

GRAND CANYON THE GUIDE NATIONAL PARK

Map Inside

North Rim

A free publication about the North Rim, Grand Canyon National Park

Volume VII, Issue 3

May 15- July 24, 1991

QUESTIONS? LOOK INSIDE

Bicycles	4
Camping	2
Food/Restaurants	2
Hiking	4
Lodging	2
Map	5
Other Services	2
Pets	5
Ranger Programs	8
Religious Services	2
Sunrise & Sunset	2
Things to Do	8

North Rim Development

The National Park Service (NPS) is in the process of completing a Development Concept Plan (DCP) for the developed area of the North Rim. As part of this process an Environmental Impact Statement (EIS) has been completed to evaluate and measure the impact of the various alternatives being considered. These alternatives include the following general concepts:

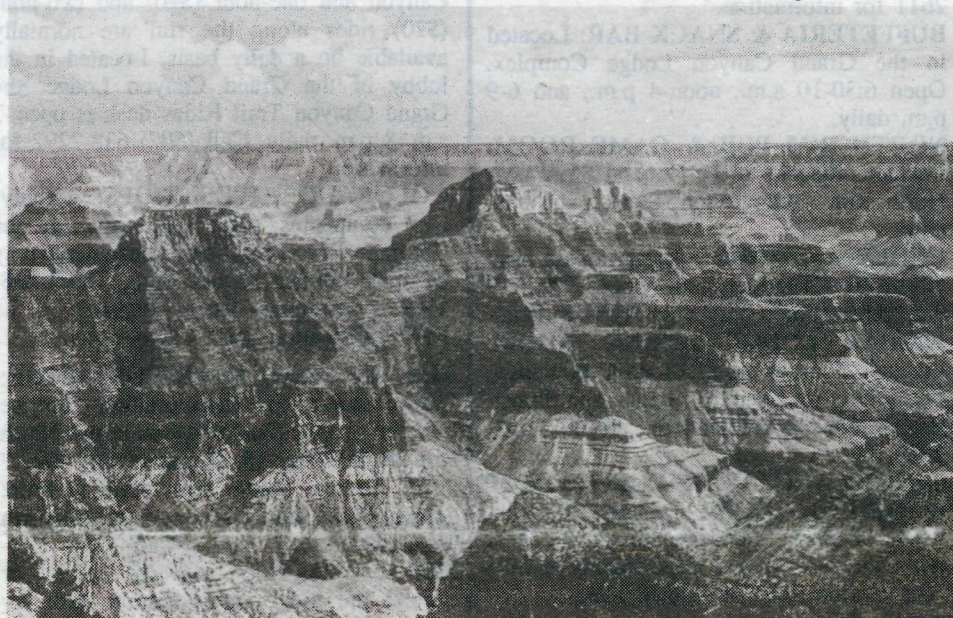
- No change in developed area or visitor accommodations.
- Development of approximately 100 new lodging rooms (80 are replacements) and a new restaurant facility.
- Increase the number of camping sites (adding approximately 50 sites).
- Construction of new NPS Information Center and improved parking.

Public meetings have been held and comments solicited during the last year. The comment period ended April 15 with over 5500 comments received. A decision on the alternatives is anticipated this fall or winter.

Help us recycle

The Guide is printed on recycled paper. You can help the park's recycling effort by returning this newspaper to the return box at the park entrance station when you have finished using it. Receptacles for recycling aluminum cans are also available at five locations within the park. Thank you.

How to See Grand Canyon



There is no "best way" to see Grand Canyon. However, visitors often seek recommendations about what to do or where to view the Canyon. For some, the answer may be to simply relax and enjoy the serenity. For others the following list may be helpful in deciding how to see the Canyon in the time you have available:

Two or Three Hours

Walk to Bright Angel Point to orient yourself. From the point you can see and hear Roaring Springs, the water source for the entire park. Also, there are good views of Bright Angel, Transept, and Roaring Springs side canyons as well as Grand Canyon Village on the South Rim, and San Francisco peaks in the distance.

Drive to Point Imperial (11 miles [18 km] from Grand Canyon Lodge) the highest point on either rim. See Mount Hayden, the Painted Desert, Saddle Mountain, and a beautiful view of eastern Grand Canyon National Park.

Half Day

In addition to the above activities, drive to Cape Royal (23 miles [37 km] from Grand Canyon Lodge and 14 miles [22 km] from the Point Imperial-Cape Royal roads junction). Here you may take the self-guided nature trail which winds its way to the point and a view of the Colorado River, as well as visiting Angels Window overlook. Because the elevation drops at Cape Royal, pinyon, juniper, and cacti grow in abundance on the rim.

Going to or returning from Cape Royal, stop at one or more scenic view, including Vista Encantadora, Painted Desert Overlook, and Walhalla Overlook. Across the road from Walhalla Overlook, view an Anasazi

Indian ruin.

Attend a ranger program at Grand Canyon Lodge or Point Imperial. See program listing elsewhere in *The Guide*.

Whole Day

In addition to the above activities, consider a short hike in the early morning (6-11 a.m.) or late afternoon (4-7 p.m.) down the North Kaibab Trail. Even a short hike will allow you to comprehend the enormity of the Canyon.

Hike the Widforss Trail to see the luxurious white fir, aspen, and ponderosa pine forest unique to the North Rim in Grand Canyon National Park. Mule deer and Kaibab squirrels are commonly sighted on this trail. In the fall there are numerous non-edible species of mushrooms.

Include a picnic at Point Imperial or Cape Royal. Watch the Canyon change while you eat.

Watch the sunset from Bright Angel Point or Cape Royal.

Overnight

Watch the sunrise from Bright Angel Point, Cape Royal, or Point Imperial.

Take a longer hike down the North Kaibab Trail. Spend the day at Roaring Springs, taking a lunch and water, and relax next to the falls. (Check with the Backcountry ranger at the Ranger Station for more information about how to hike safely.)

Drive to East Rim Drive, another picturesque spot for viewing the sunrise. Check at the Information Desk in Grand Canyon Lodge for directions to this dirt road located north of the park boundary.

Attend the National Park Service evening program.



EMERGENCY-911

Dial 911 from a pay phone or residence. Dial 9-911 from your hotel/motel room.

NOTRUF - 911 Wenn Sie im Notfall ärztliche bzw. polizeiliche Hilfe benötigen, wählen Sie von einem öffentlichen Fernsprecher die Nummer 911. Von Ihrem Hotelzimmer aus, wählen Sie 9-911.

APPEL D'URGENCE - 911 Si vous avez besoin d'aide médicale ou de la police, composez le numéro 911 depuis un téléphone public. Composez le 9-911 depuis votre chambre d'hôtel.

Do you know what time it is?

Grand Canyon is on Mountain Standard Time year round.

AUSKUNFTSUBERSSETZUNGEN über die Natur-und Kulturgeschichte des Grand Canyons werden zum Verkauf auf Französisch, Deutsch und Japanisch angeboten. Erkundigen Sie sich im Visitor Center und in den Museen.

DES TRADUCTIONS sur l'histoire naturelle et culturelle du Grand Canyon se vendent en français, allemand et japonais. Adressez-vous au Visitor Center et aux musées.

