

Welcome to Jasper Ridge Biological Preserve's 2018 Open House!

#jasperridgeopenhouse2018



Photo by Jeff Schwegman

OUR MISSION

To contribute to the understanding of the Earth's natural systems through research, education, and protection of the preserve's resources. Visit our website at <http://jrpb.stanford.edu/>.

ABOUT JASPER RIDGE BIOLOGICAL PRESERVE

Formally established as a biological preserve by Stanford University in 1973, Jasper Ridge Biological Preserve is recognized internationally not only for a century of research and teaching, but also as an important nature conservation area. Work at the preserve encompasses a broad spectrum of disciplines, including biology, geology, climatology, engineering, archaeology, art, and literature, to name just a few.

NAVIGATING OUR OPEN HOUSE

Enjoy exploring exhibits and activities that show you a sampling of how we accomplish our mission. Everything is located at Sun Field Station and on two self-guided hikes. Use the schedule, map, and trail guides on the next pages to plan your day. Staff wearing bright yellow vests and docents wearing green T-shirts will be happy to answer your questions.

BE SAFE, BE SMART! SEE BACK PAGE FOR IMPORTANT SAFETY INFORMATION

Due to high wildfire danger, SMOKING IS NOT PERMITTED anywhere on the preserve.

Self-guided hikes are on rough paths where you can encounter biting insects, poison oak, and rattlesnakes.

Closed-toe shoes and long pants are strongly recommended. **Stay on marked trails at all times.**

Picnicking is only allowed in the picnic area on the north side of Sun Field Station.

You should realize that there are health and safety risks associated with any natural environment. If you choose to attend the open house, you agree you do so voluntarily and at your own risk. You assume all risk of injury to yourself, and agree to release Stanford from any and all claims and causes of action due to your participation in these activities.

EMERGENCIES

Call 650-363-4911

San Mateo Co. Sheriff Dispatch

Calling 911 on your cell phone could have a slower response time than the number above.

ACTIVITIES



Photo by Philippe Cohen

Leslie Shao-ming Sun Field Station

The Leslie Shao-ming Sun Field Station, Stanford's first green building, is our research and education facility. It is named for Leslie Shao-ming Sun, whose love of the local environment found a perfect home at Jasper Ridge. In and around the field station you will find information about its pioneering environmentally friendly architecture and displays about preserve activities. Outside on the north side of the building are exhibits, food trucks, and a picnic area. On the south side is an authentic **Mongolian ger**, in which you can learn about our international connections and take a quiet moment to reflect and leave us your comments in the journals there. Other journals for you to write in are near the picnic tables on the north side of the field station.

Scheduled Events

Inside the Sun Field Station classroom

Listen to special presentations about the history and pre-history of the preserve, and watch a film about activities that have been going on recently.

10:30-11:00 AND 1:30-2:00—Historical Highlights of Jasper Ridge Biological Preserve by Julie Cain, Stanford University's Historic Preservation Planner

11:00-11:30 AND 2:00-2:30—Geology of Jasper Ridge (or Life on the San Andreas Fault) by Richard Nevle, Deputy Director of Stanford University's Earth Systems Program

11:30-1:30—Enjoy a 15-minute video by Tamsin Orion: *Jasper Ridge Biological Preserve: Stanford's Global Backyard*. Highlights why the preserve is so important locally, nationally, and internationally.

Outside Sun Field Station, under the oak trees

11:30-1:30—*Metamorphoses: What Passes, What Remains; Poetry, Prose, and Dance*. Poetry, prose, and an original dance performance by well-known artists will also include an open mic where you can participate. Featuring Deema Shehabi, Mike Shewmaker, Kim Shuck, Andrew Dugas, Amos White, Lynn Stegner, Bonnie Wai-Lee Kwong, Ronja Ver, Katarina Ericsson, Chris Chafe, and Nancy Etchemendy.

SELF-GUIDED HIKES

Take a hike to learn more about what goes on at the preserve. The two self-guided hikes start at Leslie Shao-ming Sun Field Station, and will take you to stations where you will meet preserve researchers and some points of interest indicated by numbers keyed on the following map and Trail Guides.

Creek Hike

This walk to the creek and back is about 0.8 mile and will take you an hour or even longer if you participate in exhibit stations along the way. You will go down a fairly steep hill and then back up the hill on your return. Take care not to slip on the gravel-covered path. You will learn about Searsville Dam and Reservoir, ants, wildlife, and how Stanford is working to conserve nature.



