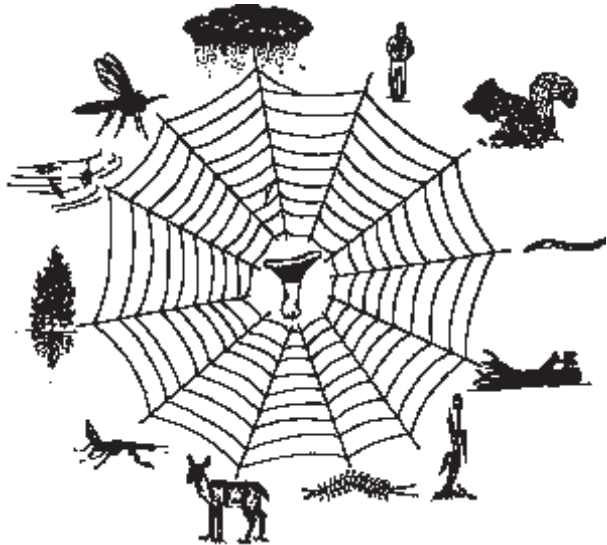


Continue connecting the children with string as their relationships to the rest of the group emerge. Bring in new elements and considerations, such as other animals, soil, water and so on, until the entire circle of children is strung together in a symbol of the web of life. You have created your ecosystem. Remember that the sun and water are essential in all forms of life on our planet.

To demonstrate how each individual is important to the whole community, take away by some plausible means one member of the web. For example, a fire or a logger kills a tree. When the tree falls, it tugs on the strings it holds. Anyone who feels a tug is in some way affected by the death of the tree. Now everyone who felt a tug from the tree gives a tug. Now everyone continues until every individual is shown to be affected by the destruction of the tree. Another example is an oil spill. How does the oil affect the different members of the web. What happens to the otter's fur during an oil spill? If the otter dies, how is the population of the invertebrates it feeds on affected? What happens to bird life during an oil spill? How are the food sources of the bird affected? I'm sure you can think of lots of things that affect the different members of a food chain and ultimately the web of life.



I like to finish a walk with a quote or poem, something that will provoke or inspire the listener.

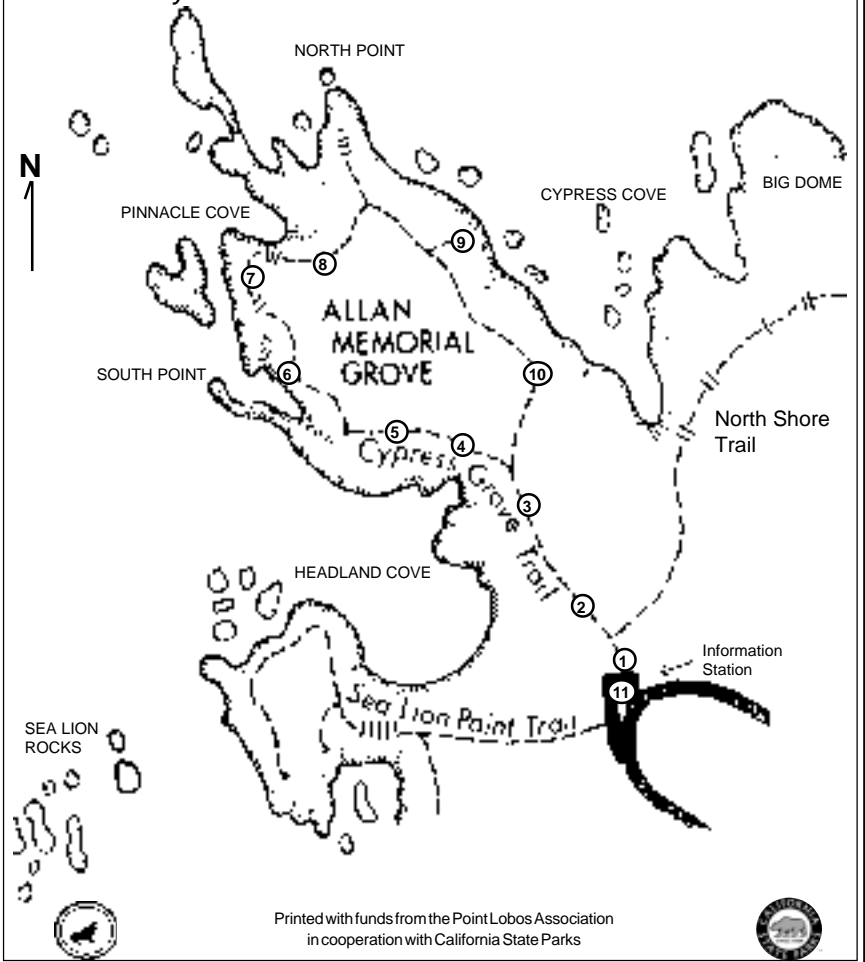
*"The single thing man must do above all else is develop a balanced relationship with the earth, for this planet is our only home. Either we use it and cherish it with every capability, or life itself will lose its tenuous hold on this small part of the universe."*

