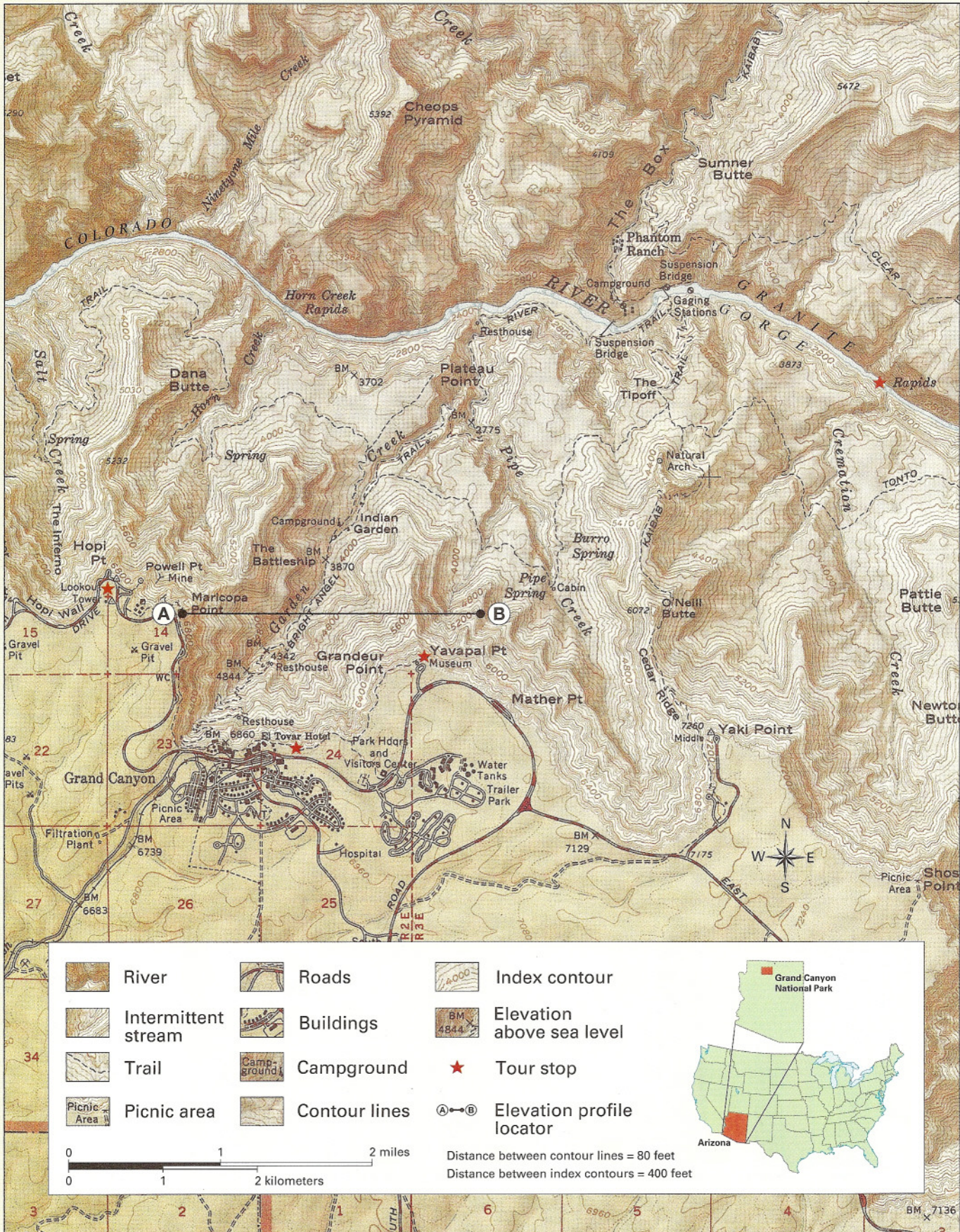


Topography of Grand Canyon National Park (detail)



National Parks: Saving the Natural Heritage of the U.S. and Canada

6.1 Introduction

Imagine standing on the rim of the Grand Canyon and looking out at one of the world's most spectacular sights. The canyon is enormous—18 miles across at its widest point. Its colorful walls look like an artist painted them in shades of red, orange, yellow, and green. A mile below, the Colorado River winds like a ribbon along the bottom of the canyon. How fortunate people must feel that this special place is open to anyone who wants to visit it.

The Grand Canyon is available to visit because it is a **national park**. National parks are large areas of land set aside by governments to preserve in their natural state. Today there are 55 national parks in the United States and 42 in Canada. Most of the parks were created to protect land and wildlife because of their rarity, beauty, or other qualities. Some parks preserve lands with historic interest as well.

Grand Canyon National Park is a good example of a single park that serves many purposes. Besides the majestic canyon, the park boasts abundant wildlife and plant life as well as ruins of ancient Native American pueblos, or villages.

