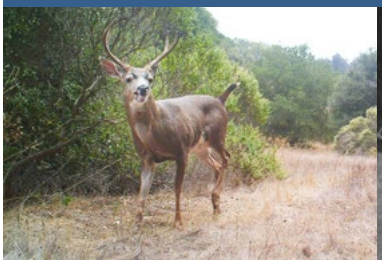
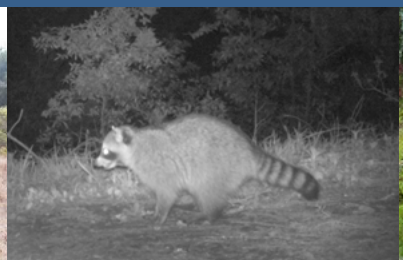
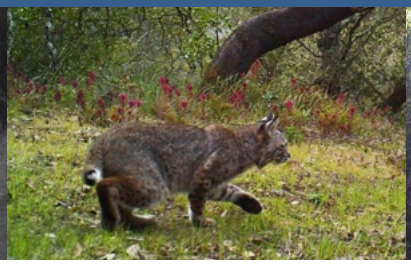
ONE TAM

Updated December 2023

MARIN WILDLIFE WATCH

onetam.org/marin-wildlife-watch


WHAT IS MARIN WILDLIFE WATCH ?

Marin Wildlife Watch is a community science program that uses wildlife cameras to help us learn about the wildlife in our parks and open spaces, including Mt. Tam.

One Tam developed this program to learn more about our mammal community, a critical gap in our knowledge of how the mountain is doing. Since mammal communities rely on connected, complex habitat, studying them helps us understand the overall health, resilience, and connectivity of the landscape. This program establishes a baseline and allows us to examine changes in our mammal community over time, informing efforts to protect them.

Read on to learn more about the program and how you can get involved!

HOW DO THE CAMERAS WORK?

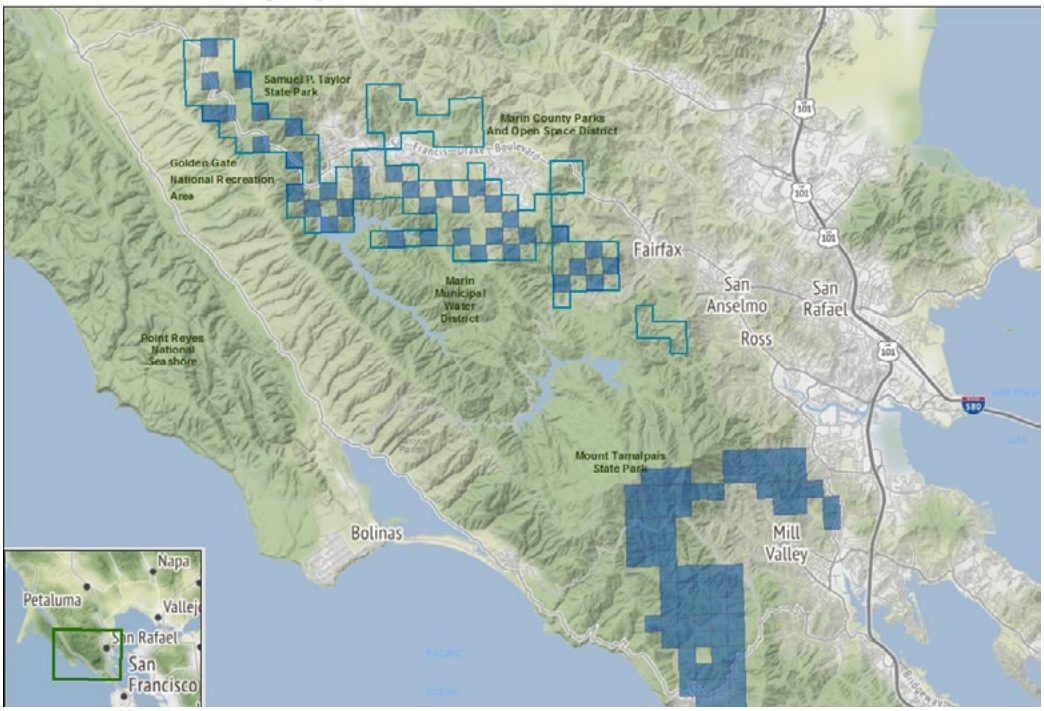
Stationary and weatherproof, the battery-operated wildlife cameras can be left outside for long periods of time. They are motion-activated, silent, and do not emit light or use a flash, and so take images without disturbing wildlife. They operate 24/7 and record photographs onto memory cards and are regularly replenished.