**David Cavagnaro, Living Water**

# Cypress Grove Nature Walk

## Theme

*The Cypress Grove Trail will provide you an opportunity to explore several different plant communities as you walk this .8 mile loop. The cypress grove, coastal scrub and kelp forest are the three dominant communities you will see.*



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in cooperation with California State Parks

## STOP # 1 Introduction

Start at the information station near the trailhead. The area is large enough for your group to gather around you. Talk about what the walk will be like. Always make sure the students understand the rules of the reserve that help protect them and the reserve. Poison oak is very evident on the west side of the trail, so it's very appropriate to make sure all the students recognize this plant.

### "Leaves of three; let me be."

smooth reddish brown stems, small white flowers or tiny green berries

grows as a shrub, ground cover, or even vining up trees

leaves are bright green in the spring turning to red and orange in the fall



If you've been in "touch" with poison oak **REMEMBER** to wash thoroughly with cool water and lots of soap.

**STOP # 2** Walk from the trailhead about 100 feet up the trail. You will be standing in an area that gives you a panoramic view the coastal scrub plant community.

### SUBJECT: The Coastal Scrub Plant Community

The varied plants of this community have adapted over thousands of years to living in this area. Rainfall is moderate during the winter months, about 15 inches per year. The plants are constantly exposed to gray, foggy skies and strong, salty ocean breezes. This dense stand of evergreen shrubs grow low in the face of the strong winds and shallow soil to protect themselves. During the dry summer and fall these drought-tolerant plants have adapted to be great water conservationists. The fog and gray skies keep temperatures cool and prevent moisture loss. The various types of leaves also help conserve moisture. The leaves may be very small and needle-like standing perpendicular to the sun or covered with fine hairs to prevent moisture loss. Other leaves can be small, thick, scruffy and tough to prevent moisture from evaporating. These drought-tolerant plants will drop their older, drier leaves to prevent water loss. The roots of these plants can go deep into the ground to find available moisture. Coastal scrub plants do everything they can to find and conserve moisture.

### Plants in this area:

Monkey flower offers its apricot-colored, trumpet-like flowers.

Lizard tail bears dense clusters of yellow flowers.

California sagebrush has long, slender, gray leaves and a pleasant aroma.



Californiasagebrush

In the springtime this area is alive with wildflowers. Footsteps-of-spring grow close to the ground with pale, yellow flowers. Star zygadene has long, green leaves and a tall spiral of white flowers. Monkey flower has sticky leaves and orange, trumpet-like flowers. The *Ceanothus* is very fragrant with its clusters of blue blossoms. The common yarrow has a white umbrella cluster of flowers with fern-like leaves. The Douglas iris has purple, orchid-like flowers. Soap root has long, gray-green, crepe paper-like leaves with tiny, white, star-shaped flowers on long, thin, woody stems. The sun cups grow close to the ground with yellow, four-petal flowers.



