FOREST FIRE-FUEL MANAGEMENT -- Done by Denise Enea at Teague Hill Preserve.

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Teague Hill Mid-Peninsula Open Space District Preserve, was a major redwood-harvest area, starting at the beginning of the American occupation of California in the mid-1800s, and that redwood forest area gave "Woodside" its name--as this was the edge of the forests, and logs traveled down Woodside Road to the port of Redwood City.

Denise Enea obtained a grant to clear the forest of fire-fuels, and this report is to outline the importance of that work, and that it is an excellent example of how all of the Mid-Pen preserves and their forests could be and should be managed in the future.

Introduction --

Mid-Peninsula Open Space District (Mid-Pen) was established in 1972 and has purchased 65,000 acres and established 26 preserves, but in the last four decades the management of the natural resources has been inadequate, and in all cases, have been in a steep decline.

PURCHASED GRASSLANDS weed-covered--At the time that Mid-Pen purchased the preserves that contain native grasslands and wildflower fields, those meadows were already infested with 50% to 100% exotic weed grass cover. Those weed grasses increase the fire fuel by 6,000%, when compared to the amount of fuel produced by the original native grasses and native wildflower fields.

The grassland weed management methods used at the Mid-Pen preserves so far, like burns and grazing, do not have any "Before-and-After" vegetation cover transect data conducted, to prove those methods actually worked to manage the weeds--or if those method instead did massive and permanent damages to the native plants in those wildflower meadows.

NEW WEEDS invading unchecked into Mid-Pen preserves--In the 1950s and 1960s, Broom *(Cytisus)* started spreading along roadsides and along trails into the forests of the Peninsula.

In the 1980s and 1990s, new weeds arrived into the grasslands, the Italian thistles, Yellow Star thistles, and Harding grass, which now cover huge acreages of many preserves. In the last five years, the new stinkwort weed has invaded grassland habitats of the preserves.

OAKS infected with Sudden Oak Death--In the 1990s, the Sudden Oak Death invaded the Mid-Pen oak woodlands and has spread in the Mid-Pen preserves unchallenged. One of the current invaders, the Slender False Brome grass moved into the Mid-Pen woodlands about a decade ago.

INADEQUATE Mid-Pen management of RARE PLANTS--Furthermore, there are rare plants in many of the preserves including all of the wildflower meadows, whose management and recovery have been largely ignored since the founding of the District. One obvious example, is

the rare but not yet listed by the State or Federal agencies, the Kings Mountain Manzanita, whose main home is Teague Hill Preserve-- but there is no evidence that this plant in the Mid-Pen preserve has ever received any attention to help in its recovery.

NEW DROUGHT CONDITIONS require fire-fuel reductions--Currently, because of the twenty-year drought, and extreme drought conditions 2019-present, wildfires are becoming common in the Santa Cruz Mountains, whereas they were largely unknown for the last century or so.

Mid-Pen has failed to adequately reduce the fire fuel at the preserve borders with the urban interfaces--until the local fire district passed an ordinance required that Mid-Pen must start clearing fuel-breaks around those edges.

MID-PEN MANAGEMENT past efforts inadequate--However efforts to manage grassland weeds, or Sudden Oak Death infestations, or reduce fire fuels at the urban interfaces, have been mostly lack-luster, and Mid-Pen managers do not seem to want to, or have adequate annual budgets from their Board, to make these issues priorities.

Mid-Pen not budgeting for adequate management of resources -- The District policy for many decades, appears to be to produce annual budgets, solely to acquire as much land as quickly as possible. Since the threats of new weeds invading on all fronts, Sudden Oak Death, and wildfires did not exist when the district was established, those items were never imagined would become critical issues, that reuired a large part of their annual budgets in the future.

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Teague Hill Fire Fuel Reduction Project 2019-2021

Denise Enea, the former Fire Chief of the Woodside Fire District, independently got a two-year grant to do a pilot fire-fuel reduction project in the oak woodland-redwood forest--at the urban interface of the Teague Hill Preserve in Woodside, off of Summit Springs Road.

PAST fire history--At some time probably between 1850 and early 1900s, there was at least one massive fire at the Teague Hill site at the Town of Woodside's interface, as evidenced by the burned redwood trunks. After Teague Hill was last logged decades ago, no fire fuel reductions or forest management projects have occurred--so there is a massive amounts of fire-fuels currently present, that could easily produce an out-of-control wildfire in the near future, and burn down whole subdivisions in the Town of Woodside.

