

Windy Hill Site Guide



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EVs Philosophy and Mission

Philosophy

The Environmental Volunteers believes all children deserve to learn about the natural world through personal exploration, so they can become responsible stewards of the Earth. At the Environmental Volunteers we believe that what children appreciate and love, they will protect.

Mission & Goals

Our Mission: To promote understanding of and responsibility for the environment through hands-on science education.

Our Vision: That all children will learn about and be inspired by the natural world so that they become responsible stewards of the Earth.

We achieve this by:

- Providing hands-on science education
- Encouraging awareness of the interrelationships between people and nature
- Fostering an attitude of stewardship for the environment
- Providing knowledge and skills to children so they can make informed decisions about the environment

Windy Hill Site Guide Objective

This guide provides EVs a detailed outline to guide a field trip at Windy Hill Open Space Preserve. EVs are welcome to also bring their individual knowledge and passions to their hike. For example, some EVs are avid birders, while others are passionate about plants, and still others know the geology. In addition, nature is always changing and so this guide cannot tell you what kinds of tracks or scat you will find or where certain animals will be each time.

Foothills Ecology Program Overview

This hike is a follow up field trip for our Foothills Ecology program. Every class that comes on this trip will have already had a visit from the EVs in their classroom with related hands on learning stations.

California is often known for its earthquakes, and all of that movement has created the amazing foothills that surround the Bay Area. Each set of hills is unique; some covered with majestic redwoods, some with mixed woodland forests, and others with golden grasslands.

Students will learn about the variety of habitats that can be found in the California foothills from grasslands to redwood forests. They will learn about all of the animals that live in these environments and how they interact with each other, including the banana slug, the dusky-footed woodrat and the acorn woodpecker.

Environmental Volunteers Program Overview

The Environmental Volunteers offers a variety of fun and educational learning programs to support environmental education in schools and in the community. Each of our programs supports the organization's mission and philosophy. In addition, we have outlined 6 principals of sustainability that are incorporated throughout our programs, and all of our school programs support teachers by aligning with the California State Educational Standards.

Principles of Sustainability

Sustainability is:

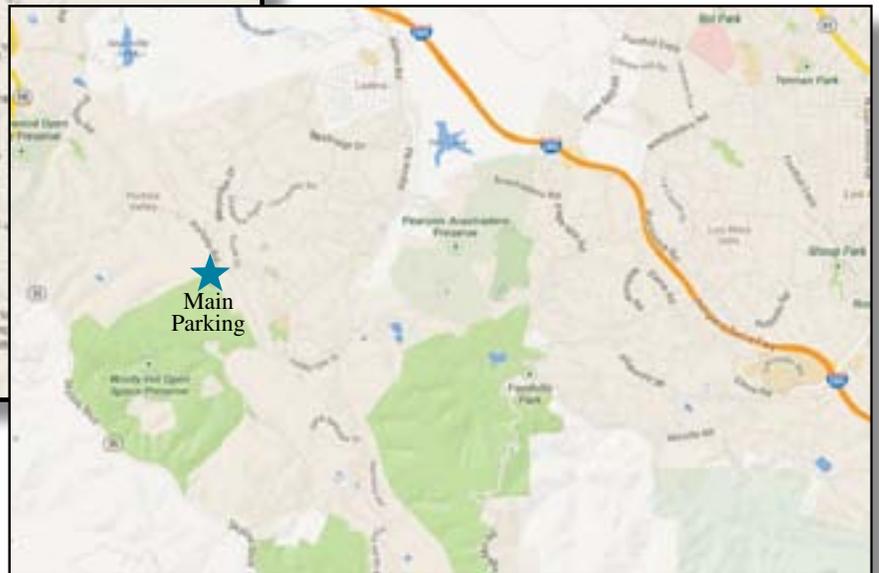
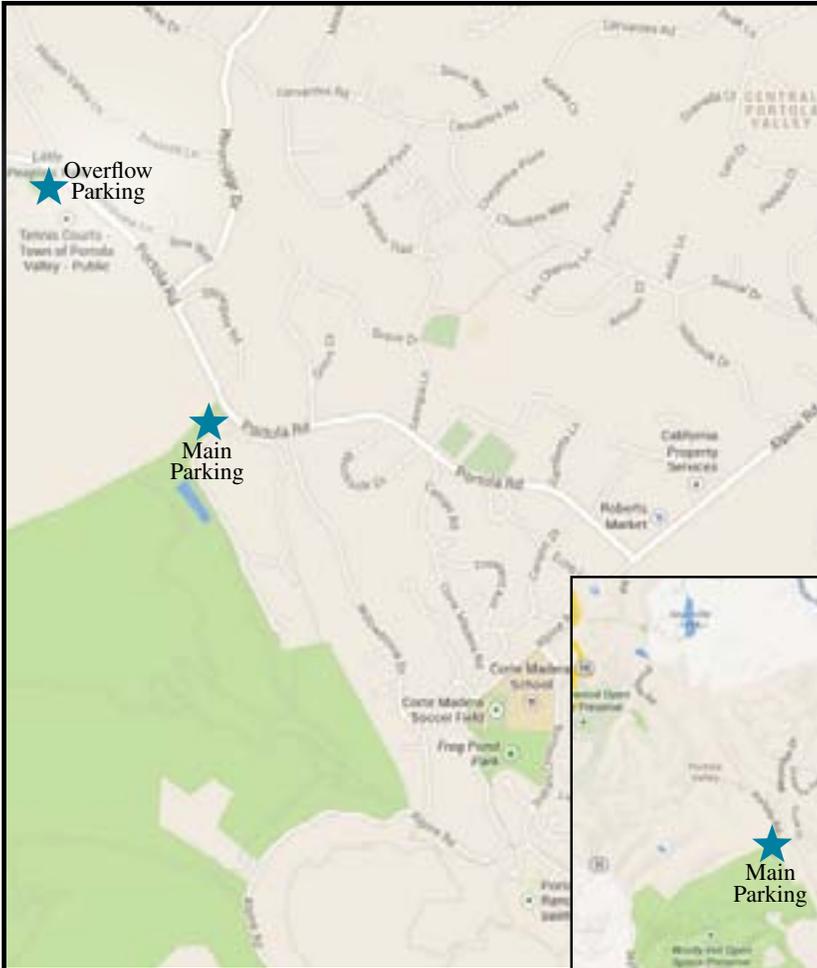
- A. **Preserving** our environment from our backyards and schoolyards, to our native habitats like forests and grasslands.
 - We teach our students to show respect for the land. We stay on hiking trails, pick up litter, and appreciate open spaces.
- B. **Restoring** our environment, wherever possible, from human impact, and assisting with the recovery of the species that live there.
 - We teach our students to respect habitats and the wildlife they support, and to understand the benefit of restoration projects and nature's ability to restore itself.
- C. **Practicing** responsible use of our planet's resources in sustainable and appropriate ways, leaving them in good shape for future generations.
 - We teach our students about the full cost of the choices we make in our lives, what resources we use to build our homes, grow our food, and support our daily lifestyles.
- D. **Conserving** the resources of our planet, to "walk lightly" upon the Earth.
 - We teach our students the importance of and techniques for using fewer resources, and to use our resources more efficiently.
- E. **Understanding** the beauty of our planet, the elegance of natural systems, and the interconnectedness of all its parts.
 - We teach our students the structure and function of the world around them, which creates the foundation for understanding the complexities of sustainable living.
- F. **Possible!** If we empower ourselves to make change, our efforts will make a difference.
 - We teach our students that California is a leader in sustainability reforms such as energy conservation and extensive recycling programs. As Californians, we are role models to our friends, our neighbors, our countrymen, and our planet.



Environmental Volunteers

Windy Hill Open Space Preserve Foothill Ecology Field Trip

Portola Road
Portola Valley, CA 94028



Directions:

From Highway 280, exit Alpine Road in Portola Valley. Go south on Alpine Road about 2.9 miles to Portola Road (the first stop sign). Turn right on Portola Road and travel 0.8 miles to the parking lot on the left side of the road.

Please note: This parking lot on Portola Road fills quickly. Overflow parking is available at the Portola Valley Town Center, approximately 0.4 miles north on Portola Road. Please do not park on Portola Road! Parking is strictly enforced.

PREPARING FOR YOUR TRIP

WHAT THE STAFF DOES:

The School Programs Manager will call the park to request a permit for the specific day of the trip. Once they approve, she will send a copy of the permit to the Lead EV. The Lead EV is required to carry a paper copy of the permit with them during the hike.

WHAT **ANY** EV ON THE TRIP DOES:

One EV stops at the materials room and picks up a field trip backpack.

WHAT EACH EV ON THE TRIP DOES:

Each EV should prepare his/her own field trip pack. This includes:

- Yellow laminated emergency procedure card
- Water bottle
- Materials for any trail activities you may want to use. (This will be unique for each person. See a list of ideas starting on page 4)

For directions, see the map on the opposite page.

BEFORE STARTING YOUR HIKE

WHEN THE BUS ARRIVES

The lead greets the teacher and helps coordinate pairing a group with their EV. Bathrooms are at the start of the trail. Students should use them now if they need them. There are no bathrooms on the trail.

ORIENTING YOUR GROUP

Always start your trip by introducing yourself and setting up your expectations with your group.