Lake Hike

This 1.7-mile loop will take you about two-and-a-half hours if you stop at exhibit stations. It is mostly level but has some moderate hills. You will walk by Searsville Dam and Reservoir and learn how whole ecosystems live inside a flower, about the habitats and geology of the preserve, and much more. **Note that for safety reasons children under 14 years old cannot cross Searsville Dam**; you can take the alternate route around the dam which adds 0.2 miles. (Parents carrying their infants in backpacks are allowed to cross the dam.)



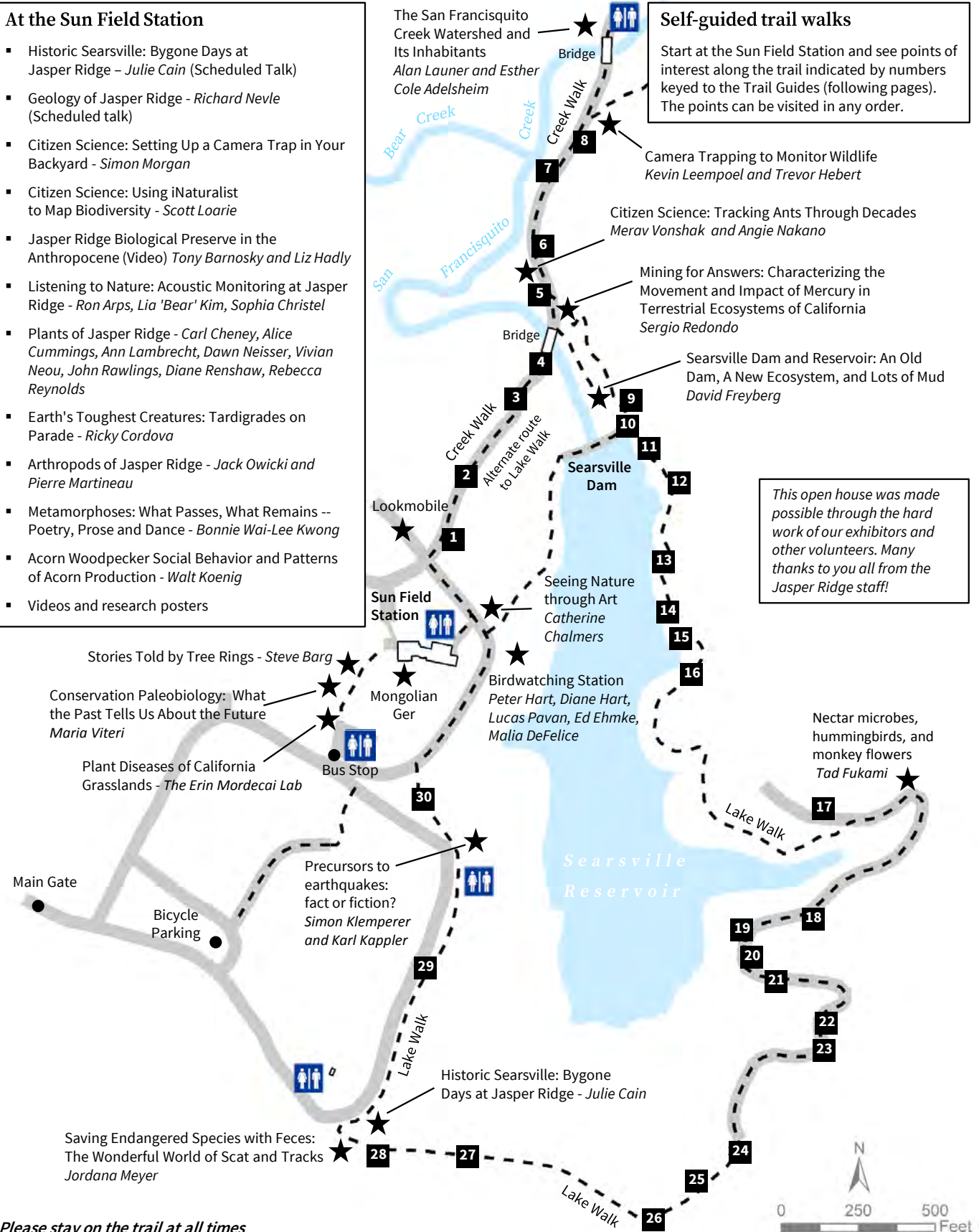
Map of Exhibits and Activities

At the Sun Field Station

- Historic Searsville: Bygone Days at Jasper Ridge - *Julie Cain* (Scheduled Talk)
- Geology of Jasper Ridge - *Richard Nevle* (Scheduled talk)
- Citizen Science: Setting Up a Camera Trap in Your Backyard - *Simon Morgan*
- Citizen Science: Using iNaturalist to Map Biodiversity - *Scott Loarie*
- Jasper Ridge Biological Preserve in the Anthropocene (Video) *Tony Barnosky and Liz Hadly*
- Listening to Nature: Acoustic Monitoring at Jasper Ridge - *Ron Arps, Lia 'Bear' Kim, Sophia Christel*
- Plants of Jasper Ridge - *Carl Cheney, Alice Cummings, Ann Lambrecht, Dawn Neisser, Vivian Neou, John Rawlings, Diane Renshaw, Rebecca Reynolds*
- Earth's Toughest Creatures: Tardigrades on Parade - *Ricky Cordova*
- Arthropods of Jasper Ridge - *Jack Owicki and Pierre Martineau*
- Metamorphoses: What Passes, What Remains -- Poetry, Prose and Dance - *Bonnie Wai-Lee Kwong*
- Acorn Woodpecker Social Behavior and Patterns of Acorn Production - *Walt Koenig*
- Videos and research posters

Self-guided trail walks

Start at the Sun Field Station and see points of interest along the trail indicated by numbers keyed to the Trail Guides (following pages). The points can be visited in any order.



This open house was made possible through the hard work of our exhibitors and other volunteers. Many thanks to you all from the Jasper Ridge staff!

Please stay on the trail at all times

TRAIL GUIDES

Creek Hike, 0.8 mile

Follow the signs from the north side of Sun Field Station down the road that heads steeply downhill. You will walk down to the new concrete bridge across San Francisquito Creek, then turn around and walk back the way you came. **Be very careful of the slippery gravel** as you start down the hill. Expect to spend about an hour on this hike.

