

**Status of Native Monterey Pine (*Pinus radiata*) Ecosystems, and
The First Monterey Pine Forest Ecosystem Conservation Plan**
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1. Present Distribution

a. Planted

Planted *Pinus radiata* grows worldwide on a minimum of 7 million planted acres. This amount grows almost entirely in tree farms in Chile, New Zealand, Australia, Spain and S. Africa. *Radiata* at present takes up about 3% of the international trade in wood and wood products, and that is likely to double in the middle distant future. It is the leading exotic plantation species in Spain, Chile, Australia and New Zealand and is of lesser but still significant importance in S. Africa, Kenya, Argentina and Uruguay. Except for Christmas trees it is almost unknown as a tree farm species in the U.S. *Radiata* is widely planted in temperate climates as an attractive, fast growing tree.

Radiata grown in tree farms are almost without exception hybrids, in most cases extreme hybrids. All three types of diversity - genetic, species and community diversity in these tree farms is measurable and essentially non-existent.

b. Native Populations

The native population and its habitat is a very different story. All three types of diversity - genetic, species and community diversity in these native forest ecosystems is very rich in all three measures. This rare forest supports some 19 other imperiled plant species. It is likely that 99.99 percent of the pine's genetic diversity exists in the three native populations.

An analogy of the distinction and importance of native forest as opposed to a tree farm was described this way "*In recent decades disease hit the domesticated tomato and corn crops in the U.S. and threatened to devastate our agriculture. Fortunately, wild tomato plants still existed in Peru, and the wild ancestor of corn in Mexico. Genes were found in these wild populations that proved resistant to the diseases.*"

The remainder of this article only discusses Native *Pinus radiata* Forest Ecosystem Habitat.

Present distribution of the native populations is limited to approximately 9,000 - 11,000 acres in three (3) locations on the Pacific Coast of North America. There are three remaining locations in California. By far the largest is in its namesake Monterey. The other populations are at Ano Nuevo (north of Santa Cruz), Cambria (north of San Luis Obispo) and two tiny islands off Mexico - Cedros and Guadalupe off the coast of Baja California. In 1908 it inhabited two other islands, Santa Rosa and Santa Cruz, but it is apparently now extirpated there.

Radiata does not occur naturally more than about 5 miles from the seacoast. The most common explanation offered is the inland reach of the summer fog. The only places it is found growing above 800 feet ASL is where ocean breezes go up over a ridge causing fog to form.

i) **Monterey Peninsula (Monterey County 4500 - 6900 acres)**

Jeffers Forest (~450 acres) is possibly the least contaminated, native stand of Monterey pine in "good" health. The Jacks Peak Park area has large core area stands surrounding it, but is known to have been genetically contaminated by extensive plantings of hybrid radiata on its tallest central ridge in the 1950's and 1960's.

ii) **Cambria (San Luis Obispo County ~2300 acres)**

None of the stands in Cambria are rated any better than "Fair" health. They are under severe stress with a high incidence of dwarf mistletoe, gall rust and have extensive infestations of bark beetle and as of 2004 pitch canker.

iii) **Ano Nuevo (Santa Cruz County ~1500 acres)**

Ano Nuevo has been logged in the past and has some genetic contamination. Those areas with genetic contamination are the healthy stands. The uncontaminated native stands with the exception of two stands totaling 44 acres, are not rated any better than "Fair" health by a forester.

iv) **Islands (Mexico ~450 acres)**

The population on Guadalupe Island may have been lost. It had been rapidly declining and only 45 trees and no seedlings existed the last time a census was taken in 1988. The pines on Cedros island appear to have a stable population but "have been considered more closely related to the Bishop pine".

II. Changes in Historic Distribution

In 1850, the total worldwide occupied habitat for Monterey pine is estimated at around 16,000 healthy, genetically diverse acres.

Currently less than 2,500 acres are in good health as determined by a forester - not an ecologist. When considering stands of good health and relatively free of genetic contamination there are possibly only as few as 600 total acres.

