

Relative and Absolute Location: What Makes Australia Unique?

33.1 Introduction

Try to picture how Australia must have looked to European explorers when they first arrived there more than 200 years ago. It probably seemed a very odd place. Winter came in July. Summer heat peaked in January. Animals hopped around, carrying their young in pouches. The land was flat and very dry. Even the patterns of stars in the night sky looked strange.

As you know, the **absolute location** of a place describes its exact position on Earth. Canberra, the capital of Australia, is located at 35°S latitude and 149°E longitude. The letters S and E refer to **hemispheres**. Its latitude tells us that Canberra is in the Southern Hemisphere. This location explains why its seasons are the opposite of those in the United States. Its longitude tells us that Canberra is in the Eastern Hemisphere. This means that it is on the opposite side of the world from the United States.

In contrast, the **relative location** of a place describes where it is in relation to other places. Relative location can affect a country's history and way of life in unexpected ways. Australia's nearest neighbors are South Pacific islands. But its language and culture came from very far away: Great Britain.

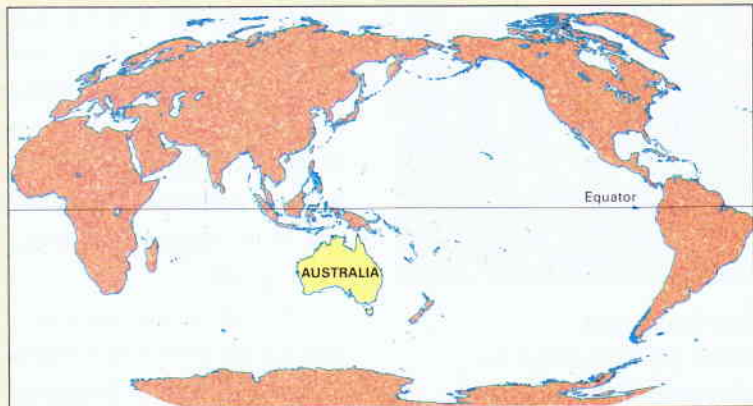
In this chapter, you will learn how Australia's location has shaped life there. You will also explore how location has helped make Australia such an interesting place to live and to visit.

Essential Question

How does a country's location shape life within its borders?

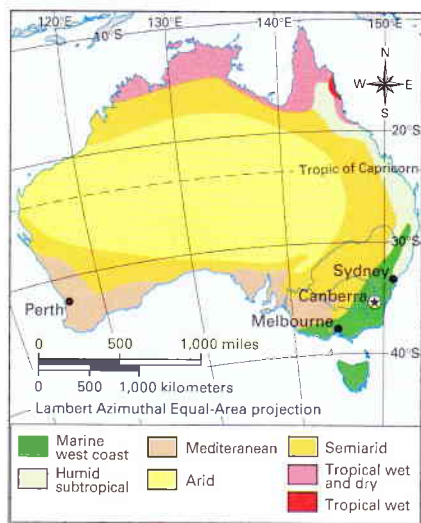
This map puts Australia at the center of the world. It is colored yellow to make it stand out. Notice where Australia is relative to the equator. Also notice how far it is from the other continents. Keep this map in mind as you try to answer the Essential Question.

Graphic Organizer



33.2 The Geographic Setting

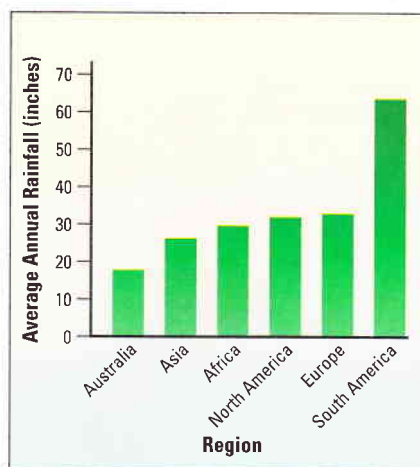
Climate Zones of Australia



Australia's Seven Climates

Australia has a mix of climate, from tropical to arid. Rain falls mainly near the coast. Most of Australia's interior is a desert.

Rainfall on Six Continents



An Arid Continent

Australia is the most arid of the inhabited continents. Droughts are common. So are wildfires during the dry summer months.

Australia is the only country in the world that is also a continent.

