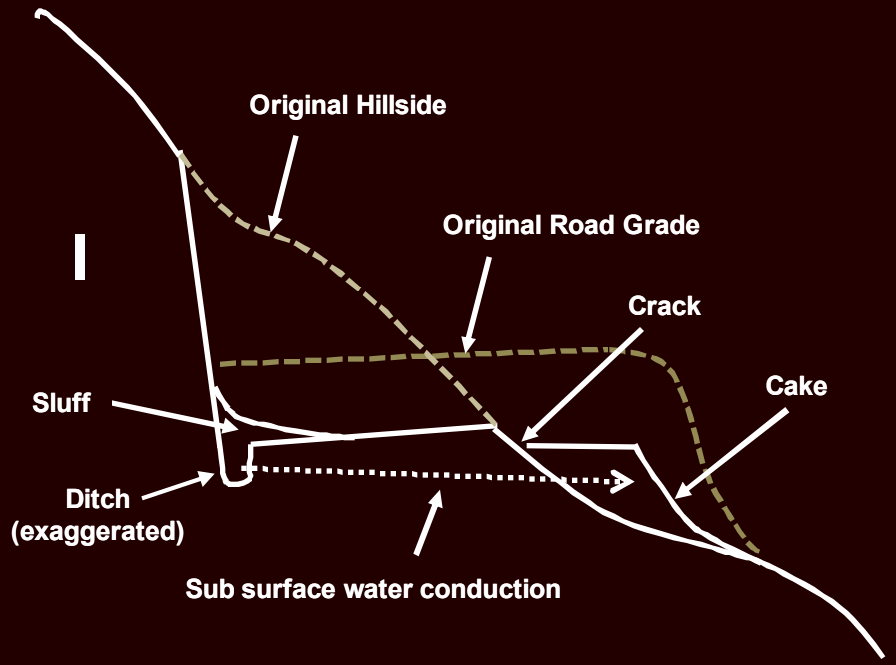
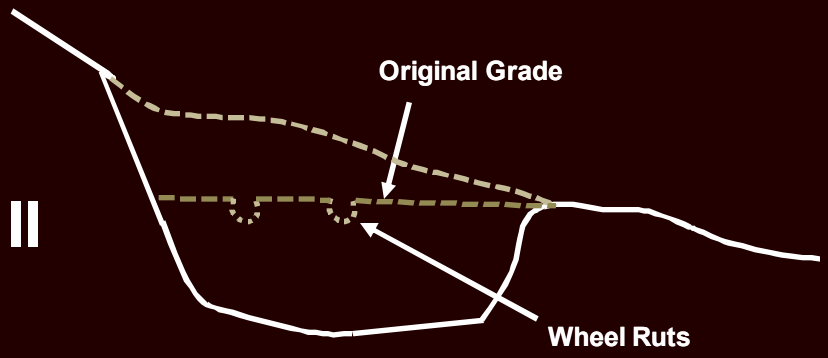
Roads to Heaven, to Hell, And Back, Somewhat

About 1922 - Photo courtesy of Edward Fenn

This is Ed Fenn's road in front of his house near Glenwood, CA (note the *Vinca major* on the bank behind the car). Back then, typical road construction was with dynamite, shovels, and very crude grading blades. Slopes receiving the fill were not cleaned or benched and the fills were not compacted. What few culverts were installed were wood. In the winter, the surface was mud.





Grades for the original dirt roads traversing these mountains were designed so that horse wagons with iron “tires” would not slide off the mountain in the winter. In general, roads were blasted out of hillsides and graded with horse-drawn blades. In cases like Type I, the outside “cake” or “perched fill” slowly slides downhill on a “slip” of decayed organic matter that was surface soil of the original fill-slope (above). In Type II cases, even simple wheel ruts can enlarge and turn the dirt road into a muddy creek.

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The watershed area behind the house was considerable, but the runoff no longer came down this draw to the right of the house because the road collected it from the slopes above, conducted it to the left behind the house, hit a switchback, and came back in front of the house to the right. In the background are a few eucalyptus that were planted here, possibly to stabilize the original channel. The orchard is behind on the top of the hill. Today, the eucalyptus is a forest 150' tall with 4' trunks, while the hilltop is a long abandoned Christmas tree farm, with pines over 100' tall. There is currently no way to get a useful repeat photo.

