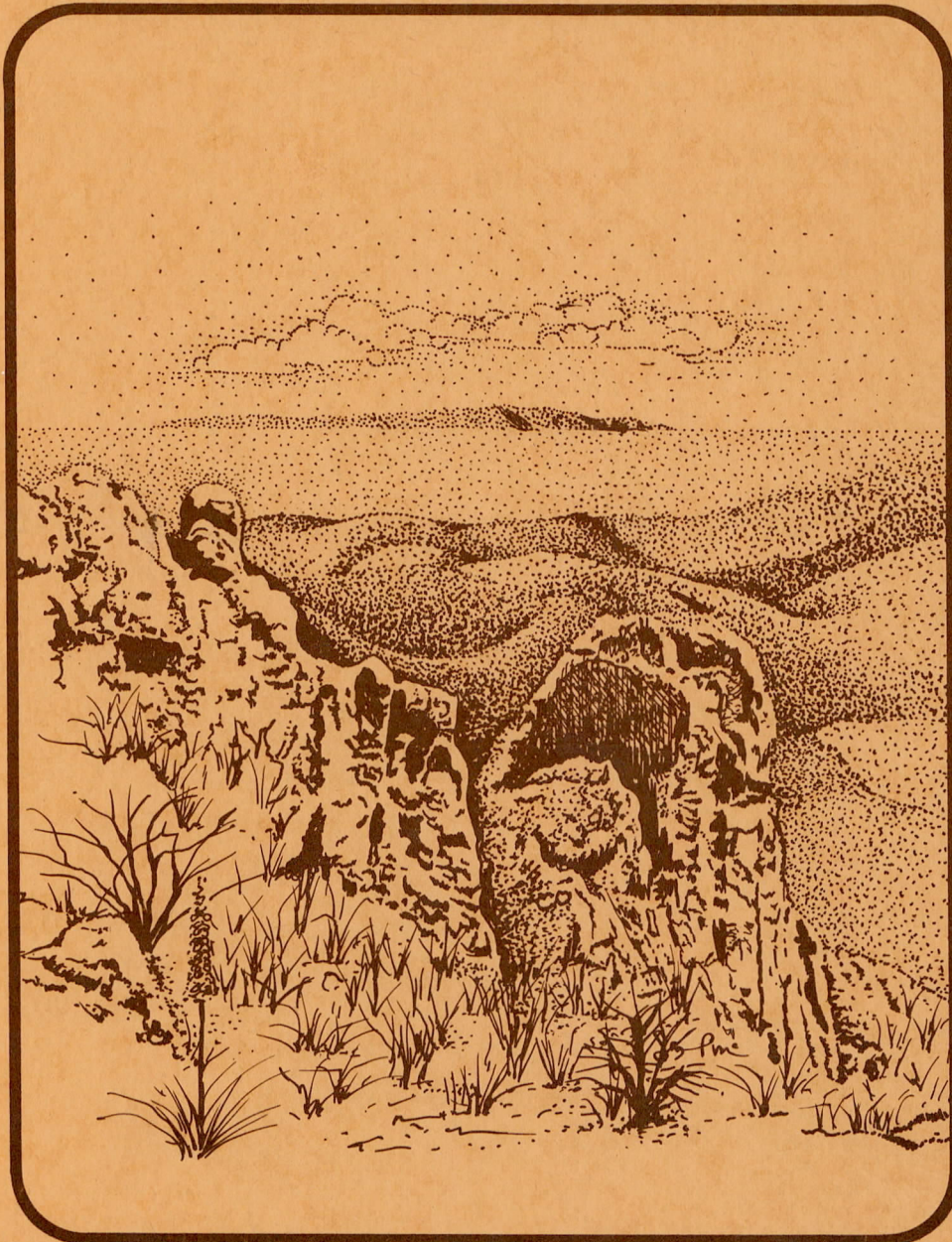


Mountains to the Sea

**A Visitor's Guide to the
Santa Monica Mountains and Seashore**



Mountains to the Sea

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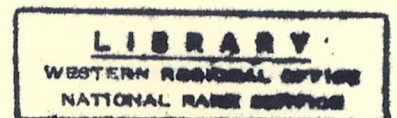
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How the Mountains Were Formed

The earth rumbles and shakes and the rocks move; we call it an earthquake. Enormous forces within the earth are squeezing the rocks together. The pressure is so great that some rocks bend or break, and slabs of rock are thrust up and over other rocks. The Santa Monica Mountains are rising from the sea.

In a wet Los Angeles winter the rain comes down hard and often. Quiet streams become raging rivers, carrying away sand and boulders (and sometimes houses) from the hillsides. As the mountains rise, they are also gradually being eroded or worn away by streams, which supply sand to the beaches and fill the valleys with deep soil.

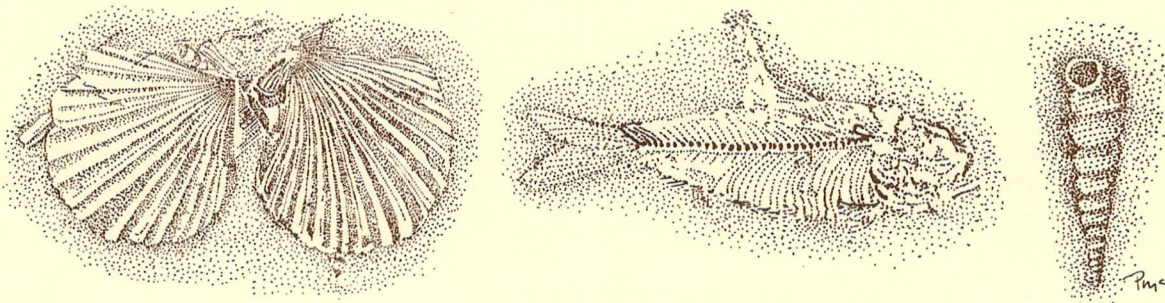
In our lifetime we may see little change in the mountains around us. But over millions of years the gradual processes of mountain building and **erosion** have completely changed the landscape and will continue to do so in the future.

The story of the Santa Monica Mountains begins 140 million years ago. Dinosaurs ruled the earth, and this

part of California was under the sea. Thick layers of mud settled at the bottom of that sea and formed a soft brown rock called **shale**.

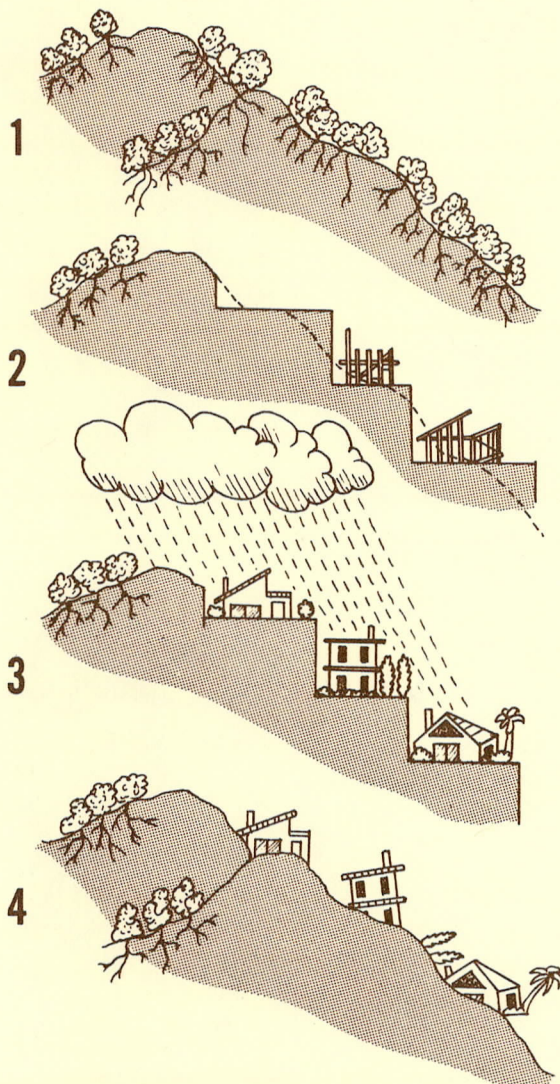
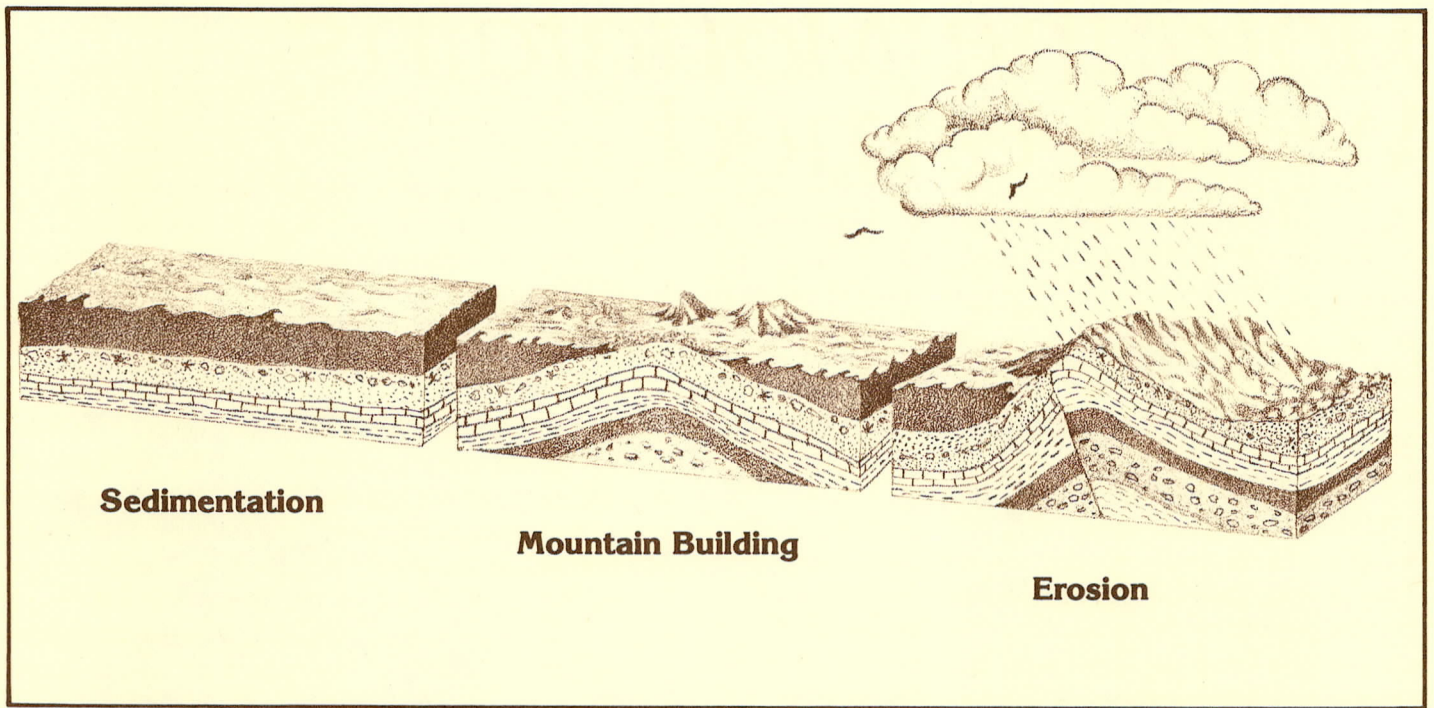
About 20 million years later, hot molten rock from deep within the earth was forced up under the shale and slowly cooled to form **granite**. The great heat and pressure of the molten rock baked the shale into a hard rock called **slate**, and pushed the mountains above the sea. *Today the eastern end of the Santa Monica Mountains is deeply eroded, exposing these oldest rocks which form the core of the mountain range. Dark-colored slate and crystalline "salt and pepper" granite can be seen in Griffith Park, in road cuts along the San Diego Freeway, and in canyons in the eastern part of the range.*