WHY TAKE PHOTOS?

While we know many of the species (bobcats, coyotes, badgers, etc.) that live in Marin's open spaces, we still have many questions about how many of them there are, how they move around, and where they are at different times of the year. This information is essential to taking better care of our public wildlands.Most mammals are difficult to study by trying to observe them directly. The cameras provide us with a reliable way of tracking the number and species of mammals passing by a specific camera location on the landscape at a specific date and time. These cameras are operating 24 hours a day, which produces a more comprehensive look at wildlife population dynamics than we have ever had before.

WHERE ARE THE CAMERAS?

There are currently about 100 active cameras. Located at regular intervals across the Lagunitas Creek (operating since 2014) and Redwood Creek (since 2017) watersheds. The total number of cameras has fluctuated as study design has evolved based on new information. They are on land managed by Marin County Parks, Marin Municipal Water District, California State Parks, and the National Park Service. This sampling method can give us information about wildlife species at different locations across a wide area.



Cameras are placed in a grid pattern (shaded in blue) across Mt. Tam. We were able to reduce the number of cameras operating on the north side of the mountain and still maintain a robust program, which is why only some of the original project area is shaded.

WHAT ARE WE LEARNING?

Black-tailed deer were one of the most common animals seen on camera.

WHAT CAN WE MEASURE?

Wildlife cameras are best at detecting mid-sized mammals like raccoons, foxes, and squirrels, though they do capture other wildlife as well. Since the cameras were installed in September 2014, we've collected 10 million photos, revealing at least 19 different species of mammals. Questions we seek to answer include, but are not limited to:

- Which species are present and where?
- How likely is a species to appear at a particular camera? How often? At how many cameras across our study area?
- Is the community balanced between predators and prey? Are any species overabundant?
- How many different species are there?
- How do mammal communities change season to season and year to year?
- Where and how many detections do we see of our rare species?
- Are there any non-native, invasive species?
- What is the Wildlife Picture Index (see below) each year?

THE WILDLIFE PICTURE INDEX

An important measurement this program enables is a biodiversity index called the Wildlife Picture Index (WPI), which combines statistical analysis of photos from the cameras with other environmental data to tell us about the presence of wildlife in an area. The WPI is used all over the world to study wildlife, and many Bay Area organizations are also implementing this method.

The first results represent the period 2014-2017 and about four million images. Overall, Tam's mammals are healthy. How do we know?

• Overall biodiversity is excellent—19 species of mammals were detected, of about 24 species that could be expected to be detected by wildlife cameras and are known to have historically inhabited Marin. This includes several rare species including the mountain lion, spotted skunk, American badger, and river otter. (Note: The cameras are best at detecting mid-sized mammals, greater than 1 kg. There are other small mammals that are not reliably detected by the cameras, and so are not included in this study, such as the 13 species of bats in Marin.)

• Mesocarnivores (medium-sized carnivores like coyotes, bobcats, and foxes) are balanced with each other (no species was dominant over others) and balanced with the species they depend on (small herbivore species)—this is an indicator of ecosystem health.

• We saw healthy presence of species across the landscape that remained steady throughout the study period.

• The WPI is mostly stable throughout the study area from 2014-2017. The WPI declines in three of four seasons each year but is relatively steady in the spring when young emerge.

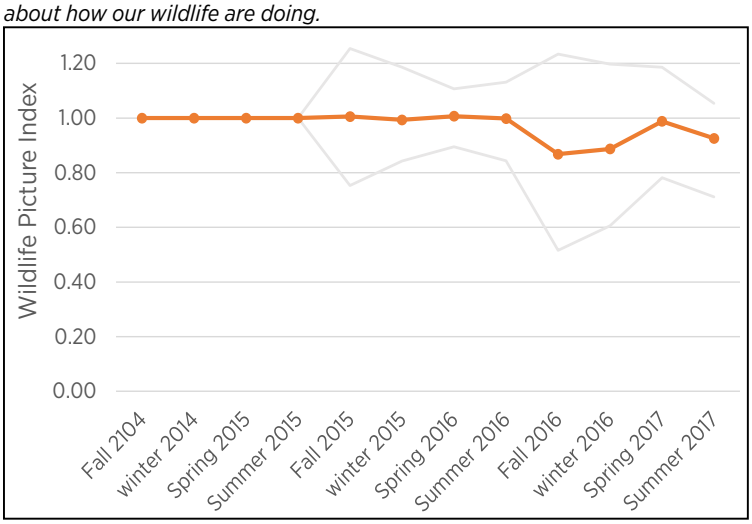
• Studying the whole landscape over time tells a more complete story than looking at just one area in one season. We can see that One Tam partner lands are connected, and wildlife is able to move between them over time and that the region overall is providing the habitat they need. This connectivity is especially important in times of environmental change.