III. Imperiled Status

a. International

In 1986, before Pitch canker was found in California, the United Nations Department of Food and Agriculture, which sets international policy for forest protection, recognized the situation on a global scale and declared Monterey pine an Endangered Species.

i) New Zealand

In 1984 New Zealand's Minister of Forestry, John Falloon, expressing serious concern about the potential loss of genetic diversity in native Monterey pine forests.

b. National

In 1988? US-Fish & Wildlife Service listed Pinus Radiata (Monterey Pine) as a "Federal Species of Concern."

c. California

i.) The California Coastal Commission considers native Monterey pine forest ecosystems Environmentally Sensitive Habitat Area which some consider more substantial protection than provided by Endangered Species laws.

ii.) In 1993 the California Department of Fish and Game put Monterey pine on its "special plants list."

d. Expert Determinations

i.) **Rare:** The Jepson Manual, a set of books considered the definitive encyclopedia for California plants and trees, states that Monterey pine is "rare."

ii.) **Endangered:** In 1994 without knowing of the United Nation's declaration, the legislatively recognized California Native Plant Society strengthened its concern of Monterey Pine by rating it "1B". Their only stronger rating is "1A" which means extinct - gone forever - like the Mammoth.

iii.) **Extinction:** The April 6, 1994 Draft Environmental Impact Report for the Pebble Beach Lot program expressed concern that the project could cause "endangerment to the Monterey pine species itself."

iv.) **Sensitive Resource:** In 1999 Monterey County considered the tree species a "Sensitive Resource" when they list it first, ahead of the live Oak, in the General Plan Slide show presentation - which is now on their Web Site.

v.) The only "experts" who have ever disputed the imperiled status of the Monterey pine forest ecosystem are those paid by the Pebble Beach Company.

IV. State, Federal and International Agency Plans and Actions

a) Agencies Plans

There are no management plans from state or federal agencies

b) Federal & State Protection Efforts.

None. There are no state or federal protection efforts. There is no native radiata on any federal property including BLM land, Wilderness areas or U.S. National Forest land. California's Point Lobos State Park contains somewhat less than 400 acres. Unfortunately there is some evidence that this population was heavily planted with hybrid (genetically uniform or contaminated) seed by the U.S. military during World War II.

c) **Research**

There is current genetic research to identify a radiata strain that would be resistant to the Pitch Canker. However even if successful, a resistant clone or strain can never recreate the genetic diversity or genetic adaptability of the existing natural radiata forests.

There are perhaps dozens of studies on radiata currently.

V. Present Threats

a) **Development (See Table)**

i.) **Common human population expansion**

Since roughly the beginning of western human settlement in about 1850, development by far, has been the main reason for the reduction and fragmentation of radiata habitat area. This has led to the decline in health for the majority of the stands remaining. Of the 6 remaining stands recognized as high quality native radiata forest, the best stand (Jeffers Forest owned by Pebble Beach Company) is under immediate threat of development. The plans are already at least one third of the way through the County approval process. The largest stand (Aguajito Property also owned by Sumitomo Bank / Pebble Beach Company) has plans drawn up for development in the next 2 to 5 years.

b) **Possible loss of preserves mistakenly considered permanently protected.**

i) **Permanent - Isn't.**

When Huffman (PBC Consultant) reports "the 25 natural and urban forest stands that are permanently protected within the County..." they define permanent far too strongly.

ii) **County Parks aren't Permanent.**

The largest "permanently protected" stand described referred to by the report is Jacks Peak (630 acres) owned by Monterey County Parks. This is the very same agency that has just (Nov 1994) made a proposal to sell off a nearby "permanently protected" park near Mount Toro to build a golf course. Public outrage caused this proposal to be withdrawn.

iii) **California State Parks aren't Permanent**

The third largest area described as "permanently protected" is Pt Lobos. Sometimes referred to as the "Crown Jewel" in the California State Park System. Nevertheless during the California budget problems of 1991 the State seriously considered selling several state parks.

