank is paramount (yes, that's French broom in the background). The next slide is to the right.

April 2020

This chute is one of our main “archaeological” resources. Here there are various sorts of cool junk tossed in to reduce channel erosion**:** car parts, bottles, an engine block, an old spray rig... Here too is the source of the *Oxalis pes-capreae* that infests the area below. It’s one of those things that can pop back up long after one thought it was gone. Good thing coffee ferns don’t mind triclopyr.

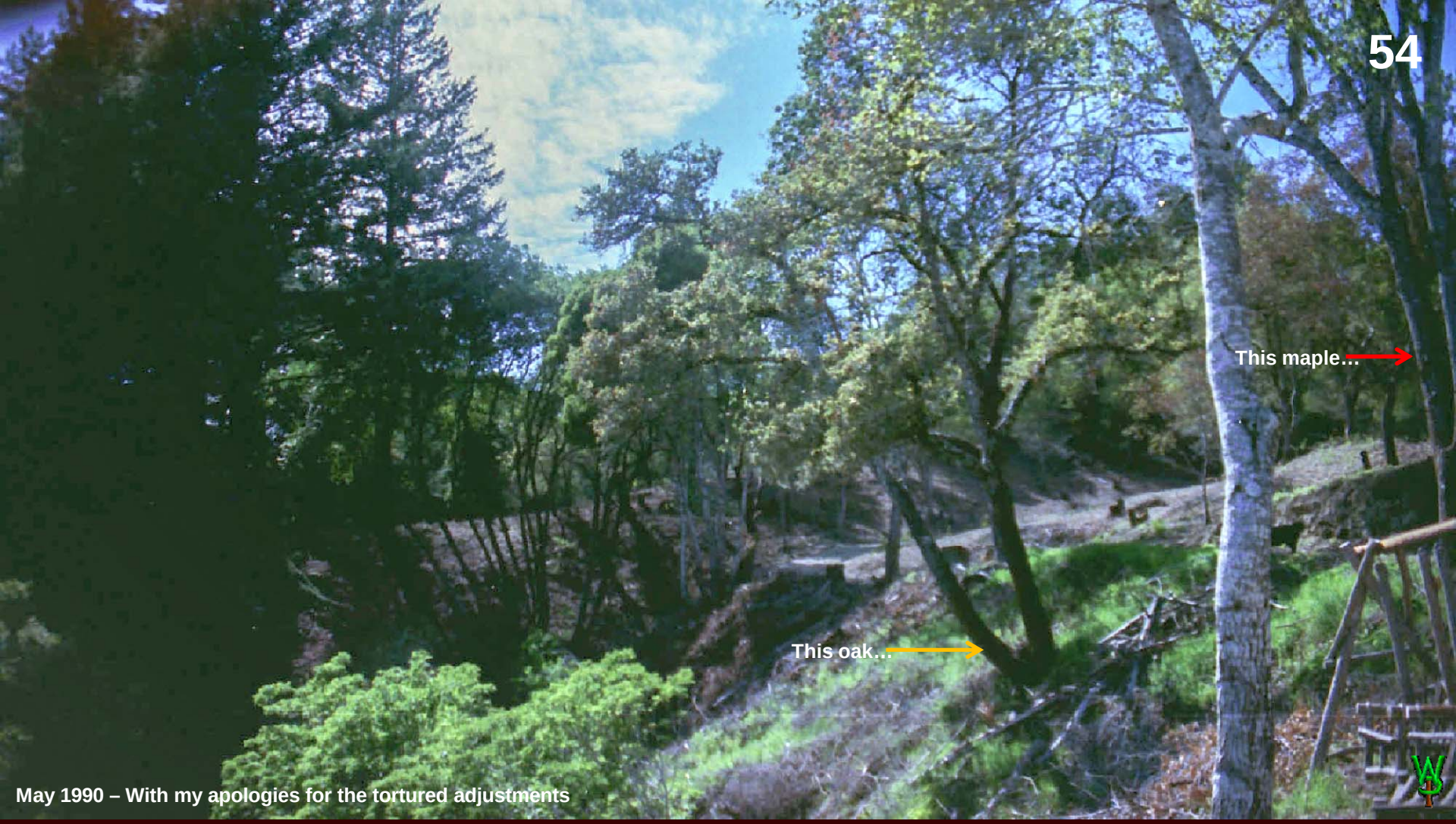
April 2020

Back and to the left, looking east, this little grassland has slowly improved from the top down, unique from the rest on the property in that the prominent grass is *Melica torreyana* and most of the annual groundcover is fairy mist *(Pterostegia drymarioides*), what I had thought of as a sandhill plant. This slope faces the challenge of a continual rain of airborne weeds, being the first slope opposing winds from our neighbors to the northeast. This is where cat's ear *(Hypochoeris spp.)* and Italian thistle first invaded the property.