It is set off from the rest of the world by the vast Pacific and Indian oceans. Australia gets its name from the Latin word *australis*, which means “southern.” Australians also call their country “Down Under” because on maps it lies “under” the equator.

Australia is not quite as large as the United States. Much of it is **desert**. Only the continent of Antarctica is more **arid**. Australia also has one of the most diverse collections of **flora** and **fauna** in the world. Scientists trace the origins of these unusual plants and animals to Australia's formation as a continent.

How Australia Drifted “Down Under” Scientists think that Earth did not always have seven continents. About 200 million years ago, all the land was joined in one **supercontinent**. Over time, this huge **landmass** broke apart into a number of **tectonic plates**. Eventually, they formed the continents we know today. Australia reached its present location after drifting north for many millions of years.

This **continental drift theory** is based on the ideas of a German geographer named Alfred Wegener. He called his supercontinent Pangaea. This is a Greek word that means “all lands.” Geographers tell us that the continents are still drifting today. The average rate of movement is less than an inch a year.

Australia's Biodiversity: From Koalas to Kookaburras One of the first Europeans to study Australia's unusual flora and fauna was a botanist named Joseph Banks. A botanist is a scientist who studies plants. Banks was surprised to find species, or types, he had never seen before. One was the small, furry koala. Another was the kookaburra, a bird with a loud laughing call.

The plants and animals that so surprised Banks are Australia's **native species**. These are species that are naturally found in an area. About 80 percent of the continent's plants and animals are found nowhere else on Earth. This is because Australia broke away from other landmasses about 50 million years ago and slowly drifted to its present location. During that time, its plants and animals developed in isolation. Until modern times, few species arrived from other places to add to Australia's **biodiversity**.

In the 1800s, Australia became a colony of Britain. The colonists brought animals and plants from their homelands to Australia. These introduced plants and animals are called **exotic species**. Many had few or no natural enemies in Australia. As a result, their populations grew quickly.

In time, exotic species of animals began to compete with native species for food and territory. The result has been a growing number of endangered and threatened species. **Endangered species** are in immediate danger of dying out. **Threatened species** may become endangered if not protected.

► Geoterms

continental drift theory the idea that continents are slowly drifting as the tectonic plates that they sit on move. This idea comes from Alfred Wegener, who proposed that Earth once had one giant supercontinent. This supercontinent broke apart into plates that have slowly drifted to their current locations.

endangered species animals or plants that are in danger of dying out in the immediate future

exotic species animals or plants that are brought into an area from somewhere else

native species animals or plants that occur naturally in an area

threatened species animals or plants that are likely to become endangered if not protected

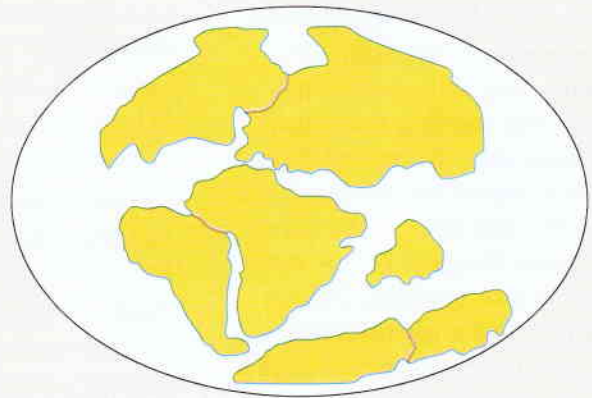
Continental Drift

These maps show how Earth's continents may have moved over time. Notice the east coast of South America. It fits like a giant puzzle piece into the west coast of Africa. According to continental drift theory, both were once part of the same giant landmass. Australia was once joined to Antarctica. It drifted off on its own about 50 million years ago.