Brief your adult chaperone

- Thank you for coming. Your help is needed to make these field trips fun and safe. I hope you will enjoy yourself, too.
- When we walk down the trail, I will take the lead to show everyone where we are going. I need you to take up the rear to make sure we don't have any stragglers.
- Today is a fun day for students. You are welcome to ask questions, but please let students ask their questions first. (Don't be afraid to remind the parent of this point if they start taking over.)



Windy Hill Open Space Preserve Permitted Trail Use

Trails for EV Use



Brief your students

- We are going to have fun exploring this beautiful habitat.
- When walking down the trail, stay behind me because I know where we are going.
- What will the animals do if we rush down the trails running and screaming? They will run away. So we are going to stay on the trails and be quiet so we can see the most wildlife possible.
- We are going to see a lot of things on this trip, but we will also hear, smell, and touch this environment. We will also return everything we examine to exactly where we found it (unless it is litter) because something in this environment can use it.
- Pick a name for your group. (Give students some guidelines, such as picking a color and an animal — e.g., The Purple Banana Slugs.)

This is a loop hike. It does not matter which direction you go around the loop. However, the whole loop is 1.6 miles long. This is farther than most groups (especially the younger students) can comfortably finish in 2 hours.

For a shorter hike, you can follow the Betsy Crowder trail until you reach the grasslands/ chaparral area. After talking about this habitat for a bit, retrace your path and then follow the very beginning of the Spring Ridge trail to Sausal pond. Some groups can switch the order of this hike to keep everyone spread out.

See the map on the opposite page for trail references.

Prevent Sudden Oak Death — Clean Your Shoes

To help prevent the spread of Sudden Oak Death please make sure your group uses the shoe brushes at the start of the trail at both the beginning and end of the hike. While there are many ways the disease moves from place to place, the primary way hikers transport it is in the dirt and seeds on our shoes.

TRAIL OVERVIEW

The very first part of the trail is a short spur between the parking lot and the main trail. Here, some things you can see include sapsucker holes in some of the trees, coast live oaks, lichen, coyote bush, poison oak, poison hemlock, buckeyes, decomposers, and fallen logs.

At the T, you can go either direction. Starting to the right, walk a few feet and then turn left through the horse gate onto the Betsy Crowder Trail. This trail starts up the hill, which is not too steep. You will be into the mixed woodland right away. Along this section, you can see eucalyptus, California bay laurel, poison oak, turkey tails, ferns, soap root, and, during the spring, miners lettuce, bedstraw, and a wide array of wildflowers.

About 3/4 of the way along the Betsy Crowder Trail, the vegetation opens up to a grasslands/ chaparral habitat. This is a good example of succession as you can see the chaparral plants are moving into the grassland area and changing the habitat. This is a completely natural change. In this area you can see coyote bush, oak trees, wild cucumber, and thistles.

At the end of the Betsy Crowder Trail is another horse gate, and then a T-junction with the Spring Ridge Trail. Turn left and head down the hill. This is a pretty steep hill, so take it slowly. At the bottom of the hill, you come to another junction. There are two trails to the left. The Sequoia's trail goes down to the neighboring community. You want to stay on the Spring Ridge Trail, which is the one on the far left.

The last section of the trail is a wide, flat trail. There is a hill on one side, and on the other side you can see a depression that leads down and opens up into Sausal Pond. Along the trail, you can see mistletoe, madrone, teasel, oak trees, and oak galls.

At Sausal Pond there are a couple of places where you can get a closer view of the water. Look for the Acorn Woodpecker granary, redwoods (planted in the Sequoia's neighborhood), lizards, cattail, mergansers, ducks, and turtles.

Finally, return to the spur trail that takes you back to the parking lot. All along the trail you may see rabbits, deer, squirrels, scrub jays, songbirds, and lizards.

Remember, you can take the loop in either direction and you do not need to complete the entire loop.

Mud Warning

This trail can be quite muddy during the rainy season. If horses are currently not allowed on the trail, you will certainly be encountering mud. The worst sections are on the Spring Ridge Trail from just past the Sequoia's neighborhood to where it connects with the Betsy Crowder Trail on the far side of the loop. On muddy days it is best to avoid these sections and stay on the drier parts of the trail.

ACTIVITY GUIDE

Traditional guided hikes usually take the format of walk a while, then stop and listen to your guide give a short lecture about what is found in that place. While informative, this approach does not embrace the hands-on approach of EV programs and also provides little support for student retention of the information.

Instead, EV hikes should be a collection of engaging activities to encourage observation, critical thinking, and overall deeper experiences with nature.

The following is a wide variety of activities that you can choose from for your field trip. Additional information about some of these activities and additional activities can be found on the EV Wiki.



