



CALIFORNIA
ACADEMY OF
SCIENCES

CALIFORNIA ACADEMY OF SCIENCES

HOTSPOT

CALIFORNIA
ON THE EDGE

Overview

California Hotspot Regions

Issues & Threats

Conservation & Protection

What You Can Do



HOTSPOT: California On The Edge

For much of Earth's history, California only existed as part of the seafloor in a deep blue ocean.

California was slowly built by plate tectonics and now lies on the edge of a continental plate. Movement along geologic faults has sculpted spectacular landscapes that have been repeatedly shaken by earthquakes and volcanic eruptions.

Cold ocean currents to the west and high mountains in the east formed a mild climate characterized by short wet winters and long dry summers.

Over millions of years, geology and climate have shaped California's unique habitats and produced a rich mosaic of life. Many plants and animals here are found nowhere else,

Above: Pacific tree frog on lily at Jepson Prairie Preserve vernal pool

[HOTSPOT: California On The Edge](#)

[Global Biodiversity Hotspot: California Floristic Province](#)

[Biodiversity Hotspots Defined](#)

[GLOBAL BIODIVERSITY HOTSPOTS - TERRESTRIAL](#)

making California one of the most biologically diverse places in the world.

Some of the most spectacular places on earth are also the most threatened. As the most populated and fastest growing state, California will be challenged to protect its unique biodiversity.

GLOBAL BIODIVERSITY HOTSPOT - CALIFORNIA FLORISTIC PROVINCE *Unique and Threatened Biodiversity*

Most of the state of California lies within a biodiversity hotspot called the California Floristic Province, an area of diverse vegetation. Designated a hotspot in 1996, it shares this distinction with 33 other places in the world.

Biodiversity hotspots are home to the highest diversity of endemics, plants and animals that are found nowhere else in the world.

Of nearly 3,500 species of plants in the California hotspot, more than 61% are endemics. The highest levels of endemism are found among amphibians.

Part of what makes California a hotspot is that its spectacular biodiversity is seriously threatened. At least 75% of the original habitat has already been lost. Over the last several decades, however, California has dedicated more effort than any other state to protecting its precious habitat and species that remain.

Biodiversity Hotspots Defined

Defining a hotspot requires understanding a regions species distributions and endemism (the degree to which species are found only in a given place).

Areas where endemic species live are irreplaceable, but which species should be considered to define a hotspot? Vascular plants and vertebrate animals were used, because there is sufficient scientific data for these species.



The California Floristic Province.

Source: [Conservation International](#)

[Coco de Mer](#)

[Threats](#)

[Biodiversity Conservation and Protection](#)

[What You Can Do](#)

[GLOBAL BIODIVERSITY HOTSPOTS - CORAL REEFS](#)

[Elkhorn Coral](#)

[Threats](#)

[Coral Reef Conservation](#)

[What You Can Do](#)

[The Endangered Species Act was signed into law by law by President Richard Nixon in 1973](#)

[Teacher Resources](#)

[California Hotspot Exhibit Overview \[271 KB PDF\]](#)

[Conservation International: California Floristic Province](#)

[California Floristic Province: Unique Biodiversity](#)

[California FLoristic Province: Human Impacts](#)

[California Floristic Province: Conservation Action](#)

[Conservation International: Threatened Species in California](#)

[Conservation International: Hotspots Science](#)

Scientific institutions like the California Academy of Sciences that have collected and documented species for more than 100 years provide much of this data. Historic and modern scientific collections are the basis for determining distribution and endemism on a world-wide scale.

Not enough research exists for terrestrial invertebrates or aquatic species and research in these areas is an urgent priority.

GLOBAL BIODIVERSITY HOTSPOTS - TERRESTRIAL

The richest terrestrial habitats are at risk

Biological diversity is not spread evenly across the planet. Some regions, called biodiversity hotspots, contain more unique species and are at greater risk from human impact. These spectacular places can still be saved if action is taken.

In 1998, Conservation International (CI) presented a strategy to focus conservation efforts in areas where they will have the greatest impact. Today, CI lists 34 global terrestrial hotspots.

COCO DE MER

Lodoicea maldivica

Sailors who first saw the double coconut floating in the sea imagined that it grew on a mythical tree at the bottom of the sea. This was a commonly held belief until the true source of nut was discovered in 1768.

