



California condor
© MARK DALY

Chuckwalla
© DOMINIC GENTILCORE

View of the Colorado River from
the South Rim in western Grand
Canyon
© AERIAL FILMWORKS / RON CHAPPLE

*In time and with water,
everything changes.*

Leonardo da Vinci

Adapting to Change

Indigenous people have lived throughout Grand Canyon since time immemorial despite changes and challenges that came with creation of the national park. Trails in the park, including Bright Angel, have been used for centuries by Native people for hunting, trading, and commuting in and out of the canyon. Seasons and traditions guided their movement. Shifts in climate might have caused the extinction of some plants and animals important in their diet and material culture, but they weathered these and other changes by adapting.

Totemic split-twig figurines (*below*) tucked away in dry caves, masonry structures, images drawn and etched into rock, and objects placed at the upper reaches of pinnacles show that the canyon has sheltered, fed, and inspired people for millennia.

Hunters

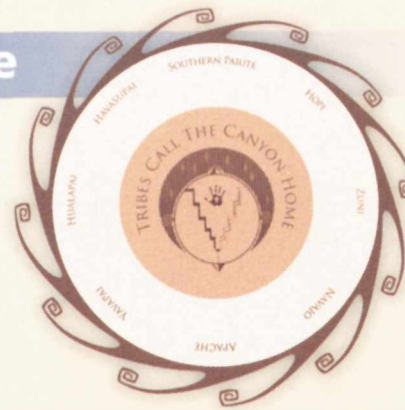
A broken spear point (*upper right*) tells us that a hunter passed through Marble Canyon, at the park's northeastern edge, about 11,000 years BP (before present). Some Indigenous people associated with the canyon are descendants of this hunter, who used his spear to bring down now-extinct large mammals such as mammoth and smaller game like deer and bighorn sheep. The broken point is one of the few artifacts found inside the park made by Indigenous people who were hunting at the end of the last ice age. (The earliest human inhabitants of North America came across a land bridge from Asia during the last ice age.)

Foragers

The river was a touchstone for Grand Canyon's Indigenous people starting around 12,000 BP. It provided drinking water and conditions where useful plants like willow, amaranth, mesquite, and salt bush grew. (Many other species here today are modern invaders.) Beginning around 2,000 BP, Indigenous people from the uplands took refuge in the canyon, close to the river, when the climate became warmer and drier.

Dwellers

Throughout the 278-mile (447-km) river corridor inside the park, people built masonry rooms, hearths, and pits for roasting food or firing pottery. (The earliest pottery found in Grand Canyon dates from about 1,500 BP, when Puebloan people farmed along canyon rims and deltas.) The combination of masonry rooms, pottery, tools, and hearths shows that some people not only hunted and foraged but also lived full lives here.



Tribal medallion

Eleven traditionally associated Tribes—Yavapai-Apache, Havasupai, Hopi, Hualapai, Kaibab Paiute, Las Vegas Paiute, Moapa Paiute, Navajo, Paiute Indian of Utah, San Juan Southern Paiute, and Zuni—continue to live in or use the canyon for trade and ceremonial purposes and to collect plants, minerals, and other traditional materials.

Uncovering Human History

From 2006 to 2009, scholars from several Tribes traditionally associated with Grand Canyon worked with park staff and the Museum of Northern Arizona on excavations in the park. Although most Tribes oppose any disturbance of their heritage, circumstances created by operations of Glen Canyon Dam necessitated the Grand Archaeology project. The erosion of sediments in the river corridor had uncovered long-buried artifacts and structures, exposing them to damage by weather and other dangers.

Through their traditional knowledge, Tribal scholars enriched the project. They helped identify meanings and uses of artifacts and discovered links with their ancestors.