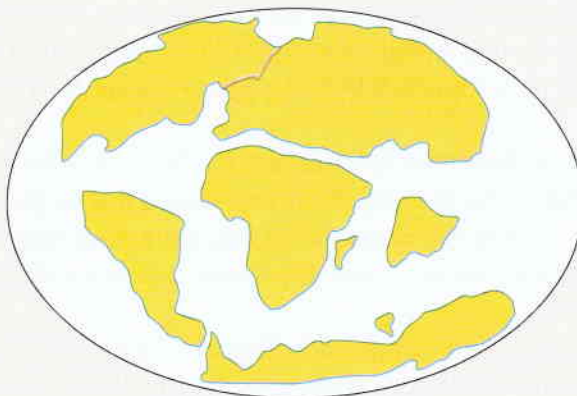
The Drifting Continents



225 million years ago



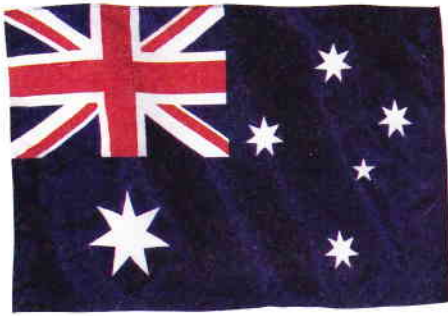
135 million years ago



65 million years ago



Today



Before and After Independence

Before independence, Australia flew the British flag, or Union Jack. It is the top of the two flags shown here. After becoming independent in 1901, Australia adopted the new flag shown below. This flag kept the Union Jack as a symbol of Australia's past. But it added the Southern Cross. This is a group of stars that can be seen only from south of the equator. The large star represents Australia's six states and its territories.

33.3 A Land Far from Great Britain

Australia's first people are known as Aborigines. The Aborigines came to Australia more than 40,000 years ago. Their way of life may be the oldest culture in the world.

The Aborigines believe in a time long ago that they call the Dreamtime. This was a time before humans when spirits roamed the Earth. These spirits formed the land and created people. They told humans how to keep the land alive. Land is sacred to Aborigines. When Europeans arrived much later, they saw the land differently. To them, land was something to be owned and used.

An Isolated Place to Send Prisoners In 1770, a British sea captain named James Cook discovered Australia while exploring the South Pacific. He claimed the land for Britain. At that time, however, Britain was having trouble with its American colonies. Nothing was done with Australia until after the Americans won their independence in 1783.

The loss of the American colonies created a problem for British prisons. Most were overflowing with convicts. Some prisoners were criminals. Others were poor people who could not pay their debts. Until the Americans rebelled, the government had reduced prison crowding by sending convicts to America. After 1783, this was no longer possible. Instead, the government decided to set up a prison colony in a place as far away as possible. That place was Australia.

In 1788, eleven ships from Britain arrived in Australia. The ships carried about 700 convicts. They also carried tools, sheep, cattle, and seeds. These convicts built Australia's first European settlement. Eventually, more than 160,000 convicts were sent there. The practice finally stopped in 1868.

The new colony grew slowly at first. The convicts supported themselves by farming. After being released from prison, many were given land of their own to farm. Over time, free settlers from Europe arrived as well. Then, in 1851, gold was discovered in the colony. Treasure hunters flooded in from all parts of the world.

As more settlers came, Aborigines were often pushed off their land. Many also died of diseases brought by the Europeans. At least 750,000 Aborigines lived in Australia when the Europeans arrived. Today there may be only about 400,000 Aborigines in the country.

British Influence in Australia Continues In 1901, Australia gained its independence. Its new flag, however, showed that its people still felt connected to Britain. The Australian flag has a small copy of the British "Union Jack" in one corner. The Union Jack is the British national flag.

Britain's influence is still strong today. English is the country's official language. Almost half of Australians claim British or Irish roots. Australians honor the British monarch. Finally, almost 10,000 Britons **immigrate** to Australia each year. They come knowing they will feel right at home "Down Under."

33.4 New Relationships with Near Neighbors

After independence, Australians adopted a “white Australia” immigration policy. The purpose of that policy was to keep people of color from entering the country. Any person who wanted to immigrate had to pass a “dictation test.” An official read aloud a 50-word statement in a European language. The newcomer had to write it down word for word. Those who could not were turned away. This test limited immigration mainly to white Europeans.

Australia Opens Its Doors to the World The “white Australia” policy ended in the 1970s. The country then opened its doors to immigrants from anywhere in the world. By 2005, more than 20 million people lived in Australia. About one of every four was born in another country.