Orange Poppy

Color Detectives

Pass out colored paint chips, a different color to each student. Greens are obviously easy—so ask the student to match the shade closely. Blues and purples will be harder—especially outside of wildflower season. Ask the students to try to find the color that is on their paint chip somewhere along the trail. When they find something that matches their color, discuss that object with them. Is it living, non-living, or once living? Try to discern what it is and talk about it, if you can recognize the object. For instance, a yellow leaf fallen from a bay tree. How does it resemble a banana slug? Does it have the same smell as the green leaves? Did you expect to see something this yellow and not a flower

out here? Then encourage them to discover a different object along the trail to match their paint chip. (Let the students know ahead of time that you will collect the paint chips at the end of the hike as you will need to use them again. This may discourage littering along the trail.)



Black-tailed deer

Deer Walk

Explain to the children that deer walking normally always step in the same spot with their back foot as they stepped with their front foot. This is called "registering". Lead the students down the path asking them to see if they can step only on the spot where the person in front of them stepped. Remind them that deer are very quiet, turning their big ears in all directions so that they can detect danger coming. Have the students cup their hands behind their ears to make "deer ears". Walk quietly down the trail and listen for what you may hear. When you stop, what sounds did you hear?

Digging Duff

Duff is plant materials that is decomposing into good, rich soil. How many different kinds of creatures can you find living in the duff? Find a place near the path where you can dig into the duff. Use your hands, a trowel or stick to measure how thick it is. Look for signs of arthropods, amphibians, and small mammals here. You may want to pull out a bug box to take a closer look at some of your smaller discoveries. Be cautious about handling centipedes, spiders, or unknown bugs barehanded. You may want to use a small flashlight to illuminate your discoveries if you are working in a dimmer area. (Note: Please return all critters to their habitat when you have finished observing them, and replace the duff as nearly as possible to its original state.)

Goldback Glamour

Docents should take one goldback fern and place it gold side down onto the clothing of a student who is wearing dark colors. Give the leaf a small pat, and you will get a perfect picture of a fern print. This leaf can be used two or three more times on other students before the spores run out. Try not to use more than one leaf; the other students can participate in other activities.



Mushroom

Group Observations

When you find something you want your group to observe closely, divide your group in two. If needed to protect the object, put it in a bug box, or on a tray (like a clipboard). Have one-half of the group gather around the object in a tight circle and kneel down. Have the other half stand in a circle around the kneelers.

Ask the group that is standing to ask questions of the inner circle about what they can see. Using the banana slug as an example, some types of questions might be what does the underside look like? Can you see anything inside the hole on the side? What does it feel like? Students in the inner circle make observations to answer the questions. After several questions, have the two groups switch places.

How Do You Do?

Stop at a plant that you know well. Ask the students, what you do when you meet someone new? They should answer that you say “Hi” or “How do you do?” or ask questions to get to know the person, etc. We’re going to do the same thing with this plant. Explain that you can speak the language of the plant, and you can translate its answers.

Hand out question cards to the students to help them think of what to ask. (It also makes sure they ask questions that you know how to answer.) The following are examples of questions and the sort of answer you might give.

What is your name? (Common name, nicknames)

How old are you? (Estimate age of plant, typical life span)

What do you do? (Producer — make lots of things sugars, chemicals (e.g., smells), fruit, etc.)

Where do you come from? (Native plant or introduced to the region)

Where do you like to live? (Preferred habitat)

Who are your friends? (Who pollinates the plant; provides nutrients (e.g., decomposers); seed distributors?)

Who are your enemies? (Who eats the plants? What damages the plant?)

Who are your neighbors? (What other plants tend to live nearby, or are actually near this plant?)

Are you a boy or a girl? (Does this plant have male and female parts on the same flower? Different flowers on the same plant? Different flowers on different plants?)



Carpenter Ant

How Fast Is It Going?

Find an ant trail. Have each person in the group “adopt” an ant and figure out how fast it is moving.

Measure out a foot along its trail, time how long it takes the ant to travel that distance. How long do you think it would take this ant to go 1 mile? Let students guess.

With a small calculator (available on many cell phones), do the following calculations:

seconds to travel 1 foot x 5,290 feet per mile ÷ 3,600 seconds per hour = time to travel 1 mile.

Example: If it takes an ant 5 seconds to travel 1 foot, then that ant will take 7 hours and 20 minutes to go a mile.

(To find the MPH, take 1 divided by your final answer. In our example, $1 \div 7.33 = 0.14$ MPH)



Western Scrub Jay

Jays and Juncos

Give each student a paper cup “nest.” Pick one of your students to be the jay and the rest to be juncos. The jay must close their eyes while the juncos go off to build nests (hide their paper cups). The juncos then come back to the EV standing near the jay, get some food (1 small dried bean) and take it back to the nest. After some time, the jay is allowed to open his/her eyes and search for food. The juncos continue to go back and forth collecting food. When the jay finds a nest with food in it, they dump the beans into their own “nest” cup. After some more time, have the juncos go collect their nests and come back to the group. Explain that all birds need food to raise their young. Juncos need 3 beans for each young. Jays need 5 beans. Discuss strategies for hiding and protecting nests, and strategies for finding nests.