Several times over the following hundred million years, the mountains rose above the sea only to be worn away by wind and water. Each time the sea again flowed over the land, and rocks and soil settled in deep layers on the bottom. Over time, layers of mud formed shale,



Fossils: Pictures of the Past

Fossils are a record of past plant and animal life preserved in the rocks. Parts of plants and animals are sometimes washed out to sea and buried in the soft, muddy or sandy bottom, which then hardens to rock. Look for fossil seaweeds, fish or seashells in shale and sandstone in the mountains. They show us which plants and animals lived when those rocks were forming beneath the sea.



and sand grains were cemented together with minerals from the sea water to form **sandstone**. In some places stream-polished pebbles or boulders were mixed with the sand to form **conglomerate**. *Today these rock layers formed beneath the sea can be seen in rocky cliffs, stream canyons, and along road cuts throughout the mountain range.*

About 15 million years ago, thick beds of sandstone and conglomerate were once again being deposited in a shallow sea covering this area. A wide variety of large mammals roamed the land. Volcanoes rumbled and smoked, and red-hot **lava** poured into the sea and onto the land. The lava cooled to form hard black **basalt**. *Black, gray, and reddish volcanic rocks can be seen today in the western part of the range.*

About 3 million years ago the Santa Monica Mountains began to rise again from the sea, gradually forming the mountain range we see today. They are still rising.

Development and Erosion

Erosion is increased when deep-rooted chaparral shrubs are removed and the natural slope is disturbed.

What Lives Here

From the Santa Monica Mountains to the Pacific Ocean, there are several different natural **communities**: chaparral, oak woodland, grassland, streamside, and seashore. Each provides for the basic needs of plants and animals that live there. Each has its own special problems of survival.

To learn about nature and life outdoors, you do not have to travel to faraway places. There are exciting natural **environments** to discover right here in the Santa Monica Mountains. Come and explore!

Look for these plants and animals:

In the Chaparral



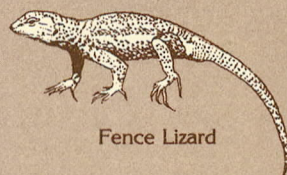
Stink Beetle



Chamise



Manzanita



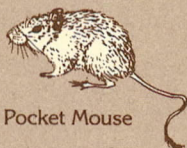
Fence Lizard



Ceanothus (Wild Lilac)



California Quail



Pocket Mouse



Buckwheat



Brush Rabbit



Spotted Skunk



Yucca



Toyon

In an Oak Woodland



Poison Oak



Gopher Snake



California Walnut



Pocket Gopher



Coast Live Oak



Red-tailed Hawk



Ground Squirrel



Valley Oak

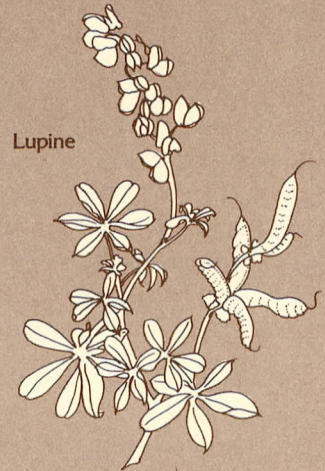
In the Grassland



Meadow Mouse



Bobcat



Lupine



Monarch Butterfly



Rattlesnake



Mustard



California Poppy



Coyote



Native Perennial Bunch Grasses



Introduced Annual Grasses
(oats, barley, rye)