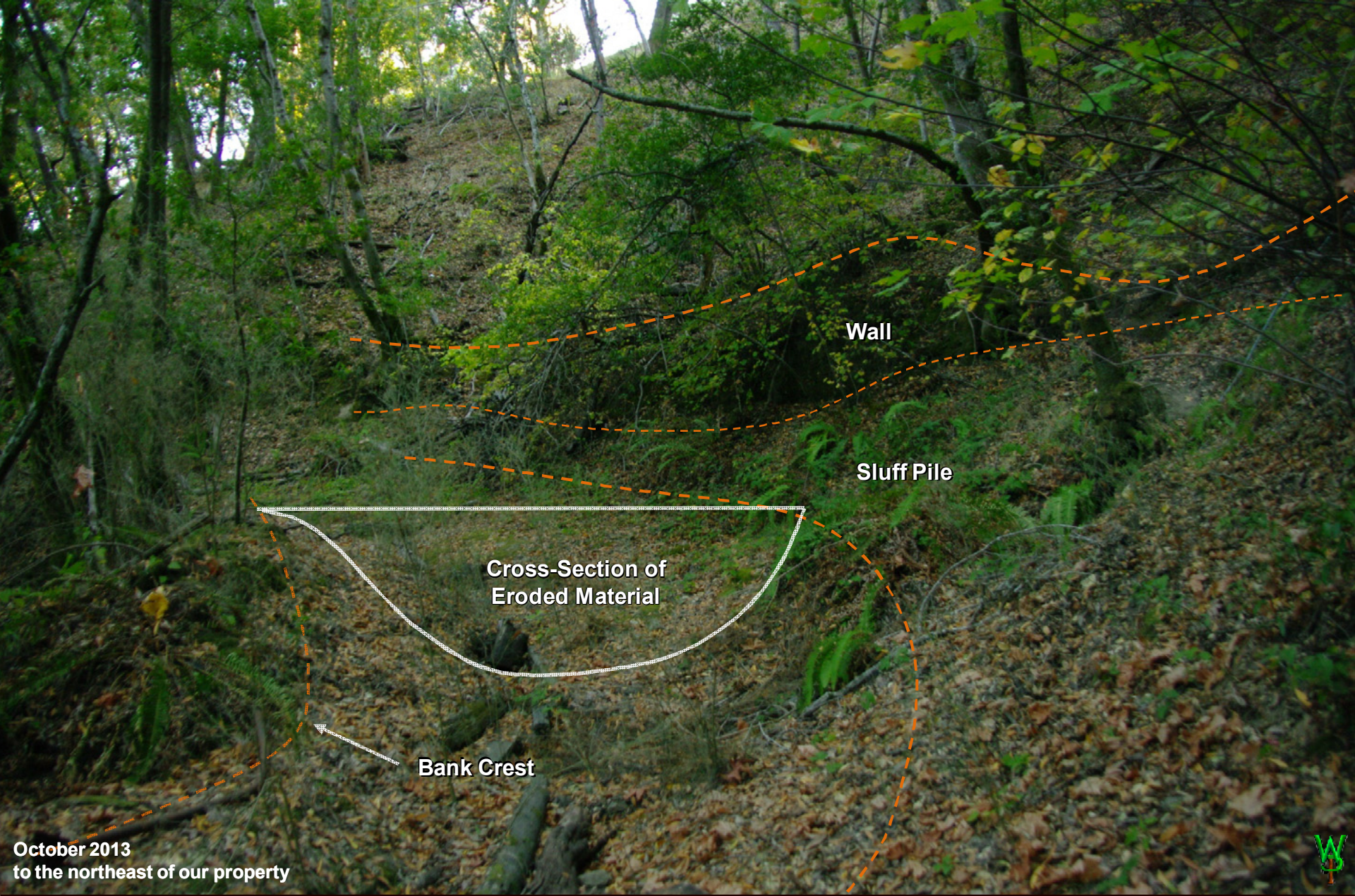
But I tried anyway. Yep, there is no doubt that this is it. I found the old root cellar dug into the hill that Ed Fenn told me would be behind where the house had once been. The redwood “sleepers” that once formed the house foundation are still there.

