

**GRAND CANYON COMPLEX
(FES)**

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final environmental statement
proposed master plan

F E S 75-97

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NATIONAL PARK / ARIZONA

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COVER SHEET for FEDERAL GRANT APPLICATION/AWARD NOTIFICATION

ARIZONA *Related to 74-80-0038*

1 APPLICATION DATE
yr mo day

19 ___ ___

THIS FORM IS TO BE COMPLETED BY APPLICANT OR CLEARINGHOUSE DEPENDING UPON STATE PROCEDURES.

APPLICANT - Organizational Unit
National Park Service
Grand Canyon National Park

4. ADDRESS - Street or P. O. Box

2 FEDERAL EMPLOYER ID NO

CITY
Grand Canyon

6. COUNTY
Coconino

7. STATE
AZ

8. ZIP CODE
86023

9. PROG NO./FEDERAL AGENCY
15.999 Dept. of the Interior
National Park Service

10. TYPE OF ACTION
a New c Modification
b Continuation

TYPE OF CHANGE (Complete if 10b or 10c was checked)
11. a Increased Dollars b Decreased Dollars
12. a Increased Duration b Decreased Duration

13. a Other Scope Change
b Cancellation

14a. EXISTING FED GRANT ID

14b. EXISTING CLEARINGHOUSE

5. REQUESTED FUND START
19 ___ ___

6. FUNDS DURATION
(Months)
yr mo

7. EST. PROJECT START
19 ___ ___

8. EST. PROJECT DURATION
(Months)
yr mo

19. APPLICANT TYPE Enter Letter J
A. State F. School District
B. Interstate G. Community Action Agency
C. COG H. Sponsored Organization
D. County I. Indian
E. City J. Other

FUNDS REQUESTED (For Changes Show Only Amt. of Inc. (+) or Dec. (-).)

20a. FEDERAL GRANT	(\$)	_____	.00
20b. FEDERAL LOAN	(\$)	_____	.00
21. STATE	(\$)	_____	.00
22. LOCAL	(\$)	_____	.00
23. OTHER	(\$)	1	.00
24. TOTAL (20,21,22,23)	(\$)	1	.00

5. BRIEF TITLE OF APPLICANT'S PROJECT Proposed Master Plan for Grand Canyon Complex - FES 75-97

5. PROJECT ABSTRACT (60 Characters Per Line - 5 Lines). Attach 1-2 Page Project Summary For Review.
Master plan to guide the use, development, interpretation, and preservation of Grand Canyon National Park for the next five years. Final Environmental Statement.

7. AREA OF PROJECT IMPACT (Indicate City, County, State, etc.)
Grand Canyon, Coconino, Arizona

8. CONGRESSIONAL DISTRICT
Of Applicant Districts Impacted By Project
[03] [03]

29. Environmental Assessment Required By State/Federal Agency?
 Yes
If Yes, Attach. No

30. CLEARINGHOUSE(S) TO WHICH SUBMITTED
a State b Area Wide

1. a NAME OF CONTACT PERSON
Bruce W. Shaw, Acting Supt.

b ADDRESS - Street or P. O. Box
Grand Canyon

c TELEPHONE NO.
638-2411 (602)

BALANCE OF FORM TO BE COMPLETED BY REVIEWING AGENCY

Dr. James Schoenwetter
Center for Environmental Studies
Department of Anthropology
Arizona State University
Tempe, AZ 85281

m: Ralph Kingery
Arizona State Clearinghouse Staff

project is referred to you for review and comment. Please evaluate as to:

(1) the program's effect upon the plans and programs of your agency
(2) the importance of its contribution to State and/or areawide goals and objectives
(3) its accord with any applicable law, order or regulation with which you are familiar
(4) additional considerations

State Application Identifier (SAI)		
December 17, 1975	State AZ	Number 75-80-0058
Economic Sec.	Archaeological Res.	
Civil Rights	Museum of Northern Az	
Indian Affairs	OEPAD	
Game & Fish	Region III	
Mineral Resources	Region IV	
Highway	Arizona Mining Ass'n	
Health		
Power		
Water		
Parks		
AORCC		
Bureau of Mines		
Arid Lands Studies		
Environmental Studies		
SW Minerals Exploration		

Please return this form to the clearinghouse no later than 15 working days from the date noted above. Please contact the clearinghouse if you need further information or additional time for review.

- No comment on this project
- Proposal is supported as written
- Comments as indicated below

DEPARTMENT OF THE INTERIOR

A15043 747381

FINAL

ENVIRONMENTAL STATEMENT

FES 75-97

PROPOSED MASTER PLAN

GRAND CANYON COMPLEX

ARIZONA

Prepared by
Grand Canyon National Park
Department of the Interior
National Park Service

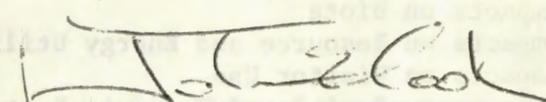

Acting Director, National Park Service

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SUMMARY

() Draft

(X) Final

Environmental Statement

Department of the Interior, National Park Service,
Grand Canyon National Park, Arizona

1. Type of Action: (X) Administrative () Legislative

2. Brief Description of Action: To provide a Master Plan for the use, development, interpretation, and preservation of Grand Canyon National Park, Arizona. The park has been enlarged to encompass the entity of "Grand Canyon." Grand Canyon Village will be redeveloped for concentrated, heavy day use activities. The majority of park lands will be managed as natural or wilderness areas.

3. Summary of Environmental Impact and Adverse Environmental Effects: Redevelopment and relocation of developments and support facilities will be done in their present areas with heavy alteration of the present environment. Public transportation will reduce air pollution and fuel consumption. The complex natural and cultural resources of the Grand Canyon will retain their integrity in the future and yet be used for the edification and inspiration of park visitors.

4. Alternatives Considered:

- a. No action
- b. Removal of South Rim accommodations and support facilities
- c. Removal of accommodations and support facilities from the North Rim
- d. Intensify use of park
- e. Lesser land acquisition and deletions
- f. By-pass road

5. Comments Have Been Requested from the Following:
(See page ii for listing)

6. Date Made Available to CEQ and to the Public:

Draft Statement: May 28, 1974

Final Statement: **NOV 26 1975**

***Advisory Council on Historic Preservation**

Department of Agriculture

*Forest Service

Soil Conservation Service

Department of the Interior

*Bureau of Indian Affairs

*Bureau of Mines

*Bureau of Outdoor Recreation

*Fish and Wildlife Service

*Bureau of Land Management

*Bureau of Reclamation

*U.S. Geological Survey

Department of Transportation

Federal Aviation Administration

*Environmental Protection Agency

*Federal Power Commission

*Arizona State Clearinghouse

*State Historic Preservation Officer

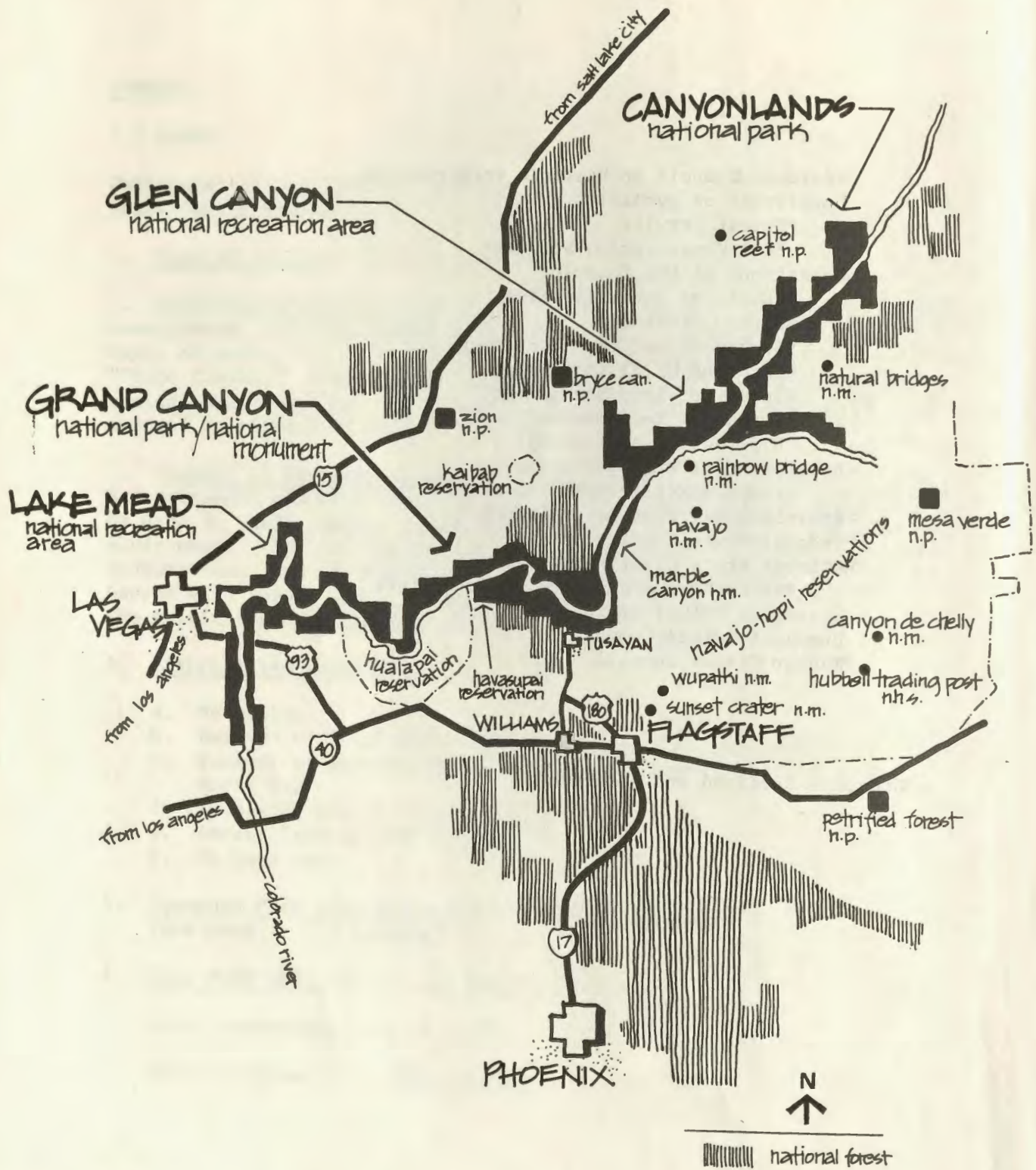
Havasupai Tribal Council

Hualapai Tribal Council

*Navajo Tribal Council

*Comments Received and Attached

the region



the region

1. DESCRIPTION OF THE PROPOSAL

The National Park Service proposes a Master Plan to guide the use, development, interpretation, and preservation of Grand Canyon National Park for the next five years. Grand Canyon National Monument, Marble Canyon National Monument, and other lands described below have been combined with Grand Canyon National Park through recent legislation, the Grand Canyon National Park Enlargement Act, Public Law 93-620. For the purposes of this statement, the two former national monuments, the national park, and other lands added by the law will be referred to as the Grand Canyon Complex.

The Master Plan for the Grand Canyon Complex is the framework of concepts upon which, and within which, the logic and details of contingent development and management plans will be developed. As these detailed and specific and contingent plans evolve, they will be accompanied by detailed and specific environmental assessments and environmental impact statements. These plans have yet to be developed and, therefore, the specific details of many actions and impacts generated by the Master Plan for the Grand Canyon Complex cannot be ascertained for this document. However, where specific actions are proposed their impacts will be quantified.

The goal of this Master Plan is to provide the concepts through which the integrity of Grand Canyon's exceptional natural spectacle can be preserved and still sensitively and realistically provide for the millions of park visitors who are drawn to it each year. The concepts of the Master Plan can be divided into three major areas of concern, which are as follows:

- A. Seeking national park status for all of the Grand Canyon by combining the Grand Canyon National Park, and Grand Canyon and Marble Canyon National Monuments, and extending the park westward to River Mile 277, including lands in Lake Mead National Recreation Area.
- B. Managing the park to retain the primitive qualities of the canyon, and utilizing the South Rim as the optimum canyon-viewing area for the majority of park visitors.
- C. Initiating environmental controls and regulations on visitor flow, access and use which are based on scientific research and are aimed at protecting the park environment and improving the human experiences within the park.

To meet its concern in these areas and to fulfill its obligation to provide for the preservation and enjoyment of Grand Canyon for this and for future generations, the National Park Service has enunciated the following objectives in its Master Plan for the Grand Canyon Complex.

Cooperative efforts will be expanded in the following areas to provide a more effective service to the public. Regional planning will be conducted on resource management and visitor use with other Federal, State, and local agencies that have jurisdictions and responsibilities in the vicinity of the Grand Canyon Complex. Local Indian tribes will be offered planning and technical assistance for recreational use of reservation lands.

A jointly operated public information and interpretive service will be provided at major key-access locations. The orderly and tasteful development of campgrounds and visitor-use facilities outside of the complex's boundaries will be encouraged. Visitor-use facilities and services providing for a predominantly day-use pattern will be developed within the complex, with the recognition that the National Park Service has a limited responsibility to meet a portion of the Regional demands for lodge, cabin, trailer, and campground facilities directly resulting from the attraction of the Grand Canyon and in recognition of regional ecological factors.

Services and facilities will be available for the visitor to the South Rim all year and from April to November on the North Rim. The North Rim will be open to limited winter use from November through April. The Grand Canyon Village on the South Rim will be retained as the major visitor service and park support area. The village will be planned for high density utilization. Visitor facilities will be buffered from the park employee community and support base. Police, fire, and visitor services will be provided on a 24-hour basis throughout the year in the village area. A public transportation system is being developed in phased stages on the South Rim to alleviate the ever-increasing automobile congestion in Grand Canyon Village and to provide a more leisurely, quiet viewing experience along the West Rim Drive. After considering ecological factors, the quality of the visitor experience, and safety of the visitor, optimum visitor-use capacities will be established for each area in the new complex. This will set the maximum limits for development and visitation.

Existing management roads, dumps, borrow pits, and other disturbed areas not necessary for future use will be returned to a natural state. The disposal of solid waste in sanitary landfills at previously disturbed sites will continue until all such sites have been utilized, covered with topsoil, returned to a natural contour, and revegetated. Alternate means of solid waste disposal will be sought to avoid ultimately having to consume undisturbed park land for this purpose. Reclaimed water from liquid waste disposal will play an increasing role in supplementing and conserving the limited supply of fresh water resources within the park.

The main interpretive effort will be toward giving the visitor the opportunity, and directing him toward, an understanding and an experience of the Grand Canyon as it exists in its natural state. The

canyon's dynamic story of time and change is as important to the canyon experience as is it's awesomeness and beauty. Park interpretation will be directed toward helping the visitor sense man's and his own relevant position in time, space, and his environment.

A multi-phased, park-oriented research program will furnish a broad spectrum of environmental information to support resource management, general management and development programs. Independent research and basic inquiry into the resources of Grand Canyon will be supported and encouraged by the establishment of research stations. Historic buildings now within the complex will continue to have their significance assessed according to the historic buildings policy of the National Park Service.

Development within or along the rim of the canyon which would detract from the natural character of the area and the visitor's viewing experience, will not be allowed. Primitive access roads and overlooks at Toroweap and other selected points will be retained where they now exist. Trails between the North and South Rims within the Bright Angel and Kaibab Trail corridor will be managed for intense visitor use while all other trails in the canyon will be managed to provide back-country hiking experiences for the more hardy visitors.

Hiking, horseback, bicycle, and motor trails will be provided on both rims of the canyon, but the North Rim visitor development outside the concentrated visitor use area of Bright Angel Point, will encourage a slower pace, a longer visit, and a constant involvement with the forest environment. Development on the North Rim will thus be limited to maintain the quality of this involvement and preservation of the more subtle qualities of the North Rim forest and overlooks.

The environment along the Colorado River within the Inner Canyon will be managed, insofar as it is possible, to minimize the ecological changes caused by the control of water flow from Glen Canyon Dam. Intensive management of recreational use is needed to assure protection of its wilderness values from human overuse and to provide for a quality experience for the river user. A River Management Plan and an Environmental Impact Analysis for that plan have been prepared. This plan will hold a limitation on recreational use until environmental studies can ascertain ecologically acceptable load limits.

Mechanical access into the canyon is limited to emergency and management helicopter use. Negotiations with the 16 scenic flight firms that operate in the area of the Grand Canyon Complex have reduced the visual and audible impact of these overflights upon the visitors at the most popular overlooks. Efforts will be continued to reduce the effects of these flights upon the canyon viewing experience of the backcountry hiker.

The actions and environmental impacts of the proposals contained within the Master Plan, for each area of the Grand Canyon Complex can be analyzed only superficially owing to its conceptual nature. More detailed and exhaustive analyses will be made in the environmental impact statements for the various development concept plans. Detailed environmental impact statements will also be written for all projects or actions which become controversial or promise to have a significant impact upon the human environment of the complex or of the region surrounding it.

A CONSOLIDATED NATIONAL PARK

Bringing national park status to all of Grand Canyon has long been the goal of those people whose primary concern is in assuring that the canyon will always retain its integrity and remain free of adverse commercial or private development. Over the years, various sections of the canyon have been preserved by their placement within various units of the National Park System. The National Park Service proposed the boundary changes shown on the map on page 5 to achieve consolidation of the Grand Canyon under a single designation.

Public Law 93-620, dated January 3, 1975, incorporated Marble Canyon National Monument, Grand Canyon National Monument, portions of Lake Mead National Recreation Area, and portions of the Kaibab National Forest into the enlarged 1,227,850-acre national park as shown on the map on page 7. This legislation has accomplished much of the National Park Service proposal.

The boundary at Marble Canyon extends downstream along both rims from the boundary of Glen Canyon National Recreation Area near Lees Ferry. Extension of the park boundary to the East Rim of Marble Canyon is only with the concurrence of the Navajo Nation. Land back from the rims remains under existing jurisdictions. State lands included within the proposed boundary will be acquired as soon as possible. Provisions will be made for buffer or easement zones back from the rims of Marble Canyon so that no intrusive developments would be visible from the Colorado River.



The National Park Service will provide for the continued use by Indians of traditional religious sites included within the new boundary and protection will be extended to all of these sites to protect them from park visitor desecration.