USE CAUTION



NEAR THE EDGE

**FOOTING
CAN BE DANGEROUS**



FACILITIES & SERVICES

CAMPING

NATIONAL PARK CAMPING

Within Grand Canyon National Park camping is permitted only in designated campgrounds. Park Service campsite reservations may be made through Ticketron by calling (800) 452-1111. Ticketron accepts VISA and Mastercard. Campsites may be available on a first-come/first-served basis. Arrive before 10 a.m. for the greatest chance of obtaining a site.

North Rim Campground: 82 sites, no hookups, showers available nearby. Closes October 22. Fee: \$10 per night. Stays are limited to 7 days per season. Reservations for individuals and organized groups of 6-100 people with a sponsorship, charter, or recognition, may be made through Ticketron (800) 452-1111.

FOREST SERVICE CAMPING

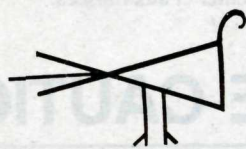
DeMotte Park Campground: 25 sites located 5 miles north of the park boundary. Operates on a first-come/first-served basis. Fee: \$6 per vehicle per night.

Jacob Lake Campground: 50 sites located at Jacob Lake, 30 miles from the park boundary. Water and restrooms are available. Fee: \$6 per vehicle per night. Reservations may be made through Mistix, 1-800-283-CAMP; \$2 reservation fee. Twenty-six sites will be retained on a first-come/first-served basis. Free evening programs.

Open Camping: Kaibab National Forest, surrounding Grand Canyon National Park, is open to "at-large" camping. Campers must observe all fire, off-road, and sanitation restrictions.

PRIVATE CAMPGROUND

Jacob Lake R.V. Park: Located 1/4-mile south of Jacob Lake on Arizona Highway 67. Eighty sites with hookups and 50 tent sites are available.



LODGING

GRAND CANYON LODGE: Motel units: double occupancy, \$50.00. Frontier and Western cabins: double occupancy, \$43.00 and \$59.00 respectively. Pioneer Cabins: one or four persons, \$53.00. Front desk is open 24 hours a day. For reservations call (801) 586-7686.

KAIBAB LODGE: Located 5 miles north of park boundary. Room rates from \$43 phone (602) 638-2389; year round reservation number (602) 526-0924, outside AZ (800) 525-0924. Also operates Park & Forest hikes, forest vehicle & mountain bike tours, camping equipment sales and rentals, and winter Nordic Ski Center. Open year round except when Hwy 67 is closed April 1 through mid-May.

JACOB LAKE LODGE: Located 30 miles north of park boundary. Double occupancy, \$45-60.00. Call (602) 643-7232 for information.

FOOD & BEVERAGE

GRAND CANYON LODGE DINING ROOM: View of the Canyon. Breakfast, 6:30-10 a.m. full menu, 6:30-11 a.m. continental menu; lunch, 11:30 a.m.-2:30 p.m.; dinner, 5-9:30 p.m. daily (reservations recommended for dinner). Call (602) 638-2611 for information.

BUFFETERIA & SNACK BAR: Located in the Grand Canyon Lodge Complex. Open 6:30-10 a.m., noon-4 p.m., and 6-9 p.m. daily.

NORTH RIM PUB & GAME ROOM: Located adjacent to the General Store near North Rim Campground. Open 4-11 p.m. daily.

GENERAL STORE: Located across from North Rim Campground. Open 7 a.m.-9 p.m. daily (hours may vary with demand).

KAIBAB LODGE DINING ROOM: Located 5 miles north of park boundary. Open daily for breakfast, lunch, and dinner. Reservations recommended. Call (602) 638-2389.

JACOB LAKE LODGE COFFEE SHOP & DINING ROOM: Located 30 miles north of park boundary. Breakfast, 7-11 a.m.; lunch 11 a.m.-8 p.m.; dinner, 5:30-8 p.m. Coffee Shop open 6:30 a.m.-8 p.m. daily.

RELIGIOUS SERVICES

CATHOLIC MASS: Saturdays at 6 p.m., in Grand Canyon Lodge recreation room.

INTERDENOMINATIONAL: Services presented by A Christian Ministry in the National Parks. Check for time and location of services at the bulletin board located near the post office.

LDS SERVICES: Sundays, 3-5 p.m., at Lodge recreation room.



LOST AND FOUND: For information about lost and found property, contact the National Park Service Information Desk located in Grand Canyon Lodge.

WEATHER: For recorded weather information call (602) 638-7888. Information updated at 7 a.m. daily.

Restrooms



The public restrooms at the Grand Canyon Lodge are often crowded. Public restrooms are available at the gas station near the campground turn off.



TOURS

BUS TOURS: Departure times for tours to Cape Royal and Point Imperial are posted in the Grand Canyon Lodge lobby where tickets also may be purchased.

GRAND CANYON TRAIL RIDES: Half-day (\$25) and full-day (\$60) trips into the Canyon and one-hour (\$10) and two-hour (\$20) rides along the rim are normally available on a daily basis. Located in the lobby of the Grand Canyon Lodge, the Grand Canyon Trail Rides desk is open 7 a.m.-8 p.m. daily. Call (602) 638-2292 for information.

COLORADO RIVER TRIPS: Twenty-two companies offer raft trips on the Colorado River. Limited arrangements may be made through Kaibab Lodge (602) 638-2389. A complete list is available at the NPS Information desk, lodge lobby.

RIM TO RIM TRANSPORTATION: Daily round-trip transportation service between Grand Canyon's South and North Rim begins May 15. Departs North Rim 7 a.m.; arrives South Rim before noon; departs South Rim 1:30 p.m.; arrives North Rim around 6:00 p.m. Call (602) 638-2820 for information and reservations, or contact the lodge transportation desk for additional information.

OTHER SERVICES

GENERAL STORE: Located across from North Rim Campground. Open 7 a.m.-9 p.m. daily (hours may vary with demand). Groceries, camping supplies, backpacking equipment.

EQUIPMENT: Camping and backpacking supplies available at General Store. See above.

POST OFFICE: Located in Grand Canyon Lodge Complex. Window service 8:30 a.m.-noon, 1-4:30 p.m., Monday through Friday; Saturday 8:30 a.m.-noon.

SERVICE STATION: Chevron Service Station is located on the access road leading to North Rim Campground. Open 7 a.m.-7 p.m. daily. Gas and repair.

LAUNDRY & SHOWERS: Located near North Rim Campground. Open 8 a.m.-8 p.m. daily.

CURIOS & GIFTS: Gift shop located in Grand Canyon Lodge Complex. Open 7:30 a.m.-9:30 p.m. daily (hours may vary).

Visitor Information



The National Park Service Information desk is located in the lobby of the Grand Canyon Lodge. Rangers and Natural History Association employees are available to answer questions from 8 a.m. to 5 p.m. daily. The Grand Canyon Natural History Association operates a book store in conjunction with the information desk.

SERVICES FOR SPECIAL POPULATIONS

Many North Rim viewpoints, facilities, and some trails are wheelchair accessible or accessible with assistance. Inquire at the Park Service Information Desk in the Lodge lobby for further details.

FACILITIES: Restrooms at the Ranger Station and Grand Canyon Lodge are wheelchair accessible. Lodge dining room and patios are accessible via a lift. Contact the Grand Canyon Lodge front desk for additional information.