To reduce erosion on the road I had to reduce the flow of water onto it at the entrance and then distribute the rest. The first step was to divert what was coming off the County road into the eucalyptus stand. This entails a requirement for sufficient capacity to take all the water coming down the County road for nearly a quarter mile in the event that but a single County culvert plugs (it's happened). That collection area is 5-6 acres because so many landowners along that stretch dump their water onto the County road… because it is a commons. It was already coming down this road entry so I simply made the best of things. I need to clean it out too.

Then I filled in this long abandoned road segment (arrow) where the water originally entered Fenn's road. This was a Type II case turned into a useless gulley. So, I retired it in 2003 by having the County fill it with ditch cleanings and then I graded it out. This kind of thing takes a lot of fill, 6-8 dump trucks worth. The County lawyers no longer allow them to do this because somebody sued them for fill contaminated with wood (this despite the recipient having signed a release agreeing to take it as is). Now they have to truck the fill some 20 miles to a landfill and I have a harder time getting fill with which to fix old problems.

We installed and maintain 2 concrete culverts (concrete burns less easily) with water-bars behind them in case they plug before I get to them (the culvert at left is behind the water bar). I also had other out-sloped water-bars made at outside corners to shed the water (right). These drainage improvements are separated by less than 100 feet. As long as the culverts are maintained, and we install a gate to keep idiot joy-riders from tearing up the water bars in the winter, this is stable. If and when I come up with more material, I can then reinforce the water bars and build more of an out-sloped configuration which will reduce these concentrated flows.

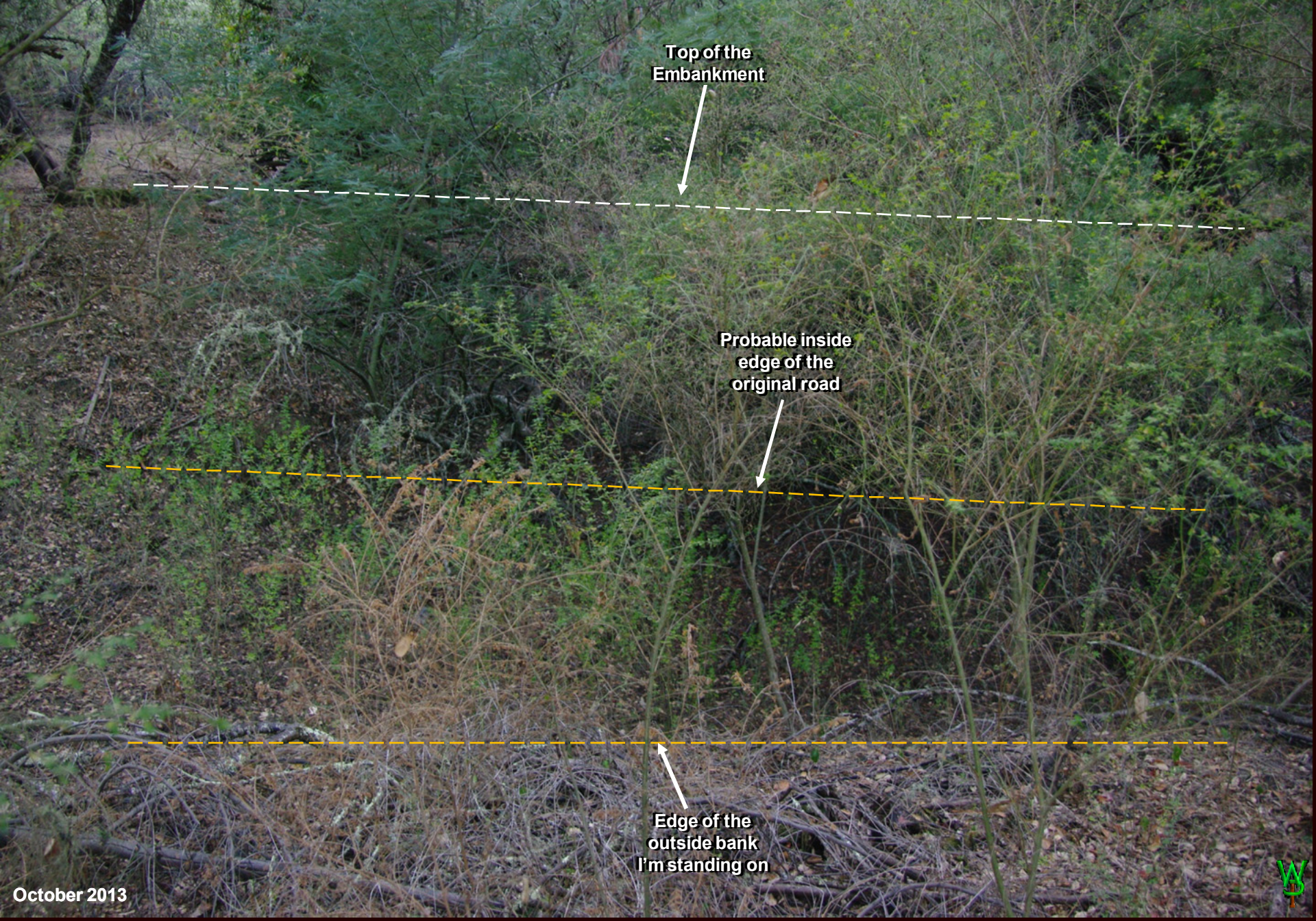
Before I put in the water bar, the flow came this way. Here, this upper section of Fenn's road suffered a Type I failure: Runoff from above added to the flow that came down the in-sloped road from the entry until the combined flow ran to the outside, and just took the cake. All that is left of the road is cut rock. It will take a lot of fill to slope this outward, but as long as the water bars work, fill material will slowly accumulate as it has on the left. Over the years, I will dress what comes down as I can and deposit what fill I have available starting behind the water bar and working downward.