1 The large oak trees you see here and behind you at the field station are Valley oaks (*Quercus lobata*), a species endemic to California, meaning it is not native elsewhere. Counting their tree rings tells us that some Valley Oaks in Jasper Ridge are at least 160 years old.



2 Poison oak (*Toxicodendron diversilobum*) is a woody shrub or vine found throughout the preserve. **Don't touch it!** It causes nasty, itchy rashes for most people. Notice the "leaves of three" which make it easy to spot.



3 The holes in the dead oak snag tell you it is a granary (storage) tree for Acorn woodpeckers, a medium-size black and white bird that is common here. They store thousands of acorns each year in holes they precisely peck into certain trees.



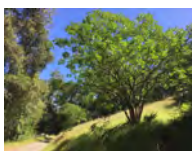
4 This equipment monitors creek flow. Heavy winter rainstorms sometimes raise the water level almost to the bridge.



5 Smile, you're on candid camera. These cameras are mounted in many places in the preserve to monitor wildlife, which trigger a snapshot when they pass by. Cutting-edge technology immediately sends the image to a server where it is processed and then used in various scientific analyses.



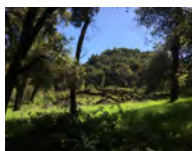
6 California buckeye (*Aesculus californica*), like the oak at station 1, is a tree endemic to our state. In May, it's easy to identify by its blooms of white and pink flowers.



7 From the trail, the **confluence of Bear Creek and San Francisquito Creek** is visible past the forked tree in front of you.



8 Pete Seeger and the Freedom Singers of Atlanta held a folk music concert in the meadow behind the station marker on August 17, 1963. It was part of their "Bon Voyage" tour after Seeger was blacklisted during the McCarthy era. He



went on to become a well-known protest singer whose causes included international disarmament, civil rights and the environment. At the time this area and the nearby lake was a popular recreational venue. A little farther down the road the **Herb Dengler** trail sign commemorates a local naturalist and artist who roamed Jasper Ridge extensively—you can purchase some of his beautiful wildflower prints through the Jasper Ridge Biological Preserve website. The hill in the distance is **Rattlesnake Rock**, an area frequented by the **Muwekma Ohlone** hundreds to thousands of years ago.

Continue down the road until you come to a new concrete bridge, **the Low-Flow Crossing**, which Stanford University installed in 2017 to improve fish passage on San Francisquito Creek. The bridge is the end of the Creek Hike. Retrace your steps back to the Sun Field Station.

