# Ecology

Look around you. What might seem like a barren landscape is actually teeming with life. Capitol Reef National Park's Waterpocket Fold is a landscape of diverse features where life has adapted to survive.

## Ecology

Ecology is the study of life. Think about what impacts your own life. Where do you live? Could you live there if the elevation was vastly different, or if the climate was significantly warmer or colder? How easy or hard is it to find sources of water, food, and shelter? Suitable habitat depends on many factors including climate, elevation, soil, slope, and aspect (north- or south-facing).

Capitol Reef National Park encompasses six primary life zones, ranging from high, cool peaks with evergreens, to riparian zones filled with water-loving plants, to the dry, hot desert. These different zones support over 1,200 plant and animal species that have evolved to survive in these diverse habitats.

Many of the animals found in Capitol Reef are found throughout the Colorado Plateau and other parts of the western United States. Look for them when you visit other parks.

## Desert

Imagine you arrived in the hot flats of Halls Creek with nothing but the clothes you have on now. How long would you last? What would you do to survive the heat?

Because of the heat, you might seek shade and wait until the cooler hours of night to move about and forage for food. That is what some animals, like ringtails, do.

Others, like the white-tailed antelope ground squirrel, are out during even the hottest part of the day. Its adaptions to heat include a higher internal temperature (90-107°F / 32-42° C), conserving moisture by not sweating, and cooling itself by washing its head with saliva. The white-tailed antelope ground squirrel obtains most of the water it requires from the plant and animal material it eats. It also has a very concentrated urine which does not waste valuable liquid.

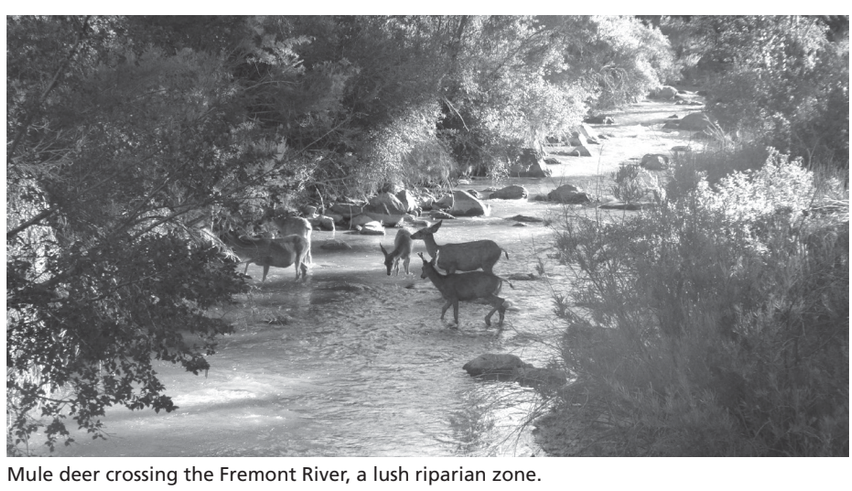
Many of Capitol Reef's plants are well-adapted to the desert climate. Small leaves, like those of cliffrose, reduce the surface area that absorbs heat from the sun and limits moisture lost through transpiration. Cliffrose also has a bitter taste that discourages animals from eating it, a relatively common adaptation in the natural world.

## Riparian

Intermittent streams in refreshing, narrow canyons provide moisture for a multitude of species. Shade from a box elder tree keeps canyon wren nestlings cool in the summer heat. Red-spotted toads catch insects clustering around a puddle that has not evaporated because of the tree's shade.