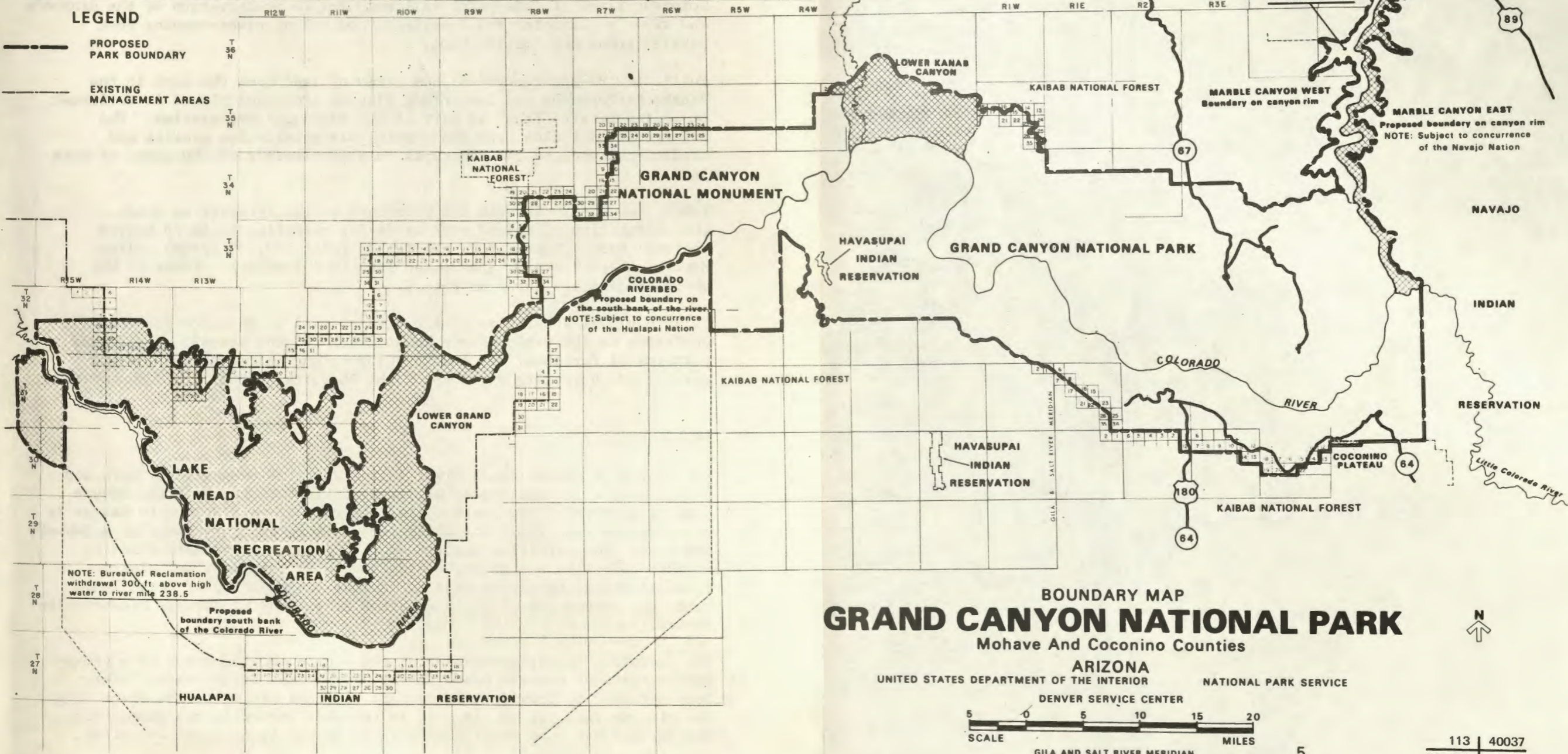
The 640-acre Coconino Plateau Addition provides a buffer to maintain a park atmosphere along the East Rim Drive. The prior boundary was within one-quarter mile of the highway at this point and non-park use such as timber cutting would have been unavoidably visible from the roadway.

The Lower Kanab Creek Addition adds a significant section of the North Rim and a portion of one of the major tributary canyons to the park. This addition consists of 36,280 acres of land which were under Forest Service jurisdiction.

EXISTING AREAS		PROPOSED ADDITIONS		PROPOSED DELETIONS	
GRAND CANYON NAT'L PARK	673,575	MARBLE CANYON EAST	25,600	MARBLE CANYON WEST	3,550
GRAND CANYON NAT'L MON.	198,280	COCONINO PLATEAU	640		
MARBLE CANYON NAT'L MON.	26,080	LOWER KANAB CANYON	36,280		
		COLORADO RIVER BED	2,700		
		LOWER GRAND CANYON	322,830		
				TOTAL	3,550
		PROPOSED NEW PARK			
		OTHER LANDS OUTSIDE MANAGEMENT AREA	11,660		
TOTAL	897,935		TOTAL	399,770	TOTAL
					1,294,095

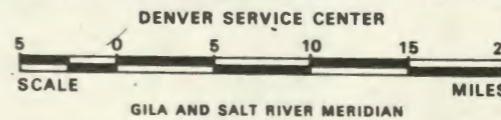
LEGEND

-  PROPOSED PARK BOUNDARY
-  EXISTING MANAGEMENT AREAS



BOUNDARY MAP
GRAND CANYON NATIONAL PARK
 Mohave And Coconino Counties

ARIZONA
 UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE



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 DEC 73 | DSC

The Colorado River Bed Addition of 2,700 acres provides National Park System status to this part of the Colorado River. This allows for a continuity of regulations governing river-running parties between Lake Mead and Lees Ferry within Grand Canyon.

The Lower Grand Canyon Addition involves 322,830 acres of land within Lake Mead National Recreation Area which contain outstanding scenic and geologic features including the Lower Granite Gorge of the Grand Canyon. This addition completes Grand Canyon National Park to the west by establishing the western boundary near River Mile 277 at Grand Wash Cliffs. National park status for lands in the recreation area lying north of the Colorado River at this point will help insure preservation of the canyon's and river's character and facilitate control of river-running boat parties under one jurisdiction.

Public Law 93-620 removed 83,809 acres of land from the park in the Manakacha-Topocoba and Tenderfoot Plateau areas and placed it in Bureau of Indian Affairs Trust as part of the Havasupai Reservation. The Enlargement Act also provided special use permits for grazing and traditional uses to the Havasupai on approximately 95,300 acres of park land.

Public Law 93-620 directs the Secretary of the Interior to study the suitability of upland park lands for retention in Grand Canyon National Park. These areas are Tuckup Point (23,700 acres), Slide Mountain (5,380 acres), and Jensen Tank (9,000 acres). Areas of the above studies are shown on page 8.


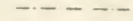

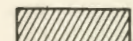
As a result of Public Law 93-620 studies will be made for possible additions to the park: Upper Kanab Creek (68,000 acres); significant portions of Parashont and Androns Canyons and Whitmore Wash (97,000 acres); and bordering portions of the Shivwits Plateau (57,000 acres).

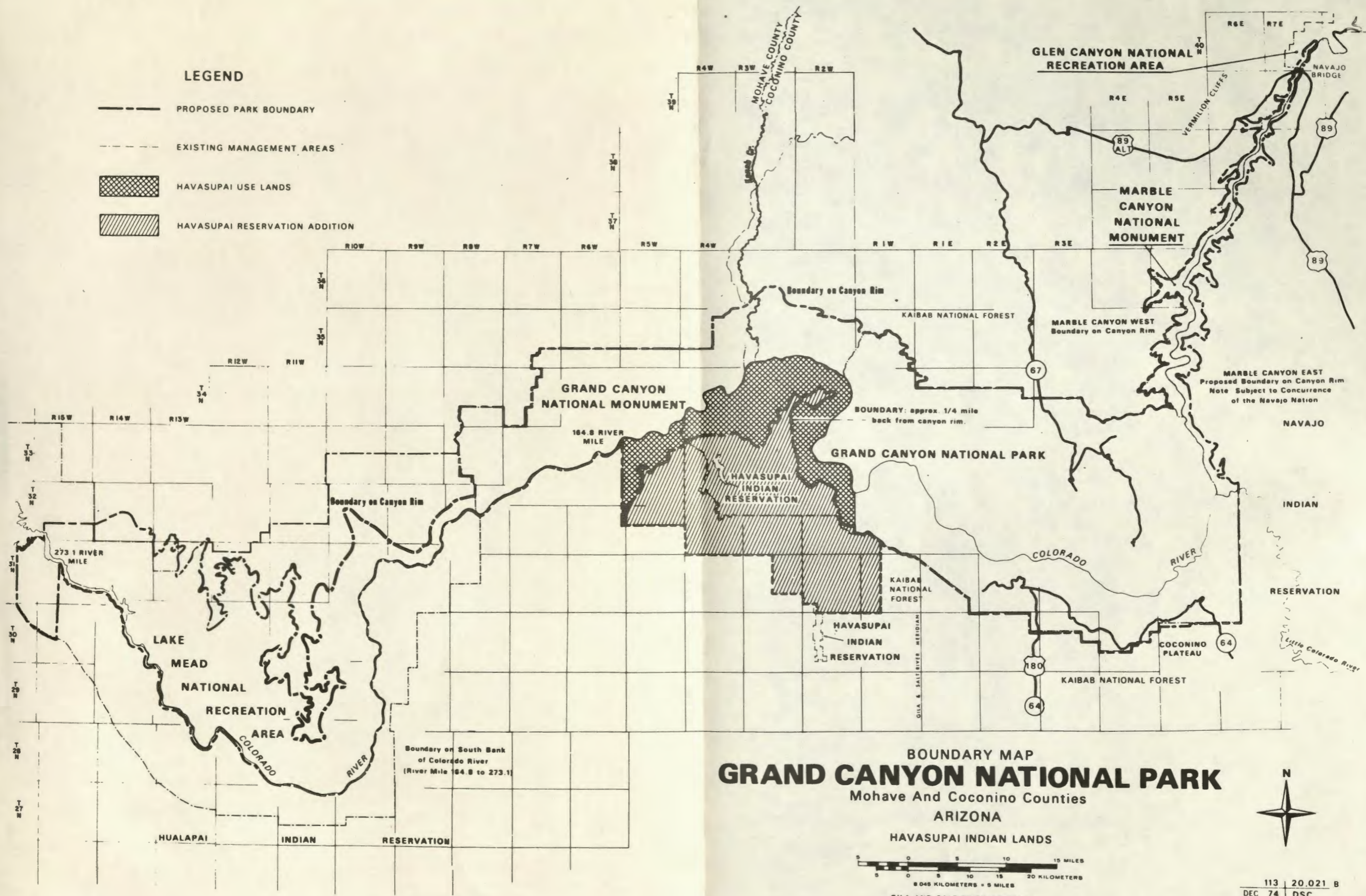
THE CANYON

The canyon of the Colorado River is the heart of the national park and the spectacle which attracts millions of visitors to the Grand Canyon Complex each year. To protect its integrity it is proposed to manage it as wilderness and limit its access to visitors on foot, horse or muleback, and boat. The primitive quality of the canyon will be maintained to strict ecological and esthetic standards. To this end, legislative recommendations have been made to include the majority of these lands below the canyon rim within the Nation's National Wilderness Preservation System.

The exception to the management of the canyon as wilderness is a cross-canyon corridor between Grand Canyon Village and Bright Angel Point. This corridor is heavily used by park visitors hiking to the river from the rims or from rim to rim. It is the main access to the canyon for hikers, and has such developments in it as the transcanyon waterline,

LEGEND

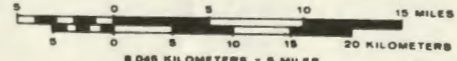
-  PROPOSED PARK BOUNDARY
-  EXISTING MANAGEMENT AREAS
-  HAVASUPAI USE LANDS
-  HAVASUPAI RESERVATION ADDITION



**BOUNDARY MAP
GRAND CANYON NATIONAL PARK**

Mohave And Coconino Counties
ARIZONA

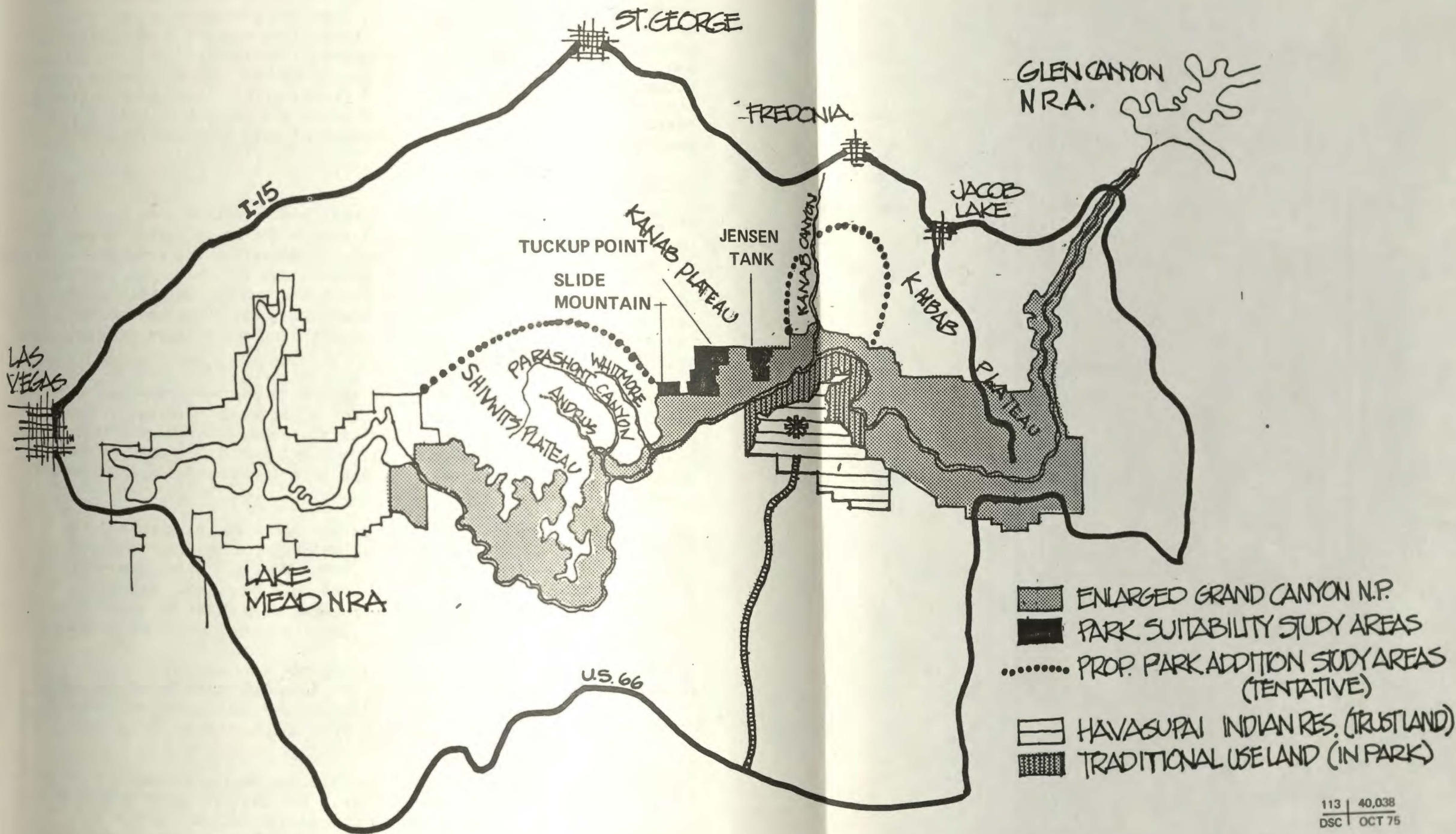
HAVASUPAI INDIAN LANDS



GILA AND SALT RIVER MERIDIAN



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DEC 74 | DSC



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DSC | OCT 75

SPECIAL STUDY AREAS Grand Canyon National Park

campgrounds, overnight accommodations, stables, rest houses, two bridges across the Colorado River and the main loading and unloading point for boating parties between Lees Ferry and Lake Mead. The concession muleback trips into the canyon are limited to the cross-canyon corridor. The developments and facilities within this corridor preclude its recommendation for wilderness status. It will be managed as a natural area, and Phantom Ranch and Indian Gardens will be retained as overnight campsites and accommodations for the canyon hiker. Use limitations have been placed on all campgrounds and trails within the canyon to prevent degradation from overuse. These limitations are listed under the Description of the Environment section of this statement, page 85.

THE SOUTH RIM - DEVELOPED

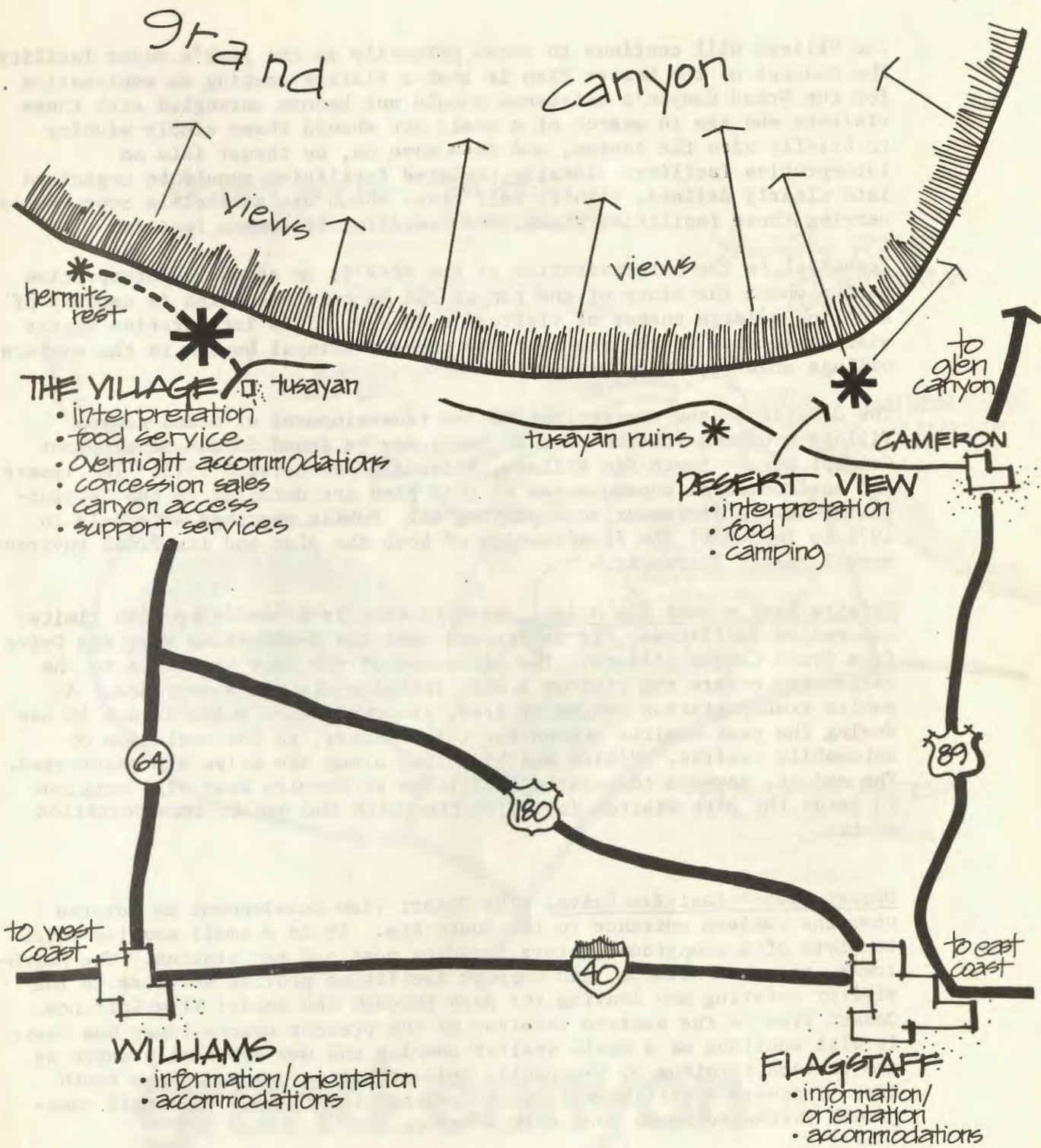
It is from the rims of the canyon that most visitors have their "Grand Canyon Experience." The rim areas absorb the heavy impact of most of the park's visitors and all of the accommodations and developments designed to cater to their needs and give them access to the canyon. Approximately 90 percent of the visitors to Grand Canyon National Park view the spectacle of the canyon from the South Rim, and the focus of nearly every one of these visits has been the resort settlement known as Grand Canyon Village. (See Map, page 12)


The Village is the focal point of travel to the South Rim, but it alone cannot satisfy the needs of the visitors in viewing the canyon. Because it serves as a broad viewing platform, the National Park Service believes that the entire South Rim - Developed area should be more intensely utilized to spread the use from the heavily impacted area of Grand Canyon Village.