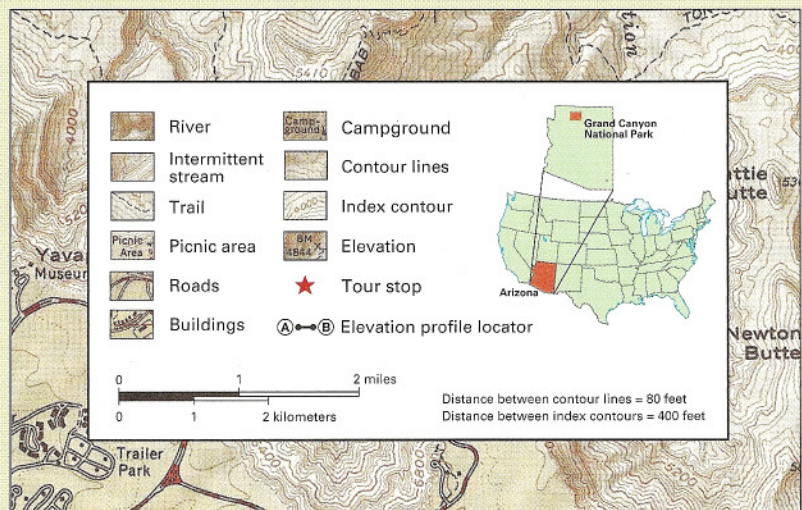
In this chapter, you will explore some of North America's national parks. To do so, you will use **topographic maps**. These large-scale maps show the landforms and other surface features of an area, both physical and human. The maps will help you understand the special features of each park.

Essential Question

What features make national parks special and worth preserving?

This map legend is from a topographic map of a national park. This type of map shows a park's topography, or the features on the surface of the land. Some are natural features. Others are created by humans. Keep the symbols on this legend in mind as you try to answer the Essential Question.

Graphic Organizer





Flora in Yellowstone National Park



Fauna in Yellowstone National Park

6.2 The Geographic Setting

When American fur trappers explored the Rocky Mountains in the 1800s, they came across a remarkable place. They saw pools of water so hot that they were covered with clouds of steam. They found puddles of boiling mud that spluttered and splattered day and night. They also saw hot springs called **geysers** that threw jets of hot water up in the air. Some of the geysers erupted on regular schedules while others would suddenly blow sky high with no warning. The trappers called this strange landscape “the place where hell bubbles up.” Today we know the area as Yellowstone National Park.

At first, people thought the trappers’ stories of boiling springs were just “tall tales.” In 1870, however, the government sent an expedition to explore the area, and it turned out that the tales were all true.

Yellowstone is a unique place. It has about 300 geysers—two thirds of all the geysers in the world. Some of those geysers on occasion erupt to 100 feet and beyond. Yellowstone also has more than 10,000 hot springs, mud pots, and steam vents.

Yellowstone Becomes the First National Park In the 1800s, more and more people moved west. As Americans turned wilderness into farms and ranches, some people began to talk about protecting the Yellowstone area as a public park.

The idea of a national park for the public was new. European cities had public gardens, but no country had ever set aside a large area of land for its citizens to visit and enjoy.

In 1872, Congress passed a law creating Yellowstone National Park out of federal land in what became the states of Montana, Idaho, and Wyoming. Yellowstone was the first national park in the world. Over time, Congress created many more national parks, and the national park movement eventually spread to Canada and other countries.

Parks Protect Special Places for Future Generations National parks have been created to protect many different places. Some parks preserve unique landforms and bodies of water. Others protect unusual **flora**, or plant life. Some provide homes for rare **fauna**, or animal life. And some preserve historic reminders of the past, such as national battlefields and national cemeteries.

The movement to set aside special places as parks was led by people called **conservationists**. Probably the best-known American conservationist is John Muir. Muir was born in Scotland, and his family relocated to the United States when he was 11. As a young man, he suffered an injury that left him temporarily blind. When his sight returned, he vowed to turn his eyes to nature. Muir walked across much of the American West. On that journey, he fell in love with the West’s plains, mountains, and forests.

Muir spent most of his life trying to preserve beautiful wild places as parks. “Everybody needs beauty as well as bread,” he wrote, “places to play in and pray in, where nature may heal and give strength to body and soul alike.” Today many people remember him as “The Father of the National Parks.” In this chapter, you will learn more about the special features of several national parks.

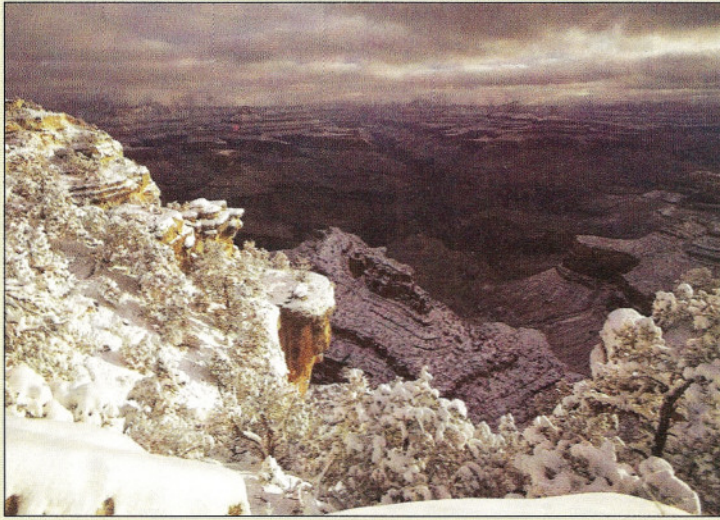
► Geotermms

conservationist someone who works to protect the beauty and natural resources of the environment from destruction or pollution