Now it is time to head back to the parking area. Use this time to reflect on the things you have seen and learned about while walking this trail. Look and listen quietly to the sounds along the trail. Watch for the small birds that like to hide in the thick brush. Look for the woodrats' nests built in the dense *Ceanothus*. Listen for the sea lions barking on the islands offshore or the crash of ocean swells crashing against the cliffs. Watch the skies for soaring hawks.

**STOP # 11** At the parking lot you should gather the group around you for a good summation of the walk. This can be accomplished in many ways, but here is a great game that you can easily do. All you need is a long ball of string and an enthusiastic group.

### SUBJECT: The Web of Life

This game makes very clear the interrelationships among all the members of nature's community. Webbing vividly portrays how plants, rocks and animals (omnivores, carnivores, herbivores and scavengers) function together in a balanced ecosystem.

The children form a circle. The leader stands inside the circle near the edge with a ball of string. "Who can name a plant that grows in this area? Seaside daisy...good! Here Miss Daisy, you hold the end of the string. Is there an animal living in this area that might eat the daisy? Rabbits...ah, a sumptuous meal. Mr. Rabbit, you take hold of the string here; you are connected to Miss Daisy by your dependence on her flowers for your lunch. Now who needs Mr. Rabbit for his lunch?" Very good! The bobcat and the hawk both feed on rabbits. If there are leftovers who would come to help in the decomposition process or who is a scavenger feeding on the leftover remains? Yes, the turkey vulture feeds on carrion and beetles of different types will feed on the remains. Then who eats the beetles? You're right! Different birds feed on many insects, not just the bugs that are green plant eaters."



Turkey vulture

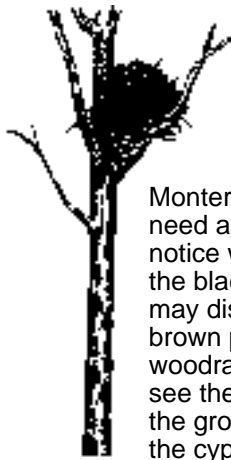
the Monterey cypress withdrew to these fog shrouded headlands. It is much cooler in the cypress grove. It is darker under the canopy of these old trees. The ground cover is sparse because of the extensive shade. Only a few plants grow well in the shade of the trees.

Look around at the edges of the forest and you can see where the brush and other low-growing plants have plenty of sunshine. This meeting of the two communities is called an ecotone.

Notice how the lower limbs of the trees have died from lack of sunlight. Both the Monterey pine and the



Monterey cypress need a lot of sun to grow well. As you look around you may notice where the ground has been disturbed by the pathways of the black-tailed mule deer. Look closely at the ground and you may discover small clippings of cypress leaves and small, dry, brown pellets or scats. These are clues that the dusky-footed woodrat is nearby. Now, if you look up into the trees, you should see the nest of the woodrat. Not all woodrats live in houses on the ground. Some build nests in the trees. We'll talk more about the cypress tree at another location on this trail.



### Plants and algae of the cypress grove.

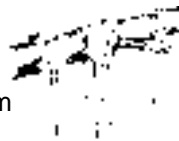
Douglas iris blooms in January and February; purple orchid-like flower

seaside daisy; light blue, daisy-like flower



stinging Phacelia; little white flowers and hairy stems

lace lichen an alga and a fungus living together, hanging from the trees

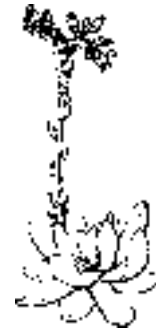


**STOP #5** Walk farther out the trail, out of the trees into an open area that overlooks Headland Cove.

### SUBJECT: The Southern Sea Otter

This is an excellent location to search the kelp forest for our most likable critter, the southern sea otter. Over sixty otters live year-round in the waters of Point Lobos. Look for a furry-looking log with bumps at both ends. With the aid of binoculars or a spotting scope you will see these animals easily. The males are an average five feet long and weigh

abundantly on the lower limbs in the cool shade. Lace lichen is a favorite food of the deer. Notice all the pathways of the deer as they travel over the hill and drop down toward the grassy areas on the rocky bluffs. The succulents found in this area are the species *Dudleya*. The grayish-green hanging garden is called bluff lettuce. The rosettes of green with red tips are sea lettuce. Look for miner's lettuce with rounded green leaves and the small white flower coming through the center. Hedge nettle or wood mint is abundant in the shade of the trees. Look for square stems; smell the fragrant leaves; look for the little purple flower. Many other colorful lichens are found on the trees and rocks. They are an indicator of good air quality.



