

Background Reading

San Diego Native Habitats

These lessons are about the **chaparral** and **coastal sage scrub habitats** that are common in San Diego and all of southern California. Students are not expected to know the difference between them. And often the same natural area will have **coastal sage scrub** on a dry, south-facing slope, and **chaparral** on a north-facing slope.

What is chaparral?

Chaparral is California's most extensive **ecosystem** and can be found in every single county in the state. It is characterized by beautiful, woody shrubs like manzanita and ceanothus and is home to a wonderful array of animals. It is also where the now extinct California grizzly bear once roamed. **Chaparral** forms a dense cover of shrubs over many hills and mountains along the coast and on the slopes of inland valleys. Some old-growth **chaparral** stands can be more than fifteen feet tall.

Chaparral is a plant community made up of hard-stemmed leathery-leaved shrubs. Cacti may also be present. **Chaparral** is one of the most widespread vegetation communities in San Diego County comprising more than 630,000 acres. While there have been major losses of various forms of **Chaparral** to agriculture and urbanization, it still appears throughout the foothills and mountains on exposed slopes and ridges, often forming a mosaic with Oak woodlands and Pine forest.

What are some clues for chaparral habitat?

The most common **chaparral** subtypes are represented by several different **species** of Manzanita with smooth red bark, Scrub oak **species**, Chamise, and several **species** of Ceanothus which are sometimes referred to as wild lilac and have blue or white flowers. Common birds are the Spotted towhee, Wrentit, and Red-shouldered hawks. A number of reptiles also inhabit this community, including western fence lizard, San Diego horned lizard, gopher snakes, and the Pacific rattlesnake. Mammals include bats, deer mice, and pocket mice, Black-tailed jackrabbits, and Brush rabbits. Larger animals are the coyote, bobcat, Mule deer, and the occasional Mountain lion.

What is coastal sage scrub?

Coastal sage scrub consists predominantly of low-growing, aromatic, and generally soft-leaved shrubs. During spring, this community of plants gives the hills around the inland valleys their soft, gray-green color. During the summer drought, many of the shrubs lose their leaves entirely, but grow them again when the rain

returns in October or November. **Coastal sage scrub** was originally the dominant vegetation in San Diego County and once grew where there is now urban and agricultural development. Nearly 70% of its original area has been lost and much of what remains exists in small patches of isolated **habitat**.

What are some clues for coastal sage scrub habitat?

The dominant shrub **species** in this **habitat** community are California sage, Flat-topped buckwheat, Black sage, Laurel sumac, Bladderpod, and the San Diego sunflower. Many animals live in both the **chaparral** and **coastal sage scrub**.

Some birds and animals live only in the **coastal sage scrub**, including the California gnatcatcher (an endangered **species**) and the coast horned lizard.

What are non-native plants and animals?

Non-native plants and animals are called exotics, invasives, non-indigenous **species**, or aliens. These **non-native plants** and animals did not originally grow in the particular geographic area they now occupy. They may come from as far away as Asia or Europe, or as near as the next state. **Non-native plants** often have few natural controls such as the diseases and insect **predators** that affect them in their place of origin. This situation allows many exotics to grow out of control and crowd out **native species**, taking away space, available nutrients, and water. Some of these **non-native plants** and animals can overtake an entire **ecosystem**.

Plants and animals have been introduced into the environment on purpose and accidentally. Immigrants and tourists like to bring pets and plants from other countries, even though it is illegal. And sometimes animals, insects, and seeds are unknowingly brought on board ships, planes, trains, and trucks coming into San Diego. Many restoration projects are conducted in order to remove invasive plants and animals, such as Arundo, a giant weed that grows in creeks and chokes out the **native plants**.

Not all **non-native plants** are troublesome; some are very useful, such as wheat. Wheat was first brought to North America by Europeans in the early 17th century; it now thrives all over the world. It has fed and employed billions of people over many centuries and has contributed to the world's agricultural productivity. Many of our food crops are grown from plants that originally grew in other places, such as corn from Mexico.

