

# A Review of Potential Environmental Consequences of Coastal Tree Removal In El Granada

**Submitted by**

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## **Introduction**

This report is being prepared for the meeting of the El Granada Wildfire Resiliency meeting to be held on Jan 25, 2022 . It is the intention of the report to explore possible unintended consequences that aggressive tree canopy removal in the El Granada ridges and neighborhood could pose, and a hope that adequate environmental reviews will be done to address and mitigate any of these potential negative outcomes. It is also the intention of this report to focus on fire prevention strategies rather than addressing solutions for less pertinent concerns, such as opening up coastal views to homes on the ridge. This report cites scientific comments and sources wherever possible.

## **Organization**

In this report, specific environmental changes to “mitigate” wildfires are described as well as contravening information that these would actually “exacerbate” wildfires - are focused on. Relevant citations and the links are included in the sources list. The sections start with a review of fire causing elements within the environment. Each section ends with a review of considerations that should be made locally on how these factors may alter the fire risks and health of the Coastal environment.

## **Purpose:**

It is further asserted that changes to something as complex as an environment ecosystem should be made gradually - and with data-driven, observable changes in nature, so any detriments to the environment, loss of sensitive habitats, or wildlife decline, can more easily be restored and rebalanced.

## **Section 1: Background of El Granada**

The three types of trees most abundant on the Coastside are Monterey pine, Monterey cypress, and blue gum eucalyptus. In the town of El Granada there are two main locations that the trees are most noticeable. One are the ridges which also include the groves in Quarry Park. These ridges contain a heavier fuel load than the medians, so a substantially larger fuel load risk factor exists there.

Much smaller groupings of eucalyptus, cedar, and some pines are on the medians that are designed to be within the neighborhood. They have the advantage of paved streets that provide a non-flammable defensible space between the trees and the adjacent homes. These medians currently provide low impact recreational opportunities, and wildlife habitat (esp. for raptors).

In 1907 the El Granada hills were planted with trees by the realty companies that promoted a more welcoming seaside resort environment. Additionally, the trees on the medians were planned during Daniel Burnham's street designs. He developed El Granada on a series of concentric circles, and integrated "park-chain" promenades which would enable residents to walk through the neighborhood, while shaded in a park setting. In Barbara VanderWerf's history book "Granada, a Synonym for Paradise" the benefits of the median trees quickly attracting wildlife, bringing moisture to the soil, are discussed. (1)

Also noted in her book, residents expressed how the trees on the medians were remarkable wind-breaks that buffered the strong gales coming off the shores and into the neighborhoods. The extra-wide medians were designed to hold very large trees - accommodating the wide branches and 300 year-life span of the blue

gums planted in these park zones. The El Granada neighborhood is known for the beauty of these historic, tree-lined streets and the community open spaces they provide.

## **Section 2: What's Causing California Wildfires?**

If we turn to wildfire experts for an explanation of the main factors creating the current, more intense, California wildfires, we see the increased forest fuel load accumulated from a lack of annual forest management, is only one factor causing these more severe fires. Dryness caused by drought and driven by high winds are the pervasive factor in most of the major California wildfires.

Wildfires are accelerating from a combination of factors, which create more intense fire conditions. These factors include: drought, heat, and aridity. Higher temperatures and high wind speeds cause moisture to be drawn out of the plants. This creates an environment which allows fires to be longer in duration, hotter in temperature and sometimes characterized as resisting suppression.

### **Drought**

“The last two years in California have brought compound drought conditions—effectively, very dry winters followed by relentless summer heat and atmospheric aridity,” explained John Abatzoglou, a climate scientist at the University of California, Merced. “This has left soil and vegetation parched across much of California, so the landscape is capable of carrying fire that resists suppression.”

### **Aridity:**

Daniel Swain, a climatologist at the University of California, Los Angeles, added that one of the most direct ways that climate change is influencing California fires is by dialing up the temperature. “Heat essentially turns the atmosphere into a giant sponge that draws moisture from plants and makes it possible for fires to burn hotter and longer,” (2)

### **Section 3: Wind Speeds and Preserving Wind Breaks**

The sample quotes below record the windspeed at several larger California wildfires. Very high winds both dry out the vegetation and quickly spread embers. The slope of the terrain can also cause an acceleration of wind speeds.