Bluff lettuce



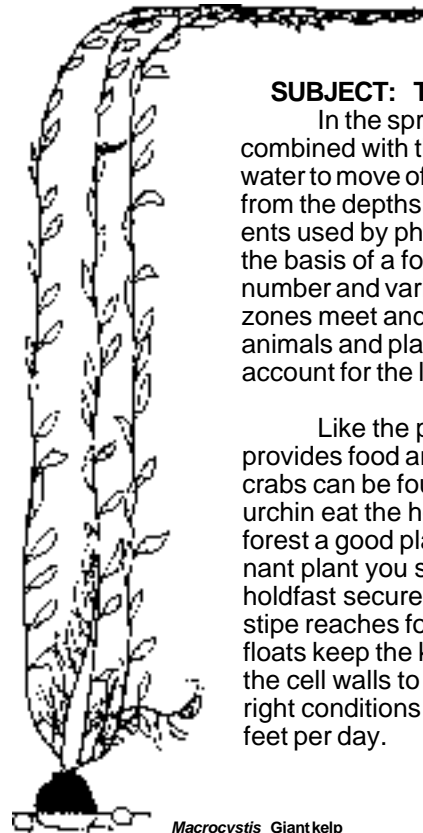
Woodmint or hedge nettle

**STOP # 9** Follow the trail to the east side of the headland and you find a path that leads down toward Cypress Cove with an overview of the cove and Big Dome, the highest point in the reserve at over 200 feet.

### SUBJECT: The Kelp Forest

In the spring and summer, northwesterly winds combined with the earth's rotation, cause the surface water to move offshore. Mineral-rich water upwelling from the depths of the submarine canyon brings nutrients used by phytoplankton. These abundant plants are the basis of a food pyramid that supports an amazing number and variety of animals. Two water temperature zones meet and overlap on the central coast, and animals and plants from both warmer and colder waters account for the large number of species found here.

Like the pine forest on land, the kelp forest provides food and shelter for many forms of life. Kelp crabs can be found feeding on the blades; the sea urchin eat the holdfasts; fish and sea otters find the kelp forest a good place to hide from predators. The dominant plant you see is *Macrocystis* or giant kelp. A holdfast secures the kelp to the rocky bottom. A long stipe reaches for the surface, and hundreds of small floats keep the kelp buoyant. Nutrients travel through the cell walls to feed this fast-growing plant. Under the right conditions giant kelp can grow as much as two feet per day.



Macrocystis Giantkelp

**STOP #6** Continue along the trail to South Point. From this location you will have a beautiful panoramic view of Sea Lion Point and Sea Lion Rocks. This will be just a brief stop to enjoy the view. Listen for the loud barking of the California sea lions that make their home on the offshore islands. You will also see a variety of birds from this location as they fly back and forth along the coast. Watch for cormorants and brown pelicans. For information about the sea lions, refer to the marine mammal walk or the teacher's packet.

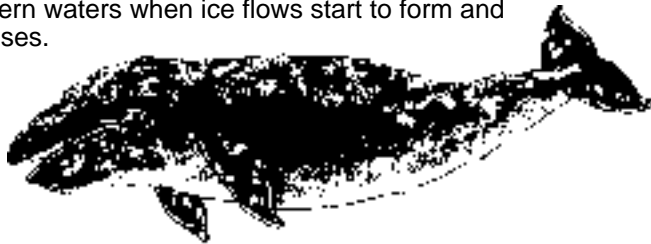


**STOP # 7** Follow the trail around the corner to a magnificent view of the Pacific Ocean. **Please keep the children well away from the edge.** There are no protective barriers at this location.