fauna all the animal life in a particular region

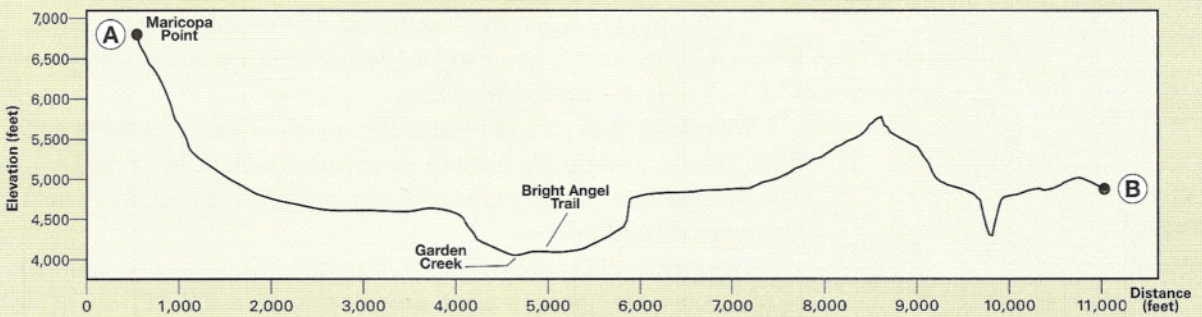
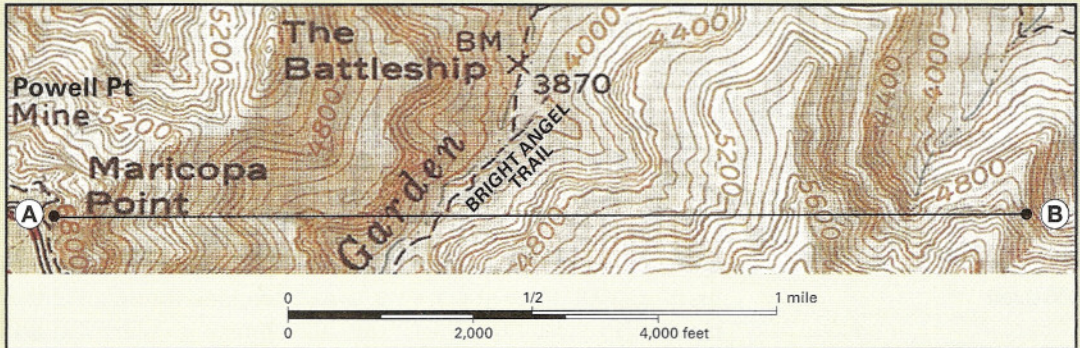
flora all the plant life in a particular region

topographic map a map that uses elevation lines and symbols to show a region's physical and human features. These features may include hills, valleys, rivers, lakes, roads, trails, and buildings.



Three Views of the Grand Canyon

This photograph looks out over the Grand Canyon from near Maricopa Point on the West Rim. The ship-shaped rock formation at its center is known as the Battleship. The section of topographic map below the photo shows this same feature. It also shows Bright Angel Trail, which leads down Garden Creek to the canyon floor. The elevation profile below the map shows this same area from a different point of view. It traces changes in elevation from Maricopa Point to a ridge near Pipe Spring.



6.3 Waterton-Glacier International Peace Park

About 10,000 years ago, huge **glaciers** covered the tops of the Rocky Mountains and gradually slid down their slopes. A glacier is a large, slow-moving mass of ice. Because of their enormous size and weight, glaciers act like bulldozers, scraping and reshaping the land as they move. Almost everywhere you look in Waterton-Glacier International Peace Park, you can see strange and wonderful shapes carved by glaciers. Landforms created by glaciers are called **arêtes**, **cirques**, **hanging valleys**, **horns**, and **moraines**.



Sperry Glacier



Mountain goat



Lake Ellen Wilson

Two Parks into One Waterton-Glacier International Peace Park unites two parks, one on each side of the border separating the United States and Canada. The park's land was once home to Kootenai and Blackfoot Indians. Both tribes fished the mountain rivers and hunted herds of buffalo there. During the 1800s, European settlers arrived and began clearing land for farms and ranches. Miners searched for copper and gold, although no large deposits were ever found. In 1895, the Blackfoot sold their homeland to the United States.

By that time, many people in both the United States and Canada wanted to protect some wilderness areas as parks. In 1895, Canada set aside the Waterton Lakes area as a park. In 1910, the U.S. Congress created Glacier National Park. The two countries joined the parks in 1932 to create the world's first international park. It was called a peace park in honor of the long friendship between the two countries. The Blackfoot and Kootenai Indians were forced to live outside the park on reservations to the east and southwest of Glacier.