The majority of park visitors enter and leave the park through the South Entrance on Arizona Route 64, which joins the East and West Rim Drives at Grand Canyon Village. The West Rim Drive dead-ends at Hermits Rest 8 miles to the west of this junction. Arizona 64 continues east for 22 miles along the East Rim Drive to Desert View before it leaves the park for its junction with U.S. 89 at Cameron.

The Master Plan proposes that this two-way circulation loop of Arizona 64 through the park along the East Rim Drive be maintained as tangential to Grand Canyon Village to reduce congestion there and to provide the essential framework from which to view the canyon.

Grand Canyon Village. Grand Canyon Village is recognized as a problem of urban planning in the Master Plan. The Village is visualized as taking the maximum brunt of overnight accommodations, public use facilities, employee community, support facilities, and other developments to meet the needs of nearly the entire visitor load to Grand Canyon. The maximum allowable amount of natural habitat to be displaced by development in the Village will be determined on broad ecological evaluations and is currently estimated as approximately 100 acres.



south rim 

The Village will continue to serve primarily as the park's major facility. The concept of the Master Plan is that a visitor seeking an explanation for the Grand Canyon's existence should not become entangled with those visitors who are in search of a meal; nor should those simply wishing to briefly view the canyon, and then move on, be thrust into an interpretive facility. Ideally, related facilities should be organized into clearly defined, tightly knit zones which are accessible over routes serving those facilities alone, and connected by common feeders.

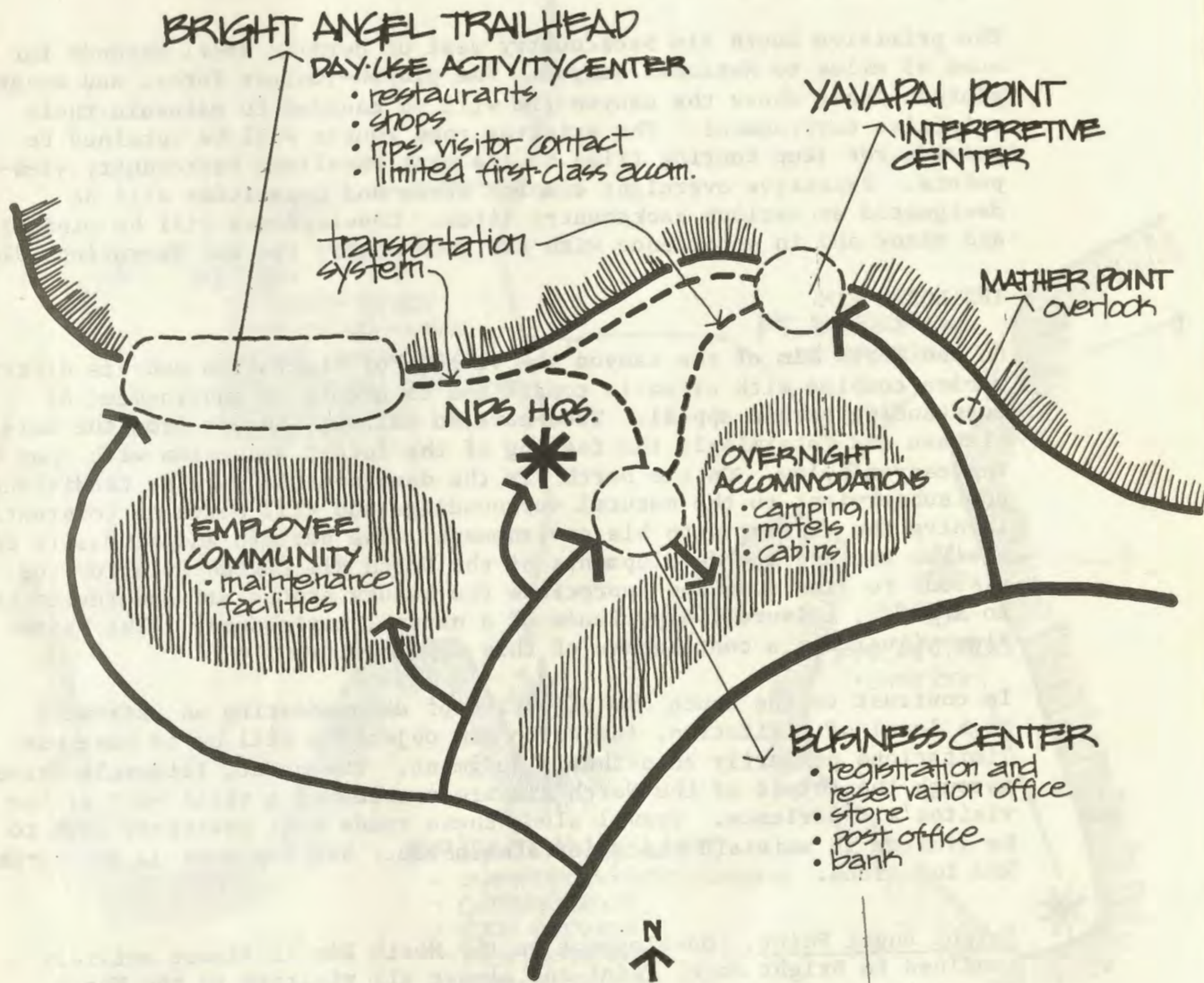
Essential to the interpretation of the area is an adequate interpretive center where the story of the canyon can be told and which is capable of handling a large number of visitors each day. This interpretive center will be located on the rim near the present Yavapai Museum in the eastern village area (see Map, page 12).

The details in the reorganization and redevelopment of Grand Canyon Village proposed for the next 25 years may be found in the Development Concept Plan - South Rim Village, National Park Service 1975. The impact and environmental consequences of this plan are detailed in the Environmental Impact Statement accompanying it. Public meetings were held in 1974 to implement the finalization of both the plan and its Final Environmental Impact Statement.

Hermits Rest - West Rim Drive. Hermits Rest is a rest-stop with limited concession facilities. It is reached over the 8-mile-long West Rim Drive from Grand Canyon Village. The closeness of the West Rim Drive to the canyon rim offers the visitor a more intimate viewing experience. A public transportation system of free, propane fueled buses is now in use during the peak visitor season for this roadway, to the exclusion of automobile traffic. Hiking and bicycling along the drive are encouraged. The modest, day-use concession facilities at Hermits Rest will continue to serve the park visitor in conjunction with the public transportation system.

Desert View - East Rim Drive. The Desert View development is located near the eastern entrance to the South Rim. It is a small complex which consists of a campground, store, trading post and gas station. The Watchtower, entrance station, and support facilities provide services to the visitor entering and leaving the park through the Desert View Entrance. Desert View is the eastern terminus of the present concessioner bus tour. It will continue as a small visitor complex and may eventually serve as the eastern terminus of the public transportation system on the South Rim. Support facilities will be increased slightly and the small campground increased by no more than 50 sites.

Three miles west of Desert View is the Tusayan Ruin and Museum. This is one example of man's prehistoric settlement along the canyon rim. The



grand canyon village

an approach to its restructuring

ruin has been excavated and the story is interpreted at the museum to give a human dimension to the canyon area. The present use of the area fulfills a vital aspect of canyon history and will be continued.

THE SOUTH RIM - UNDEVELOPED

The primitive South Rim backcountry west of Hermits Rest, extends for some 45 miles to National Canyon. The pinyon-juniper forest and desert plateau lands above the canyon rim will be managed to maintain their primitive environment. The existing road routes will be retained to provide for jeep touring trips to the many excellent backcountry viewpoints. Primitive overnight camping areas and capacities will be designated at various backcountry sites. Developments will be minimal and minor and in accordance with the Backcountry Use and Operations Plan.

THE NORTH RIM

On the North Rim of the canyon the variety of vegetation and its distribution combine with climatic conditions to create an environment of outstanding scenic appeal. Tree-covered salients thrust from the main plateau and intermingle the feeling of the forest ecosystem with that of the canyon below. On the North Rim the developments will be traditional and subservient to the natural surroundings and will serve to constantly involve the visitor with his environment. The pattern and intensity of visitor use and the developments of the North Rim currently allow the visitor to slow down and appreciate the beauty around him and invite him to a quiet, leisurely experience of a natural environment. The Master Plan visualizes a continuance of this opportunity.

In contrast to the South Rim objective of accommodating an extremely high level of visitation, the North Rim objective will be to base use limitations primarily on esthetic judgment. The quiet, leisurely drives through the forest of the North Rim are considered a vital part of the visitor's experience. Travel along these roads will therefore have to be limited to maintain the quiet atmosphere. See Map page 14 for North Rim locations.

Bright Angel Point. Development on the North Rim is almost entirely confined to Bright Angel Point and almost all visitors to the North Rim visit its facilities. The visitor facilities include the Grand Canyon Lodge of wood and stone, rustic wooden cabins, a cafeteria, a gas station, a small store, and a campground of 82 sites. The point also contains concessioner dormitories, Park Service housing, headquarters, and support facilities.

Future development will provide only for the improvement of the quality and functioning of these existing facilities. If any replacement of

to salt lake city,
los angeles



to glen canyon and
south rim

JACOB LAKE

- information / orientation
- accommodations

64

NOTE:

all roads to be
considered scenic
drives, encouraging
slow speeds; additional
pull-offs to be
developed

motor

trail

point
sublime

PT. IMPERIAL

- overlook

VISTA ENCANTADA

- overlook

BRIGHT ANGEL PT.

- overnight accommodations
- Campgrounds
- food service
- interpretation
- canyon access
- support facilities

CAPE ROYAL

- overlook
- amphitheater

Grand

canyon

north rim



lodging units is made it will be done without any significant loss of esthetic, traditional, or environmental values. Expansion of the campground by 100 sites will bring Bright Angel Point to its optimum camping capacity.

Orientation. The existing road alignment leads all visitors directly to Bright Angel Point where the present developments infringe upon the initial view of the canyon. A proposed public information center at Jacob Lake plus improved signing at the junction of the roads leading to Bright Angel Point, Point Imperial, and Cape Royal, should permit the visitor to reach the primary goal of his choice, either viewing the canyon first or finding accommodations and visitor services. Wayside interpretive facilities will be provided at a number of the overlooks.

Backcountry. The bulk of the North Rim area is to be managed for wilderness and backcountry use. The network of fire roads on the North Rim will be phased out. The fire road to Point Sublime will remain open to visitor use as a motor trail to encourage leisurely enjoyment of the scenery and natural environment of the forest.

Tuweep. The western Grand Canyon from Kanab Creek to the Grand Wash Cliffs is remote and has three primary access points into the park. Tapeats Creek will continue as an entry point for hikers into the primitive backcountry of the canyon. Whitmore Wash will continue as a minor access point for the exit of some boating parties. Development in Toroweap Valley will be limited to maintaining the remote quality of the drive through Toroweap Valley and the isolated nature of the viewing experience at Toroweap. A few of the primitive roads in the Toroweap area will be retained as motor trails for interpretation and access into more remote areas of this prior national monument area. The majority of primitive roads in the area developed apace with long-existing grazing privileges which will continue for several more years. As these privileges expire, livestock grazing will be eliminated and the ranch roads returned to a natural state.

THE COLORADO RIVER

The rapid growth in river-running through Grand Canyon during the last few years has brought to the Inner Canyon the first indications that uncontrolled use will lead to an end of the desired experience on the river. Sanitation problems, litter, and crowding appeared. The controlled flow of the Colorado River through the canyon by Glen Canyon Dam has severely altered the natural river ecosystems.

The effect of controlled river flow and human impact on the river environment is not completely known. A continuing ecological research program is underway to determine what these impacts are and their severity. A River Use Plan was implemented for the 1973 and

following seasons to control the number and scheduling of river trips as well as the total number of recreation users. A negative declaration of environmental impact was prepared on February 13, 1973. Public notice of these actions was made through press releases. As conclusions of the environmental research are reached, the present controls will be modified to reflect their findings, to help maintain or restore the river environment to as natural a condition as possible.

CARRYING CAPACITY

A park's carrying capacity is produced by the combined effect of many determinants and is limited by the most restrictive of the factors permitting its use. Geological make-up, geographical location and climatic history determine the basic parameters for Grand Canyon National Park. Local environmental conditions determine plant and animal types, successional stages and in large part, the susceptibility of those ecosystems to damage. The resistance to impact does not remain constant but normally varies with weather, season and human maintenance. Social, economic and esthetic factors can determine the carrying capacity for an area by influencing visitors' opportunities, desires, satisfactions, and behavior.

The carrying capacity for an area in any national park is that number of persons for which the area can provide quality recreation without deteriorating. Carrying capacities can be set for developed areas as well as for natural areas. Visitation is in excess of carrying capacity when it results in damage and degradation to the elements of the natural environment; when it results in degradation of a facility, as reflected in inefficiency, unreasonable maintenance or visitor stress owing to overcrowding, service delays or unsafe conditions; and when it results in a degradation of the desired visitor experience.

In Congressional mandates, administrative policies, management principles and the enabling legislation for the National Park Service and for Grand Canyon National Park, the responsibilities of management and the standards for meeting its objectives are clearly defined and dictate what uses of the park are appropriate. The maximum allowable level of use is thus a function of the difficulty it presents to the maintenance of those defined standards.

Obtaining data through research and monitoring of the environment within the Grand Canyon Complex is an objective of the park's Master Plan. The National Park Service expects to complete this research and establish carrying capacities for all areas of Grand Canyon National Park by 1979. Information is also currently being utilized to develop a mathematical modeling program for river running on the Colorado River within the complex.

ECOSYSTEM MANAGEMENT

The presentation of the Grand Canyon natural environment is a fundamental requirement for its continued existence as a relatively unimpaired natural area. The Master Plan, therefore, looks first to the care and management of the natural resources of the park. The Master Plan concept is for the preservation of a total environment, as compared with the protection of only a single feature or species. See page 18 for an overview of the resource.

A Natural Resource Management Plan is being prepared for the Grand Canyon Complex. It will determine the broad objectives for the management of the park's natural resources. A draft environmental analysis is being concurrently developed for this plan. Any future action which will have significant impact upon the natural resources of the park will have either an environmental impact statement prepared for it or an environmental analysis made. Environmental analysis is certainly a must for all potentially controversial control programs such as feral burro reduction or prescribed burning.

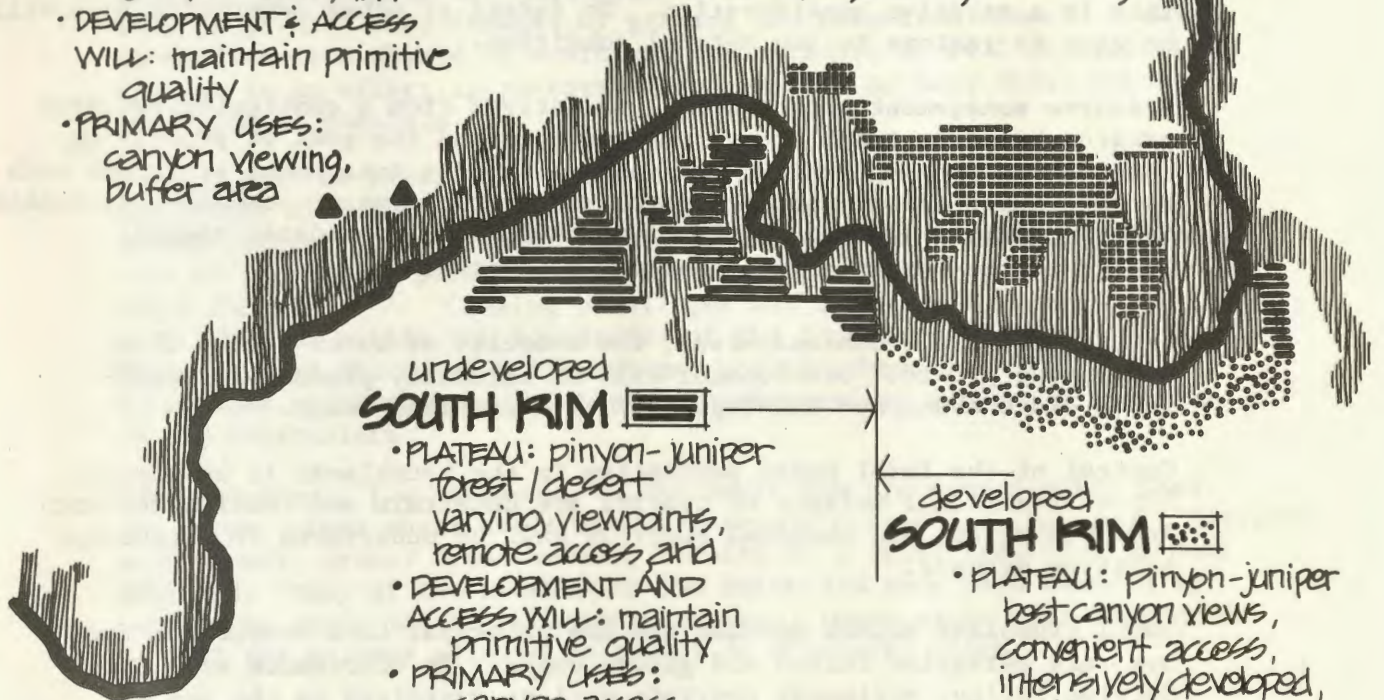
All areas within the park cannot, however, be managed as natural ecosystems. Some must be managed for intensive visitor use. Management will make the decisions as to how intensively a particular tract will be developed in providing for visitor services. Carrying capacities based on research will be set for each area. The allowable degree of departure from natural conditions will be decided upon each area's individual merits. The following discussion covers only the broader aspects of ecosystem management in the Master Plan for the Grand Canyon Complex.