Along a Stream



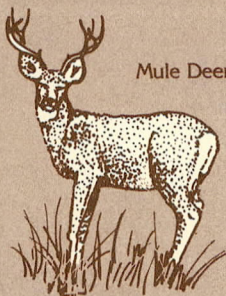
Sycamore



Anna's Hummingbird



Maidenhair Fern



Mule Deer



California Bay



Willow



Raccoon

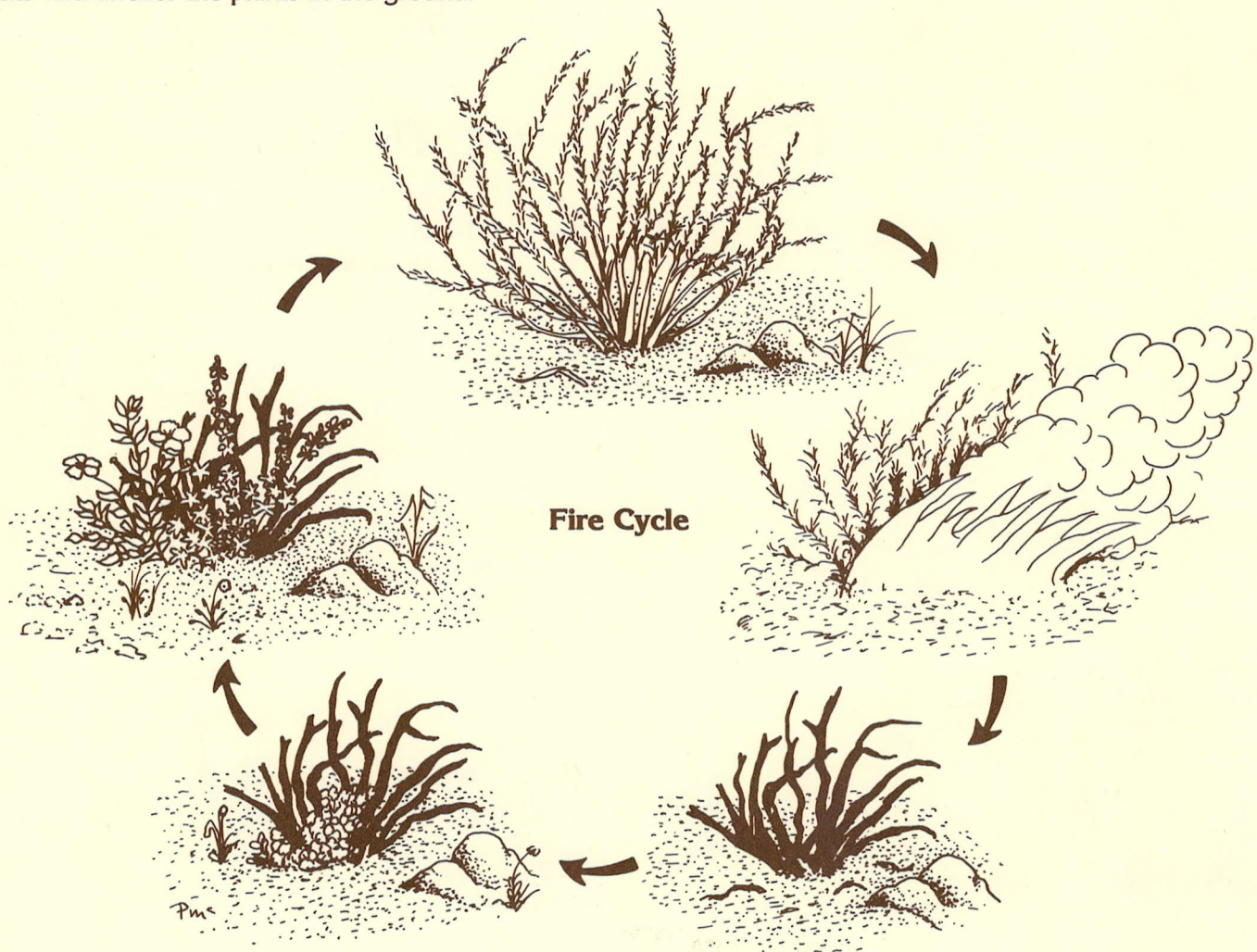
...In the Chaparral

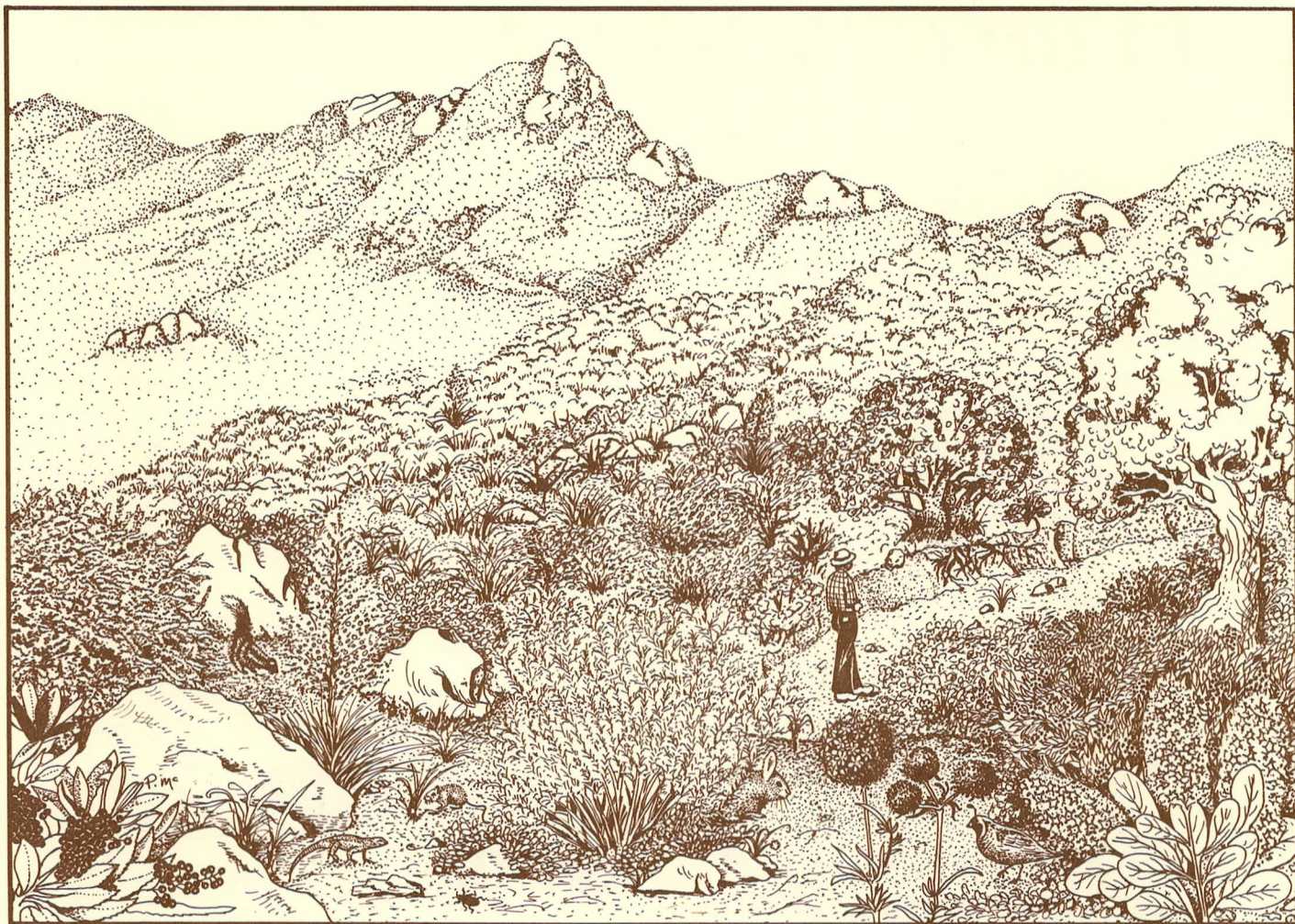
It is high noon on a sunny ridge. Little moves except a black stink beetle that crawls in the rocky soil beneath tangled branches in the chaparral. This community of dense, evergreen brush, seldom over 15 feet (5 meters) in height, covers the steep, rocky slopes of the Santa Monica Mountains. Farther down the trail a fence lizard scurries to safety within the forest of woody shrubs which remain impenetrable to us.

On this warm cloudless summer day the ground is already cracked and dry. No rain is likely to fall again until the cooler winter months. Throughout the summer and fall it is hot and dry in chaparral country. Water, essential for life, is scarce. The soil is thin and lacking in **nutrients**. Only plants **adapted** to these harsh conditions can survive in this plant community. Most chaparral shrubs have small, thick leaves, often with a waxy coating that can hold in precious moisture. Deep, spreading roots seek pockets of water trapped in the rocks and anchor the plants in the ground.

In most places on earth, living **decomposers** such as **fungi** and **bacteria** break down dead plants and animals and return their nutrients to the soil to fertilize new growth. In the chaparral, however, it is too dry for fungi and bacteria to keep up with the supply of dead leaves and branches. Fire is the chaparral's primary decomposer. Even though it threatens people's houses (which are usually built of dead wood), it is a vital stage in the life cycle of this plant community.

After a fire has blackened or turned to ash everything in its path, some chaparral shrubs regrow quickly from an unburned **root burl** beneath the soil. Other shrubs and many wildflowers have left seeds that sprout only after they have been scorched by fire. The bare hillsides are soon covered with masses of colorful wildflowers and fresh green growth. But within ten or fifteen years the larger shrubs will crowd out the flowers and once again blanket the hillsides with dense chaparral.





When fire comes, most chaparral animals fly or run from the flames or seek safety in an underground burrow. The animals soon return to feast on the tasty new growth that always follows a chaparral fire.

During the heat of the day, mule deer and coyotes rest in the shade. They will browse and hunt in the cool morning or evening hours. Many smaller **mammals** such as the spotted skunk and pocket mouse emerge at

night after spending the day underground, where temperatures are many degrees cooler.

Now, at noon, it is quiet on the ridge. The stink beetle finds little shade as it struggles across tracks made early this morning by a brush rabbit as it scampered from one clump of buckwheat to the next. Almost all the other creatures of the chaparral are resting, waiting for the cool of evening.

Water Savers: Leaf Adaptations to Drought



Chamise
small and thick



Ceanothus
thick and waxy



Toyon
leathery with
light undersides

Manzanita
light colored



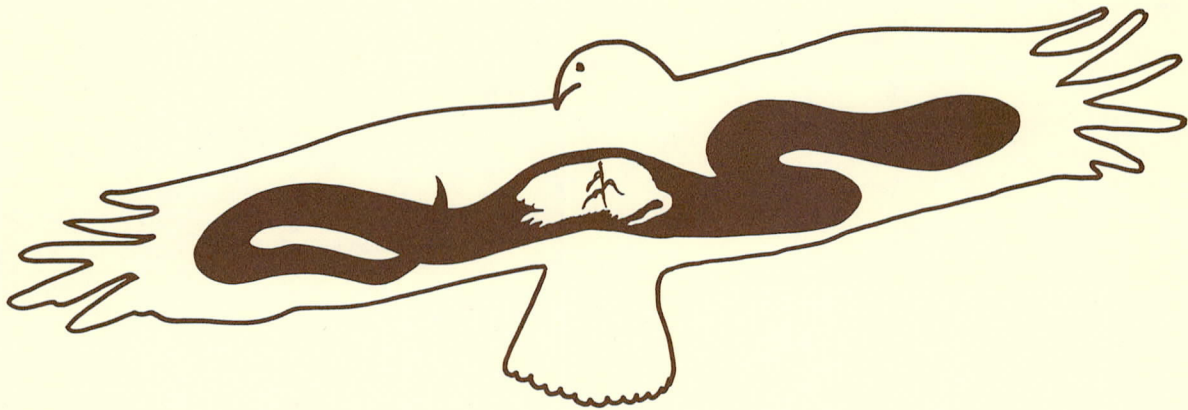
...In an Oak Woodland

Below the ridge deep soil covers the lower slope. Here the trail leaves the dry chaparral and we enter a shady woodland of large oak trees. Grass, flowers, and a few shrubs grow in the rich, moist soil beneath the oaks. Fallen branches dotted with insect holes and covered with fungi are decomposing to form new topsoil.

In the cool shade of an oak tree, a pocket gopher busily digs underground tunnels with its powerful claws. It stops and munches on a tender root it has just uncovered. Like all animals, the gopher gets energy for everything it does by eating food. The gopher eats only plants, so it is called a **herbivore**.

across the layer of dead leaves. It is seeking shelter from **predators** like the red-tailed hawk circling overhead.

With the same swiftness of the gopher snake invading the gopher's tunnel, the hawk swoops down and grabs the snake with its sharp claws. The hawk carries its **prey** to a high branch of an oak tree and eats. The red-tailed hawk has few enemies from which to hide while digesting its food. Undigested bones and scales are soon coughed up as a compact pellet, which falls to the ground. There the pellet decomposes along with the leaf litter, adding nutrients to the soil.



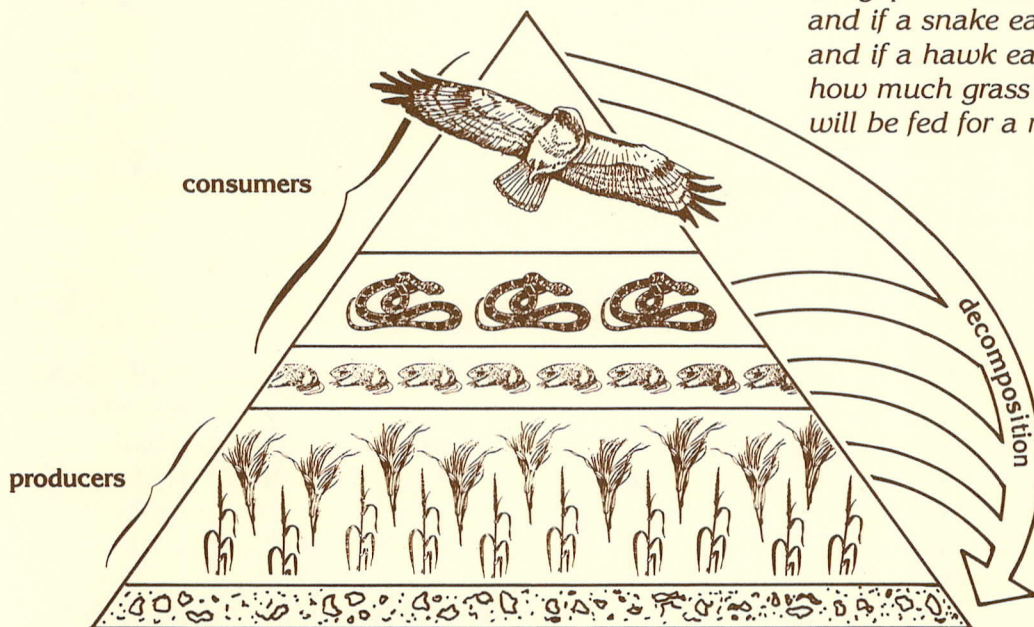
Suddenly a three-foot gopher snake, patterned with yellow and brown blotches, breaks through the mound of freshly piled dirt at the entrance to the gopher's tunnel. The snake is a **carnivore** (eats other animals) and it senses a meal. The gopher snake strikes quickly, coils around the startled gopher, and then swallows it whole. While digesting its meal, the snake moves slowly

Later the hawk soars high above the oak woodland and neighboring grassland. Below, more tender green plants grow in the sun. Green plants produce their own food by trapping energy from sunlight in a process called **photosynthesis**. Some of those plants may become the first link in a **food chain** ending in another meal for the hawk.