Natural Attractions and History Waterton-Glacier park is notable for a number of physical and human features. To begin with, the park straddles the **Continental Divide**. The Continental Divide is a ridgeline along a chain of mountains stretching from Mexico to Canada and Alaska. Rivers on the west side of the divide run toward the Pacific Ocean. Rivers on the east side flow toward the Atlantic Ocean and the Gulf of Mexico.

One of the most popular recreational activities in Glacier is to drive along Going-to-the-Sun Road. This highway links a valley on the east side of the divide and a valley on the west side. Along the drive, the road climbs through a spectacular mountain pass.

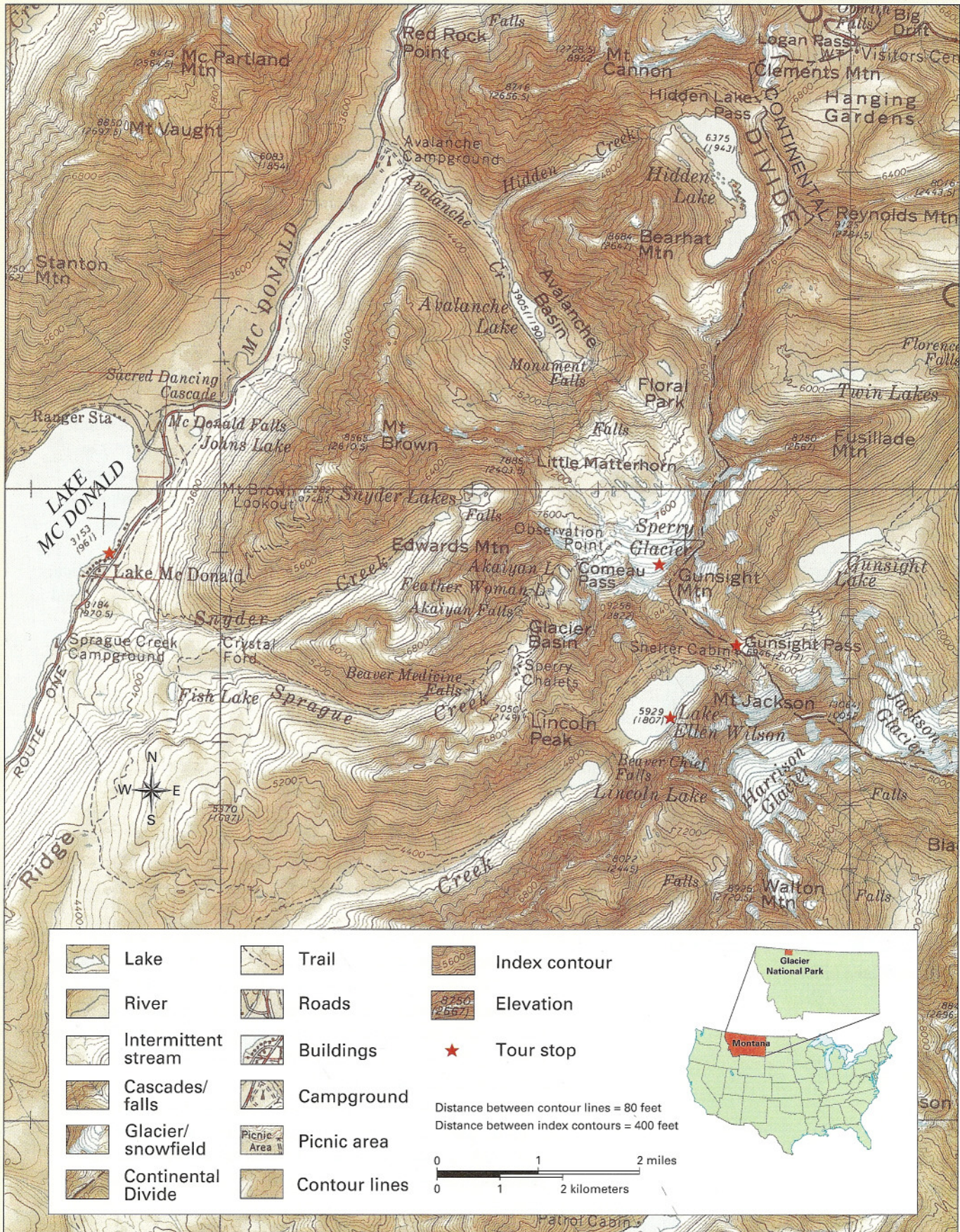
Driving the highway is a good way to experience the different **climates** on each side of the divide. On the west side, the weather is mild, with a lot of rainfall. Here you see cedar and hemlock forests, like those along the Pacific coast. On the east side, the climate is colder and drier. Forests of spruce, fir, and pine are common.

As you might expect, glaciers are one of the park's main features. In fact, Glacier park is home to 50 glaciers. It is unusual to find glaciers so far south in the Rocky Mountains.