#### **Sample Reported Wind Speeds:**

##### **- Colorado Fire at Big Sur Jan. 24, 2022 Wind - 50 mph**

“So when humidity levels dropped on Friday and winds began roaring at up to 50 miles per hour near Big Sur, dangerous fire conditions were set.” (3)

##### **- Kincade Fire in Sonoma County: October 25, 2019 - Wind: 25-40mph**

“Meanwhile, sustained northeasterly winds of 25 to 40 mph, gusting up to 60 mph in the foothills and 70 mph in the mountains, will support potential fires spreading at breakneck pace”. (4)

##### **- Camp Fire in Paradise and Concow: 2018 - Wind: 25-35 mph**

“Paradise fire had decreased humidity due to wind speeds. Hot, dry, sustained and gusting high katabatic winds (25–35 mph), similar to the Diablo wind or the Santa Ana winds of the California Coast Ranges, locally known as the Jarbo winds....The 2018 Camp Fire, the deadliest wildfire in California's history, was driven into Paradise by these winds.” (5)

Another important factor in wildfires is the slope of the land. In a Fire Weather Report by the National Wildfire Coordinating Group both Pacific coastal sea breezes and the slope of terrain are described in the role they take in accelerating fires:

“The Pacific coastal area sea breeze is at its peak at the height of the summer fire season.....The Pacific sea breeze is characterized by considerable thermal turbulence and may extend inland 30 to 40 miles or more from the water under favorable conditions. The depth of the sea breeze is usually around 1,200 to 1,500 feet, but sometimes reaches 3,000 feet or more. Its intensity will vary with the water-land temperature contrast...

..Slope winds are local diurnal winds present on all sloping surfaces. They flow upslope during the day as the result of surface heating, and downslope at night because of surface cooling... Slope Winds are driven by heat exchange at the slope surface. They can react quickly to insolation on the slope, with upslope breezes starting within a few minutes. The strength of upslope winds is also influenced by the length and steepness of the slope as well as the exposure.....Warmed air adjacent to heated slopes tends to be forced upslope to the crest where it flows off in a more-or-less continuous stream. “(6)

### **Local Considerations on Wind Speeds and Preserving Wind Breaks**

The topography of El Granada consists of a sloping area near the highway that ascends slowly in elevation until the highlands are reached. A much steeper slope can be easily be seen there, as the roads have a much deeper pitch.

This steeper slope would create accelerated wind speeds in the area that also has the larger concentration of trees, and hence, the heaviest fuel loads.

As mentioned in the background section, El Granada medians serve as windbreaks. It is very important to leave the wind break trees in the medians as a way of preventing winds from drying out the vegetation in the neighborhood and more importantly, in the hills where the fuel load is heaviest. Fires on hillsides are also much more difficult for firefighters to battle. A solution to slowing down winds already exists in El Granada. Removing median trees would remove this safety barrier. A barrier to the one common element in almost every instance of California’s fiercest wildfires.



## **Section 4: Increased Temperatures and Salty Ground Water**

According to the “California Climate Change Fourth Assessment” issued in 2018, California has already warmed between 1 and 2 degrees Fahrenheit since 1900. The daily annual maximum daily temperature is projected to increase by 5.6 - 8.8 degrees if emission levels stay constant. (7)

Having fewer plants also increases the risks of saltwater intrusion into water systems, In a report by the National Parks Service Plants and Climate Change factors are discussed. One of those topics is saltwater intrusion.

**Saltwater Intrusion:** As sea level rises, water from the surrounding areas will intrude into low-lying plant ecosystems. This means an increased risk of saltwater intrusion in fresh ground water or freshwater wells, which can be damaging to plants and disrupt wetland ecosystems. (8)

Although the flammability of eucalyptus is very controversial among scientists, what is not controversial is that the loss of tree canopy will heat the ground, dry out ground water reserves, and cause dry roots at the base of plants.