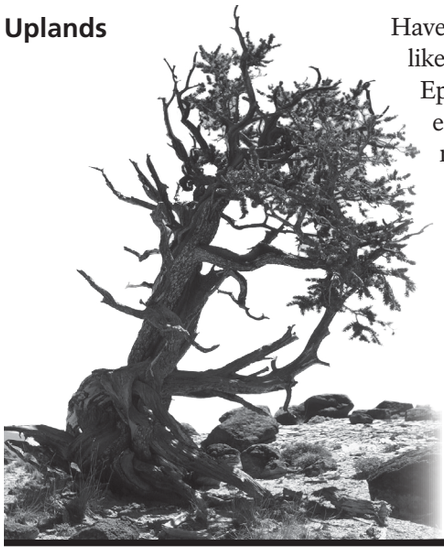
Much of Capitol Reef's life is concentrated near these canyon water sources. Listen quietly for birdsong and the rustle of deer coming to drink. Imagine it is night, with bats swarming above the water, using echolocation to find their insect prey. Many predators have co-evolved with their prey, so nocturnal prey species have predator species that are active at night, as well.

Cliffrose blooming in the desert.



Mule deer crossing the Fremont River, a lush riparian zone.

## Uplands



The resinous wood of bristlecone pines erodes rather than rots, befitting a tree that clings to rocky slopes.

Have you ever wondered what it would be like to live during the end of the Pleistocene Epoch (around 11,700 years ago), when early humans were hunting now-extinct megafauna? Remnants of the Ice Age still exist in the highest elevations of Capitol Reef. Bristlecone pines were more common during that glacial time period, but now exist only on exposed, rocky ridges and slopes at higher elevations. They grow extremely slowly; the oldest of these are up to 5,000 years old. Small changes in the climate could have a critical impact on the bristlecone pine's tenuous existence.

If you see oval paw prints with claw marks far in front of them, look up. You might spot a porcupine gnawing on fresh evergreen needles or a clump of mistletoe. Typically found in higher elevations, porcupines also eat tree bark, so look for large patches of missing bark, teeth marks on the smooth, exposed wood, and a yellowish or orange color on conifers. It is possible for porcupines to eventually kill a tree, but it's more likely that large pines will fall due to high winds and drought.

## The Future

The plant and animal species in Capitol Reef have evolved over thousands of years to fit the many habitats encompassed by the Waterpocket Fold, from the desert to the riparian zones, to the highest slopes, and everywhere in between.

What will happen if changes occur over a shorter period of time? Human-caused climate change is occuring at an unprecedented rate. How do you think this will impact the species that have evolved to precisely fit their niche environments?

Collecting any plants, animals, or parts of animals in the park is illegal, and impacts wildlife. Antler sheds and bones are the most accessible source of calcium, phosphorus, and additional minerals for many rodents and other animals. These minerals may be present in the soil, but not in a form that is usable to animals.

When you see evidence of animal life, or a colorful wildflower, or a symmetrically-formed pine cone, take a picture to remember it. Tell a ranger about your experience. Leave it as you found it, so that future park visitors will be able to enjoy it as well.

## Quick Statistics

- **Area of Park:** ~381 square miles (243,921 acres; 98,711 hectares)

- **Highest Elevation:** 8,960 ft (2731 m) in Upper Deep Creek drainage
- **Lowest Elevation:** 3,880 ft (1183 m), where Halls Creek drainage exits the park

- **Average Warmest Month:** July
- **Average Coldest Month:** January
- **Average Wettest Month:** August
- **Hottest Day Recorded:** 104°F (40°C), June 26, 1970 and July 5, 1985
- **Coldest Day Recorded:** -9°F (-23°C), January 7, 1971
- **Driest Year:** 1973, 3.72 in (9.45 cm)
- **Wettest Year:** 1957, 13.78 in (35.0 cm)

- **Total Species in Park:** 1,252
  - » Amphibian Species: 5
  - » Bird Species: 239
  - » Fish Species: 13
  - » Mammal Species: 71
  - » Reptile Species: 16
  - » Vascular Plant Species: 909
  - » Threatened, Endangered, or Candidate Species: 9

Capitol Reef species lists are available at the visitor center information desk and online (www.nps.gov/care). Utah sensitive species lists are available from the Utah Division of Wildlife and State Natural Heritage Program. Statistics for this bulletin are drawn from IRMA.nps.gov, the NPS's Northern Colorado Plateau Network, and the Western Regional Climate Center.

Oak Creek Canyon in the winter.