Waterton Lakes park is famous for its rich diversity of fauna and flora. Here you might see bighorn sheep, moose, black bears, and wolves. The park protects prairie grasslands, mountain forests, and more than 900 types of wildflowers.

The park is also rich in history. Waterton Lakes has two national historic sites: the first oil well in western Canada and the Prince of Wales Hotel, which opened on July 25, 1927.

Topography of Waterton-Glacier International Peace Park (detail)



6.4 Prince Edward Island National Park



Sand dunes



Green Gables house



Red sandstone cliffs

It was broad daylight when Anne awoke and sat up in bed... For a moment she could not remember where she was. First came a delightful thrill, as something very pleasant; then a horrible remembrance. This was Green Gables and they didn't want her because she wasn't a boy!

Maybe you recognize this scene from the novel *Anne of Green Gables*. At about the age of 11, an orphan named Anne Shirley came to live with an elderly couple on Prince Edward Island in Canada. The house they lived in was called Green Gables.

The book's author, Lucy Maud Montgomery, knew the island well because she had grown up there. A local farm gave her the inspiration for Green Gables. Today, Green Gables house is just one of many attractions that bring visitors from all over the world to Prince Edward Island National Park.

A Fragile Island Environment Prince Edward Island has a fragile environment of beaches, sand dunes, and **wetland**. The forces of wind and water and human activity over time have left their mark here. On its north shore, ocean waves have carved steep cliffs into the red sandstone. While forests of beech, sugar maple, yellow birch, and red oak once covered the island, today there are only evergreens such as fir, spruce, and tamarack.

More than a thousand years before Europeans reached North America, the Micmac Indians lived on Prince Edward Island. They called the island Epekwitk, which means "resting on the waves."

Between about 1720 and 1911, French and then English settlers made Prince Edward Island their home. In their eagerness to build homes and make a living, the settlers cleared the forest from more than half the island. They cut down trees for farming, timber exportation, and shipbuilding. In 1937, the Canadian government created Prince Edward Island National Park to protect and preserve the delicate environment of a portion of the island.

Old Settlements and Moving Dunes Visitors come to Prince Edward Island National Park to explore its natural and historical heritage. At Green Gables they can see how people lived on the island in the late 1800s. They can wander through old homes of early settlers.

Visitors to the park can explore the island's marshes, woods, and sandy beaches. The park is an important **habitat** for many types of birds and rare plants. Migrating sand dunes draw visitors to the park's north shore. A dune is a hill of sand that has been piled up by the wind; a migrating sand dune is one that is being pushed by the wind to a different location. On Prince Edward Island, the winds are slowly driving the dunes from the edge of the beach inland.

Seeing the dunes move over a period of months and years is similar to watching nature playing a game of leapfrog. The island's migrating dunes have covered up entire sections of forests, killing the trees. As the dunes move on, they reveal a "skeleton forest" of trees that were previously buried.

Topography of Prince Edward Island National Park



6.5 Yosemite National Park

High in the Sierra Mountains of California is a valley called Yosemite. It was a favorite camping site of the conservationist John Muir. Legend has it that one night in the late 1800s, during a fierce storm, Muir climbed to the top of a tall Douglas fir tree to watch as lightning forked across the dark sky. Muir could easily have been killed as he swayed in the howling winds. Luckily, he survived to see his beloved camping ground become Yosemite National Park.

A Gold Rush, Miners, and Tourists The first people in Yosemite were Miwok Indians. They roamed the valley for thousands of years before Europeans arrived. The park was named after a Miwok tribe.

In 1849, Europeans discovered gold in the foothills of the Sierra Nevada. Thousands of miners rushed in, hoping to get rich. In their eagerness to find gold, they cleared forests and polluted streams and rivers. They hunted for food until many animal species were in danger of disappearing. The miners also killed Miwok who did not flee the area.

Meanwhile, writers, artists, and photographers spread the word about the beauty of Yosemite Valley. Tourists began arriving on foot, on horseback, and by stagecoach. People built hotels to accommodate these many visitors. Others planted orchards and provided supplies for the miners. All of this human activity encroached on the expanse of natural beauty in the valley.

Led by John Muir, conservationists appealed to Congress to protect the valley and the surrounding land. In 1890, Congress agreed to create Yosemite National Park. It was the nation's third national park.

Granite Domes and Giant Trees Rounded mountains and tall, pointy rock towers circle Yosemite Valley. Millions of years of glacial activity created these amazing rock walls.

One of the most famous features rising above the valley floor is called Half Dome. Once it was a huge granite mountain with a rounded top, but long, long ago, a moving glacier sliced the mountain in two. The ice left just half of the dome behind, with a sheer 2,200-foot cliff.

El Capitan—a favorite wall for experienced rock climbers—is a 3,600-foot-high block of granite that forms the north wall of the valley. Climbers from all over the world come to Yosemite to scale “The Captain.” A few climb the incredibly steep cliff in less than 24 hours while others take a week or two to make their way to the top.