“Ground water that has been depleted by hotter temperatures also heats the ground temperature and increases fire risks.” (8)

### **Local Considerations on Increased Temperatures and Ground Water:**

The farms on the Coastside use ground water to augment irrigation during droughts and because these farms are close to the ocean, there is a continued concern about salt incursion during drought times. In addition, a significant section of the El Granada neighborhood is on wells. Fresh water coming from surface and ground sources provide potable water for drinking. Areas closer to the shore include both agriculture and wet land environments.

If fresh water evaporates before it replenishes the groundwater reserves, or there is a risk of wells drying up.

The wetlands is the habitat sensitive area where fresh and salt waters converge. The loss of fresh rain water from the hills evaporating from a lack of a tree canopy would endanger these sensitive habitats and local wildlife.

Salt incursion preventing agricultural uses would adversely affect the local farming industry. The famous “drip” of the eucalyptus also contributes to the fresh precipitation. Losing it could alter the salinity. As pointed out by the EPA in an article entitled “Climate Impacts on Coastal Areas”

“Decreases in precipitation could also increase the salinity of coastal waters. “ (9.5)

Thinning the tree canopy should not be driven by the desire for merely reducing the fuel load without the fuller considerations of the impacts on exacerbating dry vegetation conditions and drying out the ground water. Any major changes to the environment should be done more slowly and in data monitored stages.

## **Section 5: Loss of Coastal Fog and Effects on Crop Production**

Warming temperatures and the loss of ground fog is also affecting temperature changes along many California Coastal towns. It is noted that some crops must have fog to grow properly. Specifically, pumpkins and artichokes are mentioned in the literature.

“Fog is essential for plants and animals, agriculture and human health, not only in California but in coastal zones around the world. But many scientists believe that fog is declining, another casualty of global warming. Throughout California and the Western United States, some shifts driven by climate change are easy to see: increasing temperatures, shifting wind patterns and changing ocean currents.

Yet evidence is starting to mount supporting what has for years been anecdotally reported by shoreline residents and scientists—fog is vanishing from many shoreline zones, including the California coast and Santa Cruz region. While the reasons for the decline are hard to decipher, solving the mystery is crucial to understanding the future of fog and whether it will continue to grace our coastlines, nourish crops and sustain the redwoods. “ (9)

In the Bins: Artichokes love the fog: In the early 1900s, Italian farmers started planting artichokes from Half Moon Bay to Castroville. The plants thrived in the mild, foggy climate of Castroville, and by 1922 artichokes were in serious production. (10)

Other considerations are included in the article: “Coastal Fog, Climate Change, and the Environment” by [A. Torregrosa](#), [T. A. O’Brien](#) and [I. C. Faloona](#) EOS, Science News by AGU (December 16, 2014)

“Reduced coastal fog could impact agriculture by causing a greater demand for irrigation. Vulnerable human populations such as the elderly would be at increased risk of heat-related impacts: Summers with fewer fog events are strongly correlated with higher levels of emergency response requests and hospital visits [*Gershunov et al.*, 2011].” (11)

### **Local Considerations on Loss of Coastal Fog and Crop Production**

To scientists, it has become increasingly clear that the fog banks feed such plants as the redwoods and many of the crops that grow well on the local Coastside. By risking warmer temperatures when over cutting the tree canopy, El Granada could further initiate the decline of several of the long standing cash crops grown by the Coastal agricultural businesses - specifically, the regional pumpkins and artichokes.

The pumpkin has been not only a local coastside cash crop, but a source of community revenue for caring for seniors, bringing the community together in a shared festival, and serving as an iconic symbol for the region. While the artichoke is used in local gourmet specialty goods, such as pastas, jams, and even honeys. Protecting these resources is worth considering before further drying out the environment through overly aggressive tree thinning.

## **Section 6: The Continued Loss of the Tree Canopy**

No one accurately knows (or is monitoring) exactly how many trees are being lost as private owners and developers, (in conjunction with tree diseases, and wildfires\_ cause a loss of tree canopy coverage in the state of California. But the loss has been noticeable via a national accounting of the tree canopy acreage lost in larger areas. Central and Northern California are noted as having lost the most amount of tree canopy.