Food Pyramid Puzzle

If a gopher eats 50 blades of grass a day,
and if a snake eats 1 gopher a week,
and if a hawk eats 1 snake a day,
how much grass must grow so that 1 hawk
will be fed for a month?



Solution: 50 blades of grass/gopher/day x 30 days x 1 gopher/snake/week x 4 weeks x 1 snake/hawk/day x 30 days = 180,000 blades of grass/hawk.

...In the Grassland

When wind blows over the grassland, stalks of wild oats, rye, and barley bend together like waves in the ocean. In the spring, this ocean of grasses is emerald green and sprinkled with millions of brilliant wildflowers. With the heat of summer, the grassland turns a soft golden brown. This sight has earned California the nickname, "The Golden State," but it was not always so.

Many people are surprised to learn that these common grasses were not here before Spanish soldiers and missionary **padres** arrived in the late 1700s. The valleys

and low hills were then covered with a shaggy carpet of **perennial** bunch grasses, which grew in clumps and stayed greener throughout the year. With the Spanish settlers came herds of cattle and horses that continually overgrazed the bunch grasses. In the fur and hooves of the animals came seeds of **annual** European grasses, which took root in the California soil. By the 1800s most of the **native** bunch grasses had been crowded out by the Old World grasses that we see today.

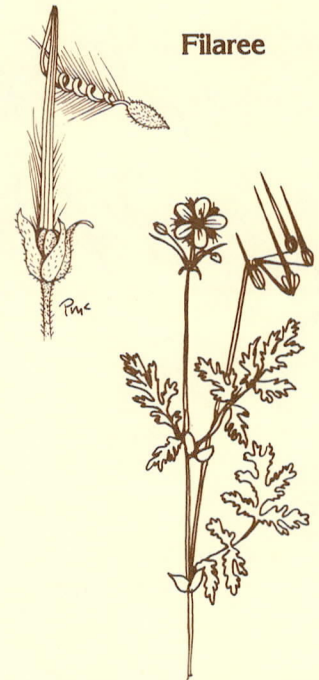
Foxtail Barley



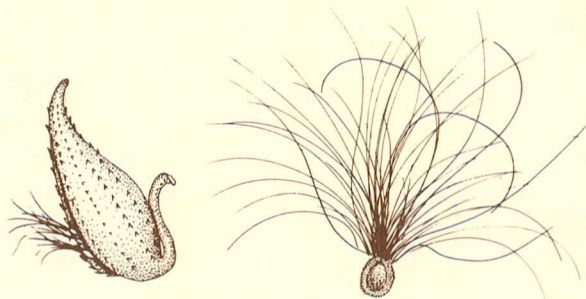
Bur Clover



Filaree



Milkweed



Burs in Your Furs

Put a large gym sock over your shoe and run through the grass. Take off the sock and see how many different kinds of seeds you can find sticking to it. Look closely at the seeds to discover the interesting ways they can travel to new places where they might grow. Some seeds like "fox tails" and burs stick to anything—your socks or pants, or the fur of an animal running through the grass. It's easy to stick a foxtail into something, but it's hard to get it out. Can you

discover why? The seed of a filaree plant can actually move along the ground and then plant itself. It is very sensitive to moisture, coiling as it dries during the day and uncoiling as the dew settles at night. The barbs that attach the seed to your sock also anchor it as it twists itself into the soil. Other seeds travel by parachute. When milkweed pods burst open, the silky-haired seeds are carried far and wide by the wind.



These **introduced** annual grasses can grow from seeds to green plants that make new seeds and then die—all in just a few short months. The seeds sprout soon after the first winter rains. Shallow roots spread out to soak up moisture, and the green grass grows quickly before the soil dries out in the hot summer sun. By June, the plants are nodding with the weight of seeds they have produced. Once the seeds are scattered, the grasses wither and die, only to be replaced by new growth the following year.

The grassland appears quiet from a distance, but if we look closely we discover a thriving community of

animals supported by an abundant food supply. Meadow mice scurry along tiny trails hidden in the grass. They busily harvest the fresh green leaves in spring, and later, the many rich seeds. Gopher and ground squirrel holes dot the grassland. Watch your step! A rattlesnake may be coiled up in an open hole avoiding the hot sun. Grasshoppers, rabbits, deer, and many other herbivores are attracted to the grassland by the rich food source. But out in the open they are exposed to the watchful eyes of carnivores such as hawks, coyotes, and bobcats that come from the neighboring chaparral and oak woodland to hunt. The grassland may look peaceful, but it is filled with the drama of life.

...Along a Stream

The dusty trail leads downhill through dry grasses and shrubs. Just a few steps from the bottom of the canyon, the scenery suddenly changes. The air is cool. Sunlight filters through a layer of tree branches with broad rustling leaves high overhead. Shrubs with soft green foliage and delicate ferns and mosses grow in the shade of the tall trees. We can smell the damp earth even before we hear the trickle of running water or see the stream. Above the water a bright orange insect with a double set of netted wings is darting back and forth. We have entered the streamside or **riparian** community of the Santa Monica Mountains.

Because it usually rains in Los Angeles only in winter and water runs rapidly off the steep, rocky slopes, only a few streams flow all year long. Most of them are so narrow—except when they are swollen by a recent rainstorm—that it is possible to jump across them. Yet many animals of the mountains depend on these canyon streams for survival.

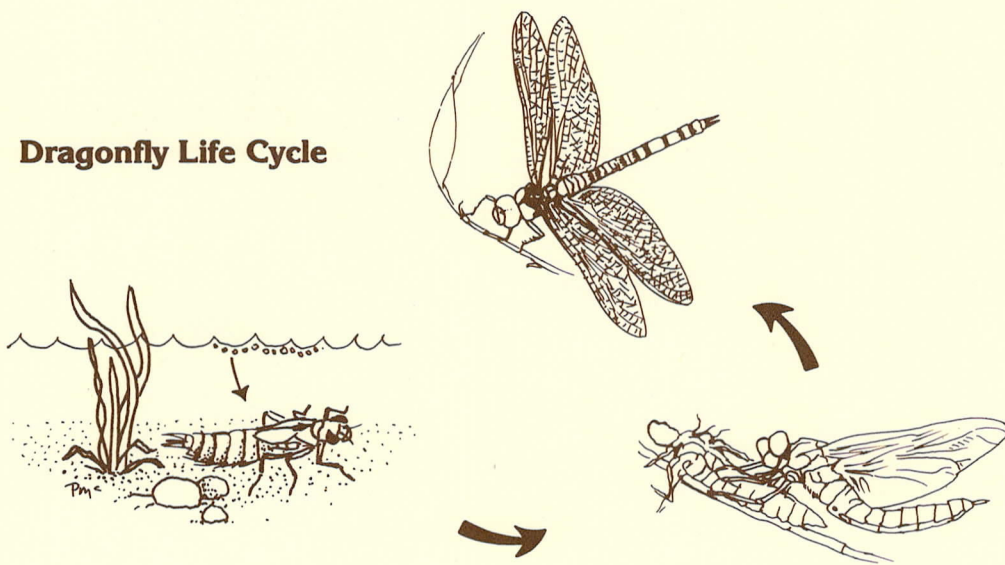
Birds and large mammals visit the streamside community to rest or hide in the dense plant cover. And during the dry summer, animals of the chaparral, oak woodland, and grassland must come to the stream to drink. Along the water's edge the animals leave signs of their presence—footprints in the mud. If we visit the stream very early in the morning or late in the afternoon, we might catch sight of a mule deer. But we would probably have to wait until night to see the clever raccoon, who leaves little hand-like prints in the mud.

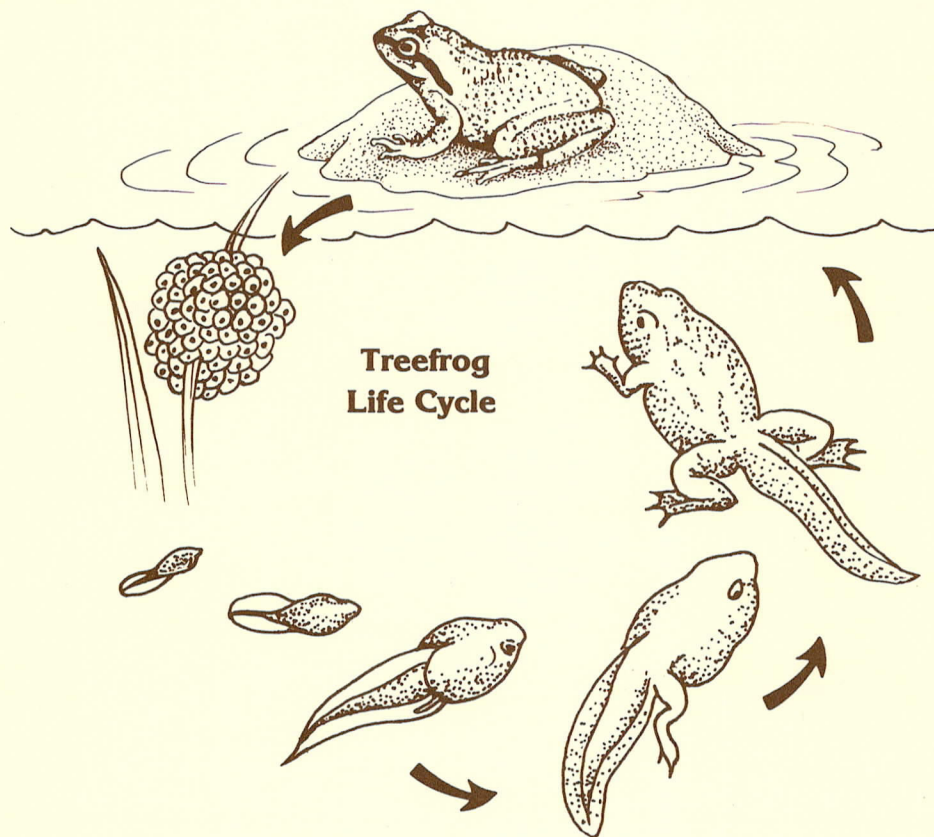
Some animals of the riparian community begin life in the water. The dragonfly, that colorful insect darting over the water, emerges from the egg as a dull brown **nymph**. It eats other small animals that also live in the water or land on its surface. When the nymph is fully grown, it crawls out of the water onto a leaf where its body undergoes a change or **metamorphosis**. Its skin dries and cracks and an adult dragonfly emerges which looks entirely different. The dragonfly stretches its wings and allows them to harden before flying off to hunt mosquitoes and other insects above the stream.