CAMPGROUND: One restroom and two campsites are wheelchair accessible.

TRAILS: Cape Royal Nature Trail is a 1/2-mile paved path with minimal elevation change, leading to several points with Canyon views.

RANGER PROGRAMS: Programs which are wheelchair accessible with assistance are indicated by "*" in the program listing.

NORTH RIM HEALTH SERVICES

MEDICAL SERVICES: North Rim Clinic is staffed by a Nurse Practitioner. Available Fri.-Mon., 9 a.m.-5 p.m., Tues. 9 a.m.-12 p.m., Thurs. 1 p.m.-5 p.m. (subject to change) on a walk-in basis, or by appointment. Call 638-2611. Health Center is located at Grand Canyon Lodge in Cabin 1.

OUT-OF-PARK SERVICES

COUNTRY STORE & GAS STATION: Gas and diesel available all year 7 a.m.-7 p.m. daily. Located 5 miles north of park boundary. Diesel fuel, automotive supplies, groceries, camping and backpacking equipment rental and sales, and curios.

JACOB LAKE LODGE & GAS STATION: Located 30 miles north of park boundary. Lodge open 7 a.m.-8 p.m. daily; gas station open 7 a.m.-8:30 p.m. daily. Dump station available.

PROPANE: Available at Jacob Lake.

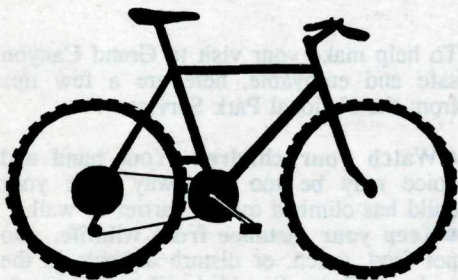
Sunrise & Sunset

May 15	5:23 a.m.	7:27 p.m.
May 20	5:19 a.m.	7:31 p.m.
May 25	5:16 a.m.	7:35 p.m.
May 30	5:14 a.m.	7:38 p.m.
June 5	5:12 a.m.	7:42 p.m.
June 10	5:11 a.m.	7:45 p.m.
June 15	5:11 a.m.	7:45 p.m.
June 20	5:12 a.m.	7:49 p.m.
July 5	5:17 a.m.	7:49 p.m.
July 10	5:20 a.m.	7:48 p.m.
July 15	5:23 a.m.	7:46 p.m.
July 20	5:26 a.m.	7:44 p.m.

Mountain biking

The North Rim of Grand Canyon and the surrounding Kaibab National Forest offer many opportunities for riding mountain bicycles. Within the National Park bicycles are permitted on paved and dirt roads unless otherwise posted. Bicycles are not permitted on any trails.

Several dirt roads offer a variety of interesting bicycle trips. These opportunities vary from short, relatively level routes, to remote view points such as Cape Final, Francois Matthes Point, and Obi Point. More arduous trips may be planned for more than one day, such as the 17-mile road to Point Sublime. Park topographical maps and the Kaibab Forest map are useful for planning bicycle routes. Both maps are available at the Park Service Information Desk in the lodge lobby.



Reporting wildlife observations

The National Park Service keeps a file of wildlife observations reported by visitors, employees, and researchers. These records provide information about the Park's wildlife species, their abundance, their locations, and population trends.

You are encouraged to be a part of the research staff by completing observation records. An example of the observation card is shown below. Additional cards may be picked up at the National Park Service Information Desk at Grand Canyon Lodge.

Animals such as mule deer, ground squirrels, ravens, white-throated swifts, and violet green swallows are common and are seen by nearly every visitor. These animals need not be reported.

Bighorn sheep and other uncommon mammals, all reptiles and amphibians, migratory birds, and raptors should be reported. If you are unsure about the importance of a sighting, please fill out a card and submit it. All accurate sightings have research value.

Observation cards may be delivered to the Information Desk or mailed to:

Superintendent
Grand Canyon National Park
P.O. Box 129
Grand Canyon, AZ 86023.



Historic Grand Canyon Lodge

Rugged, spacious, and informal, Grand Canyon Lodge has become for many visitors the essence of the North Rim. Its timbered ceilings, massive stone walls and dramatic vistas seem to be drawn directly from the natural features of Bright Angel Point. In 1982, the structure was added to the National Register of Historic Places.

Built by the Utah Parks Company, a subsidiary of Union Pacific Railroad, Grand Canyon Lodge opened for business on June 1, 1928. Consisting of a main building, one hundred standard cabins, and twenty-five deluxe cabins, the complex was designed by Gilbert Stanley Underwood. Also architect for the Ahwahnee Hotel in Yosemite Valley and the Lodge at Bryce Canyon, Underwood was instrumental in creating the rustic building style typical of many National Park structures completed during the 1920s and 1930s.

In the early morning hours of September 1, 1932, Grand Canyon Lodge and two deluxe cabins were destroyed by the largest structural fire in the park's

history. Due to financial constraints typical of the Great Depression years, reconstruction was postponed until the winter of 1936-37.

Still based upon Underwood's floor plan and palette of materials, the new Lodge retains much of the character of its predecessor. Using natural rough-hewn limestone and timbers, the structure complements rather than intrudes upon the canyon and rim environment.

The Lodge is a product of the economic prosperity of the "Roaring Twenties" and the bitter realities of the "Great Depression." It serves today as a reminder of those eras and as a tribute to American craftsmanship and architecture. Utah Parks Company owned and operated the complex until 1972 when their North Rim holdings were donated to the National Park Service. A concessionaire leases the facilities through a government contract.

The National Park Service Information Desk is located in the Grand Canyon Lodge lobby.



ANIMAL
OBSERVED

Location

Date (Month, Day, Year)

Time (a.m./p.m.)

Weather

Description, Behavior, Number, Sketch, Map, Etc. (Use reverse if necessary)

BE ACCURATE - DO NOT GUESS

Park:

Observed by:

Form 10-257 (6/58) 39235

NATURAL HISTORY FIELD OBSERVATION

Grand Canyon Quiz

1 How many people visit the Grand Canyon each year?
a) 750,000 b) 8,000,000 c) 4,000,000
d) 1,000,000

2 The Grand Canyon is an average 10 miles wide because:
a) the river was once 10 miles wide.
b) a huge earthquake split the Kaibab Plateau. c) wind, rain, and flash floods widened the canyon after the river cut the depth.

3 Two-thirds of the Grand Canyon is on the north side of the river.
True _____ False _____

4 Major environmental issues which concern the Grand Canyon include:
a) air quality, b) nearby uranium mining, c) overcrowding, d) aircraft noise, e) all of the above.

5 In an average year there are:
a) 5,000, b) 15,000, c) 30,000,
d) 50,000 flights over the Grand Canyon.

6 The number of people who fall off the canyon rim and die each year averages: a) 5, b) 10.4, c) 2.5, d) 25.

7 How many people each year hike to the bottom of Grand Canyon and stay overnight? a) 150, b) no one, there is no way down, c) 250,000, d) 50,000.

8 The record time for running from the North Rim to the South Rim (a distance of 22 miles) is: a) 2 days 4 hours, b) 12 hours 12 minutes, c) 8 hours 5 minutes, d) 3 hours 9 minutes.