**SUBJECT: The California Gray Whale**

Between December and March you may be in for a real treat. The California gray whale, our state marine mammal, passes by Point Lobos during its annual migration from the cold waters of the Arctic Ocean to the warm, sheltered calving grounds of Baja California. Over 21,000 animals make the journey of 6-8,000 miles, one-way! The whales leave the northern waters when ice flows start to form and the food supply decreases.

Gray whales are medium-sized whales, about 40 feet long weighing as much as 40 tons. Whales are mammals just like us and need to surface to breathe air. Their nostrils or blow holes are on top of their heads. Their breathing process exchanges enormous amounts of air in a matter of a few seconds. The spouting we see is simply warmer, moist air being exhaled under great pressure and then cooling to form a vapor mist. On the surface, these whales usually breathe from 3 to 5 times, with each "blow" separated by about 20 seconds. They may stay submerged up to fifteen minutes during a long, deep dive. Since the gray whales have no dorsal fin, you are likely to see only a portion of the back and occasionally the tail fluke as the whale begins its deep dive. Whales travel in groups called pods which are commonly composed of three to five animals. They swim along at about 5 m.p.h. averaging 85 to 100 miles per day. The California gray whales begin to mate during their southward journey and the pregnant mothers give birth to a single 14-foot long calf in the warm, sheltered lagoons of Baja California about 13 months later.



The gray whale has no teeth. It is a baleen whale having filtering plates hanging from the upper jaw. Gray whales feed during the summer months in the Arctic Ocean, the Chukchi Sea and Bering Sea on amphipods much like krill, small shrimp-like crustaceans. A bottom-feeder, the gray whale dives to the bottom, turns sideways and slurps up the mucky bottom sediment. By pushing its tongue against the baleen plates, water is forced out, and the baleen acts as a filter keeping the food in.



"the blow" The heart-shaped blow is about 10 feet high and can be seen for miles on a clear day. A gray whale blows three to five times, 20 seconds apart, before a longer dive.



"spy hopping" Sometimes a gray sticks its head up out of the water. The whale's head may rise 8 to 10 feet above the surface while the whale slowly turns, as if to look around.



"sounding" As the whale breaks the surface at the start of a long dive, you'll see the long row of bumps on its back. The tail flukes appear above the water, then submerge, as the whale makes the deep dive.



"breaching" If you're lucky you may see a whale breach. With its head up, the whale's body bursts above the surface as the huge animal leaps almost completely out of the water, landing with a splash.

**SUBJECT: Geology**

The Point Lobos landscape, a mosaic of bold headlands, irregular coves and rolling meadows, was produced over millions of years through interaction between land and sea. Rocks formed below the surface were later uplifted, exposed and then shaped by waves and weather into a variety of forms. Sands and gravels eroded from these rocks by a changing sea level have been deposited into an array of beaches and terraces.

This bold headland you are standing on, called Santa Lucia granodiorite, is the foundation that underlies the Monterey peninsula and Carmel area. This rock form was created 100 million years ago, during the Cretaceous period, as molten rock cooled in a subterranean chamber. As this igneous rock cooled several miles below the surface of



the earth, dinosaurs still roamed the planet's surface. Later, the rock form was uplifted and exposed at the earth's surface. Tremendous waves and weather over millions of years have eroded rock to form the craggy outcroppings and beautiful inlets of Point Lobos. Careful inspection with a magnifying glass will reveal the other minerals of the granodiorite: gray translucent quartz; creamy plagioclase feldspar; and scaly masses of the black mica, biotite. As the granodiorite became rigid, cracks were formed and filled with quartz; the resulting resistant veins stand slightly in relief on the weathered outcrop surfaces.

**STOP # 8** Continue along the trail and down the granite steps to an area where the Pinnacle rock formation and Pinnacle Cove can be seen. You'll know you're in the right place because of the reddish-orange, velvety "stuff" on the cypress trees and on the rocks.