Yosemite Falls is one of the most photographed attractions in the park. It is really three connected waterfalls that, together, drop almost 2,500 feet from the valley's rim to its floor. Yosemite Falls is the highest waterfall in North America and the among the tallest in the world.

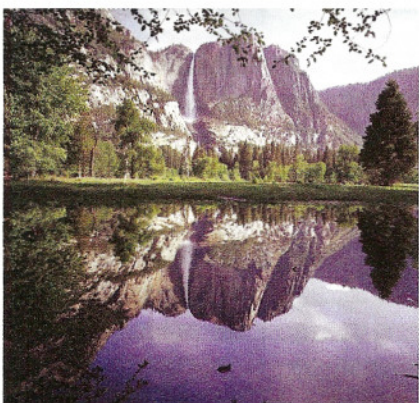
The park's fauna includes California bighorn sheep, coyotes, golden eagles, and black bears. Among its flora is the mariposa lily, a white flower that resembles a butterfly. The park also boasts groves of sequoia trees. Giant sequoias can measure up to 30 feet in circumference and more than 300 feet in height. They are the largest of all trees on Earth. They also number among the oldest living things. A tree known as Grizzly Giant in Yosemite's Mariposa Grove is believed to be at least 2,700 years old.



Half Dome

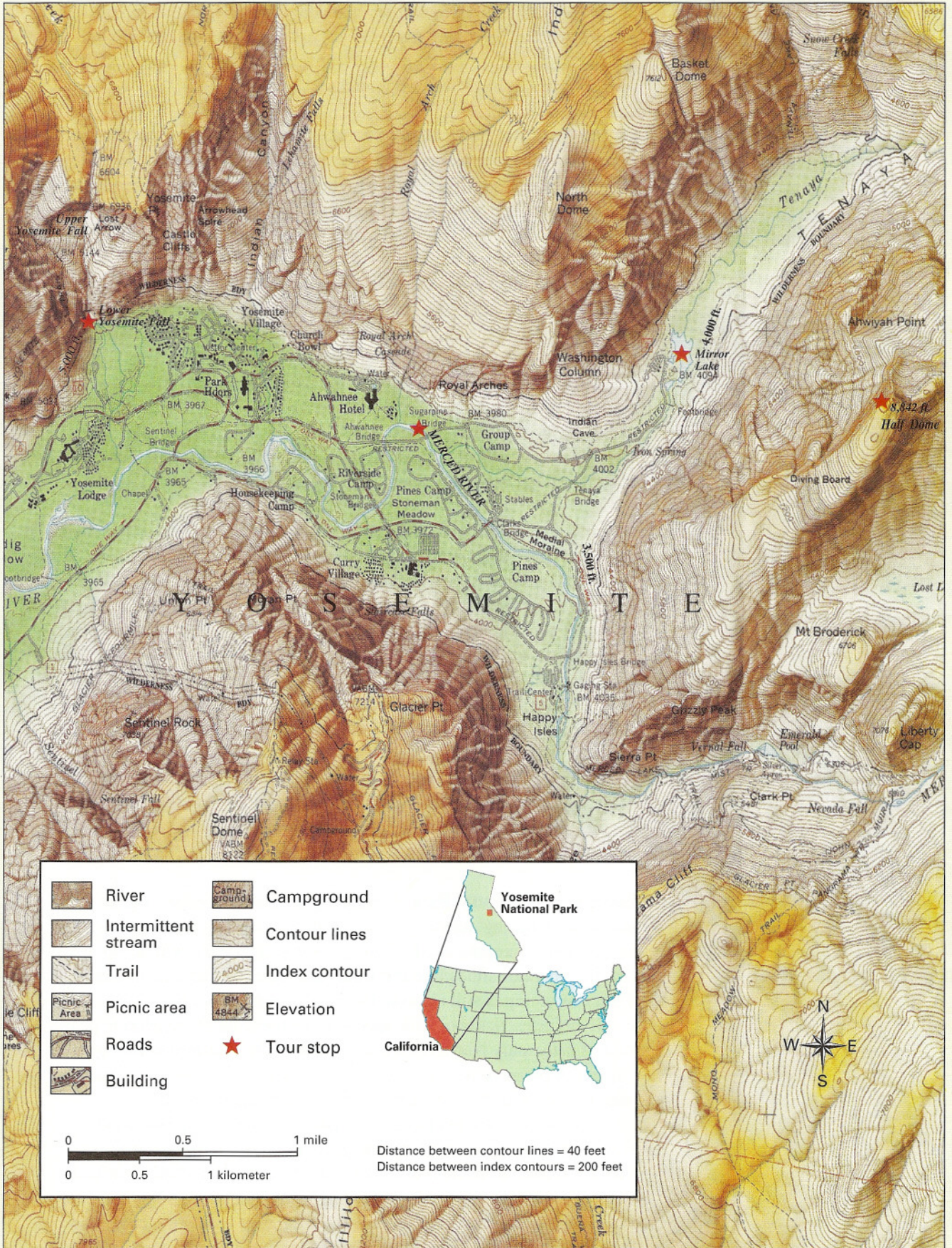


El Capitan



Yosemite Falls

Topography of Yosemite National Park (detail)



6.6 Peaks, Bears, and a Water Wilderness

You have read about two national parks and one international park in North America. There are many other parks to explore in the United States and Canada, each with its own special attractions. Here is a sampling of three quite different national parks.