Lake Hike, 1.7 mile loop

This loop begins on the north side of Sun Field Station. Follow signed path towards Searsville Dam and walk across the dam if you do not have children under 14-years-old with you. **Children under 14 cannot cross the dam.** You can still take the Lake Hike by following the trail to the Creek Hike, and then taking the marked trail (Trail 14) near Station 5. Expect the Lake Hike to take you about two hours.

9 The cave is a test bore made to determine bedrock characteristics when the dam was built in 1888-89. It has become a seasonal home for bats.



10 Searsville Dam and Reservoir was built by the Spring Valley Water Company with the intent to sell water to San Francisco, but the water turned out to be non-potable. Work began on the dam in 1888 and was completed in 1891. After the 1906 earthquake, Stanford University took over the dam and reservoir and now uses the water for various needs suitable for non-potable applications.



11 The white markers you'll see along the trail have environmental sensors that are part of an ecological research project conducted by Stanford Professor Tad Fukami and his students. They are trying to learn how ecological communities assemble by studying the microorganisms found in the nectar of the sticky monkeyflower (*Mimulus aurantiacus*) and Indian warrior (*Pedicularis densiflora*). Multiple species of microbes, mainly those of yeast, arrive at the flowers by hitchhiking on hummingbirds and insects that pollinate them. Each flower so inoculated becomes a mini microbial ecosystem, which is then analyzed to learn how the order in which microbial species arrive influences the coexistence of species.



12 Mixed woodlands or Broadleaf evergreen forests like those you see here are often found on north-facing slopes. Some key species include California bay laurel, coast live oak, poison oak, and Western leatherwood.



13 This acoustic monitor provides a way to identify species of bats that use the area around the lake. Bats consume large quantities of insects such as mosquitoes and moths, and in so doing provide a valuable ecosystem service for people. The fact that they are nocturnal, flying animals makes them challenging to study, but acoustic monitoring allows detection and recording of the ultrasonic echolocation calls that they make as they navigate and hunt. The calls differ enough from species to species to be used as a reliable method of identification. Sixteen out of seventeen California bat species have been identified using software to analyze the acoustic characteristics of each recorded echolocation call.



14 Woodrat den. The dome-shaped pile of sticks you see is the home of a Dusky-footed woodrat, *Neotoma fuscipes annectens*. This is a subspecies of special concern in California, which means they are afforded special protection. The dens can house successive generations of woodrats, and have separate rooms for food storage, nesting and nurseries.



15 Fish in Searsville Reservoir include six native species like roach, sculpin, and stickleback, and seven introduced species like crappie, large-mouth bass and sunfish. The reservoir also supports many amphibians and invertebrate animals.



16 Western leatherwood (*Dirca occidentalis*) is a rare shrub that is unusually abundant at Jasper Ridge. The species occurs only in the Bay Area, usually on cool, shady slopes with good soil drainage. Leatherwoods form distinctive yellow flowers in the winter. The strong bark, which tears off in strips, and the pliable branches of these shrubs were used by Native Americans for making twine and baskets.



17 The reddish sedimentary rock you see here is part of the Franciscan formation, a package of ancient oceanic rocks that make up much of the geologic backbone of the California Coast Ranges. In a few places, you can see the intricately folded bedding of a rock called chert. Some forms of red chert are called jasper, which possibly was the derivation of Jasper Ridge's name. The chert here originated as silica-rich shells of microscopic ocean creatures called radiolarians sunk to the floor of the Panthalassic Ocean, an ancestor to the Pacific, more than 140 million years ago in the Jurassic Period. The accumulated shells formed horizontal layers of sediment that eventually solidified and were crunched and folded as the Farallon tectonic plate collided with the North American plate, producing the folds you see in the road cut.



18 Holly-leaf cherry trees (*Prunus ilicifolia*) are in the rose family but their leaves look like holly and their fruits are cherries. To further confuse things, their leaves smell like almonds when they are crushed.



19 A wide variety of waterfowl, migrants and residents alike, rely on Searsville Reservoir. This is a good place to see different species of ducks and coots out on the water, or herons and cranes along the shore. Bald eagles occasionally fly over the lake looking for fish.