Life on a stick

Life on a Stick

Find a stick covered in lichen and moss. Have students count how many different species they can see on the stick. What starts as 1 or 2 usually becomes half a dozen or more. Most of what you find will be moss, lichens, or fungi (and bugs!). There are many species of lichen and moss and they can be hard to tell apart. In general, moss is moist, dark green, and looks “leafy” or plant-like (they are a plant after all). Lichen grow in a variety of colors, have a drier appearance, and have a variety of structures. By and large, anything that looks different is a different species —so count them!

Magic Ring

Have each person take a yarn ring (made from about 18” of yarn) and lay it on the ground near the trail. Caution them to find a spot without poison oak (and help them to do so if they need assistance). Explore this “mini-ecology” for different leaf shapes, seeds, decomposers, animals, etc. using all of the senses. How are all of these things connected? i.e., producers, consumers, decomposers, including water and energy. How are you connected to your circle?



Smaller than a penny

Penny Hike

Pass out a penny to each student in your group and challenge each of them to find at least three different things that fit on their penny. They do not have to collect these, but can show you each item. If they do pick the object up, then ask the student to put it back where they found it when you are done. Ask them not to pick any parts off of plants. Make a list of the different items found. When they have finished, ask if they are surprised to find so many small treasures on their hike. Which of the items they found are living or were once living? Which were non-living?



Turkey Tails on a log

Rolling a Log

Old logs can be good hiding places for lots of cool things. When rolling a log, **always roll it towards you!** That way anything underneath, like a snake, is able to flee away from you, rather than feeling trapped between you and the log.

Some things you may see include:

Slender salamanders — a few inches long and very slender with tiny legs. These amphibians are safe to pick up and let the kids touch or hold. Be sure to have them wet their hands first as salamanders need to remain moist.

Insects of all varieties — count how many species you can see. Do you see any insects that are in different life stages (larvae)?

Mushrooms — on all sides of the logs. The portion we see is the fruiting body (the part that sends out the spores to make more mushrooms). Most of the organism is underground or in the body of the log. Commonly seen are Turkey Tails. These are on the sides of the logs. They are fan-shaped and have a striped coloration that makes them look like turkey tails.

RUN!

This activity is great for managing an energetic group, although there isn't a specific educational purpose. In an open area (along the Spring Ridge Trail where it is wider is a good area), point out an object some distance away, a rock, a tree, etc. Tell the students to run to it, run around it, and run back to you. This expends some excess energy and helps the group to better focus on you. Make sure there aren't other hikers on the trail when you do this.

Scat Mystery

When you find scat on the trail you have two mysteries to solve 1) who made it, and 2) what did it eat? Make observations to solve your mystery. Can you see the fur or other things in the scat? If the scat is very dry, you may even pull it apart and look for bones or seeds. If you find anything, what did it come from?

Animals like coyotes use their scat to mark their territory, so it is usually right in the middle of the trail. Other animals are trying to hide their location, so you are more likely to find it under a bush or otherwise hidden. If there is not much in the scat (no bones, fur, seeds, etc.), this animal is likely an herbivore that chews its food multiple times (deer, rabbit, etc.).



Spider web

Spider Jewels

Find a spider web that is dry. Ask the students to make observation about what they see. With a spray bottle of water, spray the web lightly so that your group can see the extent and intricacy of the workmanship. Now ask the students if they see details that they couldn't see before. Early morning dew often collects on the webs in just this way. The moisture soon dries and the spider's trap is again invisible to its prey.



Bird song

Sounds Around

Have everyone sit or stand quietly and close their eyes. Listen to all of the sounds around you. How many can you count? Have each person name one sound that they heard and what they think made it. Ask did they heard a sound that would not have been heard here two hundred years ago? Ask them if they heard any sound that they thought might not be heard one hundred years from now in this spot?

Unusual Scavenger Hunt

Give each student a card with an intriguing item to find on your hike. These items may not be immediately obvious. Feel free to make up your own, but some examples include:

- A plant that looks like a feather
- Something an animal left behind
- A plant that doesn't make a flower
- Something tiny
- Something that never met its mother
- Evidence that something was hungry
- A partnership
- Something that makes you say, "Wow!"
- Something fuzzy but not furry



Leaf in the sun

Vapor locked (A transpiration activity)

Bring two small plastic Ziplock baggies. Into the first baggie put a small or waxy coated, arid-adapted leaf. Into the other, put a riparian broad leaf. Seal the bags and expose them to sunlight as you hike. Compare the moisture in the bags at the end of the hike. There will be a visible difference in the amount of water loss between the two leaves. The larger leaf will lose more water. Have the students tell you why they think this happened.