Struggling southward and looking up, it is steep atop The Wall. The slope above averages 60° but to the left below there is a vertical cliff about 8-feet tall. As you might suspect, serious weed control in this area began late in the overall scheme, which of course means more aggressive treatments are still used here. It has grass problems, various exotic cudweeds, that nasty supposedly-native bedstraw *(G. aparine)*, and horseweed, which makes up to 250,000 airborne seeds per plant. Hence this slope MUST be weeded. And I never look forward to the job. It takes a top rope. Nor is this all of it, but this section is otherwise exemplary.

May 2020

Exemplary for the way it failed up at the top. We could ill afford losing the18-24 inches of surface soil we did, but I learned something here. It *had* been covered in poison oak, a great erosion control, but terrible in a fire with a house just above. I wanted to replace it with a mix of sedge, buckeye, and elderberry, an even better erosion control system with lower fire hazards. The challenge was that shrubs inhibit the establishment of sedges. So instead of just cutting them, in 2104 I killed the poison oak (and blackberry because it is so unpleasant to weed in it). But not only did I take out the root network that was holding the surface, but it was another problem that set the soil loose**:** blue witch *(Solanum umbelliferum)* a native shrub, came up. I didn't know that gophers **love** blue witch. That piped in surface runoff which set the system loose. As a disturbed surface, when it went, up came the weeds. It takes a top-rope to work here.



May 1990 – With my apologies for the tortured adjustments

Along the slope atop The Wall (the same view as photo point 28 but from the opposite direction) it is a LOT steeper than it looks. This arrangement of slopes is characteristic of the geology in this area (where vertical walls are not uncommon) made worse by historic drainage problems. It has always been a challenge, sandwiched between a useful road on top and a near vertical cliff with an alluvial pile at the bottom. Plant grasses to knit the surface, and the gophers move in to graze on the forage, which then pipes water cutting vertical slots. Take out the heavy trees and when their root masses rot, there is nothing to hold it while water saturates the rotting mass. Leave the trees and they grow outward for light and eventually fall, taking a ball of dirt with the root mass. Such decisions are never easy, and I made some mistakes here for which I have yet to fully pay. One wants enough root mass to anchor what is effectively a “perched fill,” but not so much load from trees as to shear off the whole thing. Yet with all that weight of unstable trees forming an enormous fuel load on a near vertical wall, doing nothing was not an option. Trade-offs are difficult, and the key is timing.

One can hold the surface with mats of roots such as poison oak or these sedges, but one also needs “staples” of larger roots to prevent a shear plane from developing AND to keep the total fuel value down (a slope like this can generate a hellish updraft in a fire). The sedge in the foreground *(Carex barbarae)* with buckeye for the “staples” has done a good job for 30 years but it takes time to establish both of them. Making that transition is difficult. At point 53 (behind the poison oak), I didn’t get it right and will have to fix it.

Turning back down the road and looking right, the stake fence on the left represents the property line, which runs along the length overlooking Glenwood. For a long time this has been a grassland of California brome, now being invaded by monkey flower (a fire hazard). The huge Eucalyptus you saw in the prior photo point went down a gulley to the right. I nearly got crushed cutting that thing up. It's still there. Buried at the bottom below it a 20's vintage truck lying upside down. Must have been fun dumping it down there.

November 1989

Behind was an old garage once below a cabin that burned down in the 1970s. The one prize it supported was a roof of lead-coated steel (“terne metal”), of which I snagged a chunk and saved it for 30 years to make a dog house and a mailbox. There was nothing in it of any value, as the prior owner had raided it for every trinket he could find. The Acacia trees in the background were probably planted close by as fast growing and clean burning firewood that requires little to no splitting and makes relatively little waste.

April 1991

This was life here at first, beautiful, but pretty rugged. We got our drinking water in jugs at the hospital where Diane worked at which we also showered. We carried out our waste to RV dumps in a 10 gallon tote that didn't work terribly well, nor was it cheap. After work, it was cutting trees, hauling tops into piles, cutting up the piles, burning, bucking logs, and trying to give the wood away… over and over, for the better part of a year. I swapped a "new" cab onto the truck hung from a tree, did a valve job there...