TOROWEAP

- PLATEAU: desert
unique viewpoint,
remote access, arid
- DEVELOPMENT & ACCESS
WILL: maintain primitive
quality
- PRIMARY USES:
canyon viewing,
buffer area

NORTH RIM

- PLATEAU: spruce, fir, ponderosa forest
diverse and unusual, cool & moist, indirect access
- DEVELOPMENT & ACCESS WILL:
encourage slower pace, longer visit, & a constant
involvement with the environment - be limited
by a strict esthetic philosophy to maintain
its scenic integrity
- PRIMARY USES: canyon viewing, nature study,
scenic drives, camping, hiking and riding



undeveloped SOUTH RIM

- PLATEAU: pinyon-juniper
forest / desert
varying viewpoints,
remote access arid
- DEVELOPMENT AND
ACCESS WILL: maintain
primitive quality
- PRIMARY USES:
canyon access,
canyon viewing,
buffer area

developed SOUTH RIM

- PLATEAU: pinyon-juniper
best canyon views,
convenient access,
intensively developed,
semi-arid,
uniform vegetation
- DEVELOPMENT AND ACCESS
WILL: accommodate a
high volume of visitation,
be highly efficient, be
limited by ecological and
operational standards
- PRIMARY USES: canyon
viewing, canyon access,
visitor service

GRAND CANYON

- CANYON: desert
unique, diverse, difficult access
- DEVELOPMENT & ACCESS WILL: be
limited by strict ecological and
esthetic standards to maintain a
wilderness quality
- PRIMARY USES: hiking and riding,
scientific study, boating



the resource and its use

Forest. The forests of Grand Canyon National Park are important and fragile features which are easily damaged but difficult to restore. Developments within the forests will be limited to those necessary for visitor use and support facilities and will utilize previously or presently used sites insofar as possible. The pinyon-juniper forest offers better sites for construction and development because it offers the best balance between the ease of alteration and ease of natural restoration of any forest type in the park. However, it should be pointed out that this is a relative consideration. No forest or other vegetative type will be easy to restore to its natural condition.

Resource management programs will be derived from a continuing research program based on total ecosystems concepts and the goal of preserving rare, endangered and unique species. Intensive management practices such as fire suppression, animal control and other forms of control will continue in high visitor use areas. These areas will be considered special management use areas and not natural ecosystems.

Brushlands. In brushland areas, the scarcity of water causes slow and sparse growth. Development will be carefully planned in brushlands since abandoned developments leave enduring scars.

Control of the feral burro population in the brushlands is necessary. Since traditional methods of control are uncertain and costly, research into biological and chemical controls will be undertaken to supplement existing methods.

Small brushland animal species are the principal food source for the now rare peregrine falcon and golden eagle. In accordance with Park Service Policy, stringent controls will be exercised in the use of pesticides, because of their possible harmful effects upon non-target species and their biological magnification in animals.

As soon as fire behavior in Grand Canyon brushlands has been determined and suitable management practices initiated, wildfire will be allowed to run its course, insofar as the safety of visitors and the prevention of fires from running outside the park will permit.

Aquatic and Streamside Resources. The few permanent water sources in the Grand Canyon Complex serve as focal points for the plant and animal life and the greatest variety of plant and animal life occurs there. Due to their isolation and relative immobility, the aquatic species have developed unique characteristics particular to each individual site.

Insofar as possible, water sources will be allowed to remain in their natural condition and every effort will be made to keep these free of

pollution. Where endangered or threatened species are known to exist, special efforts will be made to eliminate conflicting human use and pollution of the resource. Three known species of fish that are in the endangered or threatened category in the Colorado and Little Colorado Rivers are the Colorado River Squawfish, Humpback Chub, and Little Colorado Spinedace. It is estimated there are fewer than 1,000 individuals of each species in existence.

Grasslands. Grasslands within the park are irregular and sparse, and are locally important in the ecological overview. Unfortunately, some grassland areas have been damaged by grazing and primitive roads. Special management care should be exercised for esthetic as well as ecological reasons in an effort to restore these areas to as near their natural condition as possible.

Grazing will be phased out, when possible, in accordance with the provisions of Public Law 93-620. The Secretary of the Interior shall permit persons holding legal grazing privileges to continue during the term of the lease, permit, or license, and periods of renewal thereafter, until January 1985. Grazing privileges may be renewed during the life of the holder within the boundaries of the former Grand Canyon National Monument, and the Havasupai Tribe may utilize those park lands designated as "Havasupai Use Lands" in perpetuity, subject to environmental constraints.

Wet grasslands, i.e. meadows, on the North Rim are more fragile than dry sites, since their soils are more easily eroded and trampled. Development in wet, grassy areas usually results in a rapid reduction of soil moisture. Many of the meadows on the North Rim have been invaded by management roads for fire-control purposes; these roads will be phased out and the meadows allowed to revert to a natural state.

RESEARCH

Natural resources research is a prerequisite to all phases of planning and resource management. Four kinds of knowledge are needed: (1) the current condition of the park's natural resources; (2) the primeval condition of these resources; (3) the most feasible methods of restoring the resources and associated environmental influences to the natural ecological state required for their continuing natural evolution, and (4) what ecological successional processes are operative. Trends in resource deterioration must be identified in order to stop or minimize detrimental influences.

The major thrust of National Park Service research at Grand Canyon will be management oriented; the greater portion of research funds allotted to the park will be directed to such studies. The scientific community, which is primarily interested in basic research, will be assisted in its basic research efforts.

Research already underway in the park covers a variety of investigations into the geology and ecology of the area. These studies include river

ecology, visitor-use impact on the park plant and animal life, meadow ecology, limnological study of the Colorado River, feral burro control, various pollution studies, and many geological projects in an effort to piece together the story of the canyon,

To aid management oriented and basic research, present research facilities in Grand Canyon Village, at Pasture Wash and on the North Rim will be expanded. A cooperative approach to research will be undertaken through arrangements with various universities and other recognized research oriented institutions.

SPECIAL ENVIRONMENTAL AREAS

Two types of environmental study areas exist within Grand Canyon, which are preserved for the primary purposes of research and education, and where natural processes are allowed to predominate: the Research Natural Area and the Environmental Study Area.

Research Natural Areas. These areas include typical or unusual biotic phenomena and characteristic or outstanding geologic, pedologic, or aquatic features and processes which preserve examples of significant natural ecosystems for comparison with those influenced by man. They provide research areas where scientists can study the ecology of the natural environment, and they serve as gene pools and preserves for rare or endangered plant and animal species. They are surrounded or buffered by park lands. Research conducted in connection with them is non-destructive and is within the scope and purpose for which the park was established.

The Federal Committee on Research Natural Areas has designated six areas in the Grand Canyon Complex as examples of significant natural ecosystems to provide educational and research areas for study and to preserve rare and endangered species.

Designation as Research Natural Areas will be sought for additional areas within the park which meet the criteria, such as portions of the Inner Canyon river environment and brushlands.

Environmental Study Areas. As part of the National Park Service's environmental awareness program two environmental study areas have been defined within the park on the South Rim. The Hermit Basin ESA below the rim near Hermits Rest is centered around a geological theme to show man's relationship to biological evolution, time, and space. The Grandview ESA on the rim in the Grandview area illustrates the theme of man's relationship to the biological world. The areas require special management and are not to be altered by development or management.

The resources of these study areas have been carefully catalogued and are available to school groups. The teachers are furnished the necessary data that enable their pupils to relate to man's place in his modern environment.

Additional environmental study area potential exists on the North Rim, Inner Canyon, and the Colorado River, which will be designated and utilized in the future as the environmental awareness program expands.

HISTORIC AND ARCHEOLOGICAL RESEARCH

Historic structures at Grand Canyon National Park will be preserved and used to increase the visitor's understanding of the resource and promote his comprehension of the development of the park.

Structures that have been nominated to or are now listed on the National Register of Historic Places will be studied for adaptive restoration and reuse in Grand Canyon Village.

There are many archeological sites within the park. Due to their potential for destruction through vandalism, protective measures will be taken to insure their preservation. Some sites near public access will be excavated, stabilized and interpreted. Excavation of these sites will be done as funding is made available. Archeological site surveys will be conducted to determine the extent of this resource. Sites threatened by destruction will be excavated, in accordance with the best established archeological practices. Interpretive thrust for this resource will be on the multiphased interaction of the site and its occupants with their surroundings and with other cultural groups.

Measures taken to comply with historical and archeological laws, regulations and policies will be covered in sections 2 and 4 of this impact statement.

REGIONAL COOPERATION

Regional cooperation among Federal and State land management agencies, Indian groups, and Northern Arizona communities in the Grand Canyon region is essential to provide for the visitor during his travels within the region. Public Law 93-620 reinforces the concept of regional coordination and a unified interpretation of the entire Grand Canyon by authorizing the Secretary of the Interior to enter into cooperative agreements to develop and operate interpretive facilities and programs on lands and waters outside the boundaries of the park.

Regional Information Centers. Information centers are proposed for key points in the region, such as Flagstaff, Williams, Cameron, and Jacob Lake, to assist tourists and for dispensing information regarding the park, recreation areas, and Indian activities. The centers will be set up and operated jointly with other Federal agencies, Indian tribal councils, and community chambers of commerce.

The concept of public information centers in the park designed to serve the visitor prior to his reaching the South and North Rim will be developed. Their location should be central in the visitor service area, since they may ultimately become part of the transportation system.

National Park Service Assistance to Indian Tribes. The National Park Service will offer planning and technical assistance to nearby Indian Tribes on the recreational use of Indian lands, and in joint planning efforts involving national park and Indian lands.

The Service will seek cooperative agreements and authorization to use funds for this type of regional planning and development.

Federal Agencies. The National Park Service will participate in and encourage planning efforts with all groups and agencies concerned with outdoor recreation and interpretive activities in the Grand Canyon region.

There is continuing concern for providing sufficient services for tourists in this region. Federal agencies provide the greater portion of camping space. Private campgrounds are meeting some of the demand and will be able to expand and install new facilities in the future. Indian Reservations offer a great potential for this and other recreational activities. Regional cooperation will go beyond the inventorying of each agency's present capabilities and programs. Joint planning sessions will initially be conducted on common specific problems among the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, and National Park Service, and then progress into joint master planning.

Aircraft Control. To control a growing noise pollution problem over Grand Canyon, negotiations have been instituted for restricting areas, heights, and routes which different types of aircraft may use in the vicinity of Grand Canyon. The U.S. Air Force and some aircraft operators have agreed to restrict flights over heavy visitor use areas. Negotiations are being conducted with the Federal Aviation Administration for better control of air space over the canyon.

If this approach does not control the noise level in and over the canyon, legislation will be sought for control of air space and aircraft activities over Grand Canyon.

RELATED PROPOSALS

The lands within the former boundaries of the park and the two monuments have been studied and evaluated for placement in the National Wilderness Preservation System. Legislation based on these evaluations has been prepared as has an environmental impact statement (FES 73-68 dated December 7, 1973). Potential wilderness areas in those lands recently added to the national park will be evaluated and recommendations made within two years as to their suitability or nonsuitability for preservation under the Wilderness Act. The current wilderness plan is shown on page 24.

Public Law 93-620, Section 10-b requires that a study shall be made by the Secretary of the Interior in consultation with the Havasupai Tribal Council to develop a plan for the use of 185,000 acres of land included in the Havasupai Reservation. The land may be used for traditional religious purposes, for the hunting and gathering of native foods, for agricultural and grazing purposes, and for the development of tribal small business enterprises. The

ACREAGES	
GROSS ACREAGE	897,935
GRAND CANYON NATIONAL PARK	673,575
GRAND CANYON NATIONAL MONUMENT	198,280
MARBLE CANYON NATIONAL MONUMENT	26,080

LEGEND

- EXISTING PARK BOUNDARY
- WILDERNESS AREA LINE
- MAJOR ROADS
- MINOR ROADS
- TRAILS
- PRIVATE LAND

UNIT	WILDERNESS
1	136,400
2	63,720
3	158,000
4	136,740
5	14,580
6	5,430
TOTALS	612,870

POTENTIAL WILDERNESS ADDITION 86,156

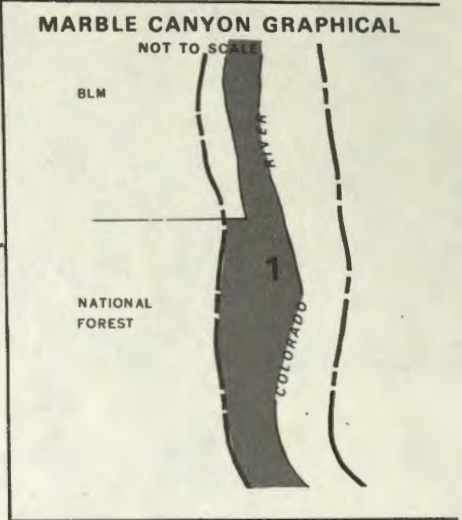
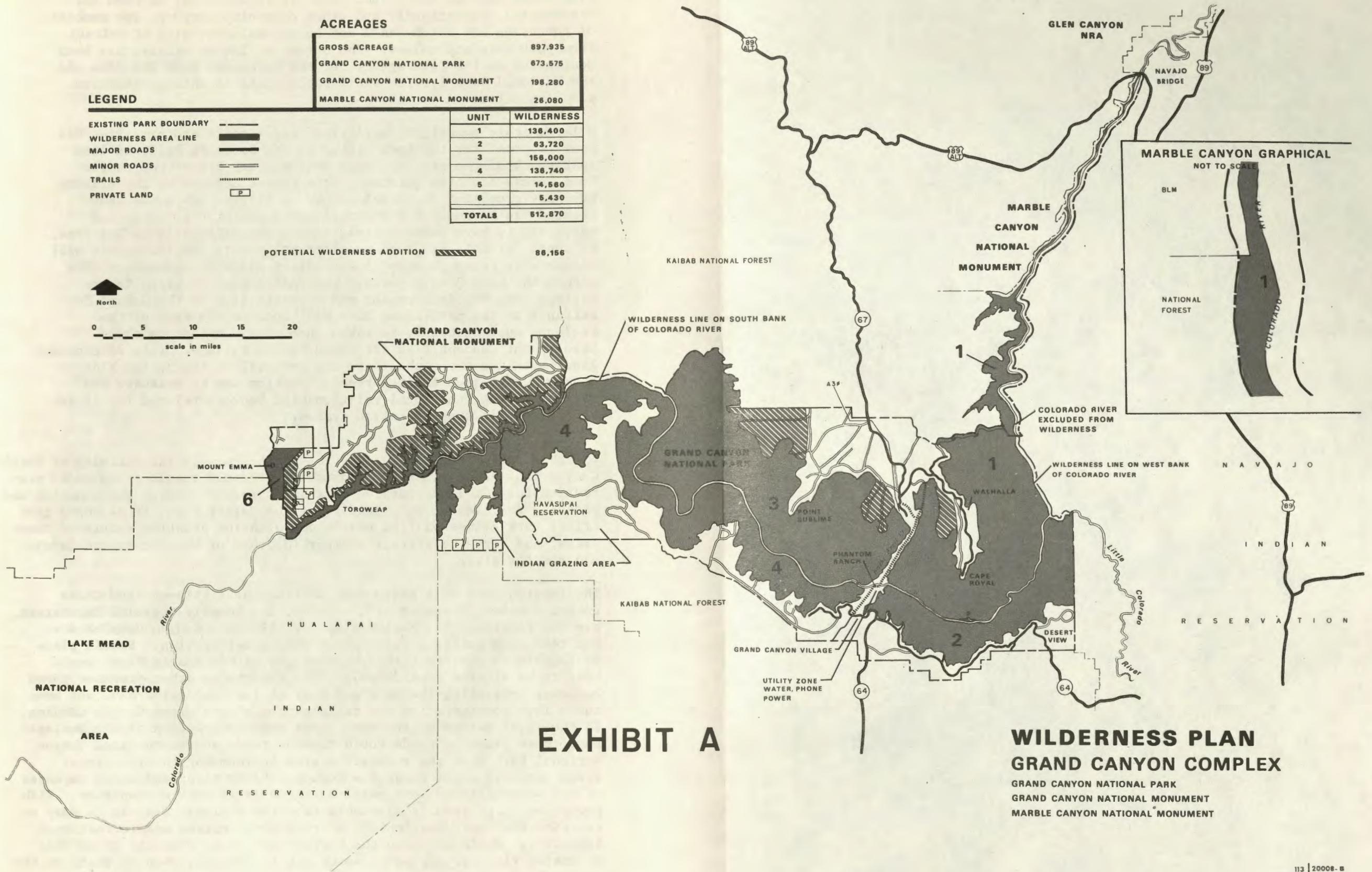
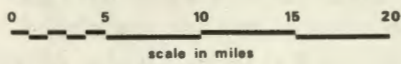


EXHIBIT A

WILDERNESS PLAN
GRAND CANYON COMPLEX
GRAND CANYON NATIONAL PARK
GRAND CANYON NATIONAL MONUMENT
MARBLE CANYON NATIONAL MONUMENT

plan shall include the selection of areas which may be used for residential, educational, and other community purposes for members of the tribe and which shall not be inconsistent with or detract from park uses and values. The Bureau of Indian Affairs has been designated as the lead agency for the Havasupai Land Use Plan and the National Park Service shall participate in this cooperative planning effort.

A large scale overnight facility of motel units and campsites has been proposed for the Apex Siding on the Santa Fe Railroad line just south of the park boundary on the South Rim of the canyon. Road access has been granted by the Forest Service to the private business proposing the development. A 55-year lease has been granted the business for the railroad lands at the siding and water rights have been obtained to the Santa Fe wells at Williams, Arizona. If this proposed development goes to completion, it will undoubtedly cause changes in subsidiary plans to the Master Plan within the next 3 to 5 years. The rail access to Grand Canyon Village from the development and a possibility of the demand for entrance to the park along Rowe Well Road to the West of the village, must certainly be taken into consideration in the Development Concept Plan for Grand Canyon Village. This development lends even greater emphasis to the proposal of the Master Plan to retain the village in its present location and to relocate and revitalize the functional relationships between related facilities and the public transportation system.

Existing and potential Navajo Tribal Park Areas in the vicinity of Marble Canyon East and the Little Colorado River could result in extended protection for rim lands outside park boundaries. Through coordination and planning assistance, an objective of the Master Plan, it is hoped that Tribal Park values will be consistent with the pristine nature of these areas, and serve to attract visitor interest of benefit to the Navajo and visitor alike.

The implications of a paved road linking the little-visited Grand Canyon National Monument with a major, and heavily traveled Interstate, are far ranging. The Master Plan for the Grand Canyon Complex does not take this possible development into consideration. Should plans go forward to construct this highway the park's Master Plan would have to be altered considerably. The impacts of other proposed paved highways encircling the park and near to its boundaries have not been taken into consideration for the planning of the Grand Canyon Complex. If the legal pathways are cleared for the construction of the Hualapai Dam, these proposed roads would provide ready access to Grand Canyon National Park from the recreation area surrounding the reservoir. These roadways would cross the Hualapai Reservation and large expanses of now uninhabited land owned by a few large cattle companies. With power and water readily available from the Hualapai Dam, it is easy to envision the rapid development of retirement cities and recreational homesites. While not "on the boards" yet, this scenario shows that no Master Plan for any park can be set in concrete when it rests on the unknowable vicissitudes of the future.