9 If you see a deer along the road you should: a) feed the poor, hungry animal, b) stop immediately in the road and take a picture, c) reduce speed, stopping only if there is a wide shoulder or turn-out.

10 The oldest rocks of Grand Canyon are approximately: a) 6 thousand years old, b) 137 million years old, c) 2 billion years old, d) half as old as the earth itself.

11 The average snowfall at the North Rim is: a) 2 ft., b) 6 ft., c) 12 ft., d) 20 ft.

Answers may be found on the last page of The Guide.

Become a junior ranger

Grand Canyon National Park offers a Junior Ranger program for children up to age 12. To take part in the program pick up a copy of the *Young Adventurer*, a special newspaper just for kids, and complete the activities outlined for the Junior Ranger Program. Copies of the *Young Adventurer* are available at the Grand Canyon Lodge Park Service Information Desk.

Hiking on the North Rim

There is only one Grand Canyon. It belongs to everyone. During your visit we ask that you respect the rights of others. Please carry out your trash.

Leave all fossils, rocks, plants and animals as you find them so those who come after you may also enjoy them.

Throwing or rolling rocks may injure people below you.

Vehicles, including bicycles, are allowed only on paved or designated roads.

Stay on trails. Cutting across switchbacks can be dangerous for both you and those below you, and it increases erosion.

Litter has become a problem on many trails. Carry trash to proper receptacles and remember that cigarette butts are litter too.

Mules have the right-of-way on the trail. If you meet a mule string, stand quietly by the side of the trail and obey any instructions given by the wrangler.

A hike into the Canyon will test your mental and physical endurance. Know and respect your limitations. Rangers will be glad to help you plan a hike within your capabilities.

Hiking reservations and permits

Permits are required for overnight hiking only; day hikes do not require a permit.

Overnight reservation requests should be sent to:

Backcountry Reservations Office
P.O. Box 129
Grand Canyon, AZ 86023

Hikers arriving without reservations should contact the North Rim Backcountry Reservations Office (BRO). Located at the Ranger Station, the BRO is open 7-11 a.m. and 4-5 p.m. daily. It may be possible to obtain a Backcountry Use Permit by placing your name on a waiting list for cancellations. The waiting list is started when the BRO opens, the day before the hike would begin. Names will be taken IN PERSON ONLY. Hikers on the waiting list must be present at 9 a.m. on the day of the hike to check on availability of permits.

Ticks

Ticks carrying relapsing tick fever have been known to occur on the North Rim. They carry a treatable disease. The symptoms which develop in 5-15 days include nausea, fatigue, muscle weakness, and headaches. If you have these symptoms after your visit to the Grand Canyon, contact your physician, and the Arizona Department of Health (602) 230-5918.

BACKCOUNTRY

HIKING INTO THE CANYON



North Rim Day Hikes

Day hiking in Grand Canyon is one way to experience some of the Canyon's rich natural beauty and immense size. No permits are required for day hikes. Backcountry rangers can provide additional information and assist you in planning a trip within your capabilities.

The round-trip hiking times listed below are averages for hikers in good physical condition. A good rule to follow is to decide how many hours you wish to hike. When 1/3 of the time has passed, turn around and begin to hike out. Carry an adequate supply of water -- at least two quarts for each person.

See numbered trails on page 5.

1. Bright Angel Point Trail: 0.5 miles [0.8 km] 30 minutes round trip.

A short walk on a paved trail to a spectacular view of the Canyon. The trail begins at the log shelter in the parking area by Grand Canyon Lodge or at the corner of the east patio behind the Lodge. Self-guiding nature trail pamphlets are available from a box along the trail.

2. Transept Trail: 1.5 miles [2.4 km] 45 minutes one way.

Trail follows the Canyon rim from Grand Canyon Lodge to the North Rim Campground.

3. Uncle Jim Trail: 5 miles [8 km] 3 hours round trip.

Winds through the forest to a point overlooking the Canyon and the North Kaibab Trail switchbacks. Begins at the North Kaibab Trail parking lot. This trail is also used by mule strings.

4. Widforss Trail: 10 miles [16 km] 5 hours round trip.

Blends forest and Canyon scenery. Even a short walk can be very satisfying. Take the dirt road 1/4-mile [0.4 km] south of Cape Royal Road one mile [1.6 km] to the Widforss Trail parking area.

5. Ken Patrick Trail: 10 miles [19.3 km] 5 hours one way.

Winds through the forest and along the rim from Point Imperial to the North Kaibab Trail parking area.

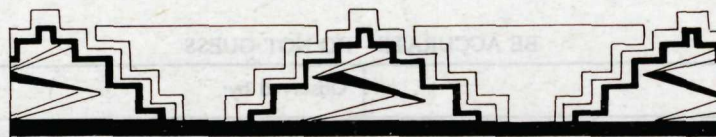
6. Cape Royal Trail: 0.6 miles [1 km] 30 minutes round trip.

An easy walk on a flat, paved trail providing views of the Canyon, Angel's Window, and the Colorado River. Markers along the trail interpret the area's natural history. Trail begins at the southeast side of the Cape Royal parking area.

7. Cliff Springs Trail: 1 mile [1.6 km] 1 hour round trip.

Meanders down a forested ravine and past a small Indian ruin. The trail ends where a chest-high boulder rests under a large overhang. The spring is on the cliff side of the boulder. Please do not drink the water as it may be contaminated. Trail begins directly across the road from Angel's Window Overlook, a small pullout on a curve 0.3 miles [0.5 km] down the road from Cape Royal.

8. North Kaibab Trail: This is the only maintained trail into the Canyon from the North Rim. Even a short hike on this trail can give you an appreciation for the Canyon's rich natural beauty and immense size. A full day (6-8 hours) should be allowed for a trip to Roaring Springs and back. Roaring Springs lies 3401 feet [930 m] below the canyon rim and is a 9.4 mile [15 km] round trip. Summer temperatures at Roaring Springs may exceed 90 degrees F [32 degrees C]. Hikers should know the prevention, symptoms, and treatment of heat stroke and heat exhaustion.



Pets

Pets must be physically restrained at all times. They are not allowed on trails. The only trail that they are allowed on is the Bridal Path which connects the Lodge with the North Kaibab Trail. The only exception is guide dogs for people who are blind or deaf.