“Analysis: California leads nation in tree loss, but worse may lie ahead: According to Global Forest Watch data, California lost the most tree canopy of any state in the U.S. — not just over the last year, but over the last five and 10 years, as well.

The state lost its trees primarily along the eastern and western edges of the state, particularly in northern California. Central California lost tree canopy in national and state parks and forests, where wildfires chewed through ancient Santa Cruz and Big Sur redwood forests.

The 2020 season was the worst season in California and accounted for 40 percent of the acreage lost in the U.S.” May 2021 (12)

Many coastal towns which are noting having significant loss of tree canopy have begun programs to replant the loss to their urban forests and regain the benefits that trees provide in carbon reduction, wildlife habitats, and cooling temperatures.

In 2009:

“Los Angeles County started tree planting programs and policies aimed to grow and maintain their urban forests.” (13)

The newest research on trees are revealing that older trees have a unique role in monitoring the health of both an urban or wilderness forest. (14). In her book "Finding the Mother Tree: Discovering the Wisdom of the Forest" by Suzanne Simard she notes that the oldest trees send biochemical messages via their root structures to the younger trees on growth rates, spatial distancing, and insect protection.

### **Local considerations on Loss of the Tree Canopy**

In El Granada, There have been proposed plans in community petitions to remove the older, taller trees from Quarry Park - as a way of reducing the height of the trees, The reasoning is based on the fear of ember spread and crown fires. (Topping or removal of trees on the medians seems to be less about reducing overall fuel load, since this is not the location of the biggest fire risks. Many residents feel that the desire by some home owners is to improve their ocean view. Most residents would agree that spending the sparse resources for serious fire suppression should not be diverted into projects to improve views.)

Scientific research such as Peter Wohlleben's popular book "The Hidden Life of Trees: What They Feel, How They Communicate" (15) is informing us that removing the older trees jeopardizes the health of the younger ones, and causes a higher likelihood of disease, crowded growth patterns, dried out and fallen trees.

Adapting research based culling of trees should include these considerations. Also, some neighbors have reported that once a contracted tree removal company arrives, they are more tempted to remove the more lucrative older trees for profit, and leave the unhealthy or dead trees. Any company contracted to remove trees

should be monitored, so healthy trees are not removed - while dried out, diseased beetle infested ones remain. Contractors who leave behind unhealthy and dried out trees is counter productive to wise forest management projects. It also undermines the planning and intentions environmentalists bring to fire suppression plans.

## **Section 7: The Controversy over the Eucalyptus Trees**

From an article entitled “The Great Eucalyptus Debate” Emma Marris briefly describes the controversial and polarized debate over the benefits or hazards of eucalyptus trees.

“The Tasmanian blue gum, *Eucalyptus globulus*, is a magnificent tree. That is perhaps the only thing that everyone agrees on...In the most general terms, there is a faction of environmentalists that want to see many of these eucalyptus trees removed, because they are a fire hazard close to homes, or because they are non-native and make poor habitat for native species, or both.

There is another faction of environmentalists that dispute that the trees are more of a fire hazard than what might replace them, see them as decent or even very valuable habitat, and want to retain them to sequester carbon, provide shade, beauty, and recreation, and to avoid the use of the herbicides that are generally necessary to thoroughly kill them off.” (16)

In the San Francisco Forest Alliance article “The Very Long Life of Eucalyptus Trees” the author debunks common myths of eucalyptus trees with research to contradict it.