2. DESCRIPTION OF THE ENVIRONMENT

GENERAL

The 1,227,850 acres of the Grand Canyon Complex lie adjacent to the Colorado River in northern Arizona. The complex extends along the Colorado River from the Paria River at Lees Ferry, Arizona, to a point near river mile 277 at Grand Wash Cliffs formerly within the Lake Mead National Recreation Area. The complex, thus, extends east-west across the southern portion of the Colorado Plateau which is a vast, semi-arid land of raised plains and basins. Dividing the complex into north and south portions is the 277-mile-long Grand Canyon which ranges from 1 to 20 miles in width and is up to 1 mile in depth. Elevation within the complex ranges from 1,400 feet at the western portion where the Colorado River enters Lake Mead, to 9,165 feet on the North Rim. Lake Mead National Recreation Area adjoins the complex along its western boundary.

ARCHEOLOGY

Archeological resources in Grand Canyon constitute a primary scientific and historic value of the park. The more than 1,200 known Indian ruins within the complex indicate and represent the adaptation of man to his environment over the past 4,000 years in the Grand Canyon region. The initial occupation of the canyon began about 4,000 years ago, and is represented by the Grand Canyon Split-Twig Figurine Complex occupation of dry caves. These deposits contain split-twig figurines which are found only in a few other locations in the southwest. An apparent lull in human occupation followed, with primary occupation in the canyon occurring between A.D. 700 and 1200. During this time, Anasazi to the north and east, and Cohonina to the south and west, used the plateaus for their agriculturally based way of life. The Anasazi occupied the depths of the Canyon as well. In the historic period, Hualapai, Havasupai and Paiute evidenced the only use of the canyon by the surrounding Indian tribes. These various cultures all left evidence of their life styles upon the land, but only the Havasupai and Hualapai still remain within the boundaries of the Grand Canyon Complex.

The archeological resources within the Grand Canyon Complex can be expected to contribute significantly to our knowledge and understanding of the following:

1. The sequence of human occupation in the canyon area.
2. The environment faced by prehistoric man.
3. The results of contact between the Cohonina and the Anasazi in the Grand Canyon Complex.

4. Past climates from the evidence found in cave floor deposits.
5. The changes in population and all aspects of culture, including settlement patterns, by prehistoric Indians in the several environments of the canyon. These can provide significant perspective and comparative data for understanding human and cultural ecological adaptations of the Anasazi, Cohonina, Hualapai, Havasupai, and Paiute cultures in and bordering the canyon.
6. Historic perspective for surviving southwestern Indians, particularly Hopi, Havasupai, Hualapai and Paiute.
7. The adaptation of a horticultural economy to an extreme environment.
8. The effects of migration of Puebloan cultures.
9. The cause of abandonment of the canyon at the end of the 12th century.

HISTORY

All areas have a past, and thus a history. The historic resources of the Grand Canyon Complex relate primarily to the establishment and development of the Grand Canyon as a national park. In some areas of development, such as the Grand Canyon Village, an archeological and historical inventory has been made in compliance with E.O. 11593. As a result, the following sites of archeological or historical significance have been nominated to the National Register: Hermits Rest Concession Building, Santa Fe Railroad Station, Water Reclamation Plant, El Tovar Hotel, Old Power House, Kolb Studio, Superintendent's Residence, mine structures on Horseshoe Mesa, Concession Mule Barns and Blacksmith Shop Complex, and Tusayan archeological site. These sites will be preserved and protected according to E.O. 11593. Other possible historical entries to the National Register including a historic district for the village, are in the process of evaluation, and have been submitted to the State Historic Preservation Officer.

In compliance with Section 106 of the National Historic Preservation Act of 1966, Procedures for Compliance with Section 106, item B (2), the National Register of Historic Places as published in the Federal Register of February 28, 1973, along with supplements through September 3, 1974, have been consulted. Eight of the above nominations have recently been placed on the National Register: The El Tovar Hotel, Santa Fe Railroad Station, Stables/Barns/Blacksmith Shop Complex, Superintendent's Residence, Water Reclamation Plant, Grandview Mine, Hermit's Rest, and Tusayan Ruins.

GEOLOGY

The Grand Canyon lies in the physiographic region known as the Colorado Plateau, or the Plateau Province. The Colorado Plateau includes southwestern Colorado, southeastern Utah, northwestern

New Mexico and north central and northeastern Arizona. It is characterized by a thick sequence of flat to gently dipping sedimentary rocks that erode into majestic plateaus and mesas separated by deep canyons. The Colorado Plateau is a stable region with few earthquakes and its surface rocks have undergone very little deformation in comparison to other portions of southwestern United States. See page 29 for Physiographic Map of the Grand Canyon Region.

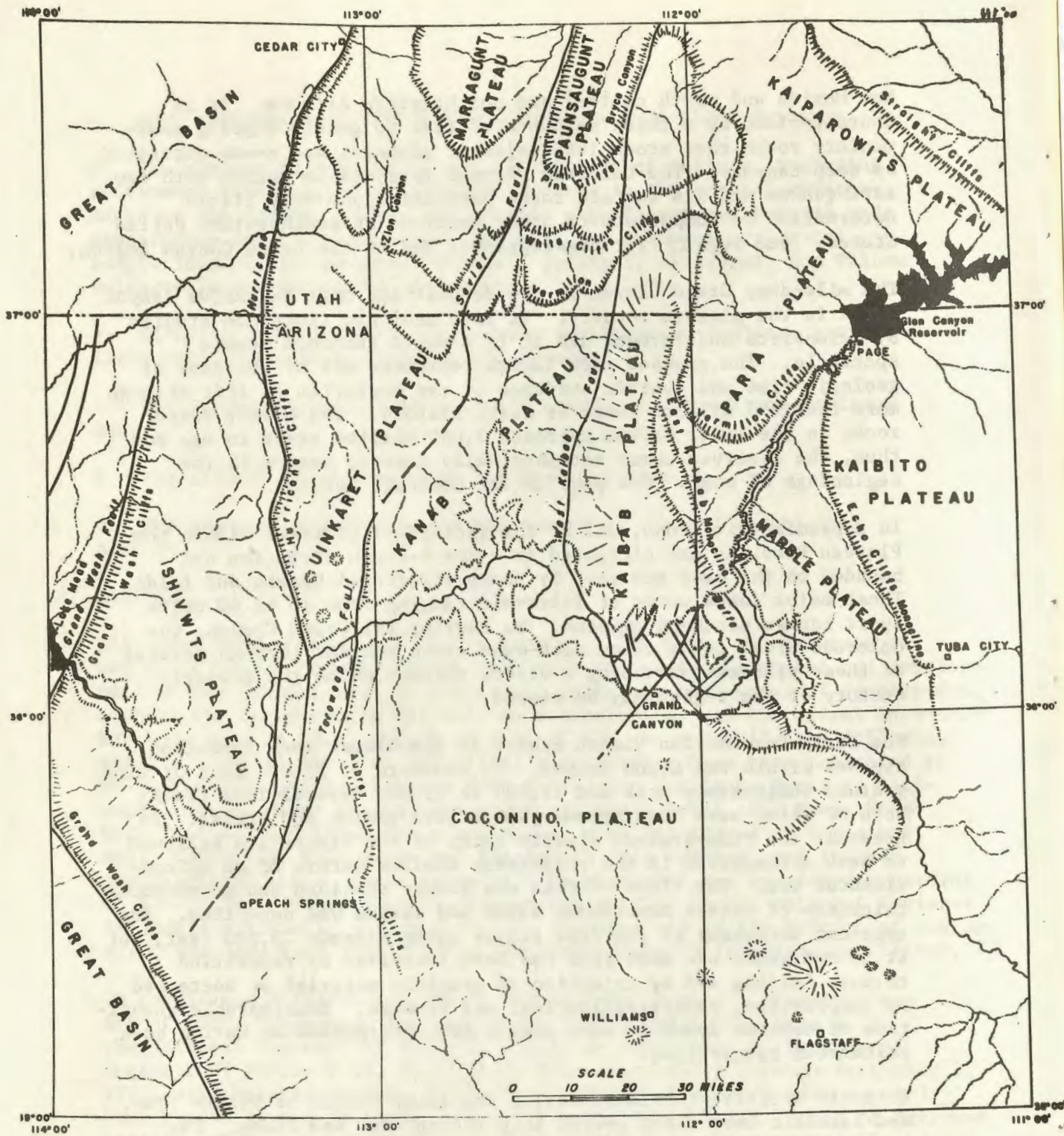
The mile-deep Grand Canyon is the deepest and most extensive canyon found in the plateau country. It is a geologic timepiece studied by scientists and laymen, and it is a world renowned scenic spectacle. The exposed rock layers represent all of the eras of geologic time and contain evidence of the evolution of life through more than 600 million years of earth history. The oldest dated rocks in the Inner Canyon approach 2,000 million years in age and thus, the observer comes metaphorically face to face with the beginnings of time. See page 30 for Geologic Section.

In a planimetric sense, all of the individual plateaus within the Plateau Province are elongated in a north-south direction and bounded on the east and west by sharp structural breaks and folds. These major zones occur at intervals ranging from 15 to 40 miles apart across northern Arizona. In carving the Grand Canyon, the Colorado River cut a clean east-west cross section through several of these plateaus providing a window through which the geologic history of the region may be viewed.

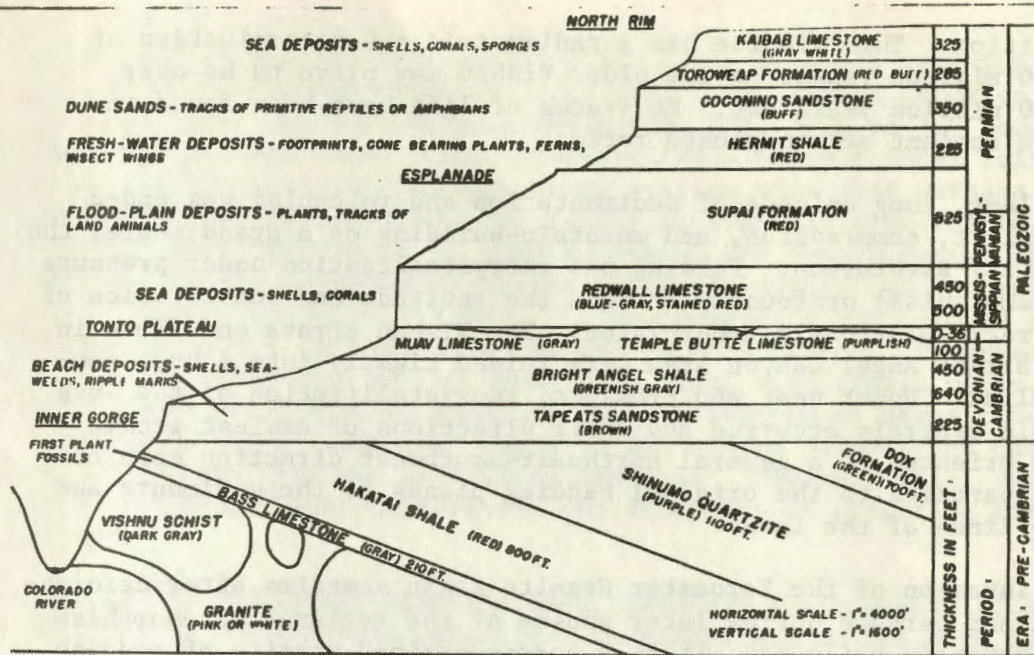
The Early Precambrian Vishnu Schist is the oldest rock formation exposed within the Grand Canyon. It consists of 25,000 feet of fine-grained sedimentary rock and 12,000 to 15,000 feet of lava flows; both of which have been metamorphosed into gneiss and schist. In general, the fine-grained clastic rocks of the Vishnu are believed to have accumulated in the relatively shallow waters of an epicontinental sea. The floor of this sea slowly subsided and an enormous thickness of rather monotonous sands and shales was deposited. The apparent thickness of the fine clayey sands exceeds 25,000 feet, but it is not known how much this has been increased by repetition through folding and by injection of granitic material or decreased by compression, recrystallization, and flowage. Considerable quantities of calcite found in some places are interpreted as having been calcareous concretions.

Volcanic activity increased during the later stages of Vishnu time, and basaltic lava flows poured into the ancient sea floor. The basalts were later metamorphosed into schists, and layers of sand and silt between the flows were changed into quartzite and quartz mica schist.

The Vishnu Schist is suspended, as it were, in the roof of a much younger batholith of granite, which invaded it in a molten



PHYSIOGRAPHY—GRAND CANYON REGION



**GENERALIZED
GEOLOGIC SECTION
AT GRAND CANYON VILLAGE**

condition. This granite has a radiometric age determination of 1,720 million years, so the older Vishnu may prove to be over 2,000 million years old. No traces of life have been found in these ancient metamorphosed rocks.

The long, long episode of sedimentation and volcanism was ended by uplift, compression, and mountain-building on a grand scale; the Mazatzal Revolution. Folding and recrystallization under pressure (metamorphism) profoundly changed the attitude and constitution of the rocks previously accumulated. The Vishnu strata and flows in the Bright Angel Canyon area were folded tightly into a huge geosyncline. Under heat and pressure, recrystallization of the less stable minerals occurred and their directions of easiest growth were oriented in a general northeast-southwest direction more or less parallel to the original bedding planes of the sediments and flow lines of the lavas.

The invasion of the Zoroaster Granite began sometime after deformation and perhaps during later phases of the regional metamorphism and mountain-building. It is a coarse-grained granite of reddish color. Not only was granitic material injected as a melt, but granitic minerals were introduced by permeating gases, and schists were granitized. New minerals resulting from contact metamorphism were added to the original mineral assemblages and to their recrystallized regional metamorphic derivatives. The mountains were probably as high as the modern Himalayas or Andes.

The last episode of the Early Precambrian was a long interval of erosion which developed the Arizonan Plain or Ep-Archean erosion surface. The high mountains which had dominated the landscape were worn away by streams and other forces of erosion until a nearly level plain remained. In the Grand Canyon, this surface has a relief not exceeding 20 feet in most areas, an observed maximum of 50 feet.

A long time elapsed after the conclusion of the Mazatzal Revolution, and before the first Late Precambrian sedimentation began. Inasmuch as there are no rocks representative of this time, it represents a gap in our knowledge of the geologic history of this area. Faulting and fracturing initiated during the Mazatzal Orogeny continued after the cooling of the Zoroaster Granite.

The Unkar Group includes all of the lower, Late Precambrian rocks found in the Grand Canyon region. The Unkar Group has a cumulative thickness of over 5,000 feet. Here and there on the Arizonan Plain up to 50 feet of the basal Hotauta Conglomerate was deposited. It incorporates angular and sub-angular fragments of quartzite, quartz, granite, pegmatite and schist derived from the underlying and inundated rocks of the Arizonan Plain.

A sea encroached upon the desert plain from the west, removing soil and interstream ridges by wave action and marine abrasion as it advanced. The surface upon which this sea began to lay down its deposits was amazingly flat. It possessed a maximum local relief of 20 to 50 feet. In remnants found over an area that perhaps exceeds 1,000 square miles, the relief is scarcely discernable. No other surface of erosion of such an extent has been reported in the world. The Bass Limestone was the first sea deposit to be laid down upon this nearly level surface. It is dominantly composed of gray dolomites which are dark brown on weathered surfaces. Interbedded shales and sandstone in the upper part, some with ripple marks, indicate fluctuating shallow water as their condition of deposition. The formation is about 200 feet thick in the canyon below Grand Canyon Village where it forms a cliff on exposure. Probable algal deposits found in this formation indicate the existence of primitive forms of life.

The Hakatai Shale overlies the Bass Limestone and consists of some 800 feet of reddish and vermilion mudstones and shales with some sandstones. It is the most vividly colored formation of Grand Canyon. An outcrop north of Pipe Creek may easily be seen from the South Rim. Ripple marks, mud cracks, and raindrop imprints are fairly common. Cubical impressions on upper surfaces of beds may be molds of salt crystals. All these features indicate that the Hakatai was deposited under shallow water conditions with occasional emergence. The formation generally erodes to a smooth slope.

The Rama Intrusives are plugs, dikes, and sills of basalt and diabase which have been intruded into the Bass Limestone and the Hakatai Shale. A 240-foot-thick sill occurs in the Hakatai Shale of Bright Angel Canyon, and is also exposed in Hindu Amphitheater. There is no known connection between the Rama Intrusives and the later volcanics of the Cardenas Formation.

The Shinumo Sandstone consists of thick-bedded to massive white, purple, red, and brown sandstone strata which grade into cemented quartzites. The formation is about 1,100 feet thick. Many outcrops are cross-bedded and some show ripple marks. They were deposited under rather uniform shallow water conditions. Where exposed, the Shinumo stands in imposing cliffs.

The Dox Formation (1,700 to 3,000 feet thick) consists largely of reddish-brown sandstones and calcareous sandstones with some green, white, and buff beds. There are some interbedded shales. Ripple marks and cross-bedding indicate shallow water deposition. Where exposed, it stands in steep cliffs and slopes.

The Cardenas Formation consists of at least 13 lava flows interbedded with eight very fine grained sandstone beds. Characteristics

of the lavas and sandstone beds suggest deposition in standing water that became shallower with time and intermittently disappeared altogether. The shallow water environment was maintained by basin subsidence or rising water level, or both, during accumulation of the lava flows and sandstones. Radiometric dates of 845 ± 15 and $1,150 \pm 30$ million years have been obtained from lavas in this formation and paleomagnetic pole positions indicate an age range of from 1,000 to 1,200 million years. The formation is nearly 1,000 feet thick in the eastern Grand Canyon. A 70-foot thick sill of probable Cardenas age is found in the upper part of the Shinumo Quartzite in Bright Angel Canyon.

The Nankoweap Group overlies the Unkar Group and is more properly considered a formation which consists dominantly of sandstone. It is separated from both overlying and underlying formations by unconformities. It is found only in the eastern Grand Canyon where it reaches a maximum thickness of 330 feet.

The youngest Precambrian rocks of the Grand Canyon region are found overlying strata of the Nankoweap and Unkar Groups in the eastern part of the park, and are referred to as the Chuar Group. These formations were elevated as fault block mountains and then eroded from most of the area while the Ep-Algonkian or Grand Canyon Peneplain was being formed.

At the base of the Chuar Group is the Galeros Formation. It consists of some 40-80 feet of massive, coarsely crystalline dolomite at the base, with 580 feet of predominantly shale strata above.

The Kwagunt Formation is the middle member of the Chuar Group. It is 1,200 feet thick and consists primarily of shales and mudstones with interbedded, thin limestones and dolomites. The basal 80 feet of this formation is a red sandstone unit which is very prominent on Carbon Butte in the eastern Grand Canyon.