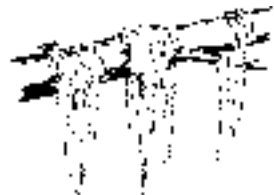
**SUBJECT: More of the Cypress Grove**

The Monterey cypress tree has adapted over time to living on these fog-shrouded headlands taking on the full force of winter storms. Gnarled, buttressed trunks and contorted branches reveal how the tree has adapted to survive on these outermost granite cliffs. Buttressing is a process whereby the cypress will grow more holding wood on the lee side of the wind to support the tree. Look around at the trunks and limbs of the trees that are fully exposed to the wind for this special effect.



One of the unique plants in the reserve is the reddish, velvety stuff on the trees and rocks. The cool moisture and subdued light makes this the perfect location for *Trentepohlia*. This green alga has green chlorophyll, which makes photosynthesis possible. Photosynthesis is the process by which chlorophyll-containing cells convert incident light to chemical energy and synthesize organic components from inorganic compounds, specifically carbohydrates from carbon dioxide and water with the simultaneous release of oxygen. The green color is masked here by the orange-red pigments, similar to carotene.

The grayish-green plant hanging in long, lacy strands from the trees is called lace lichen. Lichens are a symbiotic growth of an alga and a fungus. What you actually see is the fungus that provides the home for the alga that lives within it and produces the food. To produce the food, the alga needs the carbon dioxide and water from the surroundings. Thus, the lichens grow more



as much as 80 to 85 pounds. The females are about a foot smaller and weigh up to 55 pounds. The front paws are rounded with partially retractable claws, and the hind feet are large and webbed. The hind feet are used for propulsion and the long 10-inch tail is used as an aid for swimming. When resting or swimming leisurely, the otter is most commonly on its back. When in a hurry the otter will swim on its belly at speeds of up to 5 m.p.h. The most notable feature of the otter is its fur. In colors ranging from nearly black to reddish-brown, the fur is the thickest to be found in all animal species. An otter with a white head is often an aging male, but some females and young of both sexes may also have white or grizzled heads. The sea otter has no insulating layer of blubber, so it depends upon a rapid metabolism and its dense pelt and a layer of air bubbles in its fur to keep warm in the very cold water. The air bubbles and trapped water are warmed by the body heat to help insulate the otter. You may notice an otter, after it has been feeding, busily grooming its fur to keep it clean and water-resistant. The sea otter eats approximately 25% of its body weight daily in order to survive. As a species, the southern sea otter's diet consists of over 80 different invertebrates, including marine snails, sea urchins, clams, crabs, mussels, sea stars, squid and abalone.

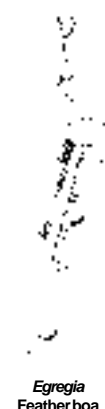


Otters mate and give birth during any time of the year, but the peak of the pupping season is January through March. Females will give birth on land or in the water to one pup every one or two years. The newborn pup is totally dependent upon the mother for protection and nourishment. The mother grooms and nurses the pup for five

to eight months. After the second month the pup is usually able to dive and start foraging for food on its own.

People still represent the greatest threat to the sea otter population. A major oil spill could endanger the entire population because oil on an otter's fur will destroy the insulating properties and cause death by hypothermia, or death by ingestion or inhalation of the petroleum product. Otters can also get caught in gill nets and drown. Other hazards include winter storms which can separate the mother from the pup, and natural predators such as the great white shark and orca, or killer whale.