Background Reading

Mediterranean Climate and Adaptations

The special combination of hot, dry summers and mild, wet winters is a type of climate called Mediterranean. Rain in the **chaparral** and **coastal sage scrub** almost always falls in late autumn and winter, rarely in the summer. This is unusual because most **habitats** in the world receive a lot of rain during the summer months. There are only five places on earth that have a Mediterranean climate: California, central Chile in South America, parts of southern Australia, South Africa, and the countries around the Mediterranean Sea.

The average rainfall in San Diego is 11 inches, measured at Lindbergh Field (the San Diego airport). The mountains get twice as much rain; the desert gets about 3 inches of rain. The warmest month is August, with an average high temperature of 78 degrees and an average low of 67 in downtown San Diego. The coldest month is January, with an average high temperature of 65 degrees and an average low of 48 degrees.

How do plants adapt to the Mediterranean climate?

To survive this type of climate, many shrubs have small, tough leaves with waxy coatings to prevent water loss. Nearly all **chaparral** shrubs are evergreen, meaning they keep most of their leaves all year. However, in the dry months of summer and autumn, some shrubs, like Ceanothus or black sage, drop nearly half their leaves. Fewer leaves mean less water will be lost through evaporation.

By mid-winter, after the first few rain storms have soaked the ground, **chaparral** and **coastal sage scrub** plants will begin to sprout new leaves. This is “springtime” for plants in this climate. As early as December, shrubs like manzanita will start blooming. Imagine, flowers in the winter! But this is how the **chaparral** has adapted to the Mediterranean-type climate in which it thrives.

How do native habitats respond to wildfires?

In the summer and autumn heat, **chaparral** and **coastal sage scrub** burn quickly if they catch fire, because the plants are so dry. In Southern California, strong Santa Ana winds from the desert are responsible for spreading the largest fires. Such large fires are natural and the **chaparral** can recover as long as fires are not too frequent. In the past, before humans came to California, the **shrublands** burned probably once every 50 to 100 years. Now, with so many fires caused by people, some areas are burning every ten years or less. With more frequent fires, the

chaparral does not have time to recover and is usually replaced by **non-native** weeds and grasses.

If given enough time, however, **chaparral** plants can deal with fire in special ways. Some shrubs send up tiny green shoots from their root collars a few days after the fire is out. Within a month or two, these re-sprouting shrubs decorate the burned landscape with little green bundles of leaves.

Other shrubs are completely burned up by fire, but live on through the thousands of seeds they have produced over the years. These seeds can hide in the soil for a century or more. They only become seedlings after their seeds have been cracked open by heat or are exposed to chemicals found in smoke and charred wood. Some shrubs can both re-sprout and produce seedlings after a fire.

There are also many annual wildflowers that appear after a fire. The seeds of these plants were produced after the last blaze and remain dormant until fire awakens them again. Then, during the first spring after a fire, burned **chaparral** hillsides are often covered with thousands of beautiful wildflowers like orange poppies, white snapdragons, and purple lupines. Sometimes these wildflowers will return a second year, but will then disappear until after the next blaze.

Within a few years after a fire, re-sprouting plants and shrub seedlings start to take over again. In 15-20 years, the **chaparral** is able to cloak the land with its green, soft velvet cover.



Figure 14: Chamise resprouting after a fire.

Background Reading

San Diego History

How did native people live with the native habitats?

Humans arrived in San Diego between 10,000 and 30,000 years ago and settled along our coast. California was much colder then, with wetlands and lakes covering areas that are now dry. There were large animals that don't even exist today such as mammoths, giant sloths, and mastodons. Slowly, over many years, the climate got warmer and drier. The lakes dried up and the largest animals became extinct. Early people arrived and adapted to San Diego's environment. One group, the Kumeyaay, lived along San Diego's coast, from an area now called Mission Valley, down to Ensenada in Baja, California.

Native people lived in balance with nature and took care of the land to make sure there were plenty of animals, fish, and plants to feed everyone. They breathed pure air and slept in deep silence under dark skies. Rivers flowed freely all the way to the ocean and were filled with trout and bass. Trees and **chaparral** sheltered many animals such as deer, grizzly bears, and mountain lions. Thousands of birds sang, ate, and lived among the shrubs and trees. Snakes fed on the field mice as did the hawks soaring above. The Native people learned how to work with the land to encourage the growth of local plants that they used for food, medicine, and domestic items like baskets.