Myth 1: Eucalyptus trees kill birds: is refuted with the many bird species are dependent upon the trees for safe nesting and winter nectar. (15)

Myth 2: Eucalyptus and other non-native trees are more flammable than native trees: refuted that the claim is no longer credible because every wildfire occurs in native vegetation. Quoted from the San Francisco Chronicle Marg Hall’s article “Cutting trees won’t help us live with fire”...“Although not easily ignited, eucalyptus trees can burn with intensity under the right conditions. This is also true of other tree species. Dry grasslands, shrubs and other fuels are easily ignitable, burn quickly and spread fire rapidly. We can’t remove “fuel” from the equation unless we pave the hills — and that’s not a good plan.” (17)



Myth 3: Nothing grows under eucalyptus: is contradicted by the study by Cal Poly SLO in a research summary by Kristen Marie Nelson entitled “Evaluating the Myth of Allelopathy in California Blue Gum Plantations”....“Our results contradict the long-standing paradigm that blue gums are toxic to California natives, which may have significant implications for management and restoration of land historically occupied by blue gum plantations.” (18)

### **Local considerations on The Controversy over the Eucalyptus Trees**

The debate over tree removal, fire suppression and changing the landscapes is as controversial on the Coastside as it is anywhere. There have even been threats of law suits on which decisions will result in catastrophic fires.

The debate is a complex one, as one side views the eucalyptus as posing a fire threat - while the other side sees the removal of the trees as setting up the conditions that exacerbate the fire threat.

Complicating the debate is that large changes in the complexities of ecosystems have an unpredictable quality, which is particularly true in sensitive habitats such as wetlands, coastal ranges, and inverted marine temperatures patterns.

That makes relying on the most reliable (rather than the most common, or popularly accepted) research essential. It also means that without proven models for successful wildfire suppression, changes should be enacted in slower stages. This is challenging when a portion of the public is driven by immense fear and the desire to destroy natural landscapes by removing all the vegetation and adding in pavement seems like the short term best solution.

## **Section 8: Protecting Local Wildlife - Raptures, Rats and Mammals**

The wildlife population that graces the coastal environment is an inexhaustible topic. But briefly: On the Coastside we are blessed with raptors such as the red-tailed hawks, red-shouldered hawks, white-tailed kites, northern harriers, and American kestrels. Barn owls and short-eared owls are active at night. Many of these birds nest in the tall eucalyptus trees in preference to the shorter, garden trees that populate fenced gardens. Although cedars and pines are also nesting sites, the neighborhood Japanese maples, shrubs, and lemon trees seem to lack the height that these birds of prey prefer for safe nest building.

Hérons and egrets are commonly seen in the medians hunting moles and other rodents. It is obvious that the larger birds benefit from the taller trees that grow here. The birds that keep the rodent population contained in numbers is a natural, and non-destructive pest control system.

Monarch butterflies also thrive in eucalyptus. As pointed out in the Santa Cruz article by Hugo McCormick: *As Eucalyptus Monarch Grove Ages, Butterflies face Risks.*

“Monarch populations at the state park began declining precipitously in 1997, Nitzberg says, which is also when the once-reliable eucalyptus curtain began coming down. “Our grove started losing trees in the early 2000s,” she recalls, with much of the damage during some violent wind storms in the ‘90s.” (19)

Wildlife such as mountain lions, deer, coyotes traverse the creeks to avoid human contact in the neighborhood. These creeks provide shade, water, and hunting opportunities with the sheltering of the eucalyptus groves. These areas are

considered a sensitive riparian environments by the Fish & Game Department, and have restrictions to protect the wildlife that depends on these areas.

### **Local considerations on Protecting Wildlife - Raptures, Rats and Mammals**

The Coastside has expressed in many postings on Next Door it's concerns regarding the use of poisons on animals deemed "pests" such as mice and rats.

Many residents have concerns that the decline of raptures will promulgate an increase in the rat population. The use of poisons will accelerate deaths in the rapture population and that decline will spiral. However, rats will know on wiring in houses and cars. Disease, house destruction and the possible electrical fires that rats bring also makes poisoning them a viable solution for many other residents.

The removal of large amounts of eucalyptus trees may have an impact on the variety and health of the bird, pollinators and mammal populations. This aspect of changing the environment needs careful review and planning.

## **Section 9: The Role of Weather Inversion in Climate Moderation**

The topographical view of the coastside with its mountain range is often referred to as having “weather inversion” with its neighboring towns to the east - on the other side of the hills.