The leaf from the arid habitat needs to conserve its water as much as possible because there isn't a lot of water in the environment. The riparian leaf doesn't work to conserve water because there is plenty in its environment. It takes a lot of energy to create the adaptations that allow the other leaf to conserve water.

Walk and Talk

Organize students in pairs (or a group of 3 with an odd number). Before you start walking to the next point on the trail, ask a question of the group. Make sure it is not a simple or one word answer. As you are walking to the next spot, the students should discuss their thoughts with their partners. When you arrive at the next spot, have the students share what they discussed. It is great to make a connection between the question and the new spot where you arrived, but it is not necessary.

Examples of good questions:

- What makes up a habitat?
- What do decomposers do for our environment?
- Why do birds sing?
- What do you notice that makes you wonder?
- How might this site look different if we come at a different time of year?
- What kind of animal might live in this area?
- What do you think this area will look like in 50 or 100 years?
- How will this site be different if we come at night?
- Water is easy to find in a riparian area. What might be hard to find?
- Why might something choose to live on a steep hill?
- How do plants have to adapt so they can stay on the hill?



Eucalyptus seeds

Which One Is Mine?

Choose any kind of natural object: rocks, acorns, leaves, etc. Have each student find one of that object on the ground. Find one for yourself as well. Each student must look closely at their object and get to know it. They should familiarize themselves with every little detail. You do the same with yours. When they feel they know their object, collect them in your hand with yours. Turn around and mix them up. Now ask students to see if they can find their object again. When they select an object, ask how they know it is theirs.

The goal, after everyone has taken their object, is for yours to be the only one left. The main message is that everything in nature is unique even if at first an object seems the same.

Who's the Farmer Here?

While exploring a plant ask, "Who's the farmer here?" Have everyone offer answers to the following questions: Who waters the plant? What happens during our long hot summers? Who plants the seeds? Who helps plants reproduce and gets a meal in return? Who tills the soil? Who eats the produce? Discuss comparisons between natural systems and farm culture. Repeat the discussion for a different kind of plant (e.g., do the activity once for a tree and once for a wildflower).

MASTERING THE NON-ANSWER

When a student asks a question, it is tempting, even instinctual, to answer the question. However, there are often ways to guide the student to the answer without giving the actual answer — resulting in better connections to the information. Here are some strategies:

- 1) When a student asks a question, respond with, “What do you think?”
- 2) Guide observations: “What do you see/hear/smell? What does that tell you?” This is good for “Why?” questions.
- 3) When you get a question about identification of a species, ask, “Imagine you are the first person to encounter this {plant, animal, organism}, and no one in the world knows what it is. How can we decide what it is? How can we make sure that the next person that sees it knows it is the same as what we saw?”

For any of these strategies, after you have gone through this process, if there is additional information to impart, go ahead and do so.

The following are a couple of scenario examples.

Birds

You could encounter any number of bird species on this trip, and students will often know only a few of them. Have students make observations about the birds. How big are they? Are they singing? How are they interacting with each other — are they trying to get another bird to leave? These are the kinds of things birders study to help them identify a bird. If the birds are at a distance or in the shade, color or beak shape is harder to spot — but if you can see these features, it is good to note as well. See if the students can determine a general category of bird (raptor, songbird, duck, etc.). If they think the bird is sort of like a _____, but not quite, have them identify what the differences are (e.g., a coot is not a duck but it’s pretty duck-like). Ask if the students can think of birds they know from a category. They may have studied some in the EV classroom program. At the very end, identify the bird for the students (if you know it).



2 holes - left is likely an insect and right is likely a rodent

Holes

There are many holes to be found in the environment. Ask students who they think made the holes, and *why* they think that. *Why* is important because it gets students to think more deeply about their observations.

Most often you will find insect and rodent holes. Differences include size and the amount of dirt around the hole. Sometimes students will suggest a snake made a hole. Ask, how do they think the snake dug the hole? Some students may suggest the snake used its fangs. You can point out that their fangs are too fragile for digging. Lead students to realize that snakes only use the holes others have made.

GLOSSARY OF FUN FACTS

The follow are some fun facts about the various species you may encounter on this trail.



Banana slug

Banana Slugs

If you find a banana slug, you can put it on a piece of clear plastic, or wet your hands and just hold it on your hand. Ask students to make observations about what they see. Students can wet their hands and touch or even hold the slug. Wetting your hands is important because the banana slug's skin must stay moist.

Banana Slugs are decomposers, eating things like leaf litter, which breaks it down and returns it to the soil. The bright yellow color is a warning to animals that they don't want to eat it. They are so slimy they will get stuck in an animal's mouth. Raccoons have learned to roll the slugs in dirt first to prevent this.