Teague Hill fuel reduction -- This project is an excellent example of clearing away fire fuels--so if a wildfire does do through, it will be at a greatly reduced level.

Clearing out SUDDEN OAK DEATH (SOD) infestations -- Teague Hill is an excellent example, of the systematic approach that the Mid-Pen District should take, to contain the spread of SOD, so that we can stop it from infecting more of our Peninsula oak woodlands in the future.

The District should post signs around the parameter of all of their SOD infestations, even those which have been managed, that are near trails so that hikers and bikers do not track that pathogen out, and spread the infection elsewhere.

CONTROL of the Broom *(Cytisus)* in the forests -- The broom plants are one of the few invasive shrubs that can move into our forests, that add fire fuel and at the same time produce a monoculture along the roadsides and trails. The project at Teague Hill could be an example of excellent broom management.

The final fix, is wherever broom is removed, that those areas are immediately sown with local ecotype seeds of the native fescue, so that the native seedlings will suppress the germination of any dormant broom seedlings still in the soil. Otherwise Broom seeds will be viable for at least 50 years and perhaps 100 years in the soil into the future, and unless suppressed with allelochemicals from a sown native plant, will come up each year to start the infestation over and over again

MANAGEMENT increases native plant DIVERSITY -- Clearing away the excess fire fuel has opened up the understory so light can get to it, to get the dormant native seeds in the soil to sprout and add diversity to the area. Also, getting the native understory, like the native Fescue to grow back, can make that forest permanently fire-safe because a lot of those natives produce very little fire fuel.

Our survey found (photo list):

Blue wild rye
Bramble native
Buttercup
Cardamine California
Coffeeberry
Honeysuckle
Iris douglasiana
Miners lettuce
Monkey flower
Native rose
Pinto violet
Purple needle grass
Rush
Snake root
Snowberry
Soap plant
Stachys mint
Stipa lepida
Western Fescue
Wild strawberry
Yerba buena
Zigadenus Fremonti.

NATIVE FESCUE--use as example to replant in the whole forest understory. At Teague Hill, we found an intact example of native Fescue grassland in the forest in the project area, and could be used as an example of how to restore the rest of the understory of this preserve. When replanted, the allelochemicals produced by the Fescue grass plants, would keep the trees at the proper fire-safe spacing, and the understory would also be fireproof, with the Fescue staying green all summer

KING'S MOUNTAIN MANZANITA is very badly neglected. This plant will not survive on that site, without the proper annual management. The King's Mountain is a rare plant, with its main habitat at the Teague Hill site, and has not been Listed by either the State or USFWS as Threatened or Endangered.

The Manzanita individual plants were flagged that are scattered in the project area, and unfortunately they are ALL on their way out, and the species will not survive on that site over time. Those plants have not been reproducing for decades, or maybe, not for a century or more.

Additionally, the other trees have grown to cover each of these plants, so the Manzanitas are lacking the amounts of light they need to thrive. An example is, where seven branches were trimmed off one individual in the past to clear the road. However, unless the trees surrounding each plant are not trimmed back, that will be a perennial problem in the future, because the plants are struggling to grow out into the only areas where they can get the light they need.

Furthermore, there are dead branches on the Manzanitas that need to be properly cut off, so that each cut is flush with the trunk so it can heal over. There are individuals with untrimmed dead branches, which weaken the whole plant. A systematic pruning of dead branches, and clearing the forest around each plant, will be essential for this species future survival.

Plus, Mid-Pen needs to harvest seeds from these Manzanitas each year, and grow out 200-300 seedlings in a nursery that is certified to be free of Phytophthora, and plant them back in areas at Teague Hill, that have already had their fire-fuels cleared and away from any exotics, so those seedlings can grow unmolested.

DRAINAGES fixed to stop sediment flow and non-point source water pollution.
The streams coming out of Teague Hill, feed into the last Endangered Steelhead stream on the Peninsula.

In the project area, someone cut a drainage ditch alongside the road, whose banks are falling down and producing sediment that ultimately flows into the San Francisquito Creek, which is the last Endangered Steelhead stream on the Peninsula. Either the ditch bottoms and sides need to be rocked, or plants like native rushes and native sedges planted, to stop the erosion and non-point water pollutions flowing downstream.

Also, the old redwood logging skid-trails from the 1800s, are very vulnerable to erosion and non-point source sediment flow, so those drainages need to be planted with something that will stop those damages--like the local native fescue, for example.

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