**Nereocystis** or bull kelp is another brown alga. The large, round float on the end of the long, hollow stipe, bobbing up and down in the water is often mistaken for a sea otter. Feather boa, **Egregia**, can be seen along the edges of the rocks. Look for the narrow, flat stipe and tiny floats. In the subdued light of this 100-foot-high forest, animals and plants create a world of spectacular color. Purple sea urchins feed on the holdfasts; cabezon, lingcod and rockfish swim in and out; crabs work busily; sea stars, anemones and other invertebrates eat and are eaten by others. The sea otter and harbor seal forage for food, and occasionally a whale wanders through. Cormorants, pelicans, herons, egrets, gulls and other birds are seen at the kelp forest looking for food or nesting materials. Sometimes you will see a cream-colored foam on the surface of the water. No, this is not some form of pollution but a very rich organic soup. As very small plants and animals die and decompose, their remains mix with the foaming water created as ocean surge pounds against the rocks. This combination of materials can be called "diatomaceous soup." The nutrients of this soup are part of the food chain feeding both plants and animals.



Egregia Feather boa



Nereocystis Bull kelp

The kelp is harvested periodically in Carmel Bay. A by-product is used as a binding agent in such products as ice cream, yogurt, chocolate milk and salad dressings.

**STOP # 10** Continue on the main trail to the small grassy area that overlooks Cypress Cove.

**SUBJECT: Monterey Cypress and Wildflowers**

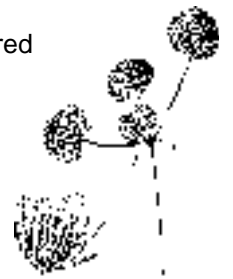
The Monterey cypress needs lots of sun to grow well. Within the interior of the grove we have not seen any young trees. As some of the older trees die and fall, they will create the open areas in the canopy that allows the sun to reach the forest floor. If seeds have been able to reach the mineral soil they will eventually germinate and begin the new trees that are needed to sustain the cypress grove. In this open area you will see several young trees that will continue to thrive in the full light of the sun.



Buckwheat has tiny pom-poms of cream to pink colored flowers.

Coyote brush has the male and female flowers on separate plants.

**Ceanothus** or wild lilac; the seeds provide food for quail.

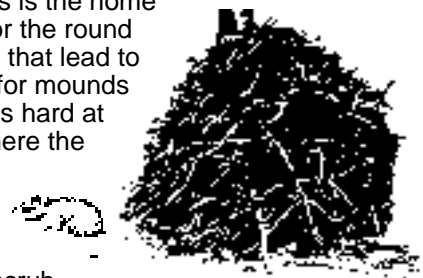


Coyote brush

**STOP # 3** Walk about 150 feet up the trail to the tree-like bush that hangs over the trail. This is **Ceanothus** or wild lilac. Watch for the blue flowers that form in winter and last through spring.

**SUBJECT: The Critters of the Coastal Scrub**

The coastal scrub community provides a protected habitat for many of the small animals that live in the reserve, and in turn, provides a plentiful hunting area for many of the predators. Within this dense tangle of brush the small rodents build their homes and burrows. Building materials can be grasses, broken twigs and branches or just a snug burrow. Keep your eyes open for a large mound of twigs and branches from 18 inches to several feet tall. This is the home of the dusky-footed woodrat. Watch for the round openings in the grasses, the pathways that lead to the burrow of the brush rabbit. Looks for mounds of earth that indicate a pocket gopher is hard at work. In several areas you will see where the brush and grasses have been trampled to create a pathway for the black-tailed mule deer. Listen for the call of a variety of small birds that are in the thick brushy area. The coastal scrub not only provides food and housing for a variety of birds, animals and reptiles, it provides camouflage and protection from the larger predators. Watch the skies for the red-tailed hawk or American kestrel. Look for the scat or droppings that the bobcat has left behind to mark its territory as it patrols and looks for food. Watch on warm days for the gopher or garter snake.



**STOP # 4** Walk to the Y in the trail and take the left fork. Walk about 100 feet and stop so you are under the canopy of the large cypress tree on the left.

**SUBJECT: The Cypress Grove**

The Monterey cypress is the reserve's most celebrated tree. These trees which at one time extended over a much larger range are now found growing naturally only at Point Lobos and Cypress Point in Pebble Beach. Cones of this tree have been found in the La Brea Tar Pits in Los Angeles. During the Pleistocene epoch 15,000 years ago as