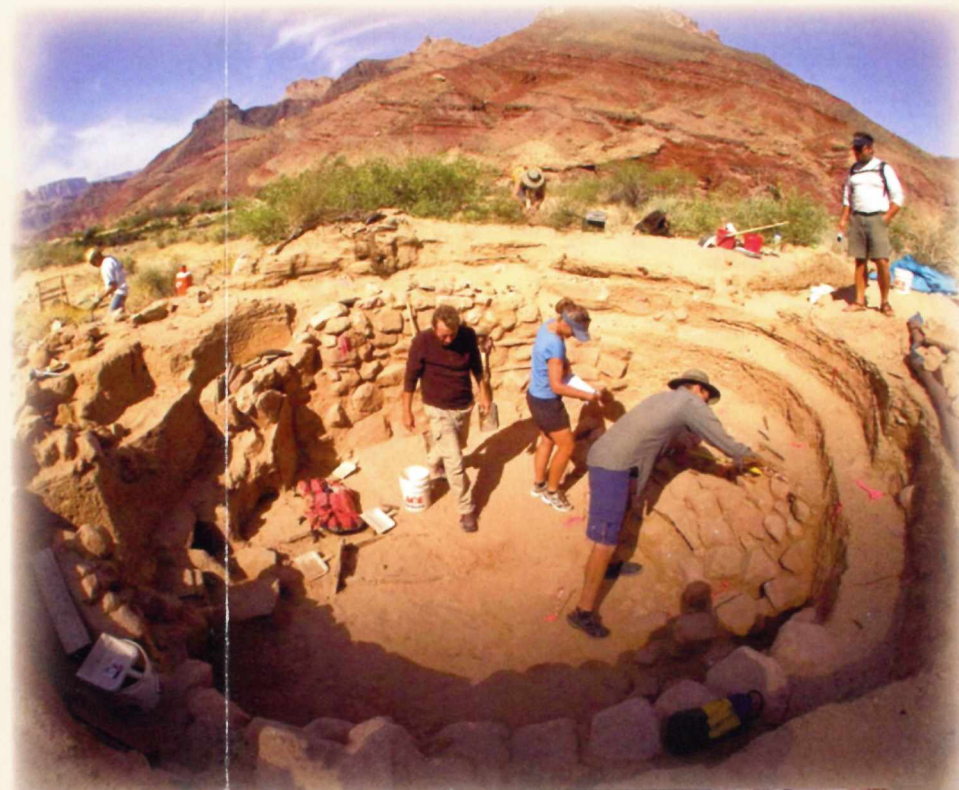
How can understanding and preserving these artifacts have value for all of us?

Grand Canyon National Park preserves and protects wildlife, natural systems, and cultural resources for future generations.



CLOCKWISE FROM
UPPER RIGHT: FOLSOM
SPEAR POINT BASE, CA.
11,000 BP—NPS / GRCA;
ROARING SPRINGS—NPS /
MICHAEL QUINN; KIVA, EXCA-
VATED 2008—NPS / GRCA; BOWL,
EARTHENWARE WITH SLIP-DECORATED
INTERIOR—NPS / GRCA; FRAGMENT, EARTHENWARE WITH SLIP DECORATION—
NPS; SPLIT-TWIG FIGURINE—NPS / GRCA; MEDALLION—NPS

ALL ARTIFACTS INCLUDED HERE WERE FOUND IN EASTERN GRAND CANYON.



A Canyon Carved by Water

The hunter's spear came to rest in a sublime, vertical landscape. Its broken point (*right*) was found halfway between the rim, where the canyon walls meet the surrounding plateau, and the bottom, where the Colorado River now runs.



Spear point,
ca. 11,000
BP, found
at Marble
Canyon

Six million years earlier, the river and its tributaries began to carve downward through the plateau.

Making Geological History

The story of Grand Canyon's formation is much deeper than six million years and continues today. Since 65 million years ago, the entire Rocky Mountain-Colorado Plateau region has been rising. The same sedimentary rocks you can see in the canyon's walls and in the diagram at right—sandstone, limestone, and shale—lie immediately below the plateau's crust. Shallow seas and changing rivers deposited the sediments over nearly two billion years.

The Colorado and its tributary rivers flowed across and cut into the plateau, revealing flat-lying, multicolored rocks formed in the Paleozoic era (about 541 to 252 million years BP). These layers, visible from both North and South rims, contain marine fossils that record some of Earth's earliest life forms.