Tips for a Safe Visit

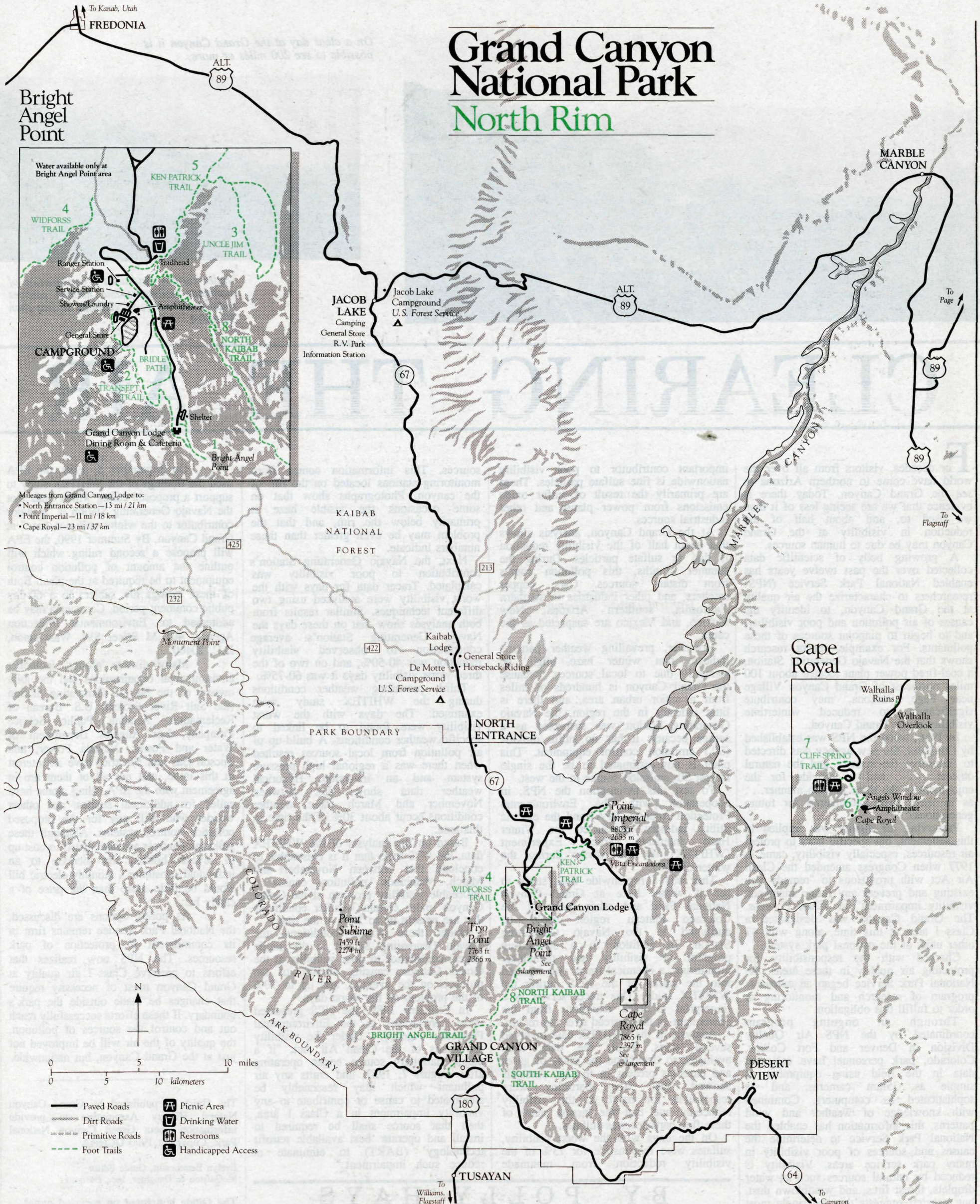
Did you know that Federal law requires you to wear seatbelts while driving in a National Park? **So buckle-up.** It's the law in Grand Canyon.

To help make your visit to Grand Canyon safe and enjoyable, here are a few tips from the National Park Service.

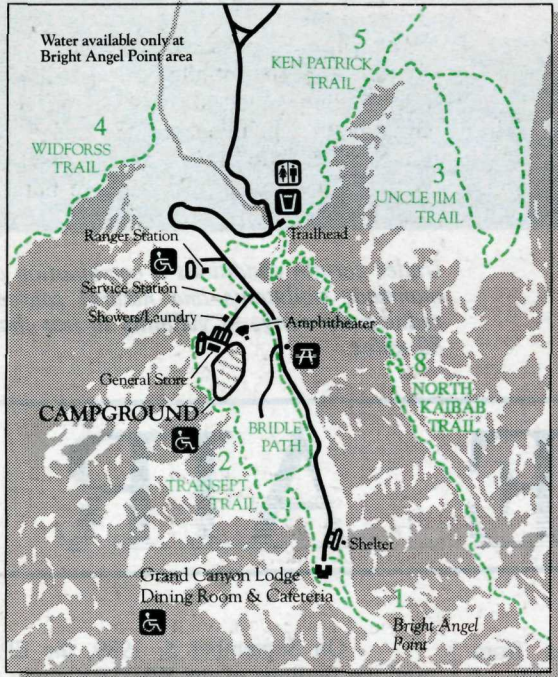
- **Watch your children.** Your hand and voice may be too far away once your child has climbed over a barrier or wall.
- **Keep your distance from wildlife.** Do not feed, touch, or disturb animals in the park. Rodents may bite and large animals have been known to kick when startled.
- **Find a friend.** Most hiker fatalities occur with solo hikers. Make sure someone knows your plans. Overnight stays in the Canyon require a free permit. Ask a ranger for permit information.
- **Pay attention to weather changes.** Use caution when walking near the canyon rim and driving in the Park, especially in rainy or snowy conditions.
- **Know your limits.** Elevation on the North Rim is 8200 feet above sea level. People with heart and respiratory problems should be especially cautious about over exertion.
- **Keep track of your belongings.** Remove all valuables from your car and trunk. Immediately report any suspicious activity to a ranger. Thieves work quickly.
- **Bicycles are permitted** only on primary paved roads, secondary dirt roads and fire roads. Helmets are *strongly* recommended, and headlights and reflectors are *required at night*.
- **Bicycle use is strictly prohibited off-road and on trails.** Violators will be cited and fined, and their bicycles confiscated.
- **Obey posted speed limits.**
- **Protect your park.** Grand Canyon National Park is fully protected by federal law to preserve it for future generations. Do not disturb or remove any natural or cultural feature, including fossils, rocks, plants, animals, and artifacts.
- **Parking in handicapped areas** is restricted to vehicles displaying handicapped license plates. Temporary parking permits are available at Grand Canyon Lodge Park Service Information Desk.
- **Camp only within designated campsites** in the National Park. Violators may be fined.
- **Visitors are responsible** for knowing park rules and regulations.

Grand Canyon National Park

North Rim



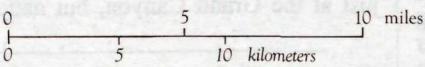
Bright Angel Point



Mileages from Grand Canyon Lodge to:

- North Entrance Station—13 mi / 21 km
- Point Imperial—11 mi / 18 km
- Cape Royal—23 mi / 37 km

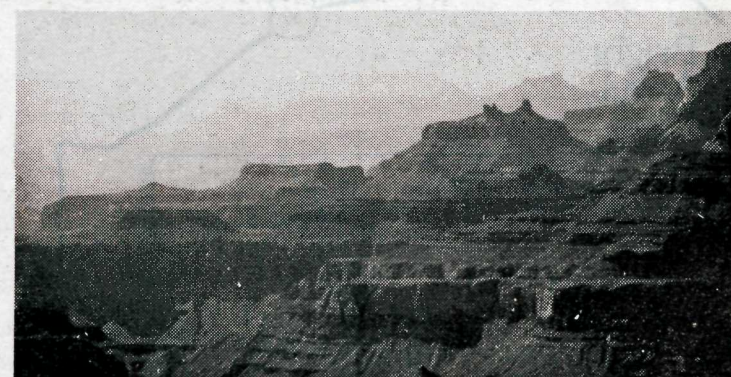
Cape Royal



- Paved Roads
- Dirt Roads
- Primitive Roads
- - - Foot Trails
- Ⓜ Picnic Area
- Ⓜ Drinking Water
- Ⓜ Restrooms
- ♿ Handicapped Access



On a clear day at the Grand Canyon it is possible to see 200 miles or more.