The treefrog is another animal whose life cycle depends on the stream. A treefrog starts life as a tadpole in a shallow, warm pool. As the tadpole grows, it gradually loses its fishy appearance. The adult treefrog breathes air and lives on land, but never far from water. Each spring the air is filled with the sounds of treefrogs' mating calls as the adults return to the stream to lay eggs.

Along a stream is one of the best places to observe seasonal changes in the mountains. In fall many of the trees and shrubs drop all their leaves after a colorful display of gold and red. In winter the branches are bare. But winters are brief in Southern California. It is not long before a lovely green canopy shades the streamside once again and provides a cool retreat from the heat of the surrounding hills.

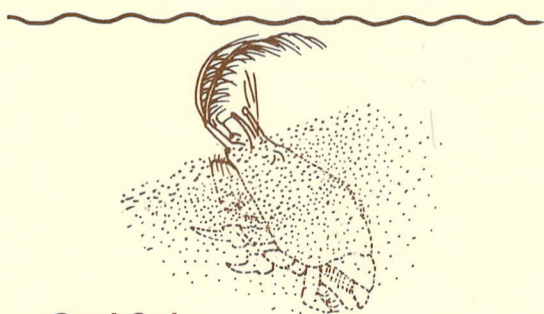
Dragonfly Life Cycle





...At the Seashore

A pair of feathery antennae sticks out of the sand, straining **microscopic** plants and animals called **plankton** from the receding wave. Defying crashing surf and churning sands, the little sand crab moves up and down the beach with the tide in a constant search for food.



Sand Crab

The sand crab is one of the many fascinating animals that live in the **intertidal zone**. This narrow strip of land—whether sandy beach or rocky shore—exists between the reach of the highest tide and the sea itself.

Tides are created by the **gravitational pull** of the moon and sun upon the waters of the earth. Twice each day the shore is covered by the incoming high tide and uncovered by the low tide. Storms at sea whip up waves that crash against the shore and gradually carve the interesting rock formations we find along the coast.

Though these changes in the rocks take many years, the day-to-day power of the sea is tremendous. If we follow the tide out, we can observe how intertidal animals survive in an environment that constantly alternates between pounding surf and drying air.

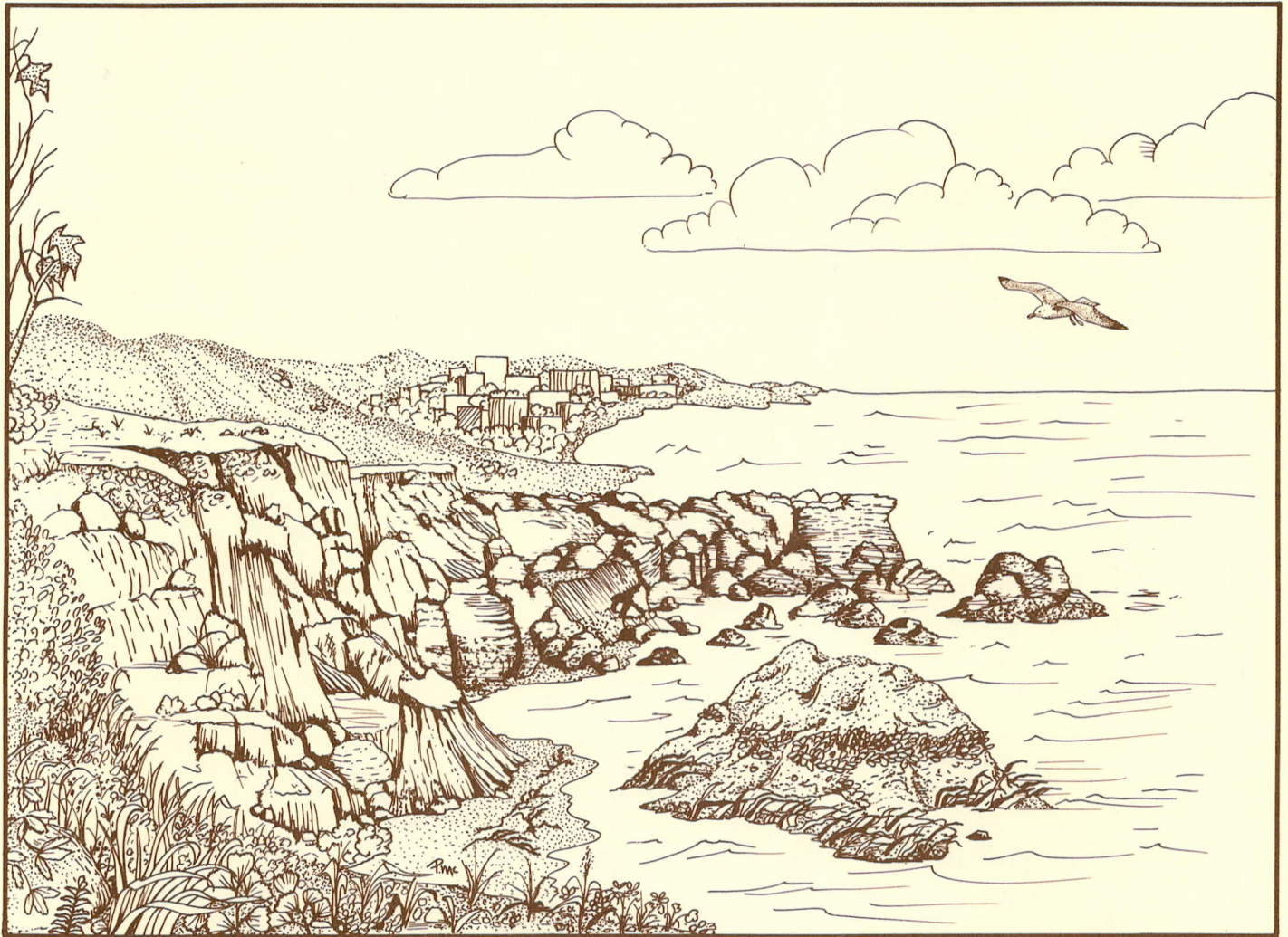
Imagine that the tide is high and the sea covers all but the largest rocks. Acorn barnacles, cemented head-first to the rock, remain glued in place no matter how roughly the ocean surges around them. They eat by extending feathery feet to rake in some of the abundant plankton that floats in the sea. Soon, when the tide has gone out, these feet will disappear behind plate “doors” that keep the barnacles from drying out.

Incoming waves don't budge the limpet either. This little single-shelled animal sticks to the rocks with a muscular foot. At night the limpet moves on this foot to



Visit a Rocky Shore

The best place to see the great variety of seashore life is at a rocky shore. Come explore when the tide is very low, and you can walk out on the rocks. When you visit, remember the stresses these animals undergo while the tide is out. Be careful not to step on them. As you pick up an animal for a closer look, please remember to handle it carefully and to put it back exactly where you found it. And because wet rocks (especially ones covered with algae) are slippery, wear tennis shoes or other shoes with rubber soles.