The marine layer on the coast tends to linger until the differential with the warmer inland climates heats up enough to draw the cooler marine layer over the hills. It’s very common to see the fog bank sitting above Half Moon Bay as one drives along 280. This inversion weather action cools the towns of San Mateo, San Carlos and Belmont and provides added relief when hot days are experienced there.

“Somewhat similar to the sea breeze, the marine layer also represents a difference between a cool, moist air mass and a warmer air mass. Unlike the sea breeze, which reforms almost every day along the east coast in Summer, the marine layer can persist for days and weeks along the west coasts of continents” (20)

It would be worth checking with climatologists and environmental weather specialists what would occur if the coastal towns were to significantly warm up for extended or longer periods of time.

Some of these questions include:

If the the temperature differential is not be as pronounced would coastal cooling air move to those regions less frequently? Would those towns endure hotter days over an extended period of time?

If coastal land areas are no longer a cooling shelf - and instead have hotter temperatures, will the cooler breezes from the oceans cause stronger winds and additional windy, high fire risk days?

### **Local Considerations on The Role of Weather Inversion in Climate Moderation**

For this report I was not able to locate accurate scientific data on how warmer coastal temperatures effect the heating up of adjacent towns, or if wind speeds are accelerated on the coastal beaches and ranges.

But as the neighboring towns are highly populated, it seems important that coastal areas know in advance how the changes to the environment might adversely affect the weather patterns of towns around them prior to drastically changing the environment in ways that effect daily temperatures.

## **Section 10: Property Values and Law Suits after a Fire**

Many people in El Granada enjoy walking along the promenades of El Granada. The realtors associations have valued tree lined neighborhoods as being 15% higher than neighborhoods without them.

“When a property looks beautiful and well-maintained, The Tree People Company say the property values can rise as much as 15 percent.”

Realtor Robert Gibbs lists the other benefits of tree lined streets:

“Trees soften hardscapes, buffer pedestrians from moving vehicles, and create “outdoor rooms” that are pleasing to walk through. They help to reduce traffic speeds, reduce the load on drainage infrastructure by absorbing precipitation, remove millions of tons of CO<sub>2</sub> emissions annually, and extend pavement life with their shade. There even is compelling research that motorist road rage is less in green urban versus stark suburban areas.

<https://smartgrowth.org/value-street-trees/>

## **Local Considerations on Property Values and Law Suits after a Fire**

The debate on the eucalyptus trees has divided the neighborhood with the contentious discussion regarding eucalyptus trees and what the best fire suppression approaches might be including removal of specified trees.

Historically the neighborhood contained many second vacation “beach” homes so the smaller residences were built in the lower land areas of El Granada closer to the highway and shoreline. These subdivided lots were infilled over the past few decades with family sized homes.

While statistical data on how many people feel trees should be removed or retained is not available, anecdotal stories are shared. Also there are the petitions that various groups have had neighbors sign.

The highlands of any neighborhood is usually where more luxury homes are built. Views are calculated in the cost appraisals of homes, and some highland residents have expressed their desire to increase views of the ocean by having the trees in the medians removed as part of the fire suppression project.

The loss of trees on the medians near Quarry Park has left those residents feeling powerless over the loss of tree landscaping that first attracted them to purchasing their homes. Strict County contractual documents and liability concerns temper any landscaping improvements they might be inclined to make.

If the highland homes receive 10 - 15% price increases due to grander vistas, while the residents in lower El Granada, lose 15% of their home values due to the loss of trees, a greater economic gap will be created as an unintended consequence. There have already been threats from one neighbor to another that legal actions would result if trees are not removed from the medians. Of course, the counter argument would be a law suit if the wind breaks wear removed and caused drier conditions and increased firestorm winds. The potential for increased acrimony is currently present in the neighborhood.

Hopefully, those making decisions about tree removal will keep in mind the losses and gains of property values that will result in their decisions. But more importantly, make the least ecologically destructive choices necessary for adequate fire suppression strategies.

Neighbors who may need to depend on one another in an emergency, would be best served by fire suppression solutions that respect the widest concerns of the residents - and the nature which drew them to live here.



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