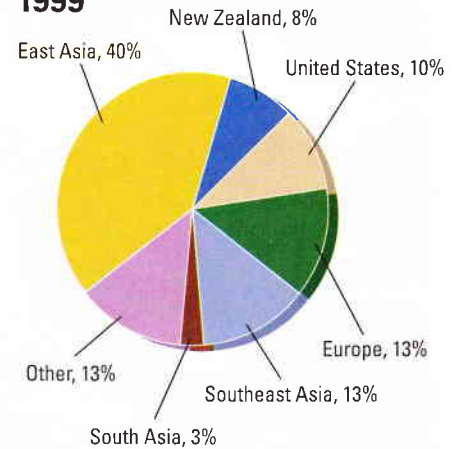
Today Australia welcomes about 90,000 immigrants each year. Almost one half of them are from Asia and Africa. People come to Australia for many reasons. Some are **refugees** fleeing wars. Others come seeking an education or a good job.

The opening of Australia has changed the country. People of color are no longer uncommon. Old ways of life have mixed with new cultures. Sometimes this has led to tension between **ethnic groups**. But the main result has been the creation of a lively **plural society**.

New Trading Partners in the Asia-Pacific Region A century ago, more than half of Australia’s exports went to Britain. Today few exports go to Europe.

The country now looks closer to home for trade. The cost of shipping goods to nearby countries is much less than shipping to Europe. By 1950, Japan was Australia’s most important trade partner. In recent years, South Korea, China, and Taiwan have also increased their trade with Australia.

Australia’s Export Markets, 1999



Source: Australian Government, Department of Foreign Affairs and Trade, www.dfat.gov.au.

Shifting Trade Patterns

Australia’s trade with Europe has dropped in recent years. Meanwhile, trade with nearby Asia has increased. More than half of all of Australia’s exports are now sold in Asia. Japan has replaced Britain as Australia’s most important trade partner.

A Plural Society in the Making

Australia once limited immigration mainly to whites. Today people from all over the world are welcome. This map shows where Australians who were born in other countries came from.

Origins of Foreign-Born Australians, 2001



Source: Australian Bureau of Statistics, www.abs.gov.au.



New Year's Eve in Sydney

Australians celebrate New Year's Eve in Sydney with fireworks over the harbor. The unusual structure on the left is the Sydney Opera House. This performing arts center is one of the world's most famous buildings.

33.5 Australia's Reversed Seasons

Australians are celebrating the New Year. Bondi Beach, near Sydney, is packed with families under beach umbrellas. The sky is a clear blue. Temperatures hover at 98°F. Surfers wait for the next big wave while children make sandcastles on the beach. In the evening, families will picnic around Sydney Harbor while waiting for one of the world's great fireworks shows.

Sunny December in the Southern Hemisphere As you recall, Australia is in the Southern Hemisphere. Its seasons are the opposite of those in the northern half of the world. Summer there starts in December and runs through March.

In Chapter 1, you learned that seasons are caused by the tilt of Earth on its **axis**. Because of this tilt, the Southern Hemisphere receives more sunlight between December and March. These are Australia's warm summer months. Those same months are the winter season north of the equator.

Seasonal Advantages of Living "Down Under" December means bundling up for winter in much of the United States. In Australia, families get ready for summer vacation. Warm days and beautiful beaches attract tourists from north of the equator. More than 6 million people vacation in Australia every year. Many come to escape winter where they live.

The reversed seasons give Australians another advantage. Countries such as the United States and Japan import out-of-season fruit. Cherries, for example, are a summer fruit in the United States. They ripen "Down Under" in December and January. Many other fruits are also harvested at this time. This fruit is shipped to supermarkets north of the equator. Stores can then offer fresh produce all year.

33.6 Australia's Amazing Wildlife

Many unusual animals live in Australia. Miniature penguins waddle ashore each night after dark. The swans you see on lakes are black, not white. Giant crocodiles are as much at home in the ocean as in **freshwater** ponds. You might even see a very odd animal that looks like a cross between a duck and a beaver. The fairy penguin, black swan, saltwater crocodile, and duck-billed platypus are just a few of the country's curious creatures.

Flora and Fauna Found Only in Australia There are more than 13 million living species of plants and animals. About one million are found in Australia. Many of these are found nowhere else on Earth.

As you read, Australia was separated from the rest of the continents a very long time ago. Its plants and animals were isolated. They developed without contact with other species elsewhere.