In the old days, if the surface got rough or the shoulder washed away, they just cut the road deeper into the hillside… and deeper, and deeper… This section of Fenn's road below said switchback,. This part of the road suffered a Type II failure: erosion down the middle. It left a bank down-slope on the left and the sluff against the inside wall of sandstone on the right. This is no longer cutting because of how we did the diversion. My estimate is that the loss of material is about four feet deep.

To the right of Ed Fenn's house in the last old photo was his chicken coop. Below it you can see the outside of his road to Glenwood. There was probably no outside shoulder; rutting probably started what you are soon to see.

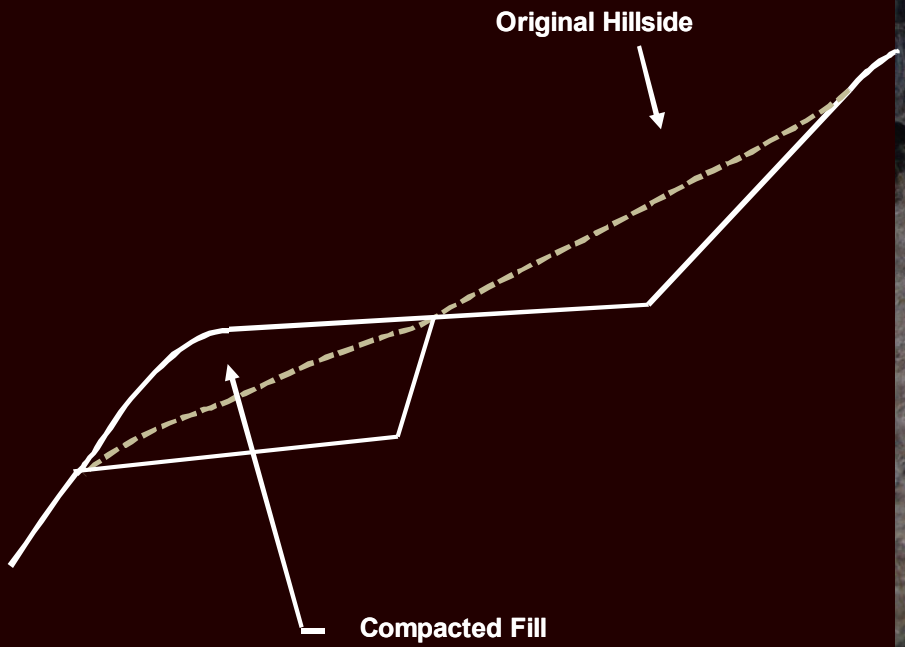
This is a view of that same spot today from closer to the edge and without benefit of the height of the porch.
Obviously, it would be easier to see what happened without all that broom.



Well, this is where the car was parked. Yes, I'm sure. As you can see, we are looking down into a rather large ditch. Here, this "road" has eroded perhaps 4-5 feet deep.