May 2020

Here, the road is a drainage channel transiting water collected from the east-facing slopes in this corner of the parcel. The concrete slab rubble is to make a stair-step trail/drainage channel similar to photo point 31. This is an exceedingly challenging design because this slope is so steep. It represents one of three pathways to the bottom of the property. In places, handholds are necessary to get up or down as there is a 4-6 foot cliff two-thirds of the way down. This too is expected to be an arduous project. But it's not the first.

May 2017

Right behind us is a similar channel that drops onto the road. This one is transitions from slab material above to granite for the cascade under the bridge. The slope at right had been a fifteen cubic-yard hole dug out a century prior for no discernible reason. The fill material here was obtained from digging the sediment out of the channel at photo point 23. The grasses doing an admirable job of holding said uncompacted fill represent another of my first experiments with plugs of California fescue. The bridge across the top was built to transport the fill by wheelbarrow, but also connects a nice picnic spot to a trailhead going to the top of the hill.

This corner has always been a cool place. The split redwood stakes represents the property line. Charlie Martin's Road down to Glenwood (discussed in the chapter on roads) is in the cut to the right, forming a deep cut-channel some 50 yards long. Rat nests under tree cover were removed immediately, as they make quite the fountain of flame in a fire.

To the left of this image had been a large patch of decadent *Ceanothus cuneatus,* since trimmed back where it was under these oaks, as it is still a quail and rat nesting area. This has been a bad spot to weed because deer bed here, bringing in bedstraw *(G. aparine)* burs on their coats from other properties. They don't like the burs, so they roll on the ground to get them off. I have actually built "stations" for the purpose, using brush to force deer to enter at a certain point, and then leaving cut brush on the ground for them to rub against. It saved a lot of time that would otherwise have been spent dealing with the weeds elsewhere on our property and beyond.

April 2020

This is the cut through which Charlie Martin's road turns up and runs along the north edge of our property. This channel used to be a muddy bog every winter. In 2016 I cut a water outlet in the berm on the right about 30 yards up and sloped off what used to be an equally vertical wall on the left to provide material to reconstruct the road grade. Concentrated flow outlets are a big problem in these mountains unless there are enough of them to dissipate discharge energy and distribute the water.

April 2020

To the southeast on our neighbor's property is the "broom wall" used to filter airborne seed from the "organic" vineyard below. Without it, the seed floated *under* the trees in much higher counts. I would like to replace them with male coyote brush, but sterile males are unavailable in nurseries except as prostrate dwarf cultivars. I whack seedlings under the trees every May to retain a buffer behind it.

Up the road, looking above, and to the left is a swale below the ridge. In the early 1980s a tractor had deposited a pile of broom at the top. Needless to say, we all know what went downhill from there. Dealing with that seed bank to the point that I could manage the consequences of thinning the canopy took the better part of two decades. It gets cliffy here too. That thinning was done in 2012 and was followed by a pre-emergence treatment in the fall of 2017, which successfully controlled the subsequent *Cardamine hirsuta* (bitter cress). The response to thinning becomes more intense as one moves down the slope. This lush hazelnut was coppiced in 2016.

Down the slope in the opposite direction, is a steep slope of virtually undisturbed soil on a neighbor's property. The differences in cover here demonstrate the degree to which the road impacts the slope above by draining the substrate. I pull the broom on it down to the road below, (which switches back) but there is little else that needs doing here beyond cutting up downed trees. In a sense, what this slope represents is what a native buffer could be, what neighbors could have eventually if they let me. It beats nothing but broom.

April 2020

The plywood at right covers the entry to what was once a spring tunnel dug about 30 feet into the hillside. At one time it was held under a prescriptive easement, supposedly granting ALL water rights from this parcel to the heirs of Charlie Martin. It suffered a cave-in during the winter of 2005 and it was not repaired; nor was the outlet pipe which broke a few years later. End of easement. The water bar is a backup for a culvert to the right.