Within Australia, however, plants and animals adapted to a wide variety of **climates**. The northeast is hot and humid. Here you might find the cassowary, a large bird that cannot fly. The center of the country is arid. This is a perfect place for red kangaroos. Kangaroos are marsupials. These are mammals that carry their young in pouches.

Exotic Species Endanger Many Native Species Early settlers from Europe brought many plants and animals with them. One was the rabbit. Rabbits adapted easily to their new home. However, they have had a harmful effect on native species. As the rabbits multiplied, they ate grasses that native animals needed to survive.

Exotic species have disturbed the natural environment in much of the country. As a result, some native species have disappeared. Others are in danger of becoming **extinct**. A small marsupial called the *bilby* is an example. Because of competition from rabbits, it may die out.

Australia's Unique Animals

Many unique animal species are found in Australia. Three are shown here: the kangaroo, the bilby, and the platypus. The kangaroo and bilby are marsupials. They raise their babies in pouches on their bellies. The platypus is one of only two mammals that reproduces by laying eggs. The other egg-laying mammal is the echidna, a native of Australia and New Guinea.





Less Ozone, More Skin Cancer

Australia has the highest rate of skin cancer in the world. This is partly because the ozone over nearby Antarctica has been thinning. Ozone protects living things from the sun's harmful rays. Less ozone means that more of these rays reach Earth.

33.7 Living Under an Ozone Hole

Surf's up, mate! In December, Australia's beaches are usually crowded with sunbathers and surfers. It's a common sight to see young people grabbing surfboards and heading for the water. Today's surfers grab for something else as well: sunscreen. They know that because of a hole in Earth's **atmosphere**, they are at risk of getting more than sunburn at the beach.

Air Pollution Creates an Ozone Hole Scientists divide Earth's atmosphere into layers. The lowest layer contains the air we breathe. The next layer begins about six miles above Earth. It contains a gas called *ozone*. You cannot see ozone. But without it, there would be no life on Earth. Ozone keeps ultraviolet (UV) rays from the sun from reaching Earth. UV rays are harmful to living things. In humans, they cause sunburn, eye disease, and skin cancer.

In 1985, scientists discovered that the ozone over Antarctica was thinning. They called this thin patch an **ozone hole**. At times, part of this ozone hole has moved north over nearby Australia.

The loss of ozone is caused mainly by chemicals known as *chloro-fluorocarbons* (CFCs). When the ozone hole was discovered, CFCs were widely used in aerosol spray cans, refrigerators, and air conditioners. When released into the air, CFCs destroy ozone. Since 1985, CFCs in the atmosphere have been reduced. As a result, the ozone hole should slowly shrink. By 2050, it may be gone completely.

"Slip, Slop, Slap" to Prevent Skin Cancer The thinning of the ozone layer has created health problems for Australians. They are used to sunbathing and enjoying outdoor activities. As a result, they are often exposed to harmful rays from the sun. In recent years, skin cancer rates have risen sharply. Two out of three Australians are now likely to develop skin cancer in their lifetime.

Australia's government is working to prevent new cases of cancer. Posters and advertisements advise Australians to "slip, slop, slap" before they go out in the sun. This means to "slip" on a shirt, "slop" on some sunscreen, and "slap" on a hat to protect their skin. There are also "no-hat, play-in-the-shade" rules at schools. Students cannot go outside to play if they are not wearing a hat.