20 Wireless mesh network (wifi) tower. Look to the top of the hill beside you. In 2009, Jasper Ridge Biological Preserve received funding from the National Science Foundation to install an outdoor wireless mesh network that extends internet connectivity to research projects and devices throughout the preserve, allowing researchers to remotely manage equipment and automatically retrieve data from instruments in the field. This tower is one of 25 stations that form the backbone of the preserve's wireless infrastructure.



21 Chaparral vegetation grows on south and southwest facing slopes, and is well-adapted to drought and fire. Most of the woody species found in chaparral are found only in western North America, suggesting that they evolved here. Chaparral communities cover approximately six percent of California.



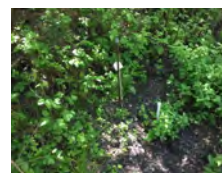
22 Red greenstone. If it is called greenstone, why is it red? Greenstone is a common rock on the southwest side of the preserve. It is a volcanic rock that contains iron minerals that alter to chlorite and epidote, which typically give it a greenish hue. Once exposed to oxidation, though, the weathered rock changes its color to red and brown. So, red greenstone!



23 California buckeye (*Aesculus californica*) is a tree endemic to our state, meaning it is not native elsewhere. In May, it's easy to identify by its blooms of white and pink flowers.



24 This instrument is a piezometer, used to measure the potential energy of groundwater. It is part of a network of similar instruments used by Stanford Professor David Freyberg and his students to understand sedimentation in the Searsville Reservoir watershed.



25 It's not Jurassic Park but it sure looks like it. These straw-like horsetails are in the genus *Equisetum*, an ancient plant that is sometimes referred to as a living fossil, because it is the only living member of a group of plants called Equisetopsida that were abundant 100 million years ago.



26 The riparian woodland and willows

you are walking through show you how fast Searsville Reservoir is filling up with sediment. Twenty years ago, this was open water. The lake is filling up with sediment because the banks of the creeks feeding it are steep-sided, with crumbly rocks that erode easily, in part because they are so tectonically tortured by the nearby San Andreas fault. With each hard rainstorm, the waters run chocolate brown with eroded sand, silt, clay, and gravel, which settles out when it hits the still waters of the lake.



27 Smile, you're on candid camera.

These cameras are mounted in many places in the preserve to monitor wildlife, which trigger a snapshot when they pass by. Cutting-edge technology immediately sends the image to a server where it is processed and then used in various scientific analyses.



28 Middle Lake is on the upstream side of the bridge. Now it is connected to Searsville Reservoir only by the narrow channel under the bridge and is surrounded by marshland, but it used to be a broad, open-water arm of the lake.



29 Site of old Searsville Beach. Before Searsville Reservoir became part of the biological preserve, it was a recreational hotspot for swimming, boating, and fishing. Sand was trucked in to make a beach in the area you are passing by.



30 The small cages are part of an exclosure experiment. In 2009, Stanford Professor Rodolfo Dirzo began a long-term study of the impact of herbivory by large mammals, principally deer and rabbits, on three oak species. For the study, he identified 75 pairs of oak seedlings for each of three species: *Quercus agrifolia* (Coast live oak), *Q. lobata* (Valley oak), and *Q. douglasii* (blue oak). One of each pair is enclosed in a circular wire cage called an "exclosure" to protect it from herbivory. For each seedling inside the exclosure, there is a paired oak seedling outside the cage identified by plastic spikes in the ground near it. If animals eating the seedlings are preventing new oaks from establishing, the oaks inside the cages should survive better than the ones outside. Only time—many years—will tell if this is the case. The ability to run long-term experiments like this is one of the great benefits of Jasper Ridge Biological Preserve.



From here, follow the signs to return to Sun Field Station and the bus stop.

IMPORTANT SAFETY INFORMATION

Poison oak grows along the trails. Take care not to brush against it. It causes a very itchy uncomfortable rash. A good rule for identifying it: "Leaves of three, let it be." See the picture below.



Ticks are common on the preserve and can carry diseases such as Lyme Disease. Watch for ticks on your clothes, do a full-body tick check after being on the preserve (check under arms, hair and hairline, groin), and do not wear the same clothing again until it has been laundered.



Chiggers are tiny bugs that bite particularly around your sock-line and other places where clothing is tight. Tuck your pants into your socks and avoid tall grass to minimize itchy bites.

Rattlesnakes have a poisonous bite. They have a rattle on their tail and a triangular head that is wider than the body. If you see one, back away at least 12 feet and notify a staff member. If bitten, stay calm and notify a staff member to help you get medical attention.