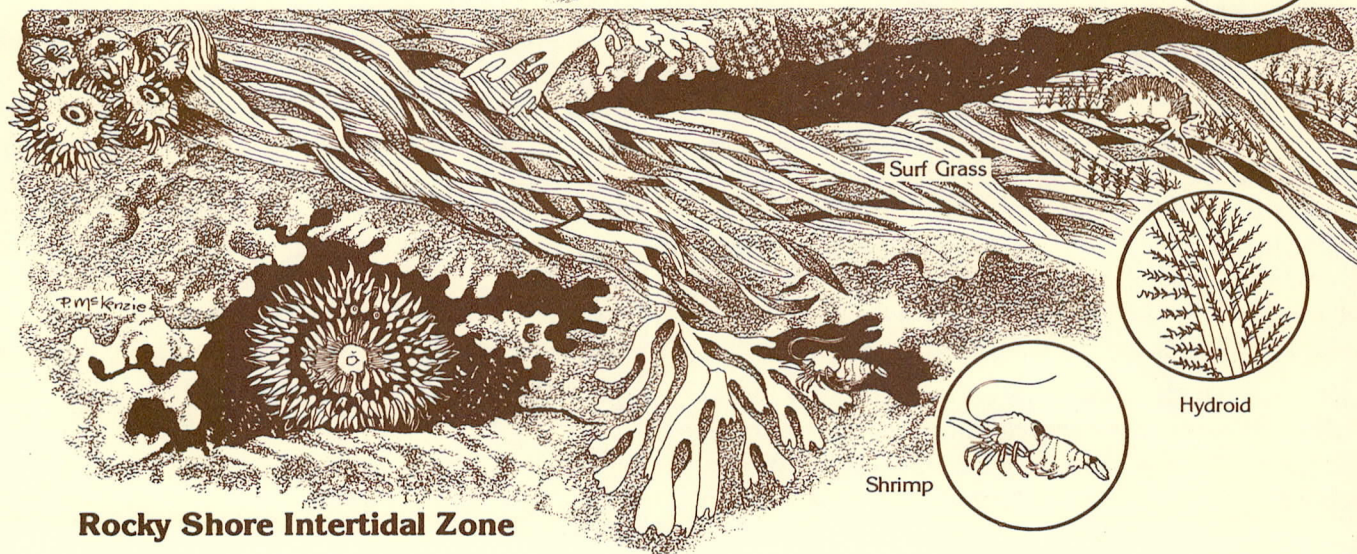
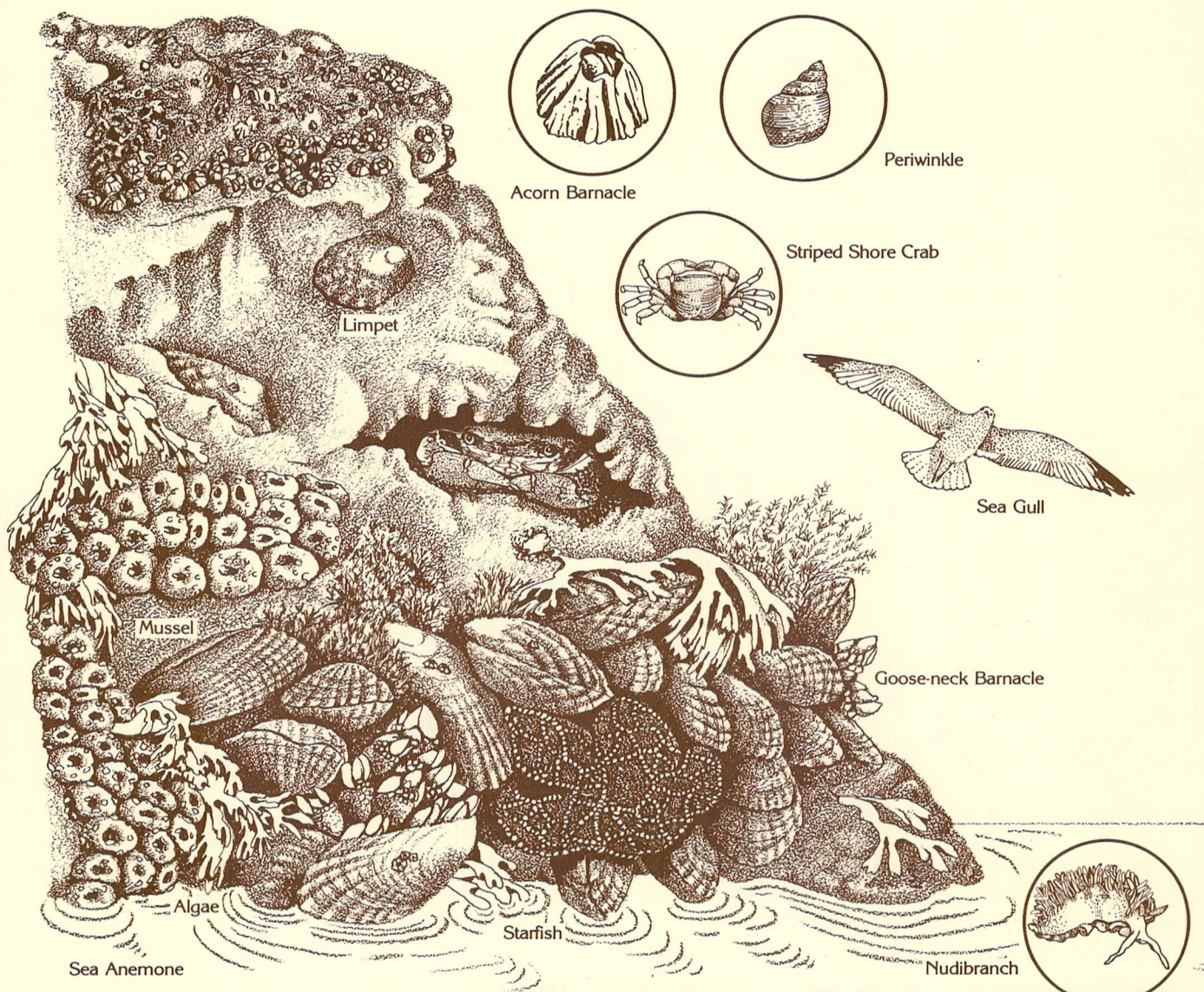
graze on nearly invisible patches of **algae**, or seaweed, that grow on the rocks. On higher rocks, reached only by the splash of the waves, tiny periwinkles consume the algae that the more water-loving limpets can't reach.

Packed together with short tentacles outstretched, sea anemones look like a bed of flowers when they are under water. Narrow, petal-like tentacles sting a small shrimp the sea has brought within reach and quickly close as they deliver the morsel of food to the anemone's mouth. But now an hour has passed and the tide has gone out noticeably. The anemones are all closing up into little balls. They look like stones, with bits of sand glued to their soft gray bodies to help reflect the sun's heat. Emerging from crevices in the rock, shore crabs scuttle over the rocks looking for leftovers.

The outgoing tide has exposed a wide band of black-shelled mussels, permanently attached to the rocks with strong threads. A hungry starfish creeps over the mussels, uses its tube feet to force one open slowly, and

then devours it. The starfish has uncovered a fleshy-stalked goose-neck barnacle, an animal that lives amidst the mussels for protection. After the starfish leaves, a sea gull plucks this exposed morsel from the rock and soars away.

When the water recedes enough to expose bright green surf grass, we know the tide is nearing its lowest point. These lower reaches of the shore are usually covered with water, protecting the inhabitants from much wave action and drying air. Since the low-tide zone is such an easy place to live, the problem is one of overcrowding. Every available space is occupied, sometimes with plants and animals living on top of one another, apartment-style. Most of them, like the brightly colored nudibranch ("NEW-di-brank") and the delicate feathery hydroids on which it feeds, could never survive farther up on the shore, where it is a long wait until the next high tide.



Rocky Shore Intertidal Zone

Who Was Here Before Us

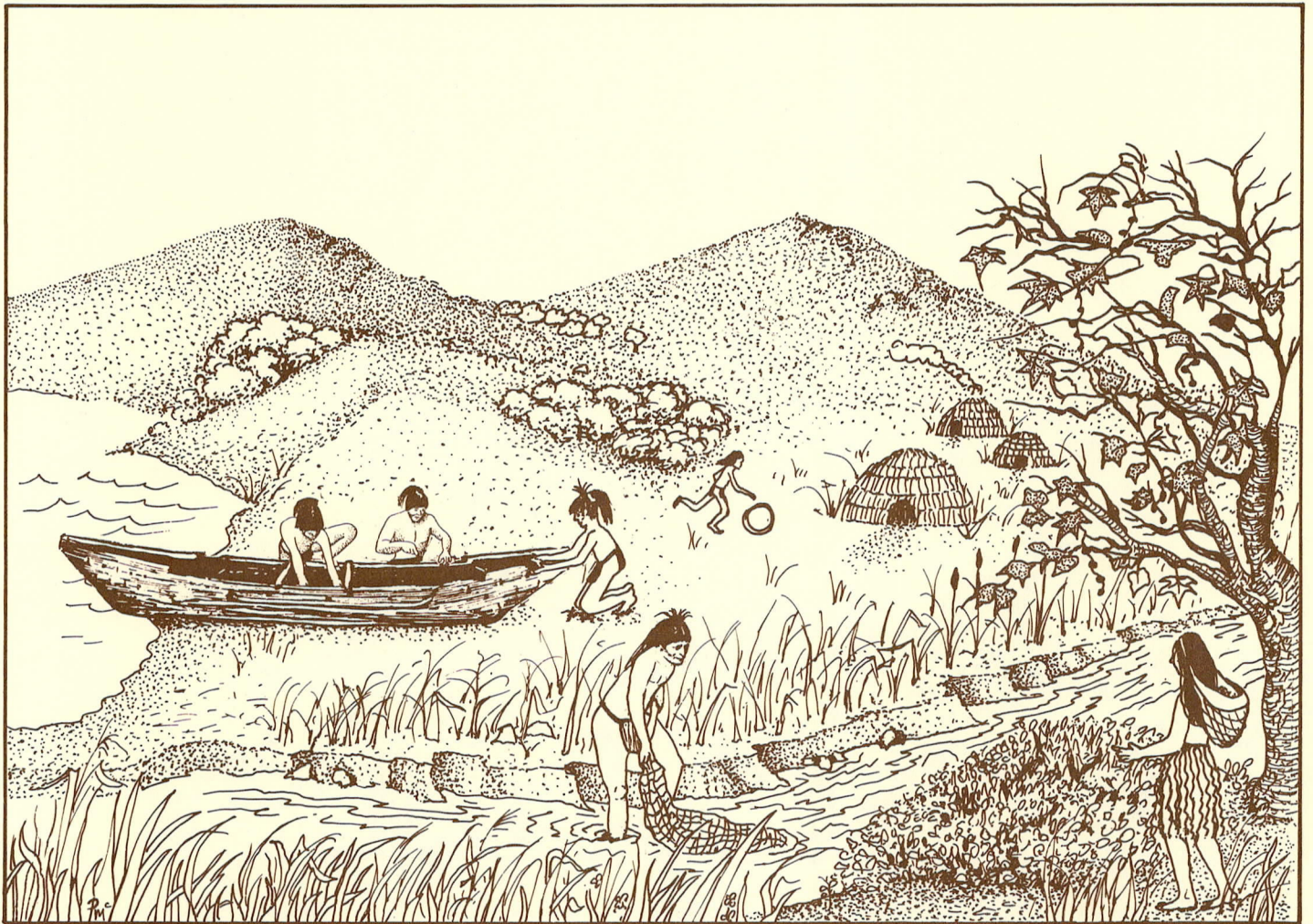
Let your imagination carry you back four hundred years. It is an early autumn morning, and we are approaching an Indian village nestled in the coastal foothills next to a stream and just a short stroll from the beach.