33.8 Australia's Night Sky

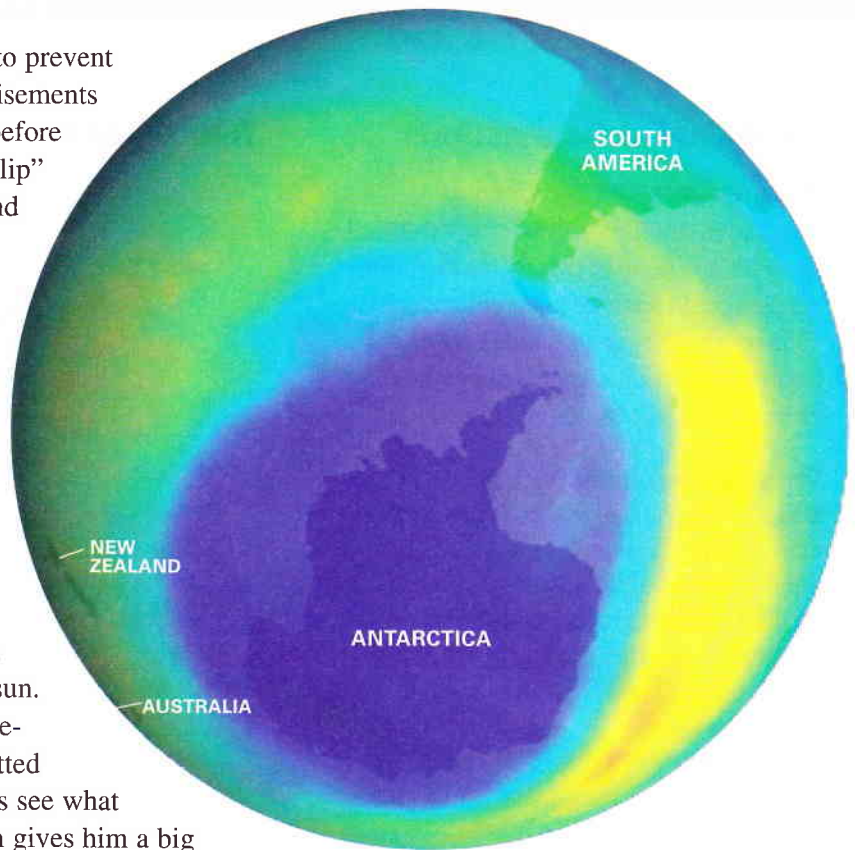
Robert Evans is a retired minister. He is also an expert on Australia's night sky. Using a tiny 16-inch telescope, he has spotted 39 supernovas. A supernova is the explosion of a large star like our sun. Despite having much more powerful telescopes, many astronomers have not spotted even one exploding star. How can Evans see what so many astronomers miss? His location gives him a big advantage. The Australian night sky is clear most of the year.

A Starry Symbol: The Southern Cross The night sky at the South Pole looks very different from the view at the North Pole. There are several constellations, or groups of stars, that are visible only in the Southern Hemisphere. One of these is the Southern Cross, or Crux. Its bright stars are important to sailors. Since ancient times, they have used the Crux to find their way in the South Pacific.

33.9 Beginning to Think Globally

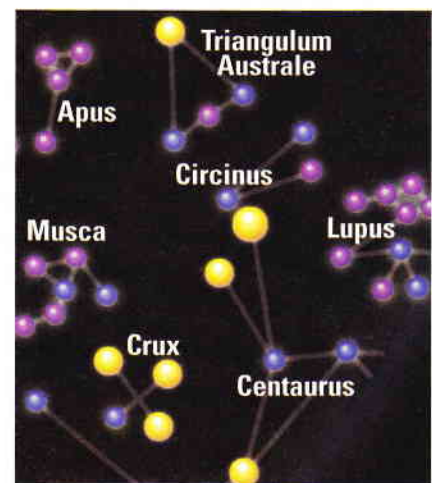
In this chapter, you learned how location has shaped life in Australia. You read how this continent drifted to its current location millions of years ago. It has been alone there ever since. You also met some of the unusual animals that are unique to Australia. You read how some of these native species are being threatened by exotic species introduced by colonists. As a result, some natives have become threatened species. Those most at risk are endangered species. If not protected, they are likely to disappear soon.

Australia is not the only country with threatened species. The World Conservation Union keeps a list of threatened species around the world. These are plants and animals that are likely to disappear if not protected. By 2004, the number of species on that list was over 15,000. Think about this as you look at a world map in the next section showing where threatened animals are located.



Antarctica's Ozone Hole

The dark blue area on this illustration shows how large the ozone hole over Antarctica has grown.



Southern Constellations

The Southern Cross, or Crux, is the smallest constellation in the sky. Four of its five stars, seen above, are so bright that sailors can use them to steer by.

33.10 Global Connections

The map shows the locations of threatened animals around the world. If nothing is done to protect them, these species could soon become endangered. This means they are in danger of rapid extinction. When a species becomes extinct, it is lost to the world forever.