November 1989

April 2020 – From a little farther back

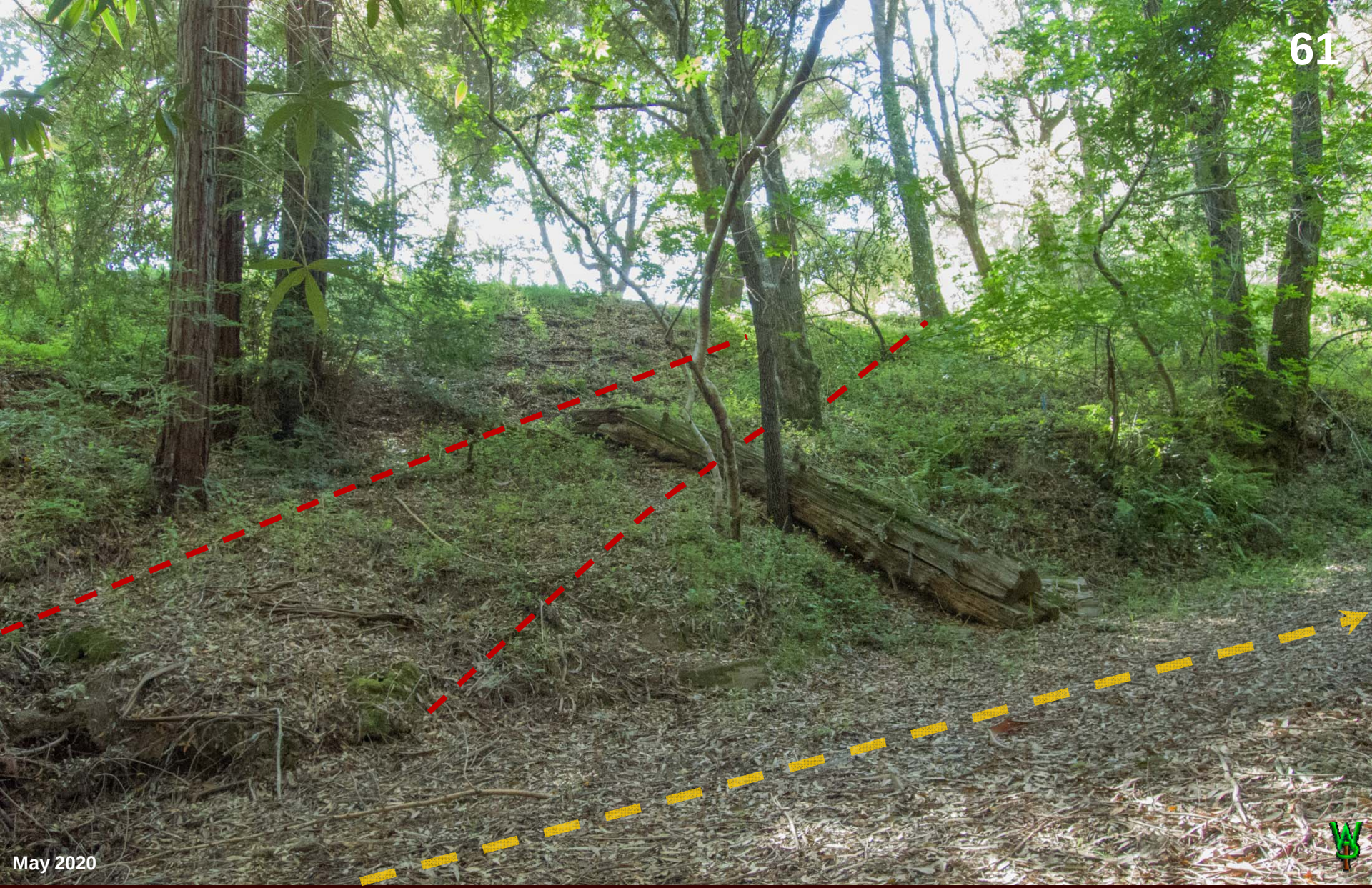
Up the road there remain the foundations of an abandoned pump house, now distributing the runoff from the road deflected by a water-bar. A letter got PG&E to remove the power pole and its lines around which they would trim every year despite that the pump house had been gone. I am converting the upper reaches of this road from an in-sloped surface to out-sloped, using material as it deposits from above, eventually eliminating the need for all but one of the water bars and effectively widening the roadway by a foot or two.

April 2020

I don’t know why, but three trees went down along this road this year despite that it was a relatively dry and uneventful winter.

April 2020

The property line is the left edge of the road we pay to maintain. The Eucalyptus grove serves an important and hopefully temporary defensive purpose in that so little grows under these trees it represents a barrier to weed invasions from neighbors to the north. Obviously, were there a fire in here the heat would be horrific. These issues are discussed in the chapter on boundaries.



Nearing the end of our tour, we are looking up an old road cut where Charlie Martin's road met Charlie McKiernan's road at the top. That path was so steep as to be impassible if things were at all wet. That grade was a big problem considering that it was the only way to get horse-drawn wagons up and out of the Glenwood resort. Hence, this original cut was bypassed many years before us with the path to the right. With help from the County Department of Public works, I filled the old cut with ditch cleanings they then didn't need to haul away and graded the slope. The still steep incline up the "new" road path was then rocked for the same reason.