Under certain conditions a combination of manmade pollutants and natural sources reduces the range of visibility to less than 80 miles.

CLEARING THE AIR

For decades, visitors from all over the world have come to northern Arizona to see the Grand Canyon. Today there is evidence that we are seeing less of it than we used to, and about half of the reduction in visibility at the Grand Canyon may be due to human sources.

A growing body of scientific data collected over the past twelve years has enabled National Park Service (NPS) researchers to characterize the air quality at the Grand Canyon, to identify the causes of air pollution and poor visibility, and to begin to pinpoint sources of these pollutants. For example, recent research shows that the Navajo Generating Station, a coal-fired power plant located about 100 miles northeast of Grand Canyon Village near Page, Arizona, may contribute significantly to reduced wintertime visibility at the Grand Canyon.

In 1916, when the NPS was established by Congress, the new agency was directed to "conserve the scenery and the natural objects . . . and to provide for the enjoyment of the same in such manner . . . as to leave them unimpaired for future generations."

Preserving air quality was implied in this statement, but specific laws to protect air resources, especially visibility, came in 1977 when Congress amended the Clean Air Act with provisions to "remedy any existing and prevent any future manmade visibility impairment" in "Class I" areas. The Grand Canyon was designated a Class I area at this time, along with 47 other units of the national park system.

Charged with the responsibility for protecting air quality in these areas, the National Park Service began an extensive program of research and monitoring in order to fulfill this obligation.

Through an ongoing program coordinated by the NPS Air Quality Division in Denver and Fort Collins, Colorado, park personnel have collected data in the field using equipment as simple as 35mm cameras, and as sophisticated as computers. Combined with knowledge of weather and wind patterns, this information has enabled the National Park Service to determine the causes and sources of poor visibility in many park service areas. Visibility is reduced by natural sources such as water droplets, forest fires, and windblown dust, but research suggests that the single most

important contributor to poor visibility nationwide is fine sulfate particles. These are primarily the result of sulfur oxide emissions from power plants and other industrial sources.

At the Grand Canyon, analysis shows that about half of the visibility reduction is due to sulfate particles. During the summer months, this pollution comes from distant sources. Cars, copper smelters, and other industries in southern California, southern Arizona, New Mexico, and Mexico are suspected as the cause.

However, prevailing weather patterns indicate that winter haze might be primarily due to local sources. Because the Grand Canyon is hundreds of miles from a major urban area, and there is little industry in the region, the Navajo Generating Station was suspected as a source because it has no sulfur dioxide (SO₂) emission control equipment. This plant is now estimated to be the single largest SO₂ emission source in the west.

To test this assumption the NPS, in cooperation with the Environmental Protection Agency (EPA) and the electric utility industry, conducted the Winter Haze Intensive Tracer Experiment (WHITEX) for six weeks during the winter of 1987.

This was a regionwide field study to see if winter haze at Grand Canyon National Park and other parks of the Colorado Plateau region could be attributed to the Navajo Generating Station. In addition to a stepped-up program of visibility and particulate monitoring, a chemical tracer was injected into the stacks of the NGS during the WHITEX study. This tracer served as a fingerprint to track emissions from the powerplant as they spread over the region.

Analysis of the WHITEX data involved several steps. First, the data were evaluated to determine the kinds of gases and particles present in the air. Analysis showed that fine particles were responsible for most of the visibility reduction, and that the largest share of these fine particles was sulfates.

On the days with the worst visibility, sulfates were responsible for 73% of the visibility reduction from manmade

sources. This information comes from monitoring stations located on the rim of the canyon. Photographs show that on some occasions the visible haze is primarily below the rim, and that the problem may be even greater than these numbers indicate.

Next, the Navajo Generating Station's contribution to poor visibility was calculated. Tracer data for days with the worst visibility were analyzed using two different techniques. Similar results from both analyses show that on these days the Navajo Generating Station's average contribution to observed visibility reduction was 40-50%, and on two of the three worst visibility days it was 60-75%.

Third, prevailing weather conditions during the WHITEX study were examined. The days with the worst visibility were found to be linked to specific weather conditions. A build-up of air pollution from local sources resulted when there was a regional high pressure system and an inversion. Historical weather data show that between November and March these weather conditions occur about 30% of the time in this area.

Based on the analysis of the WHITEX data, the NPS feels that it is reasonable to conclude that between November and March, manmade pollution causes a noticeable visibility problem at the Grand Canyon under certain weather conditions that are present up to 30% of the time.

Under these winter conditions, the Navajo Generating Station is the single largest contributor to poor visibility at the Grand Canyon, causing 40-50% of the problem on the average, and up to 70% of the problem on the worst days.

In February 1989, the NPS presented these conclusions to the Environmental Protection Agency. Under the visibility provisions of the Clean Air Act, "if a major stationary source began operating after August 7, 1962, and emits any air pollutant which may reasonably be anticipated to cause or contribute to any visibility impairment in a Class I area, then that source shall be required to install and operate 'best available retrofit technology' (BART) to eliminate or reduce such impairment."

On September 5, 1989, the EPA used the findings of the WHITEX study to support a proposed ruling which finds that the Navajo Generating Station is "a major contributor to the winter pollution haze" at Grand Canyon. By Summer 1990, the EPA will propose a second ruling which will outline the amount of pollution control equipment to be required at the plant. Both of these rulings are subject to a 60-day public comment period. Comments may be addressed to: Environmental Protection Agency, 401 M Street SW, Washington, D.C. 20460.

Many diverse groups, including environmental organizations and the joint owners of the Navajo Generating Station (the Salt River Project, U.S. Bureau of Reclamation, Arizona Public Service Company, Los Angeles Department of Water and Power, Nevada Power, and Tucson Gas and Electric) have an interest in this issue, and not all of them are in agreement with the EPA ruling. Some have called for additional studies, and others wonder who will pay for the proposed pollution control systems. Although these pollution controls are anticipated to cost up to several billion, the increase to an individual consumer's monthly electric bill would be little more than the price of a candy bar.

As policy options are discussed, the National Park Service remains firm in its commitment to protection of park resources. The NPS now realizes that efforts to preserve Class I air quality at Grand Canyon must of necessity require that changes be made outside the park's boundary. If these efforts successfully reach out and control the sources of pollution, the quality of the air will be improved not just at the Grand Canyon, but nationwide.

The Guide is published by Grand Canyon Natural History Association to provide information about Grand Canyon National Park. Copyright 1990 GCNHA

Evelyn Bettencourt, Guide Editor
McQuiston & Daughter, Inc., Designers

The Guide is printed on recycled paper.