What do the areas with most of the threatened species have in common? Tropical regions are “hot spots” for threatened species. Because of their absolute location near the equator, these areas can support great biodiversity. Thus they also have the most species to lose. Islands are also at great risk. Between 1500 and 2000, most extinctions took place on islands. Since 2000, however, about half of all extinctions occurred on continents.

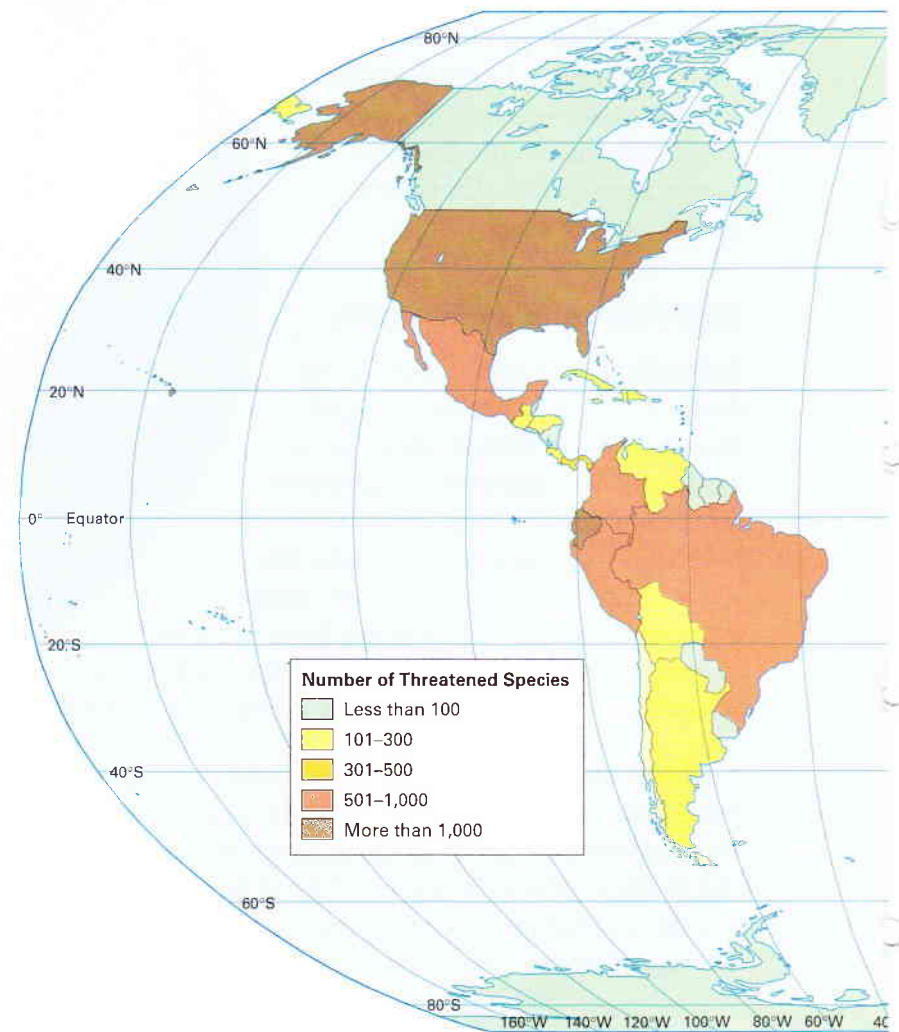
What factors pose the greatest dangers to threatened species?

In the past, exotic species posed the greatest risk to native plants and animals. This was especially true on islands and isolated places like Australia. Today, however, loss of **habitat** is the greatest danger facing most animals. More than 6 billion people live on Earth today. The human population grows by 80 million each year. As humans take over more and more land, animals are crowded out.

How does relative location affect a species' chances of survival?

Animals that live far from human settlements generally have the best chances of survival. Such places tend to be too hot, dry, cold, or high for people to live in large numbers. In northern Russia, for example, there is only about one person per square mile. This leaves a lot of habitat for wolves, reindeer, and other animals.