November 1989

This is where Charlie Martin's road met Charlie McKiernan's old toll road. When we first saw the place, this was the only road onto the property. It was a muddy mess, and would have been choked with broom but for Mr. Martin's descendants having brought a new water tank down it earlier that year. The very first thing we did here was to have it graded so that it would be passable. The tractor operator was Roger Wicht (may he rest in peace) a descendant of an old mountain family in this area. At the time, I was 35. Roger may have been the single most influential man in my maturing adulthood. Without him, we would have failed. His joy in his work and good humor were one thing, but it was his enduring commitment to the land he loved with which I sympathized that got me involved in environmental politics to redirect the insane beliefs of the movement by providing a better example of stewardship, a process which governed my life increasingly ever since. And thus we approach the end from the beginning.

March 2020

The more things change, the more they stay the same. Although it looks very similar, much is different here. The broom is gone of course. The Eucalyptus in the background has nearly doubled in height, having just finished killing the last of the oaks that had a prayer of making it beneath. The water off the County road now runs to the left, where it used to run to the right down the road. This entry really needs a gate, as it has been an attractive nuisance to joy-riding motorcyclists, four-wheelers, and overnight vagrants not all of whom make it out (usually after having done considerable damage). Please, don't try it. It dead ends in only 300 yards.

So there you have it! Your “virtual tour” of *Wildergarten* is complete. I hope that you got the impression that I see this chapter to be a somewhat cursory treatment, that there was so much to show you for which there wasn’t space, especially once these photos are repeated. But there is so much here you *cannot* have seen that I couldn’t’ show you at landscape scale. What this project is really about is way too small to communicate over such large areas with still photography. When we started, biologically this place was nothing special. Yet now, botanists find it amazing, revelatory, and a ray of hope. So many scientists for so long have thought what we have done to be impossible, but it really can be done and with a degree of detail that is a chapter on its own. One day I hope you can see it, but even better would be for you to see it every day, having made one of your own, please. You are what this book is for.

Repeating Bears Repeating…

This chapter took a traditional, albeit less-than-precise approach to repeat photography, "traditional" in that all of the photographs are at landscape scale. "Less than precise" because either the land or the camera have changed, or (usually) because I'm seeking to add information to the photo, or (too often) I'm in too much of a hurry to get that anal about it. Taking exact repeats is difficult. One has to have a print of the prior photo, and then look into the camera screen and detect if you got it, back to the house, download the camera, print the new photo, wait for decent lighting, try again…

The problem with landscape scale photography is that it cannot portray what has been accomplished with this project insofar as small annual plants are concerned. At any more than 1-2 feet, 'So, he cut some trees and it's all green. What's the big deal? Anybody can do that.' Right. Clearing trees, killing broom, or fixing drainage is a big part of the story here, but it is not even close to the majority of the work that was done. The focus of this project is on plants too small to be discernible in a landscape-scale photograph. Post-disturbance native annual plants (as are typically found in grasslands) are the key to all that underlies what happens on the landscape scale for both plants, insects, and larger wildlife**:** microbial life in soil, the foundation underlying the biological food pyramid.

Hence, despite my evident personal affection for diverse and vibrant forests, the central emphasis of this book is about grasslands, forbs, and soil, with (hopefully) an increasing focus on microbial and insect life. Forestry and brush removal was necessary to make grasslands and other forest understory groundcovers possible. There were no groundcovers to speak of here when we started.

It is physically impossible to communicate the scale of that detailed challenge with repeat photography because the critical plants to remove or recover are so small. To distinguish them, one must photograph an area too small to recognize as pertaining to a particular location. Yet to document an accomplishment of any note, one must record numerous types of groundcover cohorts, each covering an area too large to identify each plant with still photography. The resolution of even the finest cameras can't do it. It is still impossible with video or drones. We've tried.

So, the next chapter makes a paltry attempt to communicate detail, being perhaps the most important and least likely to be appreciated chapter in the whole book: Reproduction of Native Annuals.

Such is science, in that to my knowledge nobody else has even attempted to accomplish what you are about to see. If I'm wrong about that, please let me know, as I would really enjoy the company.

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Deseret Ranch

Fuels Management, Succession Run Amok

The Cone Fire (the benefits of active forestry)

The Warm Fire (what happens without it)

Fire Aftermath: Mesa Verde National Park (weeds)

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Natural Process: That Environmental Laws May Serve the Laws of Nature, ©Wildergarten Press, 2001, 454pp, ISBN: 0-9711793-0-1, LOC Control #2001092201. http://www.naturalprocess.net

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Articles at Wildergarten Press: collected writings on Constitutional history and regulatory racketeering by tax-exempt "charitable" foundations. http://www.wildergarten.com/wp_pages/articles.html

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