BY POLLY HAYS

GRAND CANYON NATURAL HISTORY ASSOCIATION:

Aid to Grand Canyon National Park

PUBLICATIONS

BOOKS

ALONG THE RIM by Nancy Loving. A brief discussion of plant and animal life on the South Rim, and guide to points along East and West rim drives from Desert View to Hermits Rest. 56 full-color and black-and-white photographs, four maps, landmark keys. 52 pp. \$2.95

GRAND CANYON GEOLOGY ALONG BRIGHT ANGEL TRAIL by David Thayer. This lucid explanation of Grand Canyon geology contains 30 photos, 30 line drawings, and 5 section maps of Bright Angel Trail. 6"x8-1/2" wirebound. 100 pp. \$8.95

GUIDE TO GRAND CANYON VILLAGE HISTORIC DISTRICT by Timothy Manns. Illustrated booklet describing historic buildings in Grand Canyon Village on the South Rim. 24 pp. \$2.50

IN THE HOUSE OF STONE AND LIGHT by J. Donald Hughes. Detailed look at the human history of Grand Canyon before and after it became a national park. Historic photographs. 137 pp. \$9.50

INTRODUCTION TO GRAND CANYON GEOLOGY by Michael Collier. The story of Grand Canyon geology in lay terms. 40 color plates. 42 pp. \$4.00 pb, \$7.50 hc

JAPANESE GUIDE TO THE GRAND CANYON by Masahiro Ohta. Introductory guide to Grand Canyon includes a map of the area. Written in Japanese specifically for Japanese visitors. 13 color plates. 26 pp. \$5.00

JOHN WESLEY POWELL AND THE ANTHROPOLOGY OF THE CANYON COUNTRY by John Wesley Powell. Reprint of the U.S. Geological Survey professional paper No. 670. Powell's ethnography dating back to the late 1800s. 30 pages. \$4.00

LIGHTFALL AND TIME: FIFTEEN SOUTHWESTERN NATIONAL PARKS by Bennett and Lamb. Paintings and essays about Grand Canyon, Arches, Canyonlands, and 12 other national parks. Informative and inspirational. 64 pages, 15 color plates, 8"x8." \$14.95 pb

MOUNTAIN LYING DOWN: VIEWS OF THE NORTH RIM by Shoemaker, Euler, and Collier. The biologic, geologic, and cultural history of the North Rim of the Grand Canyon in lay terms. 36 pp. \$3.00

RECOLLECTIONS OF PHANTOM RANCH by Elizabeth Simpson. Pocket-sized history of Phantom Ranch, the guest quarters at the bottom of the Canyon. Suggestions for day hikes. 28 pp. \$2.50

RIVER RUNNERS OF THE GRAND CANYON by David Lavender. A lively history of river running on the Colorado River as it winds its way through Grand Canyon; 1869 to the present. 75 B/W photographs. 188 pp. \$15.00

SKETCH OF GRAND CANYON PREHISTORY by A. Trinkle Jones and Robert Euler. An introduction to the anthropology and archaeology of Grand Canyon written in non-scientific terms. B/W illust. 14 pp. \$4.00

TRAIL GUIDES

POCKET-SIZE GUIDES
An informative series of trail guides containing information about the cultural and natural history of the area, as well as trail maps and photographs. 20-48 pp. \$2.95 each
BRIGHT ANGEL HERMIT GRANDVIEW NORTH KAIBAB HAVASU SOUTH KAIBAB NEW! BASS, NORTH & SOUTH

GUIDE TO HIKING THE INNER CANYON by Scott Thybony. Descriptions and maps of major trails and routes in Grand Canyon National Park. Includes information on backcountry reservations, safety, and minimum impact hiking. 43 pp. \$2.95

VIDEO

RIVER SONG: A NATURAL HISTORY OF THE COLORADO RIVER, narrated by Richard Chamberlain. The river is the lifeblood of the Grand Canyon, yet because of its remoteness it was not explored completely until 1869. Even today it is a challenge to the adventure-some. In this award-winning film we see animals, plants, geology, and the great river itself. 40 minutes. VHS, PAL. \$29.95

POSTERS

CANYON NATURE POSTER. Canyon rim setting filled with native birds, insects, reptiles, and plants. Drawn by distinguished artist Lawrence Ormsby. Full Color. Includes key. 37"x25" \$5.00

"I AM TEN THOUSAND CATHEDRALS ROLLED INTO ONE." Tom Bean photograph shows Grand Canyon at its most dramatic. 11"x14" \$4.00

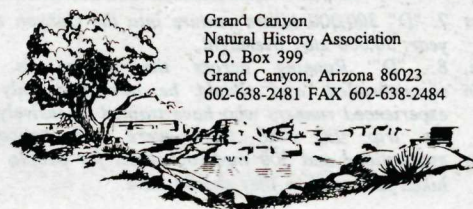
MAPS

GEOLOGIC MAP OF EASTERN PART OF GRAND CANYON NATIONAL PARK by Breed, Huntoon, and Billingsley. Colorful map graphically shows geologic formations of the Grand Canyon. \$6.00

GEOLOGIC MAP OF HURRICANE FAULT ZONE AND VICINITY WESTERN GRAND CANYON, ARIZONA by Huntoon, Billingsley, and Clark, 1981 edition. \$6.00

GEOLOGIC MAP OF LOWER GRANITE GORGE AND VICINITY, WESTERN GRAND CANYON, ARIZONA by Huntoon, Billingsley, and Clark, 1982 edition. \$6.00

GEOLOGIC MAP OF VULCANS THRONE AND VICINITY, WESTERN GRAND CANYON, ARIZONA by Huntoon, Billingsley, and Clark, 1983 edition. \$6.00



Grand Canyon
Natural History Association
P.O. Box 399
Grand Canyon, Arizona 86023
602-638-2481 FAX 602-638-2484

CASSETTE

CANYON LIFESONGS by Rita Cantu. 45 minutes of mellow vocals and orchestration. Songs written about and in the canyonlands of the Colorado Plateau, and performed by the composer. \$9.95

FOR CHILDREN

WHERE DO I LOOK? by Franklin and Huey. A child's look at the Grand Canyon provides the opportunity to recognize where we all fit in the scheme of nature. For young children. 42 B/W photographs. 40 pp. \$7.50

EXPLORING THE GRAND CANYON by Lynne Foster. A lively yet comprehensive look at the natural and cultural history of the Grand Canyon, and the hikes and activities awaiting children today. Ages 9-12. Richly illustrated. 9"x9" 160 pp. \$14.95

NEW!

GRAND CANYON WILDFLOWERS by Phillips and Richardson. A field guide to the wildflowers of the Grand Canyon area. 160+ color plates representing 140 species. Quick reference to color, location and blooming season. 145 pp. \$15.95

GRAND CAÑON POSTER. Photographs by Christopher Brown combine with words of John Wesley Powell to create a moving experience of the Canyon. 18"x24" \$5.00

WILD ANIMALS FACE TO FACE. A set of seven animal masks painted by wildlife artist Elizabeth McClelland. Coyote, Bighorn, Tassel-eared squirrel, Ringtail, Horned lizard, Monarch butterfly, Raven. Each mask 5"x7" or larger. Set \$7.95

MEMBERSHIP

Grand Canyon Natural History Association (GCNHA) is one of more than 60 National Park Cooperating Associations throughout the United States. The associations' primary function is to support interpretation and related visitor services at National Parks. Cooperating associations operate sales areas in Park Service visitor facilities, offering publications and theme-related items that help visitors to better understand the park and its resources. Cooperating associations further aid the National Park Service through donations to support interpretive, educational, and research activities.