Denali National Park Alaska's Denali National Park was established to protect its large mammals and is home to Mt. McKinley. At more than 20,000 feet, Mt. McKinley is the highest mountain in North America. The mountain was originally called Denali, an Indian word meaning "The Great One" or "The High One." It was renamed for President William McKinley in 1896.

Mt. McKinley is not the only mountain in Denali. The park includes other impressive mountains in the Alaska Range. Glaciers cover many of the tallest peaks. The park's **subarctic** climate is habitat to **mammals** such as grizzly bears, wolves, and moose.

Cars are not allowed in most of the park. Instead, visitors must explore on foot or by bicycle or bus. Park buses shuttle visitors to trails and campsites. Visitors can also board tour buses to view Denali. The bus drivers are very good at spotting wildlife. On a good summer day, visitors might even see caribou and bald eagles.

Wapusk National Park Wapusk National Park is Canada's 37th national park. The name Wapusk is a Cree Indian word that means "white bear." It's a good name for this park because Wapusk National Park was created to protect one of the world's largest known polar bear denning areas. A denning area is place where mother bears give birth to their cubs each spring.

Wapusk is not an easy park to visit. It is located in northern Manitoba, bordering Hudson Bay and far from any road. Much of the park is **tundra**, meaning the ground freezes hard in winter and becomes a swamp in summer. The park also includes a **taiga** forest of stunted spruce, larch, and willows.

The park is home to beluga whales, hundreds of thousands of birds, and a wide variety of wildflowers. But its most important animals are bears. Every year, about 190 pregnant polar bears come to the park to dig dens in the damp earth and give birth to their cubs.

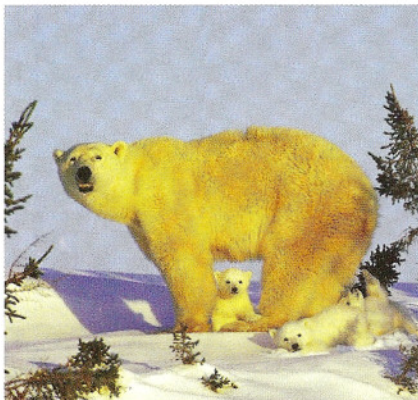
Everglades National Park A tall, long-necked bird called a great egret stands with one leg drawn up in the shallow water of a river. On the bank, an alligator is sunning itself. Nothing moves. Suddenly, with a flip of its tail, the alligator slides into the water and the egret flies off in a rush. Then everything is still again in Everglades National Park.

Everglades National Park spans the southern tip of the Florida peninsula. It is the only North American preserve with a **humid subtropical** climate. A preserve is an area where animals are protected from hunting. Summers here are hot and rainy, while winters are mild.

Everglades contains many different environments. It has ponds, rivers, and swamps as well as saw-grass prairies and pineland forests. These environments support a great variety of birds and other animals. The park is known for its large wading birds, like the spoonbill, the wood stork, the great blue heron, and the egret. It is also the only place in the world where alligators and crocodiles live near one another.



Mt. McKinley



Polar bears at Wapusk Park



Alligator in Everglades Park



6.7 Beginning to Think Globally

As you have read, the United States was the first country in the world to set aside wilderness areas as national parks. The idea of protecting land in parks soon spread to Canada. People from all over the world come to both countries to visit national parks. Some of these parks are known for their scenic beauty while others are visited for their flora and fauna.

Threats to National Parks The United States has led the movement to preserve wilderness areas. However, putting land in a park does not guarantee that it will be preserved from harm.

Many parks face threats from outside their boundaries. Air pollution, for example, drifts into parks from other areas. Great Smoky Mountains National Park spans Tennessee and North Carolina. Air pollution from nearby power plants is harming plants and wildlife there. Exotic, or non-native, species are another threat to native plants and animals. Infestations of nonnative insects and diseases occur when changes in the environment reduce their usual predators.

Local development can also hurt parks. Water levels are dropping in the Everglades because canals, levees, and other water-control systems divert water away from the park. The water that does reach the park is often polluted with **sewage** and **toxic waste**.

Loving Parks to Death Popular parks are also in danger of being loved to death. Large numbers of visitors are hard on parks. Their cars cause pollution, and their feet wear away fragile soil. Careless campers sometimes litter areas with trash or start fires.

Parks rich in natural resources face other threats. People eager to use those resources may pressure governments to open parks to farming, logging, mining, or oil drilling.

Around the world, lands set aside for parks or wildlife face similar threats. Think about these threats as you examine preserved land around the world in the next section.

Air Quality in the Great Smokies

Air pollution is a major problem in many national parks. These images are of Great Smoky Mountains National Park on a clear and a polluted day. Factories and cars outside parks create pollution that is carried by wind over the parks. The resulting haze and smog can destroy the beautiful views that people come to see. Air pollution can also harm a park's flora and fauna.