Why did the WPI go down? There was a small decline in mesocarnivores in the summer from 2014-2017, however the scale of the decline is not immediately alarming. Declines and increases in biodiversity appear to be site-specific, which may mean wildlife is moving across the landscape to adjacent lands as conditions change seasonally, and over time. Wildlife populations fluctuate over time in response to many factors including food availability, habitat quality, weather events, and disease. This study period also occurred at the height of a multi-year historic drought, but we are unable to say at this time if this contributed to the results. In addition, modeling rare species could have contributed simply because they come in and out of detection and could potentially pull the index down.

The One Tam partners acknowledge that Mt. Tam is changing quickly. The combination of drought and forest disease is bringing about dramatic changes in habitat structure and food availability for many species. Continuing Marin Wildlife Watch will help us understand how wildlife are responding to these changes, and what role agencies and community members can play in improving the health of the mountain.

To learn more, visit: onetam.org/peak-health/wildlife/mammals

The Wildlife Picture Index, pictured below, is represented on a scale of 0 to 1. While it declined slightly from 2014-2017, as noted above our mammal community is doing well overall. More analysis will help us understand more about how our wildlife are doing.



WE CAN'T DO IT WITHOUT YOU!

BECOME A COMMUNITY SCIENTIST

For those who enjoy viewing wildlife photos, this is your chance to spot an elusive mountain lion, playful coyote, or a whole family of foxes! Our cameras collect hundreds of thousands of images each year which must be processed to become data for the program. Volunteers view the images online and identify the animals they contain. Volunteers are critical to this program and are building this body of knowledge together with One Tam scientists—without your help, we wouldn't be able to process all that data or to draw insights from it.

JOIN THE TEAM!

Learn how to get involved and view FAQs about this project at onetam.org/marin-wildlife-watch

For questions, contact communityscience@onetam.org

WHAT'S NEW IN 2024?

Volunteers can now participate online! The program is utilizing an online platform with computer vision called Wildlife Insights to help streamline the process and visualize information from the photos more easily. This is an excellent remote volunteering opportunity where you can participate at your own pace and includes opportunities to connect with One Tam staff and fellow volunteers. In-person volunteer opportunities may be offered in the future.

With our improved data management system in place, One Tam hopes to broaden our community of volunteers and enable the analysis of data collected since 2017. We are also part of a new regional consortium of wildlife camera projects to exchange learning and gain an even broader picture of how the region's wildlife is doing.

Wildlife Insights

One Tam has partnered with Conservation Interntional and Google to bring this data processing and visualizng platform to Marin Wildlife Watch. We are excited for the efficiencies and volunteer experience it enables.

Get a first-hand glimpse into the secret lives of Mt. Tam's animals—sights you may not see anywhere else—and gain animal ID skills by volunteering!

River otter and American badger are two of several rare mammal species observed in this study.

CARING FOR OUR WILDLIFE

Marin's open spaces provide food, shelter, safety, and migration corridors for a wide variety of wildlife. These connected islands are vital refuges in an otherwise highly developed urban region. The agencies that care for Mt. Tam's lands are entrusted with protecting the plants and animals that call this special place home, as well as those that might just be passing through. The more we know about when and how animals use different habitats, the better we can protect them and the places they need.

We will continue operating the cameras in the Lagunitas Creek and Redwood Creek corridors to learn more about how wildlife behavior and patterns change with the seasons, with the goal of potentially tracking changes in the number and abundance of species on both the north and south sides of the mountain. We are particularly interested in knowing more about rare species like river otters and spotted skunks, as well as carnivores such as coyotes, foxes, mountain lions and bobcats, which play a critical role in ecosystem health.

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