The Sixty Mile Formation is the upper member of the Chuar Group and is mainly composed of breccias and coarse, pebbly sandstones, with subordinate cherty siltstones. It is only 120 feet thick, but its breccias suggest tectonic uplift with erosion of the surrounding outcrops of younger formations in the Chuar Group due to slight warping.

Following the deposition of the Late Precambrian Chuar strata, the Grand Canyon area was subjected to stresses reviving earlier faults and leading to the elevation of block faulted mountains similar to those now seen in the Basin and Range section of western America. This period of mountain building is called the Grand Canyon Revolution.

The uplifted block-faulted mountains were then subjected to a long period of subaerial erosion. This erosion produced the Ep-Algonkian erosion surface which, although often referred to as the Grand Canyon

Penepplain, actually consists of a series of block-faulted, quartzite ridges, some of which rise 800 to 900 feet above the general base of erosion.

Rocks of the Paleozoic Era began being deposited in Middle Cambrian time in Grand Canyon. The Grand Canyon Penepplain was slowly submerged beneath a sea encroaching from the west. Here and there, thin submerged conglomerates, arkoses, and quartzite breccias were deposited as surface debris was reworked by the waves. Then thick, cross-bedded, brown sandstones were deposited. The monadnocks of the Grand Canyon Penepplain projected above the water as islands until successively covered by Tapeats and later sediments. The Tapeats Sandstone averages about 200 feet thick below Grand Canyon Village.

The Bright Angel Shale was deposited on top of the Tapeats Sandstone and grades into thin-bedded sandstones and greenish to buff micaceous shales. Most of the dolomite beds, which weather to a brownish color, occur in the upper part of the formation. During the last part of Bright Angel time the last of the Cambrian islands were buried. The Bright Angel Formation is generally 350-400 feet thick below Grand Canyon Village. Trilobites, small extinct marine arthropods, are the characteristic fossils. Some primitive brachiopods are also found. The Bright Angel represents an intermediate stage in the west to east transgression of the Cambrian sea.

The Muav Limestone consists largely of gray and buff limestones. The base has layers of impure, mottled limestone interbedded with greenish shale and buff sandstone lithologically similar to the Bright Angel Formation from which it is transitional. The top of the formation consists of brown shales and sandstones. It varies in thickness from 300 to 400 feet, below Grand Canyon Village. Trilobites and brachiopods are the characteristic fossils. The Muav Limestone was deposited well offshore as the Cambrian sea advanced from west to east across the Grand Canyon Region.

No beds of certain Ordovician or Silurian age have been found in Grand Canyon National Park. They either were never deposited or were removed by erosion since deposition. An undulating dolomite overlies the Muav Limestone in the western Grand Canyon near the Hurricane Fault. Fossil evidence is yet lacking but this formation may prove to be Ordovician or Silurian in age.

Hollows and channels eroded in the top of the Muav Limestone are filled with a calcareous sandstone and a lavender to purplish colored dolomitic limestone. These outcrops of the Devonian Temple Butte Limestone are usually found in cliff faces. Scales from an extinct armored fish have been found in this formation as well as corals, brachiopods, and gastropods. Nearly all of the remnant outcrops of this formation are less than 100 feet thick in the eastern Grand Canyon. In the middle portion of the Grand Canyon, the Temple Butte Limestone is several

hundred feet thick and everywhere separates the Muav Limestone from the Redwall Limestone. The formation becomes progressively thicker to the west and toward the lower end of Grand Canyon it attains a maximum thickness of more than 1,000 feet. This difference in thickness is primarily due to erosion in Late Devonian and Early Mississippian time.

The Mississippian Redwall Limestone consists of thick to massively bedded, bluish-gray limestone beds. Various horizons contain irregular white chert nodules. The formation averages 500 feet in thickness, below Grand Canyon Village, and forms the major part of a cliff generally 600 feet high. It is the most conspicuous cliff above the Tonto Rim. The prevailing red color is a surface feature only, an iron oxide painted over it by rainwash from the overlying Supai redbeds. Various marine invertebrates, including brachiopods, corals, and crinoids, are the characteristic fossils found in this formation.

During a period of erosion following Redwall deposition, caves, solution hollows, cavities, and fissures (karst topography) were eroded in the Redwall Limestone. Erosion probably began in Mississippian time and extended into the Pennsylvanian Period.

The Supai Formation was deposited in Late Pennsylvanian and Early Permian time. It is a thick (1,000 foot) series of alternating red crossbedded sandstones and shales. The lower fourth of the formation, which includes calcareous sandstones and limestones, may be marine in origin and is Pennsylvanian in age. The upper part, the bulk of the formation, is probably Permian as is the overlying Hermit Shale. It is nonmarine and on bedding plane surfaces, trails of quadrupeds are found. Some of the footprints indicate that the animals making them were the size of small lizards. Some larger tracks, 2-3 inches across, were made by heavier and probably more sluggish creatures. The animals are believed to have been either amphibians or primitive reptiles. The Permian Hermit Shale is 100-300 feet in thickness, and is a deep red color. The strata are mostly shales and siltstones with a few lenticular sandstones near the base. The red color resulting from iron oxide, mud cracks, and ripple marks, indicate shallow water conditions and intermittent exposure to air. Thirty-five species of fossil plants, mostly ferns, have been described from the Hermit. There are also quadrupedal footprints on some of the bedding planes.

The Coconino Sandstone is a massive, white to buff, crossbedded sandstone and is 400 feet thick below Grand Canyon Village. It is a rather pure, uniformly fine-grained quartz sandstone. The grains are rounded and commonly pitted and frosted. Eolian crossbedding on a large scale is characteristic. The formation was accumulated in a huge desert sand dune area. Trails of quadrupedal animals, small primitive reptiles or amphibians, have been found on crossbedded surfaces.

The Toroweap Formation, deposited by the Toroweap sea, includes red

and yellowish sandstones at top and bottom with intermediate gray limestones. The Toroweap Sea spread over the Coconino dune area from the northwest while the sand was still fairly loose. The formation is about 290 feet thick below Grand Canyon Village.

The Toroweap Sea retreated westward from the Grand Canyon Region, and then returned, advancing across the Grand Canyon Region from west to east, as the Kaibab Sea.

The Kaibab Limestone is composed of massive, marine limestones. They form the uppermost cliff along the rim. Some of the beds contain admixtures of sand and nodules of white chert. Bedded cherts also occur. Where erosion has not removed the uppermost beds near the rim, it measures 320 feet in thickness. The Kaibab has a rather abundant marine fauna of brachiopods, corals, cephalopods, crinoids, and sponges.

After withdrawal of the Kaibab Sea, there followed a period of arid erosion. No mountain building or even slight deformation affected the thick succession of Paleozoic strata. Broad shallow valleys were cut, but nowhere did the downcutting continue long enough to remove much of the upper part of the Kaibab Formation. Some karst erosion took place at the end of the Permian or near the beginning of the Triassic.

The presence of an erosion surface at the top of the Kaibab rimrock of the Grand Canyon indicates that the land surface was above sea level at the beginning of the Mesozoic Era. Erosion has removed most of the Triassic Moenkopi Formation and almost all of the more recent Mesozoic and Cenozoic rocks from the Grand Canyon region. Their prior existence over the canyon's strata can only be established through inference and extrapolation from outcrops in nearby areas.

The Moenkopi Formation is found both immediately east and south of the park. It consists of 500-600 feet of continental, red to chocolate brown shales, siltstones, mudstones, and sandstones. It also contains thin beds of yellowish to greenish limestones and some gypsum. The fossils include plants, reptiles, amphibians, and fish. Cedar Mountain, just east of Desert View, is an erosional remnant of Moenkopi capped by Shinarump Conglomerate. Red Butte, 15 miles south of Grand Canyon Village, is composed of Moenkopi and Chinle strata and is capped by a 150-foot thick flow of Pliocene basalt.

The basal member of the Chinle Formation is the Shinarump Conglomerate. Regional upwarping had ended the deposition of the Moenkopi Formation and caused a general withdrawal of the Triassic seas. Recurrent uplift along the Mogollon Highlands forms a generally northwestward flowing drainage system. At first, streams cut valleys and large channels, and then later began to aggrade and deposit the conglomeratic and sandy sediments of the basal members of the Chinle Formation

followed by the upper layers of siltstone, claystone, and thin sandstones. These fluviatile deposits contain large quantities of petrified wood and form the Painted Desert between Cameron and Tuba City, Arizona.

The reddish-orange, parallel-bedded siltstones of the Wingate Sandstone were apparently not deposited in the Grand Canyon area. This formation is very prominent in Navajo Country, but is absent in the Echo Cliffs east of Marble Canyon.

The Jurassic Period was ushered in by the fluvial and small lake deposits of the Moenave Formation. The basal Dinosaur Canyon member is a moderate reddish-orange sandstone which conformably overlies the Chinle Formation. The upper Springdale Sandstone member is a pale reddish brown, fine to medium grained, cross-bedded sandstone. Primitive crocodile fossil remains indicate a tropical to sub-tropical climate in this area at that time. The original thickness in the Grand Canyon area would be probably less than 100 feet.

The Kayenta Formation east of Grand Canyon consists of approximately 500 feet of variegated sandstones and mudstones formed in marshes and in dune areas. The overlying Navajo Sandstone is a massive, cross-bedded, pale reddish brown to pale orange, medium-grained sandstone. It is primarily a sand dune deposit.

The Carmel Formation and the Entrada Sandstone are undifferentiated just to the east of the Grand Canyon. The strata consist of friable white cross bedded and flat-bedded sandstone banded by a few thin beds of rust-colored siltstone. Total thickness is between 200 and 300 feet. The deposits indicate fluviatile and shallow water deposition. The strata lie unconformably on the beveled tops of the Navajo Sandstone dunes.

The Cow Springs Formation is a massive, greenish-gray to yellowish-gray, fine-grained, cross bedded sandstone. Its thickness to the east of Grand Canyon is approximately 350 feet. It is an eolian deposit and may be mistaken for the Navajo Sandstone which it closely resembles.

Epirogenic uplift to the south and southwest of the canyon area marked the end of the Jurassic Period and the beginning of the Cretaceous. Widespread erosion leveled the Triassic and Jurassic rocks in northern Arizona and produced a gently rolling and channeled landscape. The Dakota sandstone represents the initial transgression of the Late Cretaceous sea into the Grand Canyon area from the east. It consists of a lower, fluvial sandstone, a middle carbonaceous member of lagoonal origin, and an upper shallow marine sandstone. The formation is approximately 100 feet thick east of Grand Canyon.

The Mancos Shale is mostly banded, light to medium gray shales with some yellowish-grays in the sandier parts. Its thickness to the east of Grand Canyon is 400-500 feet. The overlying Toreva Formation consists of a basal, cliff-forming sandstone member, a middle slope-forming carbonaceous member, and an upper cliff-forming sandstone member. Above this, the Wepo Formation comprises a series of intercalated siltstones, mudstones, sandstones, and coal. The siltstone and mudstone units are dark olive-gray to olive-brown. The Straight Cliffs Sandstone of the Kaiparowits Basin is correlative with the Toreva and Wepo Formations. It is a massive, fine-to-medium-grained sandstone with some coal and carbonaceous shale in the middle part.

The marine, near-shore Wahweap Sandstone which outcrops in the Lake Powell - Kaiparowits Region, consists of alternating sandstone and shale in the lower part, and massive resistant sandstone in the upper part. Westward, it grades into fluvial siltstones and shales.

Unconformably overlying the Wahweap is the Kaiparowits Formation, composed of thin bedded sandstone with subordinate amounts of calcareous siltstone, limestone, and conglomerate. This formation was deposited in streams and fresh-water lakes and ponds in a tropical climate.

The Canaan Peak Formation is mostly a pebble-cobble conglomerate and conglomeratic sandstone containing a few interbedded mudstones. It lies unconformably on the Kaiparowits Formation and ranges from 0 to 1,000 feet in thickness. The initial movement of the Kaibab Uplift probably began during the deposition of this formation. The conglomerates were derived from western sources.

Regional uplift, tilting and structural development related to the Laramide Orogeny began perhaps as early as just before the deposition of the Kaiparowits Formation and was certainly underway by the end of Kaiparowits time.

At the close of the Cretaceous, the dominant regional drainage direction was east and northeast across the large flood plain that was northeastern Arizona. A blanket of Mesozoic rocks as thick as 4,000 to 8,000 feet had been deposited over the top of the Kaibab Limestone as the land surface gradually sank. The subsidence was interrupted by short periods of erosion indicating that the land surface remained very close to sea level. This Mesozoic subsidence took place on a very large scale that involved most of the Colorado Plateau. Gentle regional warping of the Paleozoic rocks may have occurred during this period, but faulting and intense folding did not occur in the Grand Canyon region. At the beginning of the Cenozoic Era, the Kaibab Limestone which forms the present rim of Grand Canyon, was more than 4,000 feet below sea level--more than 2 miles below its present elevation.

The quiescence of 500 million years of Paleozoic and Mesozoic rule

abruptly came to an end with the advent of the Cenozoic Era and the Laramide Revolution. The Laramide Revolution was a series of orogenies that caused world-wide structural deformation. The Colorado Plateau was not exempt from this deformation and was affected throughout most of Paleocene and early Eocene time (between 50 and 60 million years ago).

Strong, eastward-directed, compressive forces created north trending folds and monoclines such as the East Kaibab Monocline which bounds the Kaibab Plateau on the eastern side of the park. The Colorado Plateau was generally uplifted in Laramide time, perhaps as much as three-quarters of a mile above sea level. This drained the seas from the region and initiated a major erosion cycle that is continuing to this day. The uplift of the Plateau was not uniform; instead, the surface rose in gentle swales and arches which were terminated at their margins by north-south structural zones. The anticlinal Kaibab Uplift and many other broad-scale features began during this period of uplift.

Following the Laramide Revolution the Colorado Plateau stabilized in an elevated position and its surface underwent vigorous erosion. The land surface in the Grand Canyon area was beveled and most of the Cretaceous, Jurassic and Triassic formations were stripped away. Early Cenozoic sediments accumulated in adjacent areas but little definite record remains of Early Cenozoic sedimentation on the Grand Canyon section of the Colorado Plateau.

North of the Grand Canyon the Pine Hollow Formation is of Paleocene age and is predominately red to purplish-gray mudstone, calcareous mudstone, or very fine-grained clastic limestone. It is generally conformable on, and locally intertongues with, the Canaan Peak Formation in southern Utah. However, in places, it appears to lie on an irregular, low-relief surface formed on the Canaan Peak Formation.

The Wasatch (Claron) Formation consists of a lower pink, fine-grained limestone member about 800 feet thick, a middle white limestone member about 550 feet thick, and an upper variegated sandstone member which is 300 to 600 feet thick. The lower part of the Wasatch Formation is probably Paleocene and early to middle Eocene fresh-water mollusks have been found in the middle member. The Wasatch unconformably overlies older formations involved in the folding of the East Kaibab Monocline to form the Kaibab Uplift. The Wasatch was not deformed by this uplift and thus indicates that the movement occurred prior to its deposition.

Igneous intrusive activity began in southern Utah during the Oligocene. In the Aquarius Plateau the Wasatch Formation is overlain by several hundred feet of white tuffaceous sandstone, volcanic breccia, and latite welded tuff, which is believed to be of Oligocene age as it is in turn overlain by the Tuff of Osiris, which has been radiometrically dated as early Miocene. Uplift began during the Oligocene in the Central Arizona Mountain area. The Kaibab Plateau would not have stood as a barrier to east or west-flowing streams. The eolian Chuska Sandstone

in the eastern Navajo Reservation may be partially or wholly Oligocene in age.

The Ancestral Little Colorado River had excavated a large valley to the east of Grand Canyon by Miocene time. Paleozoic and Precambrian gravels were being washed north across the present trace of the Grand Canyon from the uplifted Central Arizona Mountains. The volcanic Peach Springs Tuff was emplaced in Peach Springs Canyon some 18 million years ago and effectively blocked any large river from exiting through this canyon from the Grand Canyon area. By 14 million years ago, the broad valley drained by the present Cataract Creek had been excavated and stream and shallow lake deposits were covered by basaltic lavas from the Mt. Floyd area to the south.

The second major orogeny to affect the Colorado Plateau since Precambrian time occurred in Late Miocene and Early Pliocene time. Throughout the region west of the Rocky Mountains the earth's crust was under tensional stress and normal faulting became prevalent over the Colorado Plateau. This was the Basin and Range Orogeny and it was largely responsible for the intense block faulting in the Basin and Range Province to the west and south of the Colorado Plateau. Normal faulting commenced in Late Miocene time but appears to have reached its peak of intensity in Pliocene time in the Grand Canyon region. The great Hurricane Fault of western Grand Canyon, and the faulting along the West and Central Kaibab Fault zones was initiated at this time, displacing the plateaus west of the Kaibab Plateau downward and leaving the Kaibab elevated above its surroundings.

Tensional stress downdropped central Arizona away from the Mogollon Rim and basaltic vulcanism closely followed the normal faulting. The renewed uplift of the Colorado Plateau left its surface at an average elevation of about one and one-half miles. The Pliocene Muddy Creek Formation was deposited in basins between the block faulted mountains in the Lake Mead area. These deposits lie athwart the path of the present Colorado River near Hoover Dam. A date of 10.6 million years on the overlying Fortification Basalt member and a lack of earlier Colorado River gravels indicate that the Colorado River could not have exited from the Grand Canyon area at that point before that date.

About 9.4 million years ago, a small olivine basalt flow poured out across what is now Red Butte, just south of the park. It caps approximately 1,000 feet of Triassic strata and indicates the thickness of Moenkopi and Chinle formations which still existed in this area at that time. A similar flow occurred at Cedar Ranch on the north side of the San Francisco Peaks and covered Triassic strata now lie 400 feet above the general surface of erosion. This flow has been dated at 7.35 million years which is very close to the 7.6 million year date for the Switzer Mesa flow in nearby Flagstaff, Arizona.

The Cretaceous Mancos Formation outcrops east of the Kaibab Plateau drainage divide. Microfossils from this formation are found in Colorado River sediments below Lake Mead that are no older than 5.5 million years. This indicates that the Kaibab Uplift had not been breached before this date by the Colorado River and the Grand Canyon was thus not in existence as we know it today. However, by 3.3 million years ago the Colorado River was well established in the western Grand Canyon and had cut to within 350 feet of its present elevation.

Lake Bidahochi formed in Late Miocene to Early Pliocene time in the valley of the Little Colorado River, indicating that no great river such as the Colorado could have passed through there since that time. The middle member of the Bidahochi Formation (the Hopi Buttes volcanics) has a radiometric age of 4.1 million years. Stage 1 volcanics of the San Francisco field began eruption about 2.5 million years ago and eruptions have continued intermittently in that area until 1064 A.D. with the eruption of Sunset Crater. Lava flows have intermittently blocked the Colorado River near Toroweap in Grand Canyon National Monument. There is evidence to indicate that one of the lakes backed up behind the highest of these flows probably extended upstream as far as Lees Ferry and maintained itself until the lava dam was breached. The oldest of these canyon blocking flows has an age of 1.2 million years and shows that at that time the Colorado River had excavated the Grand Canyon to within 50 feet of its present depth.