6.8 Global Connections

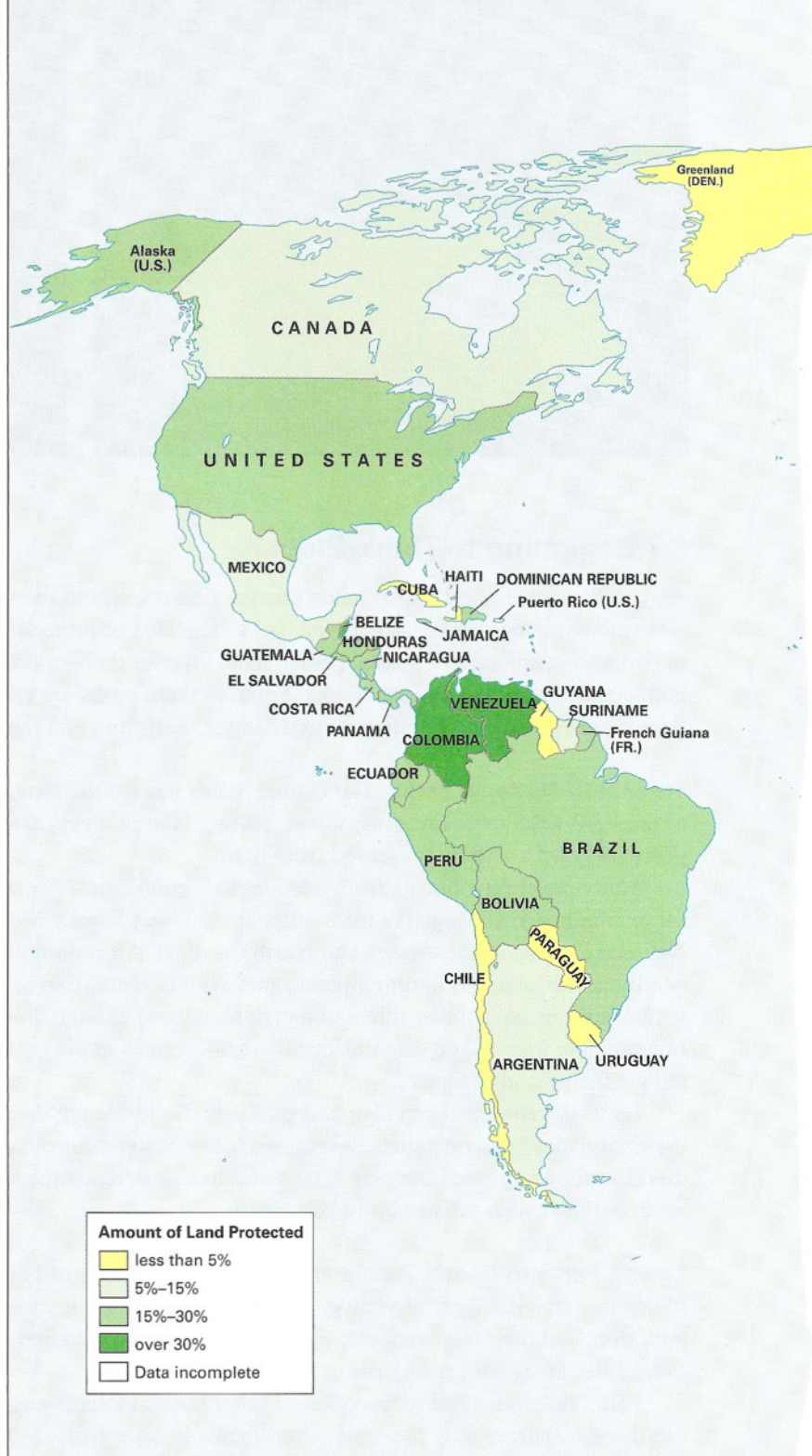
The map shows amounts of land preserved for parks and wildlife around the world. Some of these areas are preserved as national parks. Some are protected as national forests or wilderness areas. Some are set aside as special preserves for rare or unique flora and fauna.

What problems make it hard for countries to set land aside for parks? In many countries, the cost of creating parks may be a preventive factor. Poor countries may decide they are better off spending their money on things their citizens need more than parks. If a country lacks schools, for instance, parks may look like an unaffordable luxury.

What challenges do countries face in managing lands already set aside? Often the greatest management challenge is finding the right balance between preserving and using land. Some people argue that preserved land should be closed to all uses. They believe that this is the best way to protect special places and environments. Others feel just as strongly that people should be able to use and enjoy protected lands. They believe that this is the best way to build public support for parks. Balancing these two opinions is not easy.

Has the world done a good job of setting aside unique lands for preservation? Thousands of special areas have been preserved around the world. Still, many people think we can and must do better. The world is growing more crowded year by year, they argue. Unless we act now to protect more land, many other special places may be lost forever.

Protected Lands Around the World, 2003





Source: World Resources Institute, EarthTrends: The Environmental Information Portal, earthtrends.wri.org.