What animals and plants did the Spanish and settlers bring?

When the Spanish arrived in the mid 1500s to build a mission in San Diego, they also brought new plants and animals to the region. The Spanish brought seeds to grow wheat, oats, citrus fruits, mustard, and pepper. Animals such as horses, cattle, and sheep also joined as well. These grazing animals roamed the mission lands, eating and trampling the wild **native plants**. The seeds of new crops quickly spread outside the garden areas and started to compete with the **native plants**.

As San Diego started to develop, the Spanish offered free land to encourage skilled settlers like farmers, miners, and traders to move into the area. The new settlers built their homes in Old Town and other villages. In 1821, California won independence from Spain and became part of Mexico. Large ranchos, used to raise herds of cattle for leather and tallow for candles, spread across San Diego. Acres of **chaparral** and **coastal sage scrub** were destroyed by the numerous free-range cattle. Years later, San Diego had a great drought that ended the local cattle industry.

To find water, ranchers had to drive their cattle further south into Baja California or up into the mountains.

What changes happened to native habitats when cities grew?

During the 1880s and 1890s, San Diego became a city with a developing downtown that included hotels, theaters, the wharf, and new landscaping. Dams were constructed along the San Diego and Sweetwater rivers to provide water for the growing city. Plans were made to plant 100 **non-native** trees per year in what would become Balboa Park, and to provide 300 more trees each year for planting in the city. **Coastal sage scrub** and **chaparral** plants were quickly replaced in these rapidly developing areas.

The 1900s brought even more modern changes to the **ecosystem**. Museums, bridges, gardens, and a zoo were constructed in Balboa Park, which had once been covered with **coastal sage scrub**. And today, about three million people live in San Diego County, more than 100 times the number of Native people that lived here before Father Serra arrived.

With more and more people coming to San Diego, acres of **chaparral** and **coastal sage scrub** were replaced by large housing projects on the mesas. Buildings, subdivisions, and parking lots replaced more of the **chaparral**. Wide roads and freeways now cut through the middle of **habitats**, restricting movements of plants and animals. Outside the landscaped yards, the **native** shrubs and wildflowers are being replaced by Eucalyptus and pepper trees, mustard, oats, and pampas grasses. All of these alterations to the environment have resulted in removal of critical **habitat** for the remaining **native** birds, mammals, reptiles, and fish trying to survive in their changing world.



Figure 15: Mustard, a common invasive plant found in San Diego.

Vocabulary List

Adaptation: A physical or behavioral characteristic of a plant or animal that helps it survive in its natural environment.

Chaparral: The largest and most diverse plant community in San Diego County. Plants are composed of hard stemmed, leathery leaved shrubs.

Coastal Sage Scrub: Plant community named after the commonly-found coastal sagebrush. It is defined by waist-high shrubs on slopes or flats that receive much sunshine and little rainfall.

Conservation: The wise use or protection of natural resources.

Consumer: An organism that gets energy and matter by eating other organisms.

Decomposer: Bacteria and fungi that get energy from the matter in dead organisms and waste.

Ecosystem: A community of plants, animals, and their surroundings that depend on each other.

Energy: The capacity to do work or the source of power to do work.

Food chain: The path that energy takes from one organism to another in the form of food.

Habitat: The place where an organism lives and meets its needs.

Native: The plants, animals, and habitats that have existed in an area for thousands of years, before the arrival of Spanish settlers.

Naturalist: A person who studies or teaches about nature.

Non-Native Plants: Plants that did not originally grow in the geographic areas they now occupy.

Organism: A living thing, such as a plant, animal, or other life form that can grow and reproduce.

Predator: An animal that lives by killing and eating other animals.

Prey: An animal hunted or killed by another animal for food.

Producer: An organism that makes its own food.

Scat: Undigested foods and liquids that are not used by the body and are expelled.

Shrubland: A type of habitat that includes chaparral and coastal sage scrub plant communities.

Species: A living thing, such as a plant, animal, or other life form that can grow and reproduce.

Wildlife: Non-domesticated animals including but not limited to, insects, spiders, birds, reptiles, fish, amphibians, and mammals.