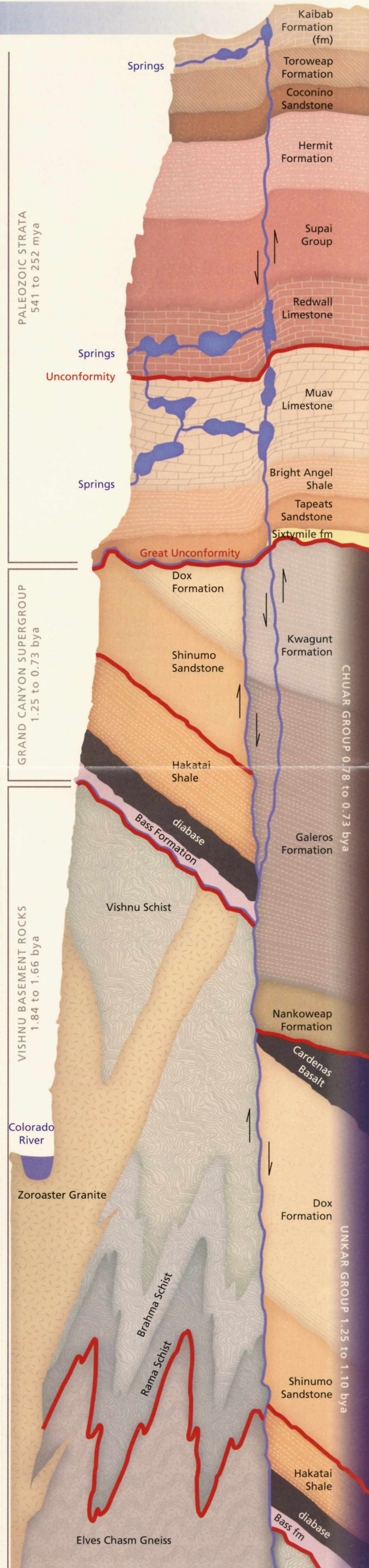
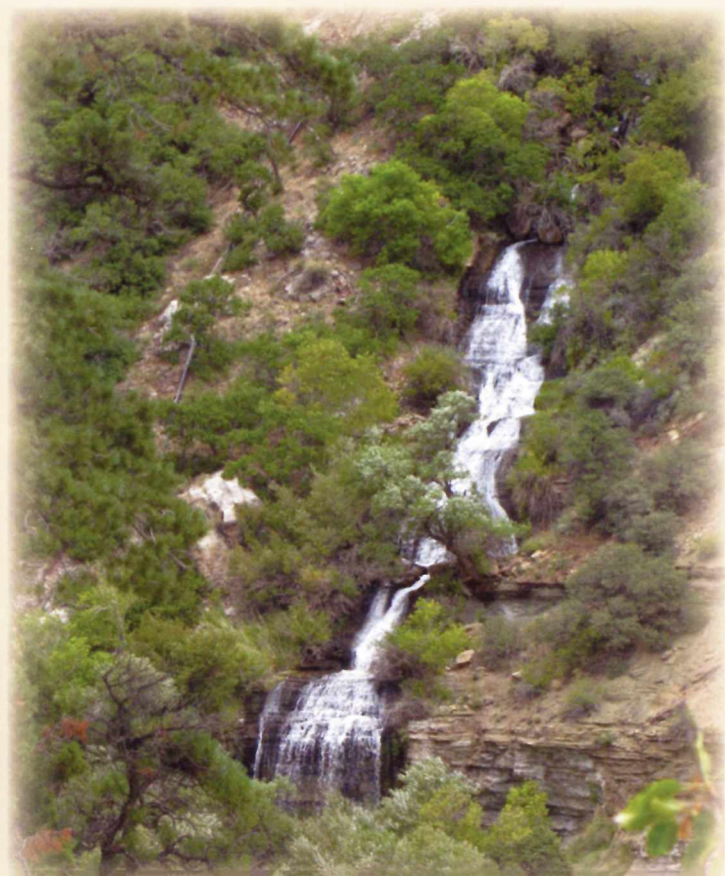
Below the Paleozoic rocks are the tilted layers of the Grand Canyon Supergroup, formed about one billion years BP. You can see them from Desert View Drive and at the Yavapai Geology Museum.

Below the supergroup, at the canyon bottom, the river cut through some of the plateau's oldest, or "basement," rocks, formed as early as 1.84 billion years BP.

Water in the Rocks

Precipitation falling on the Coconino (South Rim) and Kaibab (North Rim) plateaus becomes Grand Canyon's groundwater. It percolates through porous, faulted, or fractured rock. Some water exits from the canyon walls, far below the rims, as springs or seeps.

Roaring Springs (*below*) is one of Grand Canyon's 700 seasonal and perennial seeps and springs. It emerges from a limestone cave 3,500 feet (1,067 m) below the North Rim in eastern Grand Canyon. A pipeline built in the 1960s travels through Phantom Ranch at the canyon bottom before it reaches the South Rim. It is the only local source of drinking water for both rims and the inner canyon. Breaks and repairs sometimes interrupt water delivery.