Here it is as a cross-section, just above where the water from the road rejoined the original channel. This is what I'm calling a "Type II" road failure. I have had a County planner tell me with a straight face that "The County wants these roads to go back to Nature." From its appearance, do you think it will do that on its own, or will it just keep cutting? There was a lot of water that came down here until we changed its course at the top. Yet this is not our property. Did I do the right thing?

Here is where the water comes out of the eucalyptus grove Fenn planted, which quite apparently did its job. There is little apparent channel incision here after 23 years at full flow except at the very bottom where there are no trees. Effectively, my diverting the water at the top into that original channel and diffusing the rest did arrest the channeling of the Type II road surface. It's a fixable situation now. Do you see the material available to do it? Yes, eucalyptus works fine. It is dense, rots slowly, and is obviously plentiful.



This road was changed from an in-slope to an out-slope configuration in 2006, typical of the design for timber haul roads today. I would love to be able to shape our other roads to be like this one: out-sloped, wide, and maintenance free but for cleaning out one cross ditch once-a-year. This kind of road is particularly resistant to gopher damage, because there is not enough water at any one point to enter a hole and turn it into a trench. So, why don't I do it? I don't have the fill material I need, yet.

This road is the backup drainage for a flat that occasionally spills off one end. The ridge has impossibly steep sidewalls; so there is really no good place to drop the water off to the sides. So what I did is run the water down the spine while slowing and retaining it with strategically placed branches, losing altitude until the grade into the channel was much more gradual. The presumption is that the ridges are of harder material than the gullies (that may not be true). Still, the propensity for a convex surface is to break up the flow into smaller and more chaotic flows, thus reducing surface wear. The branches last about 15 years.

This road is to get equipment in and material out for forest thinning or brush and weed control. To that end, I changed the grade from an in-sloped to an out- sloped drainage configuration, thus eliminating the need for culverts. It has worked beautifully to reduce the flow in the channel below, and has required no maintenance at all other than weeding. The two fir trees on the right are there to be gin-poles for purpose of high-lead yarding redwood logs out of the stand. The deck of skinny logs at the end of the road are for future corral posts or a pole barn should the need arise. I can't sell them to anyone with a better use.

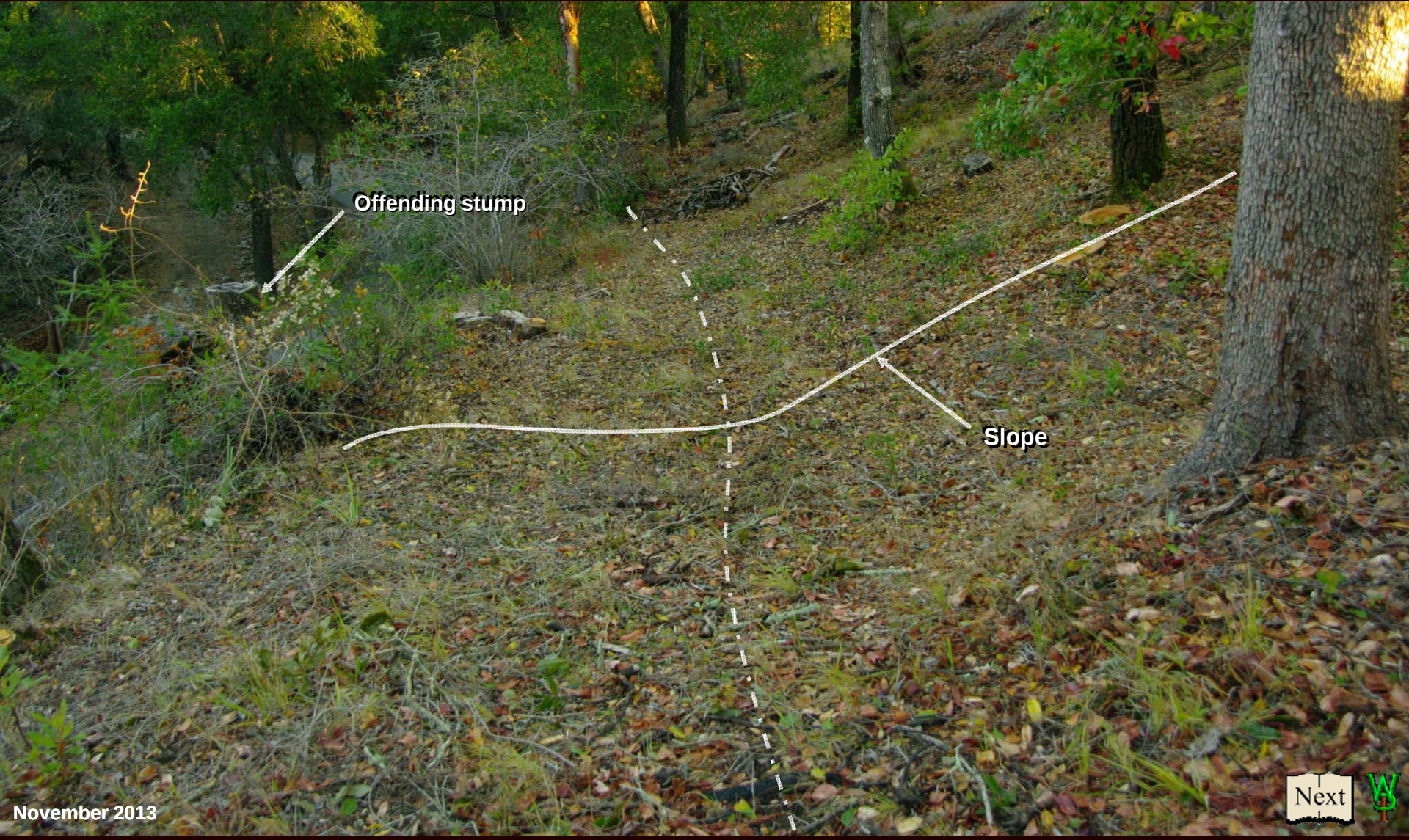
Are we done? No! There are roads here that could be better, particularly with regard to how they collect water. The problem with this culvert is the east facing wall of the slope on the northern half of this place (to the left) is so steep, there is no good place to run the water down it. Sometimes you have to make one, as we did in the case of the rock drainages you have seen. That just takes time and money to get done. I've done one channel every several years with this one left to do. Hopefully I will have the situation corrected within my lifetime. In any case, this one gets its ditch cleaned and a bigger water-bar as soon as I get to…