Banana Slugs have two sets of tentacles, the longer pair can sense light and dark and the lower pair sense chemicals or "smells." The front half of the slug is covered by the mantle. This is a remnant of the shells of their relatives; snails and mollusks. They have a breathing hole on one side of their body and they have as many as 27,000 teeth in their tiny little mouths.

Bedstraw

This plant was once used to stuff mattresses, which is how it got its name. Seen in the spring, it has elongated leaves that grow 6 around the stem every inch or so. Pull a piece up and toss it on a student. It will stick to their clothes because it is covered with velcro-like hairs. The plant itself has very weak roots that don't provide support to the plant. Instead it grabs onto neighboring plants to hold itself up.

Buckeye

The buckeye is adapted to the dry season by leafing out as early as January and then dropping its leaves in June. The leaves are compound (meaning they have multiple smaller leaflets in each leaf) and have five leaflets arranged like fingers on your hand. The seed is large and looks like a buck's eye. It falls and rolls away from the tree. At certain times of the year you can find one that has sent out the initial root. The Ohlone used the seeds as a backup to acorn mush. Buckeyes need a lot of leaching and don't taste as good as acorns.



California bay laurel

California Bay Laurel

The California bay laurel is native and related to the Mediterranean bay tree, which provides the bay leaves we buy in the grocery store. The California bay can also be used in cooking, but it is even more potent. We don't eat the leaves; we just let them flavor the soups and sauces we make. Thus, sometimes we call this the spaghetti sauce tree.

Crumple up a leaf and let students smell it. Why would a tree make such a potent smell? In this case it is a warning. If animals like insects

and deer eat it, they will end up with an upset stomach. When they smell these leaves, they leave them alone. As a result, the leaves are often in pristine condition. The Ohlone used bay leaves to keep bugs away and to clear their sinuses.

During the fall, you can find the nuts. Break one open and show students how similar they are to another familiar California tree – the avocado.



Coyote bush - female flowers

Coyote Bush

These bushes are special because they have male and female plants. When not in bloom they are very hard to tell apart. The male has small yellow flowers similar to baby's breath. The female has white flowers, about a centimeter long. At first these flowers are narrow, but later in the season they frizz out. Some describe it as a bad perm, which can help you remember which is male and which is female. The male and female plants are usually near each other.

So why is it called Coyote Bush? There are different ideas. One is that the frizzy female flowers are also supposed to look like a coyote caught its fur on a branch. Another is that the bush is highly adaptable like the coyote. This plant can be found in a wide variety of places, but it does particularly well in hot, dry habitats like the chaparral.



Gopher mounds

Gopher Holes

Mounds of dirt found throughout a field are gopher holes. Remind students not to stomp on the dirt mounds, as these are the gophers' homes. We know these are made by gophers because the holes are covered up. Moles don't bother covering their holes and California ground squirrels tend to excavate around their holes so they are almost funnel-shaped.



Granary tree—close up

Granary Tree

On the Spring Ridge Trail near Sausal Pond, there is a granary tree. Have students look at the trunk and tell you if they see something unusual. The trunk is covered in holes, many of which are filled with an acorn. This is a granary tree of an Acorn Woodpecker family.

The birds need to work together in order to maintain the granary. They need to drill the holes, collect the acorns, defend them from intruders like squirrels and jays, raise their young, etc. Oak trees only produce acorns for part of the year, so the woodpeckers have to collect enough to last all year. During the year, the acorns dry and shrink making them loose in the holes and easier for others to steal. Woodpeckers will check the acorns regularly and move them to a smaller hole as needed.

Lichen

Lichen is a mutualistic relationship of a fungi and algae living together. Fungi provide the structure and draws water and nutrients from the surroundings. Algae perform the photosynthesis to feed both species. There are a wide variety of lichen, with different colors and shapes.

Miner's Lettuce

During the rainy season, Miner's Lettuce is abundant. This plant got its name during the gold rush when the miners often ate it to stave off scurvy. It is very high in vitamin C. When things dry out, there will be no sign of the plant.



Turret Spider turret

Turret Spiders

Along an exposed slope you can usually find the turrets of Turret Spiders. Turrets can range in size, but can reach as much as 3/4 inch in diameter. The spiders are usually not seen as they hide in their burrows at the base of the turret.

The turret is how this spider spins its "web." They typically hunt by waiting for vibrations of their prey (insects) that walk by their burrow and jump out to grab it. Female spiders spend their entire lives (up to 16 years) in and around their burrow. Males travel once when they are 8- or 9-years-old to find a mate and then they die.



Sapsucker holes

Woodpecker holes

There are three types of holes that various woodpecker species make. Woodpeckers that eat bugs listen for the bugs under the bark and then peck a hole at the sound. Their holes are small and scattered. Sapsuckers peck holes to get the sap to flow. Because the sap is everywhere on the tree, they make their holes in even rows. Acorn Woodpeckers have to store acorns so they have food all year round. Their holes are large enough to hold the acorns and grouped together on a single tree to make a granary.

