

MARITIME CHAPARRAL



Condition: Significant Concern

Trend: Declining

Confidence: High



WHY IS THIS RESOURCE INCLUDED?

Special status plants and sensitive plant communities are often found clustered in areas with unusual geology, soils, aspects, elevations, or combinations of these attributes. Mt. Tam's unique geography and location near the coast have created a number of different microclimates on the mountain. The part of Mt. Tam that receives a marine influence, in the form of persistent summer fog, contains maritime chaparral, a type of chaparral that is associated with several special status plants.

Manzanita dominance is characteristic of maritime chaparral found on coastal slopes subject to summer fog or heavy winter rainfall on ocean-facing uplands. Over half of the 95 species and subspecies of manzanita in California are locally endemic, occurring in lowlands adjacent to the coast and within the summer marine fog zone. This abundance of locally endemic shrub species along the California coast results in a pattern of exceptional beta diversity, or high levels of species turnover in community composition across space. As a result of this diversity, maritime chaparral communities are recognized as one of the most diverse woody communities in the state. Although relatively few, maritime chaparral plant species of special interest in the One Tam area of focus include:

- The rare Marin manzanita (*Arctostaphylos virgata*) California Native Plant Society (CNPS) rank 1B.2: Plants Rare, Threatened, or Endangered in California and Elsewhere, Moderately threatened in California
- Two rare wild lilacs:
 - Mason's ceanothus (*Ceanothus masonii*) CNPS rank 1B.2: Plants Rare, Threatened, or Endangered in California and Elsewhere, Moderately threatened in California
 - Point Reyes ceanothus (*C. gloriosus var. exaltatus*) CNPS rank 4.3 Plants of Limited Distribution - A Watch List, Not very threatened in California
- Coinleaf manzanita (*Arctostaphylos sensitiva*), a species that is prominent in maritime chaparral and a regional endemic in the Santa Cruz Mountains and on Mt. Tam. Thus, it is a good indicator of maritime chaparral, complementing the other locally endemic manzanita and ceanothus species in this community.

Maritime chaparral species like these can be used as an indicator of biological integrity or diversity, natural disturbance regime, and habitat quality.

OVERALL CONDITION

This fog- and fire-dependent plant community is found in patches along California's central coast from Santa Barbara to Sonoma County. Maritime chaparral is a plant community of concern in California, and the community on Bolinas Ridge is the best known patch within the One Tam area of focus. Current Marin Municipal Water District (MMWD) and National Park Service (NPS) rare plant monitoring data indicate that at least 100 individuals of Mason's ceanothus persist on Bolinas Ridge. The extent of maritime chaparral on the south slope of Mt. Tam is not known but is presumably substantially less than that on Bolinas Ridge. A smaller area of maritime chaparral containing a few remnant Marin manzanitas, and characterized by coinleaf manzanita, occurs in the vicinity of Camp Alice Eastwood on the south slope of Mt. Tam above Muir Woods.

Maritime chaparral communities on Mt. Tam are experiencing heavy Douglas-fir (*Pseudotsuga menziesii*) encroachment as a result of fire suppression, and fire-dependent shrubs are not recruiting. The extent of maritime chaparral communities appears to be declining based on NPS and MMWD staff observations of an abundance of senescent and dead chaparral shrubs under encroaching Douglas-fir stands. Fog has also decreased in coastal California by approximately 30% since the early 20th century. The rare species chosen for the metrics below are restricted to maritime chaparral, and are dependent on the fire and fog that allow these communities to persist. Therefore, their status and trends reflect those of the broader maritime chaparral community.

DESIRED CONDITIONS

The desired condition is to maintain viable populations of maritime chaparral community endemics over a minimum of 90 acres of endemic habitat.

STRESSORS

Lack of Fire: The vegetation mosaic on Mt. Tam is naturally dynamic, and vegetation succession occurs under natural conditions, largely mediated by the fire cycle. Removal of fire as a key ecosystem process is resulting in the successional reduction of grasslands, chaparral, and oak woodlands. Chaparral is adapted to fire return intervals from about 30 to 150 years, and requires periodic fire to regenerate.






Forest Encroachment and Shade: In the absence of fire, Douglas-fir encroaches into many different kinds of plant communities, including maritime chaparral. Shade-intolerant maritime chaparral species are vulnerable to the shading caused by these conifers in the absence of fire, a process heavily suppressed in the One Tam area of focus.

Road and Trail Maintenance: Road and trail work can introduce plant pathogens if equipment is not cleaned properly. Rare chaparral species such as Marin manzanita do not sprout if they are cut during trail clearing or by mowing along the sides of fire roads.

Climate Change: Potential changes to fog patterns as a result of climate change could threaten maritime chaparral species that are dependent on summer fog for moisture. Marin manzanita is a particularly good indicator of shift in summer marine layer, as is coinleaf manzanita, which is restricted to lower, fog-influenced parts of the mountain. Climate scenarios predict an increase in drought stress regardless of precipitation changes, which is particularly problematic for "non-sprouting" species such as the rare species considered below, as they are relatively shallow rooting.

Plant Diseases: Manzanita species in the One Tam area of focus have been affected by the fungal pathogen *Phytophthora ramorum*, which causes Sudden Oak Death (SOD). *Phytophthora cinnamomi*, which is particularly deadly to some manzanitas, is also known to be on Mt. Tam. In general, pathogen-related dieback of large stands of madrone and manzanita would be expected to cause effects very similar to those of SOD, including: changes in species composition in infested vegetation (mainly types of chaparral); changes in ecosystem functions; loss of food sources for wildlife; changes in fire frequency or intensity; decreased water quality due to increased erosion from exposed soil surfaces; and increased opportunities for weed invasion in open sites.

METRICS AND GOALS

Metric	Condition Goal(s)	Status
Metric 1 Number and age class of individual mason's ceanothus	Maintain 200 Mason's ceanothus individuals on Bolinas Ridge	
Metric 2 Number and age class of Point Reyes ceanothus individuals	Maintain 30 Point Reyes ceanothus individuals on Bolinas Ridge with at least two age classes	
Metric 3 Number and age class of Marin manzanita	<ul style="list-style-type: none"> • Support 200 Marin manzanita individuals on Bolinas Ridge, with at least two age classes • Determine potential to increase Marin manzanita individuals on south slope of Mt. Tam and better assess its presence and potential for recruitment 	
Metric 4 Extent of rare species	Maintain 90 acres of maritime chaparral community endemic habitat on Bolinas Ridge. Assess possibility for recovering second population of Marin manzanita on south slope to increase presence of maritime chaparral and create second viable population within the One Tam area of focus.	
Metric 5 Acres and spatial distribution of <i>phytophthora</i> -impacted habitat	Unknown	

INFORMATION GAPS

Genetics: Analysis of Mason's ceanothus is needed to determine if it is a viable species, or a series of semi-stable or introgressing hybrids between *C. gloriosus var. exaltatus* and *C. cuneatus var. ramulosus*.

Seeds: Research on germination requirements and seed life for rare species is needed to determine if maritime chaparral that has been taken over by forest can return to chaparral after a fire.

Plant Pathogens: A field study is needed to determine whether other plant pathogens are present, and any threats they pose to individual manzanita species, especially special status plants.