The Pleistocene Epoch was marked by three periods of mountain glaciation in the San Francisco Peaks south of the park. Meltwaters from these glaciers and those upstream on the Colorado River drainage in the Rocky Mountains greatly increased the volume of water passing through the canyon and undoubtedly accelerated canyon cutting. The primary volcanos in the San Francisco Peaks area erupted during the Pleistocene. The Tappan Wash flow, just east of the park, flowed into the Little Colorado in the last 500,000 years and blocked its flow for several miles. Very little erosion occurred on the Coconino Plateau south of the park during the Pleistocene and the plateau appears today much as it did then.

Grand Canyon Village is in an area of relatively low seismic activity, and the probability of a destructive earthquake is low. Three or four minor quakes have occurred in this century, but damage has been negligible. One major fault, called the Bright Angel Fault, dates from the Precambrian era and trends northeast-southwest through the western part of the village. The Santa Fe Railroad tracks follow a shallow valley that has been created by long-term erosion along the fault line. The Bright Angel Fault which has undergone a vertical displacement of about 175 feet since the Paleozoic era, has not been active for millions of years and presently does not constitute a threat to the village development.

Perhaps the greatest potential geologic hazards in the area are the occasional rockfalls that occur along the canyon walls. These rockfalls, which are largely responsible for the progressive widening of the canyon, are the result of the cumulative effect of several agents. Heavy rains can produce highly erosive surface runoff that cascades down the canyon walls, scours the surface of the sedimentary rock strata, and dislodges rock material. Ground water movement can erode and subvert promontories and surface rocks, causing them to collapse or fall into depressions of the canyon below. Freezing and consequent expansion of water, which enters joints and cracks in rock strata, may cause portions of the canyon walls to flake off. Similarly, the tremendous pressure exerted by developing plant roots may be sufficient to dislodge huge boulders and make rocks near the canyon rim unstable. Rockfalls along the canyon rim are sufficiently frequent in the village area to warrant concern in planning for development. In December 1932, a huge promontory immediately west of Kolb Studio fell a thousand feet into the canyon during a thunderstorm. In the mid-1950's, another large rock mass broke loose from a layer of Coconino sandstone about 500 feet below the rim and smashed against the canyon walls several hundred feet below.

Rim falls, landslides and flash flood washing in the inner gorge affect the river and side stream environment. The greatest potential hazard of such activity would be realized if a rockfall were to hit a camping party on the beach below. In addition, washing from flash floods in tributaries can change the configuration of rapids in the Colorado River, and perhaps natural damming could occur for short periods if enough material were involved.

A hazard to man-made objects is also posed as a result of the canyon's erosional processes. An example is the trans-canyon pipeline, washed out during a flash flood in 1966. Trails and other facilities are also threatened, with trails washing out with regularity. An occasional death results from rock slides above the trails.

The mineral potential of the Grand Canyon Complex is not known in any detail. The first American prospectors entered Grand Canyon in 1874 and hundreds of claims were located between then and the establishment of the national park in 1919. Small deposits have been found of silver, gold, lead, uranium, vanadium, copper, guano, tungsten, molybdenum, antimony, salt, kyanite, selenium, tellurium, and asbestos. In most instances, the low tenor of the ore bodies and their small extent, coupled with the lack of water and excessive difficulty of transportation, has prevented any significant amount of mineral production from Grand Canyon. The copper mines on Horseshoe Mesa produced for a number of years before the owners discovered the greater wealth to be had in transporting tourists instead of copper ore on their pack mules.

The only mine which has produced a significant amount of ore is the

Little Orphan Lode Mine on the South Rim of the Grand Canyon and 2 miles west of Grand Canyon Village. The primary ore body consists of uranium and some copper mineralization in a pipe with a very limited extent. The mine covers approximately 3.5 acres on the surface. The mine was operated by Western Gold and Uranium, Inc., (subsequently Western Equities and then Westec, Inc.) until May 1966. At that time they had completed an Atomic Energy Commission production allocation of 2.2 million pounds of uranium ore (U_3O_8). Shortly after meeting their production allocation, Westec, Inc., went through voluntary bankruptcy proceedings. The mine was sold to the Cotter Corporation in September 1967. They operated the mine from October 1967 through December 1969. The depressed state of the uranium market forced closure of the mine and it has not produced since December 31, 1969.

The deed to the Little Orphan Lode Mine was transferred to the National Park Service in the autumn of 1962 by Western Equities, Inc. The following reservations and conditions were made in conveying the Orphan Lode Mining Claim No. 43506 to the United States of America. All mineral rights on the claim are reserved to the grantor for a period of 25 years but shall be limited to underground mining, and surface rights are maintained for the approximately 3 acres of land required for the operation of the mine until the expiration of mineral rights. Thus by November 19, 1987 all rights and properties of the claim will become National Park Service property.

All park visitors using the West Rim Drive must pass by the mine site which is an intrusion into the canyon perspective. The mining area is unsightly and obtrusive, security fences are in poor repair, and the entire mine site is a safety hazard to curiosity seekers. Theft and acts of vandalism are not uncommon as the mine has been idle since December 1969. The value of Cotter's developments has been estimated at \$140,000 and an offer has been made to them to give up their rights to the operation prior to 1987.

No oilshale or coal-bearing strata are known to exist within the Grand Canyon Complex or in areas proposed for expansion. Petroleum or natural gas has not been drilled for within the park. As the Colorado River has cut through to the basement of metamorphic rocks, it is assumed that any fluid resources that may have existed have long since followed the path of the groundwater resource and drained from the strata adjacent to the canyon. Two wells have been drilled well back from the canyon on both the North and South rims in an effort to find oil. Both wells were dry holes. There are no known geothermal resources present in the Grand Canyon Complex.

SOILS

Erosion and weathering of the highly jointed Kaibab Limestone and the few remnant patches of Moenkopi siltstone along the rims of the canyon have produced thin, stony, poorly developed mountain soils. Rim soils are

developed in place and are so immature that in only a few small areas can the beginnings of soil profiles be seen. Soils within the canyon resemble those on the rims in that soil profiles have not developed and most of the soil material is derived from the immediate bedrock. Alluvial deposits along the Colorado River and major tributaries combine with colluvial deposits to form the major transported soils of the Inner Canyon. Comprehensive or detailed soil mapping of the park has not been done and only excessively generalized soils classification has been done. Perhaps the best way to view the soils within the park is just to consider them as a shallow skin of dirt covering the bedrock.

The shallow soils insure that any excavations will require extensive blasting into the underlying bedrock. The shallow soils and scattered vegetation provide for rapid infiltration of rain and snowmelt. Productivity of the soils is low and wherever revegetation attempts are contemplated special soil studies will have to be done to insure success of the planting.

CLIMATE

The Grand Canyon has many climates, depending mainly on the elevation. Average annual precipitation varies from more than 25 inches along the forested North Rim (8,200 feet) to less than 9 inches on the desert of the Inner Canyon (2,400 feet). Intermediate amounts of about 16 inches per year fall on the South Rim (7,000 feet). The North Rim receives more precipitation in winter than in summer; the South Rim and the Inner Canyon receive about equal amounts during the two seasons. The spring and fall are relatively dry in all three areas. Summer precipitation usually falls from thunderstorms that form over the heated canyon walls almost every afternoon from early July until the end of August. Although these storms are capable of producing locally heavy downpours, they rarely last more than 30 minutes and usually cease completely shortly after sundown.

Winter precipitation is not as consistent as that of summer, varying greatly from year to year in both amount and frequency of occurrence. It is associated with middle latitude storms moving eastward from the Pacific Ocean and normally falls in gentle to moderate showers which may persist for several days. When these storms intensify over the California Coast, move directly into Northern Arizona from the west, and meet a cold wave sweeping down from the northwest, severe storms with heavy snow and strong winds can strike the areas. Practically all of the winter precipitation on the North and South Rims occurs as snow. An annual average accumulation of more than 150 inches on the Kaibab Plateau makes snowplowing expensive and has kept the road to the North Rim closed from November until mid-May in the past. Snowfall is a rarity in the Inner Canyon and averages less than 1 inch per year.

As can be seen from the temperature data which follows, the temperature will increase as one descends into the canyon. However, during the winter months there are short periods of temperature inversion when clouds fill

the canyon and cold air drains into and is trapped within the canyon while the rims are being warmed by direct sunshine. Based on an elevation gradient of 4,800 feet and a dry adiabatic lapse rate of 5.4°F/1,000 feet, the average adiabatic temperature change between the rim and the river is approximately 26°F. The air in the canyon is considered to be conditionally stable in August and September; statically unstable in June and July; and statically stable for the rest of the year. The hourly temperatures at the rim and the river approach each other to within a few degrees in the hour just preceding sunrise.

MONTHS JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

MEAN MAXIMUM TEMPERATURES (°F)

INNER CAN.	56	62	71	82	92	101	106	103	97	84	68	57
DESERT V.	40	43	48	57	69	78	84	80	73	61	49	39
SO. RIM	41	45	51	60	70	81	84	82	76	65	52	43
NO. RIM	37	39	44	53	62	73	77	75	69	59	46	40

MEAN MONTHLY TEMPERATURES (°F)

INNER CAN.	46	52	59	69	77	86	92	89	83	72	57	47
DESERT V.	31	34	37	44	56	64	72	68	61	50	39	30
SO. RIM	30	33	38	46	54	64	69	67	61	50	39	31
NO. RIM	26	29	33	41	48	56	62	60	54	45	35	30

MEAN MINIMUM TEMPERATURES (°F)

INNER CAN.	36	42	48	56	63	72	78	75	69	58	46	37
DESERT V.	21	24	26	32	42	50	59	56	49	39	30	21
SO. RIM	18	21	25	32	39	47	54	53	47	36	27	20
NO. RIM	16	18	21	29	34	40	46	45	39	31	24	20

MEAN PRECIPITATION (Inches)

INNER CAN.	.68	.75	.79	.47	.33	.29	.80	1.36	.88	.70	.51	.87
DESERT V.	.85	.92	1.45	.74	.56	.36	1.25	1.45	1.01	1.70	.81	1.80
SO. RIM	1.32	1.53	1.37	.92	.65	.46	1.87	2.28	1.50	1.21	.95	1.61
NO. RIM	3.17	3.22	2.63	1.73	1.17	.86	1.93	2.85	1.99	1.38	1.48	2.83

AIR QUALITY

Natural dust particles, water vapor, chemicals given off by growing plants, and the refraction of light all combine to form a haze which is a natural part of the Grand Canyon environment. The predominant wind direction in the Grand Canyon area above the rims is from the southwest. Below the rims of the canyon there is little large-scale horizontal air movement. The deep, narrow configuration of the canyon forms a relatively closed air system of over 5,000 vertical feet. In 1880, Clarence Dutton described the natural haze within the confines of the canyon thusly, "The very air is then visible.

We see it, palpably, as a tenuous fluid, and the rocks beyond it do not appear blue, as they do in other regions but reveal themselves clothed in colors of their own. The Grand Canyon is ever full of this haze. It fills it to the brim. We are really looking through miles of atmosphere under the impression that they are only so many furlongs. This apparent concentration of haze, however, greatly intensifies all the beautiful or mysterious optical defects which are dependent upon the intervention of the atmosphere."

The visibility within the canyon is constantly being monitored by a laser beam which is directed from the Yavapai Museum on the South Rim to a mirror at Phantom Ranch at river level. By measuring the amount of light scatter of the returning beam of light, a measure of air contaminants can be obtained. This experiment is being performed by Drs. Layton, O'Dell and Malm of the Physics Department at Northern Arizona University.

Surveys have been made to measure the aerosol-sized particles in the air. These are much smaller particles than wind borne dust and the measurements are independent of the amount of dust in the air. In 1970, measurements made on backcountry trails indicated that aerosol particles measured from 300 to 700 parts per million. This compares quite favorably with some of the cleanest air on Earth (over the Pacific Ocean) where aerosol counts commonly range from 100 to 200 parts per million. On those trails which start near Grand Canyon Village (the area of highest automobile and human use) the count rose to 1,500 to 1,700 parts per million. When there are strong up-canyon winds along the Colorado River, the small particle count rises to about 2,400 parts per million. These winds would be coming from the Henderson-Las Vegas area where there are both automobiles and coal-fueled powerplants. An analysis of particulate matter in the air at Phantom Ranch made by the University of Utah indicated only a tiny amount of fly ash which would be an indicator of air pollution from powerplants. Thus at this time the major air pollution problem at the Grand Canyon is the automobile. The aerosol analyses were performed by Dr. Eric Walther of the Colorado Plateau Environment Advisory Council.

The National Park Service operates an air quality sampling station just north of the Visitor Center in Grand Canyon Village. The 24-hour air samples, which have been taken periodically since 1970, are analyzed by the Environmental Protection Agency for particulate matter, sulphur dioxide, nitrogen oxides and heavy metals. Sulfation plates have been exposed within the park in a cooperative program with the Forest Service. Available information indicates that dustfall and sulfation rates, as well as the levels of sulphur dioxide, nitrogen oxides, lead, benzene organics, and total oxidants are all low to very low. When compared with national standards of air quality set by the EPA, the data indicate that the air of the village and of the canyon is excellent. See page 47, Summary of Air Quality Data.

Because of its almost pristine purity, the air in Grand Canyon can be degraded by introducing pollutant levels which would be considered negligible in metropolitan areas. The development and operation of the park must contribute to the perpetuation of this outstanding resource.

Summary of available air quality data for Grand Canyon Village and immediate vicinity, 1970-1972.

<u>Pollutant</u>	<u>Grand Canyon EPA Mean</u>	<u>Annual Phoenix mean</u>	<u>Grand Canyon Walther's data</u>	<u>EPA Standard-1¹</u>	<u>EPA Standard-2²</u>	<u>Arizona 24-hour standard</u>
Total particulates (aerosol) ug/m ³	34 (n=56)	108-265	18	260 ³	150 ³	100
Dustfall ug/cm ³ /day	-	11.5	10	-	-	-
Sulphur Dioxide ppb	4 (n=50)	ca.4	ca.4	30 ³	20 ³	-
Sulfation rate ug/cm ² /day	-	1.75	0.38	-	-	-
Nitrogen Dioxide ug/m ³	21 (n=58)	168	22	100 ⁴	100 ⁴	-
Total oxidants ug/m ³	-	17.5	10.4	160 ⁵	160 ⁵	-
*Lead ug/m ³	0.15	3.12	-	-	-	-
Benzene organics ug/m ³	1.0	-	-	-	-	-
Benzopyrene ug/m ³	0.11	-	-	-	-	-

*1969 data. n = number of data points

1. Level of pollutant which, if exceeded, endangers "public health"
2. Level of pollutant which, if exceeded, endangers "public welfare"
3. Maximum 24-hour concentration
4. Annual arithmetic mean
5. Maximum 1-hour concentration

NOISE LEVELS

One of the many environmental stresses that man seeks to escape by visiting Grand Canyon is the clamor of our technological society. To a great degree, he can do this if he travels into the outback of the canyon's wilderness. But all of the park is not wilderness and the vast majority of park visitors do not pass beyond the developed areas or the corridor trails where the problem of noise pollution is at its highest.

Noise pollution is insidious, in that we suffer less from noises that we accept, and thus noise levels creep upward unnoticed. If Grand Canyon Village for instance is as noisy as the metropolis that the visitor has just left, then it is doubtful if the visitor will notice any noise pollution. Grand Canyon Village is not a quiet place, and there are periods when one cannot escape from the noise of man even by being deep within the canyon.

A preliminary sound survey was made on Labor Day in 1971 by Dr. Black of Northern Arizona University. He reported that the drone of aircraft engines could be heard almost continuously on that day of survey. The aircraft are a mixture of fixed-wing and helicopter tour planes, private planes, military aircraft, and high altitude commercial craft. Automobile noises were the most pervasive at overlooks and within Grand Canyon Village.