Over the years the GCNHA has donated well over \$1 million in aid to the National Park Service. These grants fund a wide variety of activities such as wayside exhibits, library books and periodicals, audio-visual productions and equipment, free publications, honorariums for training lectures, environmental education, museum exhibits and equipment, volunteer-in-park programs, and memberships in educational, scientific, or historical societies.

GCNHA members receive a 20% discount on all publications purchased in its stores or by mail order. Most other National Park Service Cooperating Associations will honor your GCNHA membership card to receive their designated discount on sale items. To become a member, visit any GCNHA sales area or write to GCNHA, P.O. Box 399, Grand Canyon, AZ 86023.

Annual Memberships:

Student \$ 5.00
Regular 10.00

Lifetime Memberships:

Life Member 150.00
Patron 500.00
Benefactor 1,000.00
(Individual or Corporate)

PUBLICATIONS ORDER FORM

Name _____

Address _____

zip _____

Please send the following publications:

QUANTITY	TITLE	PRICE

Minimum credit purchase \$5.00

Subtotal _____

Signature _____ Members deduct 20% - _____

MasterCard # _____ Membership dues + _____

VISA # _____ Postage and Handling + _____

(Please list all digits from your charge card.)

Total Order _____

Expiration Date _____

Phone () _____

POSTAGE & HANDLING RATES

U.S. & CANADA	FOREIGN AIRMAIL
First book, audio cassette, video, calendar or folded map \$4.00	First item \$8.00
Each additional item50	Each additional item \$2.00
First map or poster in tube \$5.00	(Sorry, no tubed items sent abroad.)
Each additional item50	

Programs begin May 16 unless otherwise indicated.

PROGRAMS	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Nature Walk Explores plants and wildlife of the ponderosa pine forest, including wildflowers and the rare Kaibab squirrel. Moderately strenuous because of altitude and a 100-foot [30m] elevation change. <i>Not recommended</i> for people with heart, respiratory, or walking difficulties. Meet at the Log Shelter on the east side of Lodge parking lot. Allow 1-1/2 hours for this 1-1/2-mile walk.	8:30 a.m.	8:30 a.m.	8:30 a.m.	8:30 a.m.	8:30 a.m.	8:30 a.m.	8:30 a.m.
Geology Talk* Investigates how Grand Canyon was formed. Meet at East patio, Grand Canyon Lodge for this 30 minute talk.	10:30 a.m.	10:30 a.m.	10:30 a.m.	10:30 a.m.	10:30 a.m.	10:30 a.m.	10:30 a.m.
Point Imperial Talk*/Walk A 25-minute talk examines the Painted Desert and other unique features visible only from this point, the highest in Grand Canyon. Followed by a 45-minute walk along the most spectacular section of the Ken Patrick Trail. Meet at Point Imperial. <i>Begins May 23.</i>	10:30 a.m.	10:30 a.m.	10:30 a.m.	10:30 a.m.	10:30 a.m.	10:30 a.m.	10:30 a.m.
Geology Walk Along the way to Bright Angel Point we'll discuss formation of the Grand Canyon. Moderately strenuous because of altitude and 100-foot [30 m] elevation change. Meet at East Patio, Grand Canyon Lodge for this 1-hour, 1/2-mile walk.	2:00 p.m.	2:00 p.m.	2:00 p.m.	2:00 p.m.	2:00 p.m.	2:00 p.m.	2:00 p.m.
Archaeology Talk Meet Ranger at Walhalla Overlook for a 45-minute talk & tour of the largest excavated Indian Ruin on the North Rim.	2:00 p.m.	2:00 p.m.	2:00 p.m.	2:00 p.m.	2:00 p.m.	2:00 p.m.	2:00 p.m.
Geology Talk Join a Ranger at the Cape Royal Amphitheater for a 30-minute talk on the geology of the Grand Canyon with special emphasis on features which may be seen from Cape Royal. Amphitheater is a 1/2-mile level walk from parking lot. <i>Begins May 23.</i>	4:00 p.m.	4:00 p.m.	4:00 p.m.	4:00 p.m.	4:00 p.m.	4:00 p.m.	4:00 p.m.
History Talk* Learn about Spanish <i>conquistadors</i> , Franciscan monks, prospectors, adventurers, presidents, and scientists at Grand Canyon, and how Grand Canyon National Park came to be. Meet at East patio, Grand Canyon Lodge, for this 30-minute talk.	4:00 p.m.	4:00 p.m.	4:00 p.m.	4:00 p.m.	4:00 p.m.	4:00 p.m.	4:00 p.m.
Canyon Talk* A 30-minute "Ranger's Choice" topic explores some aspect of the Grand Canyon story. Meet at East patio, Grand Canyon Lodge. <i>Begins May 24.</i>	5:00 p.m.	5:00 p.m.	5:00 p.m.	5:00 p.m.	5:00 p.m.	5:00 p.m.	5:00 p.m.
Evening Program* Two programs nightly, (one located at Grand Canyon Lodge recreation room the other at Campground Amphitheater) cover some aspect of the Grand Canyon story. Topics posted in the Grand Canyon Lodge and at Campground. Each program preceded by a 15-minute question and answer period. Dress warmly for the campground program. Allow 1 hour. Evening program at campground <i>begins May 24.</i>	8:00 p.m.	8:00 p.m.	8:00 p.m.	8:00 p.m.	8:00 p.m.	8:00 p.m.	8:00 p.m.
Night Walk Meet at the East Patio of Grand Canyon Lodge for a look at the night sky or a discussion of night life in the Canyon. <i>Flashlight recommended.</i> Allow 1 hour for this 1/2-mile walk. <i>Begins May 24.</i>	9:15 p.m.	9:15 p.m.	9:15 p.m.	9:15 p.m.	9:15 p.m.	9:15 p.m.	9:15 p.m.
Children's Program A fun-filled 45 minutes of storytelling, songs, or games for children ages 4-10. Meet at National Park Information Desk in Lodge. <i>Begins May 27.</i>		2:00 p.m.		2:00 p.m.			2:00 p.m.

*Indicates program is wheelchair accessible with assistance.

Quiz answers

1. "C" 4 million visitors per year.

2. "C" The river cuts the depth of the canyon and carries away sediments.

3. "True" Because the Kaibab Plateau slopes toward the south, runoff from the North Rim flows into the

canyon, whereas runoff from the South Rim flows away from the canyon.

4. "E" Many serious problems threaten Grand Canyon, making it important that citizens become involved in park protection.

5. "D"

6. "C" Falls are an unfortunate result of carelessness near the rim.

7. "D" 300,000 hikers venture into the Canyon each year. 50,000 stay overnight.

8. "D" Running across the canyon is not recommended, and should be attempted only by experienced runners who have trained extensively for the trip. In 1988 there were 173 helicopter evacuations and 300 medical assists for people who hiked farther than they should have.

9. "C" Stopping in the road creates a hazard, and it is unlawful to feed animals within the park.

10. "C and D" Radiometric dating of igneous intrusions in the Vishnu Group gives an age of nearly 1.7 billion years. The Vishnu is older than the intrusions in it.

11. "C" Winter 1990 snowfall totaled 8 ft. (2.44 m). Record 1984-85, 25 ft. (7.62 m).