Threatened Species Around the World



Bald Eagle

Where threatened:
Continental
United States

Estimated population:
3,000 breeding pairs



Ibex

Where threatened:
European Alps

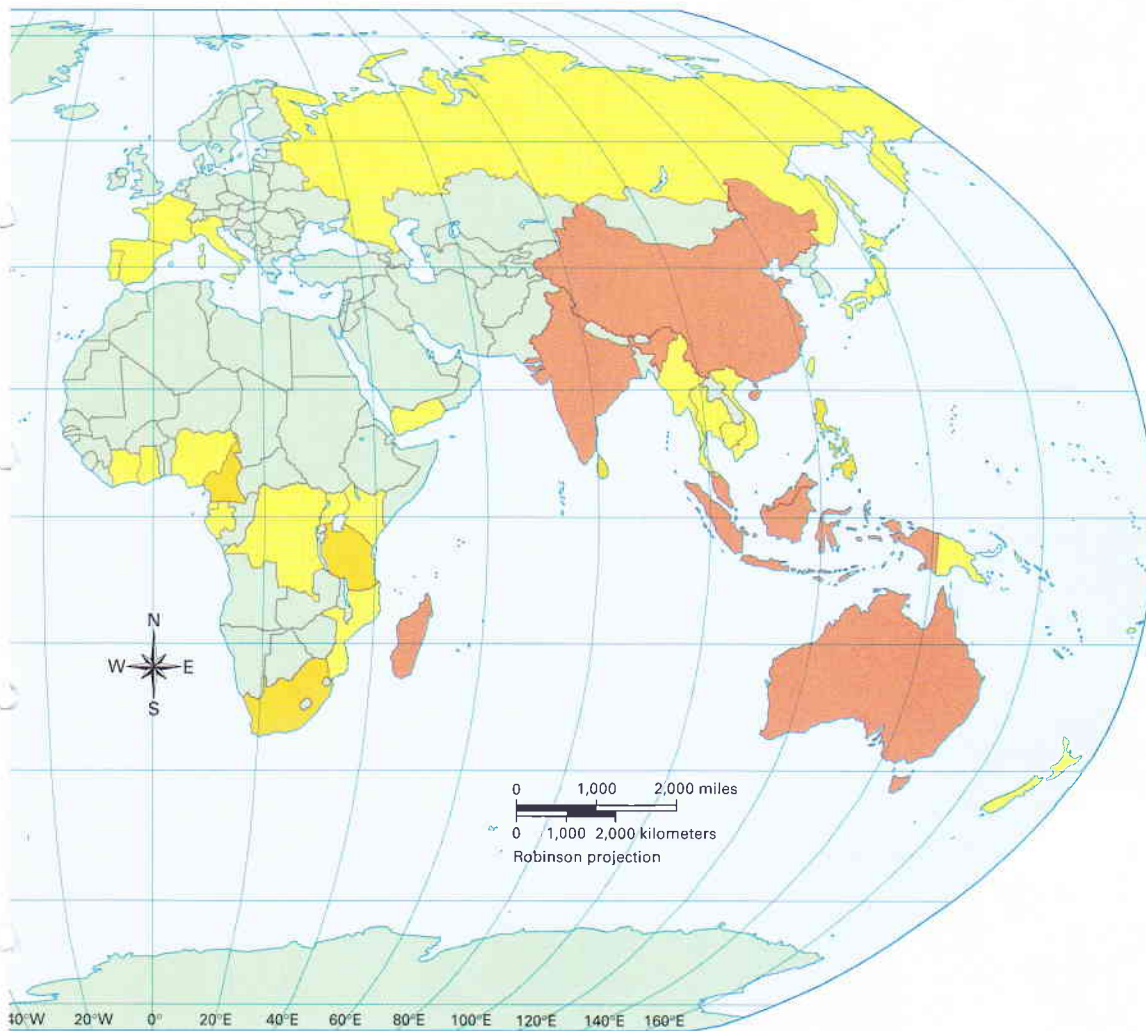
Estimated population:
30,000



Black Rhinoceros

Where threatened:
Africa

Estimated population:
3,600



Source: IUCN Species Survival Commission, "2004 IUCN Red List of Threatened Species," www.redlist.org.



Humpback Whale

Where threatened:
The world's oceans

Estimated population:
15,000



Snow Leopard

Where threatened:
Mountains of
Central Asia

Estimated population:
6,000



Long-beaked Echidna

Where threatened:
New Guinea

Estimated population:
less than 300,000



Giant Panda

Where threatened:
China

Estimated population:
1,000