Seeds occasionally washed up on the coast of India and were viewed as sacred. Today, the seed is so valuable that its chances of being allowed to fall into water and drift away are extremely small! The coco de mer is now a rare protected species that is endemic to only two of the 115 Seychelle Islands in the Indian Ocean.

This palm produces the largest seed in the world. Coco de mer has distinct male and female plants. Flowers are borne in enormous fleshy spikes and the large fruits take ten years to ripen into a fibrous envelope around a hard, two-lobed edible nut. It is an example of a drift seed that is dispersed by the sea.

THREATS

Issues Facing these Areas

- **Population Pressures** - Human impact drives all the other threats to these hotspots.
- **Loss of Habitat** - Deforestation, unsustainable farming and hunting, pollution,

and development.

- **Unsustainable Resource Use** - Fossil fuel consumption, draw down of freshwater water sources
- **Introduced Non-native Species** - Invasive species out-compete or prey on native species.

Biodiversity Conservation and Protection

The World Conservation Union (IUCN) works to protect the environment.

Earth Summit Conferences bring together governments from around the world to decide how to protect biodiversity and natural resources.

Ecotourism in Costa Rica and the Galapagos Islands are good examples of the economic benefit of strong conservation programs.

WHAT YOU CAN DO

- Conservation International Biodiversity Hotspots:
<http://www.biodiversityhotspots.org/>
- Join organizations that are working to protect biodiversity and natural resources.
- Don't buy items made from endangered or threatened species.
- Visit the Academy's Naturalist Center on the second floor of this building to learn more.

GLOBAL BIODIVERSITY HOTSPOTS - CORAL REEFS

The richest tropical marine habitats are at risk

Worldwide, 25% have been destroyed or badly degraded.

In 2002, concerned scientists (including Academy scientist Dr. John McCosker) listed ten coral reef hotspots as priority areas for conservation. Eight are next to terrestrial hotspots, and all contain marine species highly vulnerable to extinction. Some scientists estimate that in only 15 years, by 2020, up to 70% of these unique ecosystems may be irreversibly lost.

Hundreds of millions of people depend on coral reefs for food and their livelihoods. Coral reefs also provide protection from damage by tropical storms, hurricanes and typhoons, yet these immensely important habitats are at risk from human activities.

ELKHORN CORAL

Acropora palmate

These corals only occur in shallow Caribbean waterzones with lots of wave action and water temperatures from 66° to 86°F (19 to 30 °C). During storms branches that break off can fall to the sea floor and grow. This helps reefs rebuild after hurricanes.

Coral reefs offer shoreline protection from storms and tsunamis, provide important habitat and increase biological diversity. Reefs also provide subsistence for local people.

Coral bleaching caused by UV exposure, prolonged water temperature changes and bacterial infection resulted in widespread coral mortality on reefs.

These corals, once the dominant reef building species in this area, are now proposed for listing as endangered.

THREATS

Issues Facing these Areas

- **Population Pressures** - Human impact drives all the other threats to coral reefs.
- **Loss of Habitat** - Destructive fishing methods, over-fishing, coral harvesting, oil spills, logging, agriculture, and coastal development contribute to habitat loss. The clear cutting of mangrove forests for shrimp farms allows silt to smother reefs.
- **Global Warming** - In 1998 global warming increased some ocean surface temperatures and caused severe coral bleaching and disease.

Coral Reef Conservation

- The Nature Conservancy's Rescue the Reef program focuses its conservation efforts on a different coral reef hotspot each year.
- Conservation International builds conservation alliances to address threats facing reefs.
- National Oceanic and Atmospheric Administration (NOAA) focuses on reefs in U.S. territorial waters, especially Florida and Hawaii.
- New Guinea's coral reefs are protected by tribal laws, while those of Sulawesi are protected for ecotourism.

WHAT YOU CAN DO

- Conservation International's Marine Portals website:
<http://www.conservation.org/>
- Purchase captive-bred fish for home aquariums and don't buy items made from

corals or reef animals.

- Every Day Ways to Help Coral Reefs and Rescue the Reefs:
<http://www.nature.org/>
- Buy sustainably caught or farmed seafood. Visit the Academy's [Seafood Guide](#) for a list of sustainable seafood choices or download the [Seafood Guide PDF](#) [240 KB]