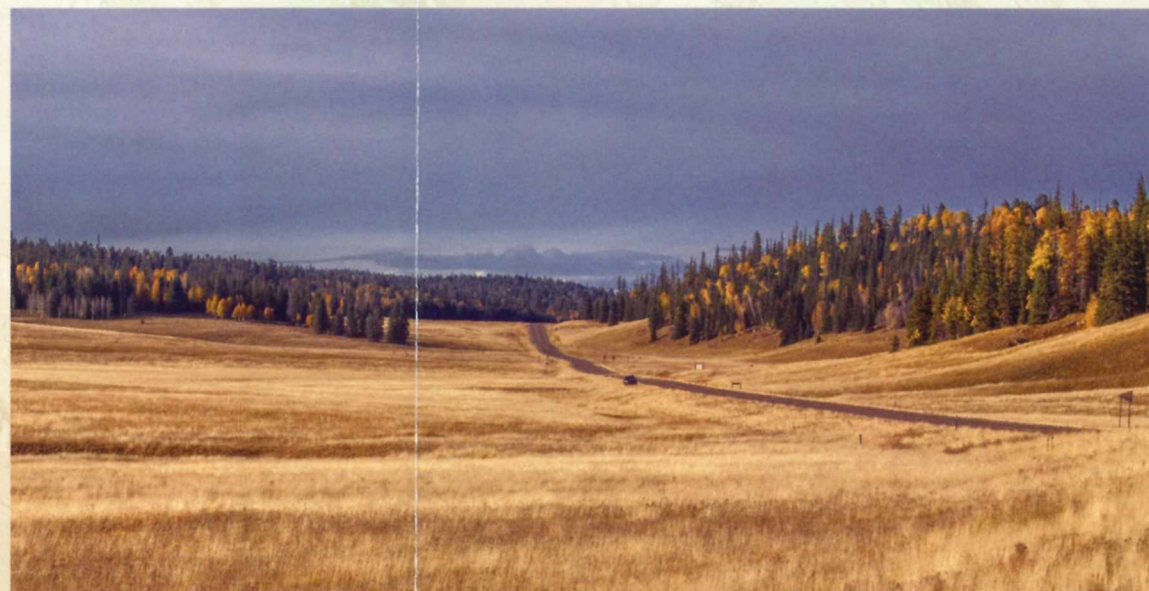


From Rim to River

Before you are waves of stair-stepped ledges, cliffs, and buttes painted ochre, green, and gray. Within moments the colors deepen, then brighten as clouds drift past. You marvel at the slender, shimmering ribbon of river that, along with erosion, carved through rock layers to create this natural wonder. Side canyons branch in all directions from the river.

Behind you—at the South Rim—are roads, signs, sidewalks and trails, hotels, visitor centers, museums, campgrounds, offices, concessioners, a rail depot, buses, cars, and bicycles. At the North Rim you'll find fewer human-made distractions. Use the free pocket maps and NPS App to locate visitor services and learn how to get around both rims.

Development has changed many parts of the Colorado Plateau, which surrounds Grand Canyon. Use the map below to imagine this vast plateau with less human impact. Its colors (green for cooler, wetter areas; brown for warmer, drier areas) and mixed shaded relief (for cliffs, talus slopes, and ledges) suggest the wide range of terrain that determines the region's water supply, ecosystems, and species.



The Kaibab Plateau, underpinned by limestone, is topped by mixed conifer forest.

© MICHAEL JUST

The Grand Canyon is home to 11 associated Tribes who have a deep connection to the living landscape.

North Rim

With higher elevations of 8,000–8,900 feet (2,438–2,713 m) and more precipitation than the South Rim, North Rim temperatures are cooler, and forests are thicker. The southward tilt of the land directs water to side canyons where sharp, narrow landforms result from the increased erosion.

On your approach through the Kaibab Plateau, you'll pass through some fire-blackened, wooded areas. After people began to suppress fires in the 1900s, dense undergrowth accumulated and became added fuel. Although native ponderosa pines and other species are adapted to withstand lower-temperature fires, many trees succumbed

when fires began to burn hotter and longer. Now the forest composition is changing as more aspen and subalpine trees, like Engelmann spruce, fill in former areas of mixed conifers.

From the visitor center, take a short walk to Bright Angel Point for views of Bright Angel Canyon and Roaring Springs, the main source for drinking water in Grand Canyon. Drive north to Point Imperial where you can see Vermilion Cliffs and Marble Canyon to the east. From here, drive south to Cape Royal for a panoramic view of the Unkar Delta, farmed by Indigenous ancestors, and the Colorado River.



Steller's jay

© TOM AND PAT LEESON

Subalpine fir

© EMMA SLAWSON

Kaibab squirrel

© BARBARA ANNE AM ENDE

Where the River Exits the Park

Near the park's western edge, the Colorado River flows through the Grand Wash Cliffs. Here the Hoover Dam (completed in 1935) impounds the river to create Lake Mead. Water from the lake is used for recreation and sent to major cities, small communities, and agricultural areas throughout California, Nevada, and Arizona. As human use of water grows throughout the Southwest, can one river meet the increased demand?