Woodrat nest

Woodrat nests look like large piles of twigs. A nest gets used again by the next generation of woodrats, who continue to add to the nest, so it can get to be several feet high.

A NOTE ON CLASSIFICATION SYSTEMS

Ecologists use a classification system to help organize what they know about different species and how species are similar or different. You may be familiar with the seven levels of classification: kingdom, phylum, class, order, family, genus, and species. This is important for professional ecologists who are studying how organisms are related. The classification system also leads to the Latin name. Every scientist in the world uses the same Latin name, which helps with communication about each organism.

However, our goal on the field trip is to engage students and inspire them to appreciate and love the plants and animals they are learning about. (See the philosophy and mission on page iv) Consider two approaches to teaching about the same tree.

- This is *Umbellularia californica* of the family *Lauraceae*. This is the same family as *Persea americana*.

Versus

- This is the “Spaghetti Sauce tree.” It has wonderfully smelly leaves that we use in cooking things like spaghetti sauce. The smell is a warning to animals to not eat the leaves. It is in the same family as the avocado and we call it the California Bay Laurel.

Which version is the most interesting and memorable? Which is more likely to inspire a student to grow up loving their environment and wanting to protect it as an ecologist, an environmental lawyer, or maybe just an environmentally conscious citizen? The EV does not specifically teach Latin names or formal classifications. We teach common names (California Bay Laurel), nicknames (“Spaghetti Sauce Tree”), and general groupings (evergreen tree, member of the avocado family).

GLOSSARY

Adaptation:

A behavior or physical characteristic that helps a species to survive in its environment.

Carnivore:

A species that eats meat.

Chaparral Community:

An ecological community with little available water and comprised mostly of shrubby plants.

Climate:

Typical weather trends over time such as mild winters, dry summers.

Competition:

One individual prevents another from using a resource, such as food, mates, territory, or nesting sites.

Consumer:

A species that must find or hunt for food.

Cooperation:

Two or more individuals working together for mutual benefit.

Decomposer:

Any organism that helps to break down dead material to return its components to the environment.

Duff:

Layer of plant litter found under trees in forest communities.

Ecology:

The study of the interactions of organisms between each other and their surroundings.

Environment:

All surroundings both living and non-living.

Erosion:

The process of wind and water breaking down rocks and landforms.

Extinction:

When all individuals of a species have died.

Grafting:

A process of connecting one part of a plant onto another so they grow as one organism.

Grassland Community:

An ecological community dominated by grass species.

Habitat:

Place where an organism lives.

Herbivore:

A species that eats plants.

Invasive:

A non-native species that becomes well established in a community to the detriment of the native species.

Invertebrates:

Animal species that do not possess a backbone.

Lichen:

An organism made up of an algae and a fungus growing in a mutualistic relationship.

Mixed Woodland Community:

An ecological community dominated by a variety of tree species.

Native:

A species indigenous to a particular community.

Niche:

The role of a species within their environment.

Non-native:

A species not originally belonging to a particular community.

Omnivore:

A species that eats both plants and meat.

Organism:

An individual of any living species.

Parasitism:

An intimate relationship between two species where one species benefits and the other is harmed.

Predation:

A relationship where one organism kills and eats another organism.

Predator:

The individual that kills and eats another organism.

Producer:

A species that is able to manufacture its own food.

Prey:

The individual that is killed and eaten by another organism.

Relationship:

The way in which two organisms interact with each other.

Riparian Community:

An ecological community growing near, or on the bank of a waterway.

Scavenger:

A type of decomposer that forages for dead material and digests it similarly to a carnivore.

Species:

A group of organisms that share a unique group of common characteristics. In most cases individuals within the group are capable of mating.

Succession:

The natural process by which one ecological community transforms into another.

Topography:

The configuration of a surface, including its natural and man-made features.

Watershed:

All of the land that drains its water into the same body of water.

Weather:

The status of conditions such as temperature, precipitation, wind, etc. at a given time.

SUGGESTED FIELD GUIDES

This guide intentionally does not have extensive information about the species found in the foothills environment. Information about particular species that are important for a particular learning station is found in the write up for that station. Beyond that there are a number of excellent field guides published covering the whole range of species. These guide provide far more depth and quality of information than can be reasonably produced within this guide. The National Audubon Society and Peterson Field Guides are two reputable publishers. In particular, here are some guide books we recommend.

- The Sibley Guide to Birds by David Allen Sibley
- The Audubon Society Field Guide to North American Trees: Western Region
- National Audubon Society Pocket Guide: Familiar Animal Tracks of North America
- Peterson Field Guides: Western Reptiles and Amphibians
- The Audubon Society Nature Guides: Western Forests

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PHOTO CREDITS

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