

# Measuring the Health of the Mountain: A Report on Mount Tamalpais' Natural Resources (2016)

(Chapter 19 excerpts)

ONE  
TAM

## MAMMALS



**Condition: Caution**

**Trend: Unknown**

**Confidence:  
Moderate**



### WHY IS THIS RESOURCE INCLUDED?

There are currently 40 known native mammal species in the One Tam area of focus. Mammals are good indicators of ecological condition because they are responsive to changes in habitat and rely on the health of lower trophic levels due to high energetic requirements as well as connectivity in the landscape. This chapter sheet focuses on terrestrial mammals greater than one kilogram that are likely to be detected by the Marin Wildlife Picture Index Project (MWPIP).

Obtaining reliable information about abundance and distribution of mammals, understanding community structure, the health of different mammalian trophic levels, and reliably determining trends in mammalian abundance are important metrics in determining overall ecosystem health. In the past, the level of effort to achieve the above was generally beyond the capacity of most land management organizations. Camera trapping at the landscape level provides a non-invasive tool to obtain these metrics and reliably measure change over time.

In September 2014, a grid of 128 cameras was established in a variety of habitat types throughout the Lagunitas Creek corridor as a part of Phase I of the MWPIP. Sites across One Tam partner agencies' lands were chosen to help learn more about how mammals are using these interconnected landscapes, and to establish much needed baseline information about mammalian diversity, abundance, and distribution. The proposed MWPIP Phase II would add 100–120 cameras in the Redwood Creek Watershed.

The MWPIP targets small to large terrestrial mammals (usually one kilogram or greater). Analysis of these data provides baseline abundance estimates of the mammalian community, with continued monitoring allowing us to determine if mammalian abundance is stable, increasing, or decreasing over time. By establishing a large grid of cameras evenly spaced across the landscape, these data can also be separated out to measure the abundance of individual species or trophic levels across seasons and years. This approach helps achieve the goal of understanding both the condition (i.e., presence, abundance, and diversity) and trend of the mammalian community as a whole, as well as by guilds or trophic levels (e.g., carnivores or prey) and individual species (e.g., American badger or deer). Additionally, management changes and environmental stressors like drought and the degree of their effects on the mammalian community can be accurately determined through the MWPIP.

## OVERALL CONDITION

Preliminary results from 3 months of data from the MWPIP in nearby areas suggests most native mammal species are present. Occupancy results from preliminary data suggest relatively healthy mammal diversity, with an abundance of small mammal (prey species) present. Few large exotic mammals have been reported.

## DESIRED CONDITIONS

The desired condition for the mammalian community on Mt. Tam is to maintain native biodiversity at high levels and the habitats that support it. More specifically, this would entail:

- The full suite of native mammals is present
- Native species diversity is high and stable or increasing; mammals are well represented across trophic levels; mammals are distributed across the landscape in appropriate habitats
- Rare species are present in suitable habitat types; where appropriate, actions are taken to increase the abundance and distribution of rare species (e.g., maintaining large grassland patches for rare species like badgers)
- Non-native mammals, especially species like wild boars, that have large ecosystem impacts, are not present
- Wildlife habitat is protected or enhanced through actions such as non-native plant removal and maintaining landscape connectivity (Note: This will differ by species and the habitats they utilize)

## STRESSORS:

**Historical Impacts:** Although most of the One Tam area of focus is protected, past land uses still affect habitat quality and quantity. Certain species of mammals were also the targets of hunting and trapping for centuries, the results of which may still be affecting regional mammal numbers and diversity.

**Habitat Loss and Fragmentation:** The contiguous open spaces of One Tam area of focus are threaded with trails and roads, and are surrounded by a mix of agricultural, suburban, and urban areas. Habitat loss and fragmentation caused by these landscape features may have a negative effect on mammal numbers and diversity, and can be particularly detrimental to species like mountain lions that require large home ranges.





**Disease:** Mammals are subject to a range of diseases, many of which are potentially spread by contact with pets, including canine distemper, canine parvovirus, leptospirosis, and feline leukemia, among others. A canine distemper outbreak dramatically affected Marin County's gray fox populations in the mid-1990s. Disease is also likely a factor in range-wide declines in spotted skunks.

**Rodenticides and Pesticides:** Mammals are at risk of potentially deadly rodenticide exposure, especially where they live adjacent to residential areas. Additionally, rodenticide exposure has been linked with susceptibility to mange in bobcats.

**Visitor Use Pressures:** Studies have documented recreational use altering the use of protected areas by carnivores, and also dogs affecting the abundance and behavior of mammal communities near trails.

**Invasive Species:** Invasive plants and animals can have far-reaching and detrimental effects on Mt. Tam's ecosystems. Invasive plants may dramatically alter wildlife habitat. Some invasive animals can outcompete native species for food, water, nest or burrow sites, and shelter. Other species such as feral pigs can do great damage as they trample foliage and upturn soil while rooting and foraging for food.

## METRICS USED TO MEASURE HEALTH

Metric	Condition Goal(s)	Status
<b>Metric 1</b> Native species richness	<ul style="list-style-type: none"> <li>• Maintain the full suite of expected native mammal species</li> <li>• No additional mammal species are lost from Mt. Tam</li> </ul>	
<b>Metric 2</b> Presence and distribution of rare species	<ul style="list-style-type: none"> <li>• Rare species are detected in appropriate habitat types</li> <li>• More detections at more cameras (greater distribution) is desired</li> <li>• Document extant range within study area with the goal to maintain the presence of these species</li> </ul>	
<b>Metric 3</b> Wildlife picture index for key groups	Undetermined due to lack of data	
<b>Metric 4</b> Invasive, non-native mammal species	No non-native mammals present, especially feral pigs or cats, as they have greater effects on ecological communities	

## INFORMATION GAPS

**Climate Change:** We do not know how the effects of climate change may alter mammal habitats on Mt. Tam.

**Wildlife Camera Data:** At least three years of data are required to analyze a WPI, so continuation of the MWPIP Phase I on Lagunitas Creek Watershed is needed. We are planning to implement Phase II of the MWPIP in Redwood Creek Watershed by early 2017.

**Small Mammal Diversity and Population Information:** We currently have very little population data for native small mammal species, apart from incidental sightings and a few small inventories. A needs statement to develop an assessment program for small mammals is included in Chapter 22 of this report.