Scorpion

© SEIG KOPNITZ



Ringtail

© DAVE WELLING

Safety and Regulations

Stay on trails and away from cliffs. • Thunderstorms are common in summer. In the event of lightning, seek shelter and stay away from the rim and exposed areas. • Using remotely piloted aircraft like drones is prohibited. • Pets must be leashed. Refer to the pocket maps for restrictions and information. • Motor vehicles, including mountain bikes, are restricted to maintained roads. The map above does not show roads. Use pocket maps or the NPS App for road and trail information. • When hiking, carry food and water. Wear sun protection and appropriate clothing and shoes. Do not try to hike to the river and back in one day; it is dangerous.

• Federal laws protect all natural and cultural features in the park. • It is illegal to feed deer, squirrels, or other wildlife. • For firearms regulations check the park website.

Accessibility

We strive to make facilities, services, and programs accessible to all. Call or check the park website.

Emergencies call 911



Grand Canyon rattlesnake

© GARY VAIS

More Information
Grand Canyon National Park
PO Box 129
Grand Canyon, AZ 86023
www.nps.gov/grca
928-638-7888

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National Park Foundation.
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www.nationalparks.org

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South Rim

Pinyon and juniper trees survive with less than 15 inches (38 cm) of rainfall annually at this elevation of 7,000 feet (2,134 m). Both trees have tiny leaves to minimize the surface area exposed to the dry air. Yucca's thick, waxy leaves conserve the moisture that their muscular roots pull from the South Rim's dry, rocky soil. Cliffrose and Gambel oak hug the rim. As you move away from the rim, soil moisture and nutrient levels improve, and ponderosa pines grow in stands.

From Mather Point, gaze across and downward. You'll see tiny patches of bright green in the canyon bottom. The spots of color mark springs at Phantom

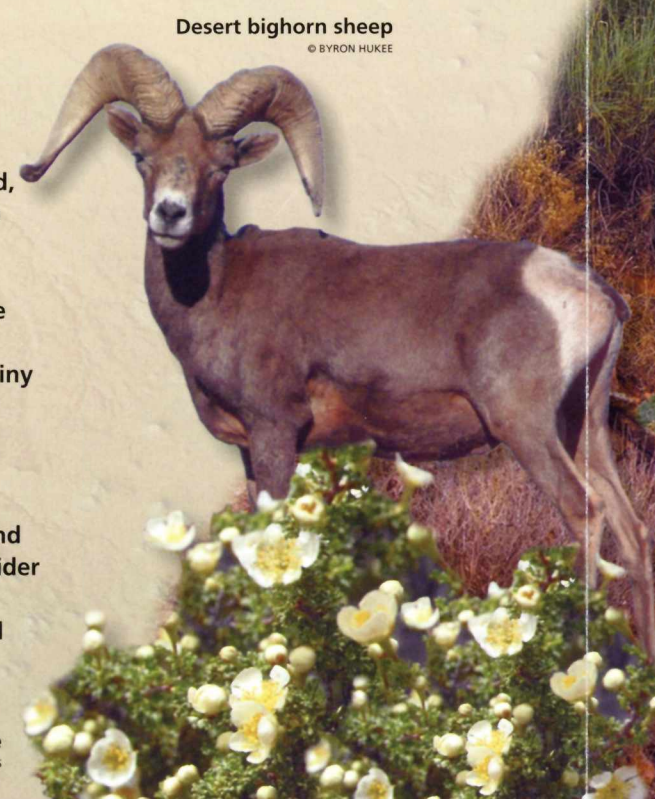
Ranch and Bright Angel Campground, stopping points for many who make the rim-to-rim trek.

A rim-side walk of less than one mile (1.6 km) will take you from Mather Point to Yavapai Point. On cold or rainy days, study the canyon's rock layers from the geology museum's picture windows.

It's 25 miles (40 km) by car from Grand Canyon Village to Desert View. Consider a stop at the Tusayan Museum and Archeology site. Pullouts offer broad views of the Painted Desert and the river.

Cliffrose

© ROBERT RIBICKAS



Desert bighorn sheep

© BYRON HURKE

Hiking the Bright Angel Trail

© DAVID FRENCH

The River's Course

The Colorado River begins as a trickle of meltwater high in northern Colorado's Never Summer Mountains. Streams and tributary rivers increase its size and volume until it reaches Lake Powell, created by Glen Canyon Dam (completed in 1963). The lake traps most sediment carried by the river, so the water released from the dam base is clearer. It is also colder. Grand Canyon's native fish are adapted to more sediment and warmer water. As a result, they cannot thrive today.