The village consists of about 30 round houses made of interwoven branches and grass. Smoke from cooking fires comes out of holes in the roofs. At the far end of the village on an open field, some boys play a game with hoops and sticks. Another field nearby is set apart with poles decorated with paint and feathers and is used for special ceremonies and festivals.

In the village people work at different tasks. A man makes string by rolling plant fiber against his bare thigh.

A woman weaves a basket from reeds. Another woman skins a deer. She may use the hide as clothing or a cover for her bed. The meat is sure to be eaten soon, and some of the remaining bones and antlers will be shaped into tools.

As we walk down to the beach, we see a man fishing in the stream with a net. On the beach, a group of men build a canoe. They split driftwood into planks, drill holes in the planks, and lace them together with strong plant-fiber cord. They seal the seams between the planks with tar, which seeped up from the ocean floor. The canoe will be watertight and will take them as far as Santa Catalina and the other channel islands to fish and to trade with the Indians who live there.



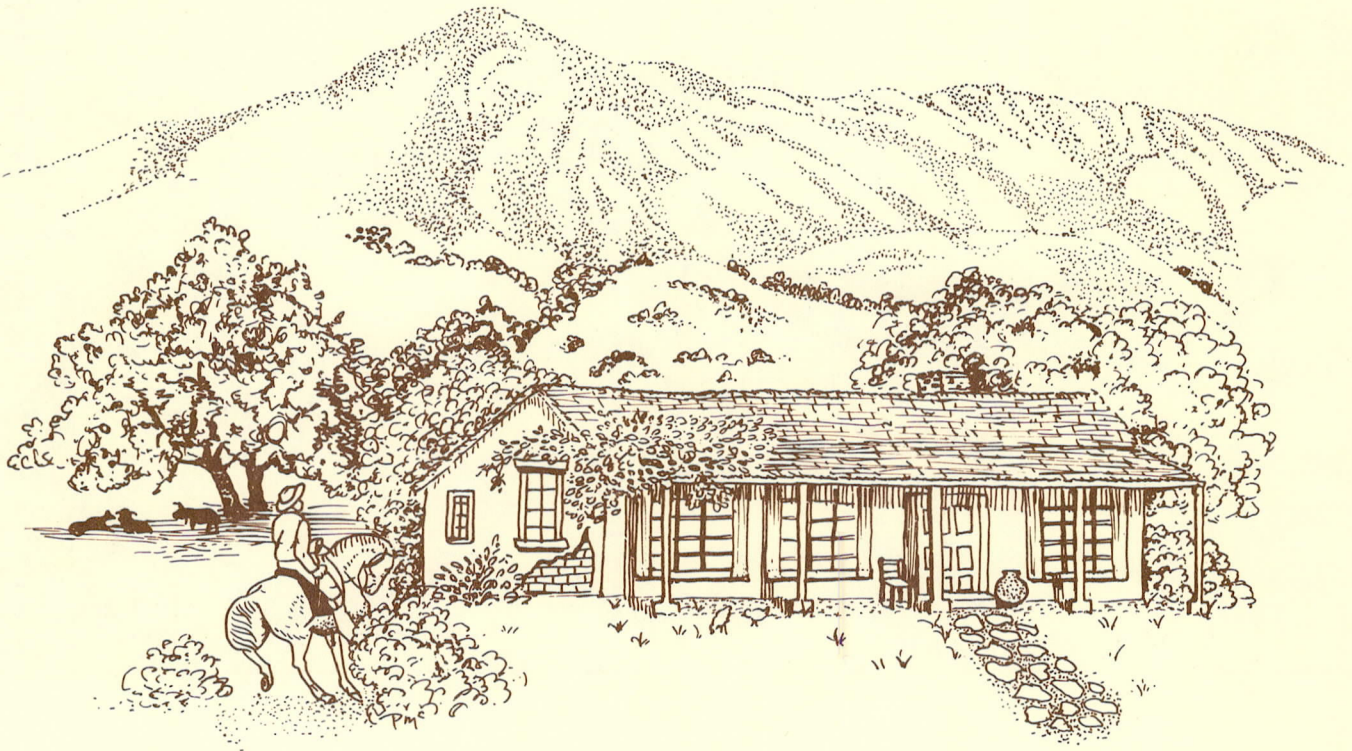
The sun feels very hot now. We return to the village just as a group of women arrive carrying baskets filled with plant seeds, berries, roots, and bulbs they have gathered from the chaparral and grassland nearby. Other women have baskets of acorns, gathered in the oak woodlands. They shell the acorns and grind them between two stones to form a fine meal like flour. The acorn meal will be cooked into mush, bread, or cakes, but only after the bitter tannin is removed by repeated rinsings with water. We can't stay to watch, because it is time for us to leap ahead two hundred years to the days of the Spanish missions.

The Indian village we visited is gone now. Most of the Indians live in missions in the interior valleys. On this day in 1781, a band of Spanish settlers and their governor have gathered on a broad plain several miles to the southeast of the Santa Monica Mountains to establish a new town. There are only eleven founding families, and the name of the town is twelve words long—*El Pueblo de Nuestra Señora la Reina de Los Angeles de Porciuncula*—The Town of Our Lady the Queen of the Angels of Porciuncula. (The Los Angeles River was called *Río Porciuncula* at the time.)

The little town of Los Angeles grew as more people came to farm and graze animals in the surrounding hills



and valleys. In 1834, soon after Mexico's independence from Spain, the mission system was abandoned. In the 1830s and 1840s life on the many **ranchos** surrounding the town was fine and easy. It was a time of roundups, barbecues, bull fights, and **fandangos**. Hard-riding cowboys, or **vaqueros**, who often were former mission Indians, herded longhorn cattle over the unfenced range.



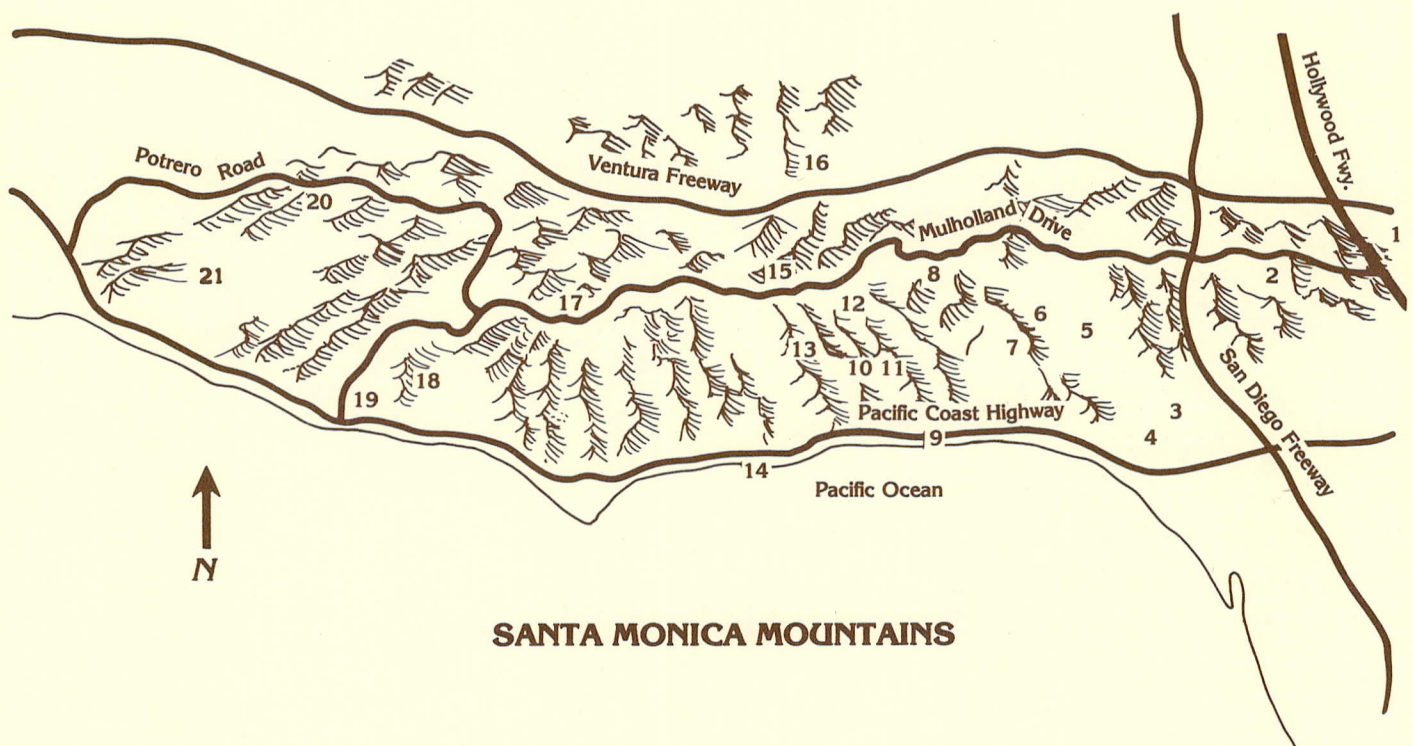
Los Angeles grew faster after California became part of the United States in 1847. **Homesteaders** settled on the old rancho lands and changed them from cattle ranches to vegetable fields and citrus groves. In the early 1900s Los Angeles began importing water from Northern California, which allowed the land to support more agriculture and more people. Today Los Angeles is the second largest city in the United States. Most large fields and orchards have now been replaced by roads and buildings.

Many people who like living close to nature have built their homes in the Santa Monica Mountains. But many more people are here now than there were four hundred years ago when Indians lived in harmony with the land. Can we save some of the wildlife, clean air, and beautiful views that people have enjoyed in these mountains for thousands of years? Today we create parks to protect the undeveloped land and keep it as a home for the wild plants and animals. It's also a place for us to visit—the Santa Monica Mountains National Recreation Area.



Where to Go

These are some places you might like to visit in the Santa Monica Mountains National Recreation Area. For more information on Santa Monica Mountains park lands, hikes, and special programs visit the National Park Service Visitor Services Office at 22900 Ventura Boulevard, Woodland Hills, CA 91364, or call (213) 888-3770.