…this. This is a different type of problem, one that is ***going*** to happen, since made more complex by lawyers. The original problem is the stump. Although I removed the weight of the tree, it was doomed to slide. However, it slid a LOT sooner because the County cleans the ditches (since filled with sluff) to keep the water off the pavement. The County lawyers have spoken: 'There shall be no water on pavement' because they don't want to be sued. The problem with that "logic" is that anybody stupid enough to drive fast enough to hydroplane on this single-lane, treacherous, windy road deserves what they get. Ditch cleaning undermined the slope by digging the blade into the hillside, the ditch filled within a couple of months, and the water runs on the pavement anyway.

Here is another view from the other side. The roots had tangled with other stumps and started to pull the top off the whole slope. The reason I am making a point of this is that the customary landowner practice is to wait for a storm and allow the stump to fall and block the road. Then the County comes along (after dealing with probably bigger problems elsewhere) and cleans it up for free. Then they hydro-seed the whole slope with exotic grasses and hope it doesn't fail. I can't let that happen. So the Department of Public Works gave me a permit (free) to get rid of this mess. I'll reslope the whole bank and you will get to see a revegetation project like no one has ever seen. After all, innovative process development using native plants is what this place is all about. We'll see if it works.

Yet there was a minor complication to beginning the job to which you are now a witness, one that required a bit of extra documentation for posterity. Note that the grade on the side opposite the line becomes almost flat across the slope. Note also how this flat section follows roughly the same grade as the county road below.

Here we are just south and above what will be the beginning of where I will be cutting into the slope to reshape it. The track is about six to eight feet wide, too narrow for a car, or even most wagons.



Even without the road below, the original slope would never have been level across it as it is here. It is almost as if this was an even older road, one made long ago, except that the only “older road” made before Charley McKiernan made his in the late 1850s was the one made by the Indians of Mission Santa Clara in 1791. Accordingly, it seems likely that this may indeed be that old Spanish track. Unfortunately, sloping this bank will remove just about all of the old road. What to do? Get the permit, document it for the archaeological record, check it with a metal detector, and scrape it off to stockpile the native grasses and save the topsoil for the revegetation job. It is saddening to take out this likely vestige of the mission era, and it does cause one to ponder what the Indians had to do to build it or how the land might have looked to the Spanish when they passed by, but it’s just how things have to be.