Federal Wilderness areas may be the strongest and longest lasting protection by designation of governmental agency, but still isn't necessarily permanent. There is a land swap at proposed at Los Padres Dam in Carmel Valley - some 5 miles from

stands of native radiata. This proposes to allow development on an area that is currently designated wilderness.

b. Pitch Canker Fungus (*Fusarium subglutinans* f. sp. *pini*)

The fungus was first detected in California and in radiata in 1986.

Symptoms

In certain observational plots, up to 85% of the trees have become symptomatic. That is not to say the other 15 per cent won't get it. Trees can have the disease without exhibiting symptoms.

Spread

The disease seems to spread quickly. At Sunset Beach in 1988, at most 1 tree was symptomatic. There is now extensive mortality. In Carmel in 1992 only 1 tree was found to be infected. In November 1993 some 132 trees were found to be infected.

Mortality vs Symptoms

There is little data on the percent of symptomatic trees that die from the disease. Some symptomatic trees have survived 8 years, others have died within 2 years. While it may take up to a decade for the tree to die exclusively from the disease, trees weakened by fusarium are then susceptible to quick death from attack by bark beetles.

Native Monterey Pine Forest Ecosystem Conservation Management Plan

The smallest native Monterey pine forest stand found to be in at least "Good" health is a 36 acre parcel which is a subset of a 56 acre stand. This stand is surrounded by recent development so it can not yet be concluded that a 56 acre stand can remain perpetually healthy and self-sustaining.

The next smallest healthy stand is some 105 acres. This stand has had less development induced fragmentation and edge effects. However a highly traveled road was paved through it some 7 years ago. While this 105 acre area is still healthy after 7 years with a highly traveled paved road through it and is in moderate use by dog walkers and children, population dynamics of radiata are unknown.

Sustainability cannot be insured for this 105 acre area if any significant population dynamic "cycle" exceeds 100 or even 20 years, which is highly likely since the lifespan of the dominant species is 80 - 180 years. If so, larger areas with more insulation from man-made impacts may be needed. Notably, this 105 acre stand has had very low seedling regeneration for the past 20-25 years.

- 1. All remaining healthy, native stands of contiguous radiata habitat shall be removed from any and all possibility of development.**

This specifically includes those areas described in the otherwise discredited Huffman (PBC Consultant) Report as:

"Remaining native Radiata habitat in Good Health."

Remaining Native Radiata habitat in Good Health			
Common Name	Parcel Names	Acres	Threats *
Jeffers Forest (includes Pescadero Canyon & East Stillwater watersheds)	P, Q, R, Y	350	240 Acre Golf Course Application by Pebble Beach Co. active as of Feb 2004.
North Jacks Peak	Pebble Beach Co.'s Aguajito Property	715	1996-1999 - Resort Planned
Mormon Property	Corporation of the President of Mormon	417	No known plans. However, property owner, could propose development at any time.
Pacific Grove High Cross Country Course, next to Rip Van Winkle park.	Areas C, B-2 & Navajo Tract	105	29 acres of houses and a driving range are proposed.
Indian Village & Spyglass Hill	Pebble Beach Co.	56	1994 - 20 acres of mansions are proposed.
Del Mesa Forest	Del Mesa Carmel Open Space	228	Relatively Protected
Jack's Peak Park	Jack's Peak Regional Park	630	County owned. The County tried to sell a nearby park for a golf course development in 1994.
Total		2,502	

* All radiata forests are threatened by Pitch Canker. Large, healthy, contiguous native stands have the largest genetic diversity, thus the best chance of survival against the disease.

2. Preserving these areas will allow the best defense to combat both loss of habitat from development and retain maximum genetic diversity for resisting the current threat from Pitch Canker, and future attacks by other diseases.

3. Additionally, it would be wise to similarly protect those areas of the next highest health rating, "Fair", which are contiguous to those areas listed above of the highest health rating. Contiguousness provides a buffer from man-made insults and insurance where we have underestimated either the threats or overestimated our conservation acts.