Fire Closure

During hot, dry weather state and national park sites may be closed due to high fire danger. Telephone before starting your trip.

National Park Service (213) 888-3770

State Parks (24-hour recorded message) (213) 454-2372

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Glossary

How the Mountains Were Formed

- basalt** - fine-grained black volcanic rock.
- conglomerate** - rock consisting of sand particles and larger rounded rocks cemented together.
- erosion** - wearing away of rocks or soil by natural processes such as wind and rain.
- granite** - light-colored, coarse-grained rock that cooled slowly from molten rock beneath the earth's surface.
- lava** - melted rock that flows out of a volcano.
- sandstone** - rock formed from sand particles cemented together.
- sedimentation** - depositing of rocks, soil, or plant and animal remains by water or wind. Material settles in layers at the bottom of a body of water.
- shale** - soft, fine-grained rock formed from clay particles laid down in thin layers.
- slate** - hard rock formed from shale under heat and pressure; it tends to break into thin sheets.

What Lives Here

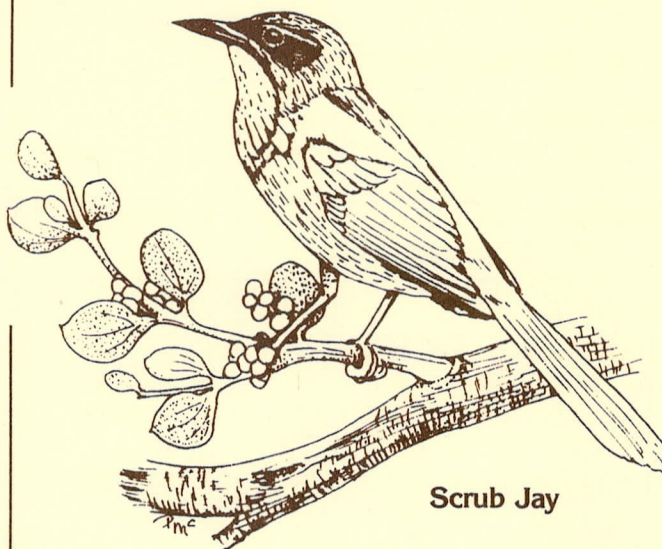
- community** - an interdependent group of plants and animals living in a particular environment.
- environment** - conditions surrounding and affecting the life of plants and animals.

... In the Chaparral

- adapted** - changed in structure or function to better adjust to the environment.
- bacteria** - simple one-celled microorganisms widespread in the environment.
- decomposers** - plants and animals including many microorganisms that break down plant and animal remains into simpler substances.
- fungi** - group of simple plants including mildews, molds, and mushrooms that have no green pigment (singular: fungus).
- mammal** - group of warm-blooded, hairy animals that feed milk to their young.
- nutrients** - substances promoting growth.
- root burl** - a large knot at or below the soil surface from which new shoots grow.

... In an Oak Woodland

- carnivore** - an animal that eats other animals.
- consumers** - plant- and meat-eaters. All animals and some plants that cannot make their own food.
- food chain** - the linkage of eating and eaten members of a community (green plants → herbivores → carnivores → larger carnivores).
- herbivore** - an animal that eats only plants.
- photosynthesis** - process by which green plants produce food (sugar) in the presence of sunlight.
- predator** - an animal that hunts and kills other animals for food.
- prey** - an animal that is hunted by other animals.
- producers** - food-makers, the green plants. They produce food using water and minerals from the soil, carbon dioxide from the air, and energy from sunlight.



Scrub Jay

... In the Grassland

annual - plant that completes its life cycle in one year.

introduced - brought to an area by people.

missionary padres - Spanish Franciscan priests who established and administered missions from San Diego to San Francisco between 1769 and 1834.

native - plant that has grown in an area since pre-historic times.

perennial - plant that continues to live year after year from the same roots.

... Along a Stream

metamorphosis - change in body form and habits during development. (Complete metamorphosis=extreme change; e.g., egg → caterpillar → chrysalis → butterfly. Incomplete metamorphosis=moderate change; e.g., egg → nymph → dragonfly.)

nymph - the immature form of an insect that undergoes incomplete metamorphosis.

riparian - living along a stream or pond.

... At the Seashore

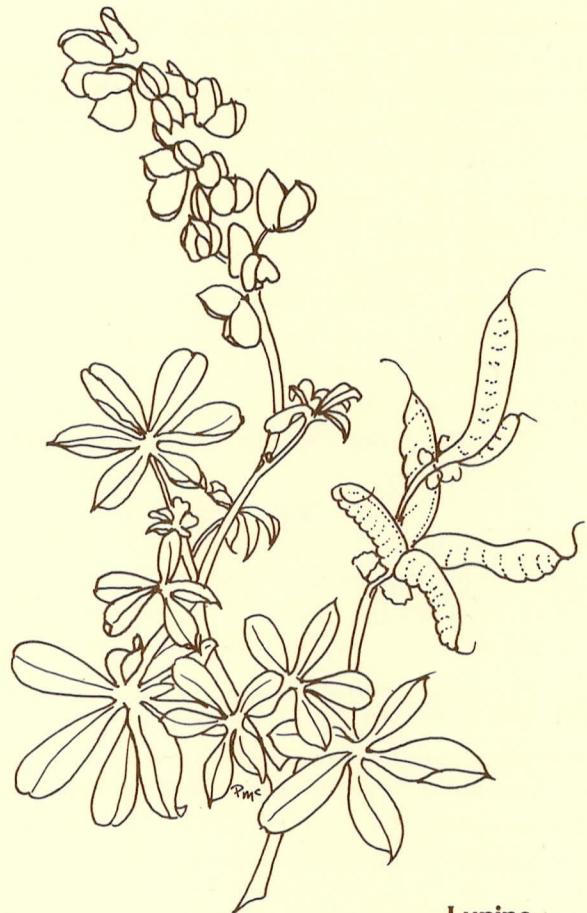
algae - simple green plants that live in water or on moist surfaces. They may also have red or brown pigments.

gravitational pull - the force exerted by every object in the universe upon every other object; the strength depends on the mass of the objects and the distance between them.

intertidal zone - the area between the highest high tide and the lowest low tide. In Southern California the maximum tidal variation is about 10 vertical feet.

microscopic - so small that it can be seen only through a microscope.

plankton - plant and animal life that drifts in the surface waters of the sea.



Lupine

Who Was Here Before Us

fandango - a dancing party.

homesteader - a person who settles public land granted by the U.S. government and develops it as a farm.

ranchos - large ranches in Spanish and Mexican California on which longhorn cattle were raised for export. Some fruits and vegetables were raised for the individual rancho needs.

vaquero - cowboy.

Recommended Reading

How the Mountains Were Formed

Geology Field Guide to Southern California (1972) and

Geology Field Guide to Coastal Southern California by Robert P. Sharp (1978)
Kendall/Hunt Publishing Co.

What Lives Here

An Island Called California by Elna Bakker (1971) U.C. Press

A Field Guide to Pacific States Wildflowers, The Peterson Field Guide Series, by Theodore F. Niehaus (1976) Houghton Mifflin Co.

Key to Coastal and Chaparral Flowering Plants of Southern California by Barbara J. Collins (1972) California State University Foundation, Northridge

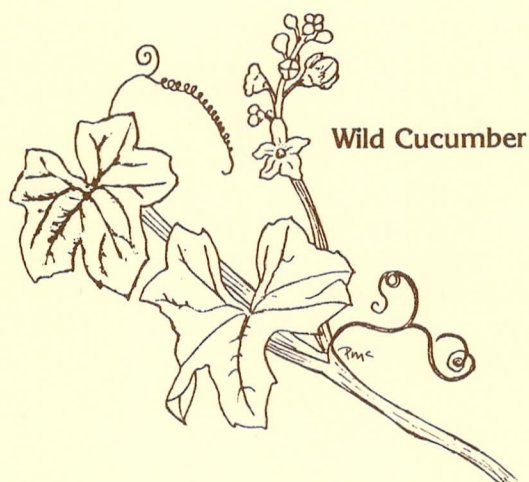
Marine Life of Southern California by Donald J. Reish (1972) California State College at Long Beach

Spiders and Their Kin by Herbert W. Levi and Lorna R. Levi (1968) Golden Press

The Insects of the Los Angeles Basin by Charles L. Hogue (1974) Natural History Museum of Los Angeles County

The Butterflies of Southern California by Thomas C. Emmel and John F. Emmel (1973) Natural History Museum of Los Angeles County

A Field Guide to Western Birds by Roger Tory Peterson (1961) Houghton Mifflin Co.



California Natural History Guides, Arthur C. Smith, General Editor, U.C. Press

Climate of Southern California Bailey

Fossil Vertebrates of Southern California Downs

Mammals of Southern California Booth

Mushrooms of Southern California Orr/Orr

Native Shrubs of Southern California Raven

Native Trees of Southern California Peterson

Seashore Life of Southern California Hinton

Seashore Plants of Southern California Dawson

Amphibians and Reptiles of California Stebbins

Cacti of California Dawson

Early Uses of California Plants Balls

Edible and Useful Plants of California Clarke

Ferns and Fern Allies of California Grillos

Grasses in California Crampton

Introduction to California Plant Life Ornduff

Marine Mammals of California Orr

Teaching Science in an Outdoor Environment Grass/Railton

California Insects Powell/Hogue

Windows into the Santa Monica Mountains, Outdoor Explorations by Sue Irey and Jean Dillingham (1980) Topanga-Las Virgenes

Resource Conservation District and National Park Service

Sharing Nature with Children by Joseph Bharat Cornell (1979) Ananda Publications

Who Was Here Before Us

The Natural World of the California Indians by Robert F. Heizer and Albert B. Elsasser (1980) U.C. Press

Los Angeles, Biography of a City by John and Laree Caughey (1976) U.C. Press

Where to Go

California Coastal Access Guide by the California Coastal Commission (1981) U.C. Press

Hiking Trails of the Santa Monica Mountains by Milt McAuley (1982) Canyon Publishing Co.

\$2.00