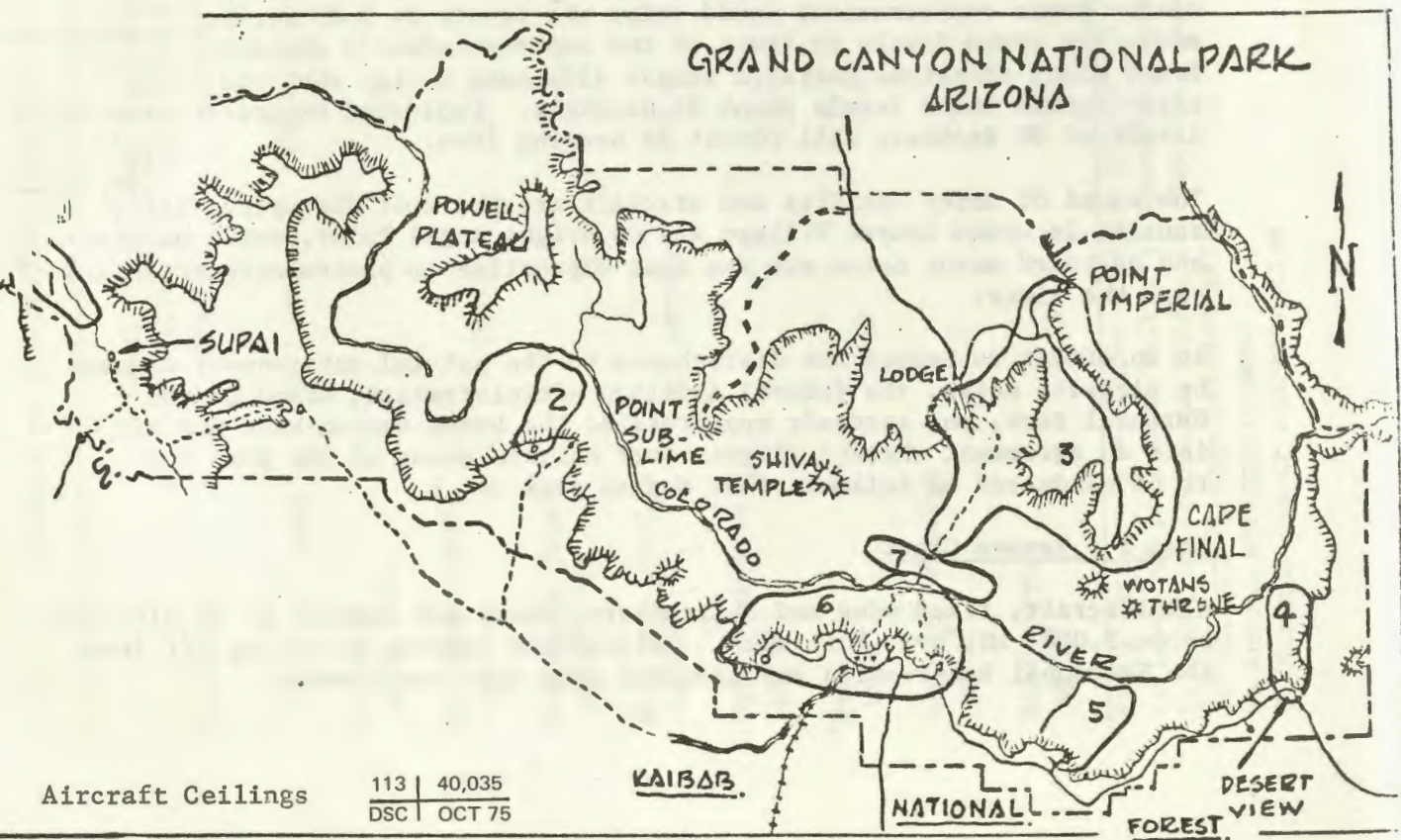
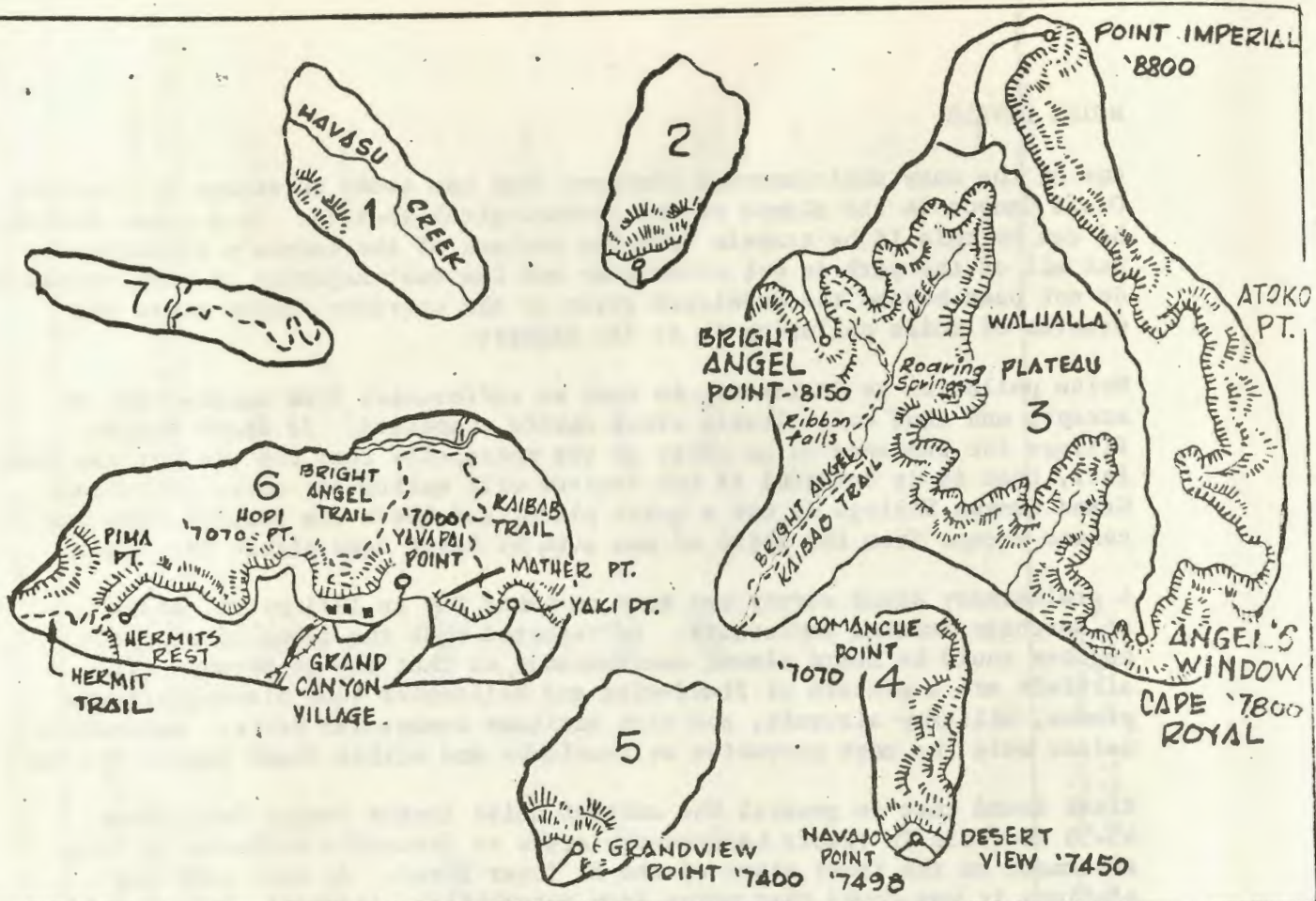
Black found that in general the ambient noise levels ranged from about 45-50 decibels in remote backcountry areas to around 70 decibels in late afternoon on the front steps of the El Tovar Hotel. At most sampling stations it was found that noise from automobiles, aircraft, buses, and motorcycles elevated the ambient levels as much as 25-30 decibels while nearby human conversations would raise the levels by 5-15 decibels. While measuring sound levels in front of the Superintendent's residence, Black found eight occasions during a single 15-minute period when the motor vehicle noise raised sound levels about 85 decibels. Prolonged exposure to noise levels of 80 decibels will result in hearing loss.

The sound of motor vehicles and aircraft are the most disruptive noise sources in Grand Canyon Village and on Bright Angel Point, while aircraft and outboard motor noise are the most disruptive in backcountry areas and near the river.

In an effort to reduce the disturbance to the natural environment caused by aircraft noise, the Federal Aviation Administration, Grand Canyon National Park, and aircraft operators at the Grand Canyon have entered into an agreement whereby flights over certain areas of the park are to be conducted as follows: (See Map on page 49 .)

Area 1 - Havasu Creek

All aircraft, fixed wing and helicopters, shall not operate at an altitude below 5,000' MSL over this area. Helicopters landing or taking off from the Havasupai Reservation are exempted from this requirement.



Aircraft Ceilings

113	40,035
DSC	OCT 75

Area 2 - Bass Trail

No flights shall be conducted by either fixed wing aircraft or helicopters within this area. When necessary to overfly the area, aircraft shall not operate below an altitude of 6,500' MSL within the confines of the Canyon and not below an altitude of 8,500' MSL while over the Rim.

Area 3 - North Rim, Cape Royal, and North Kaibab Trail

No flights shall be conducted within this area by either fixed wing aircraft or helicopters. When circumstances do not permit avoiding these areas, aircraft shall not operate over them below an altitude of 10,000' MSL.

Area 4 - Desert View

Helicopters and fixed wing aircraft shall not operate over this area below an altitude of 8,500' MSL.

Area 5 - Grandview

Fixed wing aircraft shall not operate below an altitude of 8,500' MSL within this area. Helicopters shall operate at an altitude not below 8,500' MSL when flying over the Rim areas and not below 5,000' MSL when flying within the Canyon.

Area 6 - South Rim

Helicopters and fixed wing aircraft shall not operate over this area below an altitude of 8,500' MSL.

Area 7 - Phantom Corridor

Helicopters and fixed wing aircraft shall not operate over this area below 6,000' MSL.

The viewing of the Grand Canyon and the Grand Canyon "experience" should be within the context of a certain modicum of quiet contemplation. The Master Plan calls for a reduction in noise levels within the park both through regulation and through a program of education. The widespread mystique which says that a mechanical device is not efficient unless it is noisy is being countered by environmentally oriented interpretive programs within the park.

BIOTA

More than a thousand species of plants are found within the complex. Large native animals such as mule deer, bighorn sheep, mountain lion, bobcat, and coyote seek their livelihood within the Grand Canyon and

Grand Canyon Birds

KEY		South Rim	Inner Canyon	North Rim	Grand Canyon National Monument		South Rim	Inner Canyon	North Rim	Grand Canyon National Monument
a—abundant c—common u—uncommon										
r—rare [?]-hypothetical *—specimen										
GREBES						SHORE BIRDS				
Eared Grebe *		r				Killdeer *	u	u		u
Western Grebe					r	Common Snipe *	u		r	
Pied-billed Grebe *		r	r			Long-billed Curlew	r	r		r
PELICANS AND CORMORANTS						Spotted Sandpiper *	u	u	u	
Double-crested Cormorant			r			Solitary Sandpiper *	u	u	u	
						Greater Yellowlegs	r			
HERONS AND IBISES						Least Sandpiper *	r			r
Great Blue Heron		u	u	u	u	Dowitcher, sp.	r			
Common Egret					r	American Avocet		r		r
Snowy Egret		r	u			Black-necked Stilt				r
Black-crowned Night Heron			r			Wilson's Phalarope *	u			u
American Bittern		?				Northern Phalarope *	r	r	r	
Wood Ibis		r								
White-faced Ibis		r	r		r					
SWANS, GEESE AND DUCKS						GULLS AND TERNS				
Canada Goose			r	r	r	Ring-billed Gull		r	r	
Snow Goose		r	r			Sabine's Gull	r			
Mallard *		u	u	u		Tern, sp.	?			
Gadwall			?	?	?					
Pintail			r		r					
Green-winged Teal		u	u	u		DOVES AND PIGEONS				
Blue-winged Teal		r		r		Band-tailed Pigeon *	u	u	u	u
Cinnamon Teal			r	r		Mourning Dove *	c	c		c
Shoveler		r		r	r	Ground Dove	r			
Canvasback					r					
Lesser Scaup *		r			r	VULTURES, HAWKS AND EAGLES				
Bufflehead *			r			Turkey Vulture	c	c	c	c
White-winged Scoter			r			Goshawk *	u		r	
Ruddy Duck				r		Sharp-shinned Hawk *	c	c	c	
Hooded Merganser *		r	r			Cooper's Hawk *	u	u	u	u
Common Merganser *			r			Red-tailed Hawk *	c	c	c	c
Red-breasted Merganser *		r				Swainson's Hawk	u		u	
						Ferruginous Hawk	r	r	r	r
GROUSE, QUAIL AND TURKEYS						Golden Eagle *	c	u	c	c
Blue Grouse *					c	Bald Eagle	r	r	r	r
Gambel Quail					c	Marsh Hawk *	u		u	u
Turkey		c	r	c		Osprey	r			
						Prairie Falcon	u		u	
RAILS AND COOTS						Peregrine Falcon *	r	r	r	
Virginia Rail *		r	r			Pigeon Hawk *	r	r	r	
American Coot *		u	r	r		Sparrow Hawk *	c	c	c	c
						CUCKOOS AND ROADRUNNERS				
						Yellow-billed Cuckoo		r		
						Roadrunner	u	u		u

Grand Canyon Birds

KEY							
a—abundant c—common u—uncommon	r—rare [?]-hypothetical *—specimen	South Rim	Inner Canyon	North Rim	Grand Canyon National Monument		
OWLS							
Screech Owl*		u					
Flammulated Owl *		r	r	r			
Great Horned Owl *		c	c	c	c		
Pygmy Owl *		r					
Burrowing Owl		r	r		r		
Spotted Owl *		r	r				
Long-eared Owl *		r			u		
Saw-whet Owl		r					
POOR-WILLS AND NIGHTHAWKS							
Poor-will *		c	u	u			
Common Nighthawk *		c	u	u	u		
SWIFTS AND HUMMINGBIRDS							
White-throated Swift *		a	a	a	a		
Black-chinned Hummingbird *		c	c		c		
Broad-tailed Hummingbird *		c	c	c			
Rufous Hummingbird *		u		u	u		
Calliope Hummingbird							
KINGFISHERS							
Belted Kingfisher *		u	c	u			
WOODPECKERS							
Yellow-shafted Flicker *		r					
Red-shafted Flicker *		a	r	a			
Pileated Woodpecker				r			
Acorn Woodpecker		u					
Lewis' Woodpecker *		c			u		
Yellow-bellied Sapsucker *		u	u				
Williamson's Sapsucker *		u		a			
Hairy Woodpecker *		c	r	c			
Downy Woodpecker		u	u	u			
Ladder-backed Woodpecker*		u					
Northern Three-toed Woodpecker*				u			
SILKY FLYCATCHERS							
Phainopepla		r	u		u		
SHRIKES AND STARLINGS							
Loggerhead Shrike*		u		u	c		
Starling			r		u		
VIREOS							
Bell's Vireo			r		r		
Gray Vireo		u					
Solitary Vireo*		u	u				
Red-eyed Vireo*			r				
Warbling Vireo*		u		c			
THRUSHES, BLUEBIRDS AND SOLITAIRES							
Robin *		a	u	a	a		
Hermit Thrush*		u	r	a			
Western Bluebird*		a	u	u	a		
Mountain Bluebird*		c	r	c	c		
Townsend's Solitaire*		c	u	c			
GNATCATCHERS AND KINGLETS							
Blue-gray Gnatcatcher*		c	a	u	c		
Golden-crowned Kinglet*		r	r	u	r		
Ruby-crowned Kinglet*		c	c	c			
PIPITS AND WAXWINGS							
Water Pipit*		r					
Bohemian Waxwing		r					
Cedar Waxwing*		u	r				
FLYCATCHERS							
Eastern Kingbird			r				
Western Kingbird *		c	u	u	c		
Cassin's Kingbird *		u	u	u			
Ash-throated Flycatcher*		c	c	u	c		
Black Phoebe*			c	r	r		
Say's Phoebe*		c	a	r	c		
Traill's Flycatcher*		r	r				
Hammond's Flycatcher*		r		r			
Dusky Flycatcher*			r				
Gray Flycatcher*		c	r				
Western Wood Pewee*		c		a			
Olive-sided Flycatcher*		u	u	c			
Vermilion Flycatcher			r				
LARKS							
Horned Lark*		u	u	u	c		
SWALLOWS							
Violet-green Swallow*		a	a	a			
Tree Swallow			r	r			
Bank Swallow			?				
Rough-winged Swallow		u	r	r			
Barn Swallow		r	r				
(Cliff Swallow		?					
Purple Martin*		u			r		
JAYS, MAGPIES AND RAVENS							
Steller's Jay*		a	u	a			
Scrub Jay*		c	c	u			
Black-billed Magpie				r			
Common Raven*		a	a	a	a		
Common Crow*		r					
Pinon Jay*		c	c	c	c		
Clark's Nutcracker*		u	r	c			

Grand Canyon Birds

KEY								
a—abundant c—common u—uncommon r—rare [?]-hypothetical *—specimen	South Rim	Inner Canyon	North Rim	Grand Canyon National Monument	South Rim	Inner Canyon	North Rim	Grand Canyon National Monument
WARBLERS								
Orange-crowned Warbler*	u		r					
Nashville Warbler*	u	r	r					
Virginia's Warbler*	u	r	u					
Lucy's Warbler	c	r						
Yellow Warbler*	c	c	r	u				
Audubon's Warbler*	a	u	a	c				
Black-throated Gray Warbler*	c	r	u					
Townsend's Warbler	r		r					
Black-throated Green Warbler*				r				
Hermit Warbler*	r		r					
Grace's Warbler	u	?	u					
Northern Waterthrush*	r	r						
MacGillivray's Warbler	u	r	u					
Yellowthroat*		u	r	r				
Yellow-breasted Chat*		c						
Wilson's Warbler*	u	u	u					
Painted Redstart		r						
WEAVER FINCHES								
House Sparrow	c	r		u				
MEADOWLARKS, BLACKBIRDS AND ORIOLES								
Eastern Meadowlark	?							
Meadowlark, sp.	u	r	r	c				
Yellow-headed Blackbird	u	r	u	u				
Red-winged Blackbird*	r	c	r	c				
Scott's Oriole				c				
Bullock's Oriole*	u	r		r				
Brewer's Blackbird*	u	u	u	c				
Brown-headed Cowbird*	c		u	c				
CHICKADEES AND TITMICE								
Black-capped Chickadee	?		?					
Mountain Chickadee*	a	r	a					
Plain Titmouse*	c	r	r					
Verdin		?						
Common Bushtit*	c	r	c					
NUTHATCHES AND CREEPERS								
White-breasted Nuthatch*	a	u	a	u				
Red-breasted Nuthatch*	c	r	c					
Pygmy Nuthatch*	a	r	a					
Brown Creeper*	c		c					
THRASHERS								
Mockingbird	u	u	u	c				
Sage Thrasher*	r	r		r				
GROSBEAKS, FINCHES AND SPARROWS								
Rose-breasted Grosbeak*	r	r						
Black-headed Grosbeak*	c	u	c					
Blue Grosbeak*		r						
Indigo Bunting	u	c	u	u				
Lazuli Bunting*		r						
Dickcissel*	c		c					
Evening Grosbeak*	u							
Purple Finch*	a	u	c					
Cassin's Finch*	u	u	u	c				
House Finch*	u		u	u				
Pine Grosbeak*	r			u	u			
Black Rosy Finch*	c	r	c					
Pine Siskin*		r						
American Goldfinch	u	r	u	u				
Lesser Goldfinch*	c		u					
Red Crossbill*	c	c	c					
Green-tailed Towhee*	c	c	c					
Rufous-sided Towhee*	r		r					
Brown Towhee	r							
Lark Bunting	r	r						
Savannah Sparrow*	?							
Grasshopper Sparrow*	u	u	u	u				
Vesper Sparrow*	c	c	c	c				
Lark Sparrow*	u	a	r	a				
Rufous-crowned Sparrow*	r	r						
Black-throated Sparrow*	u	r	u	r				
Sage Sparrow*	c	c	u	c				
Slated-colored Junco*	a	c	a					
Oregon Junco*		r						
Gray-headed Junco*	a	r	a					
Tree Sparrow	u	r	u					
Chipping Sparrow*	r	r		r				
Brewer's Sparrow*	c	c	r	c				
White-crowned Sparrow*	r	r						
Fox Sparrow	u	u	u					
Lincoln's Sparrow*	c	c	c					
Song Sparrow*								
WRENS								
House Wren*	u	r	u					
Winter Wren	r							
Bewick's Wren*	r	r		r				
Long-billed Marsh Wren*		r						
Cañon Wren*		a		a				
Rock Wren*	c	c	c	c				
TANAGERS								
Western Tanager*	c	u	c	u				
Hepatic Tanager	r							
DIPPERS								
Dipper*		c						

surrounding plateaus. Seventy-five to 80 species of mammals, 225 varieties of birds, and 41 species of amphibians and reptiles have been recorded from the Grand Canyon Complex. Bird and mammal species and abundance are given on pages 51-53 and 55-58.

Sixteen species of fish have been recorded from the Colorado River and its tributaries within the Grand Canyon Complex. However, the available data indicate that the main channel of Marble and Grand Canyons is unfavorable fish habitat. The volume and swiftness of the river, plus the shortened period of sunlight due to the high walls, in conjunction with the cold water being discharged from Glen Canyon Dam, keep the river cold throughout most of the canyon. No major tributaries effectively ameliorate the low temperature of the waters, and spawning temperatures for the native fishes are not met. Daily changes in river level preclude the availability of warm, rich backwaters for juvenile fish and reduce the number of aquatic life forms that would normally make up a food base for the fish. To an aquatic biologist, the river through the Grand Canyon Complex is a very sterile environment. The rare humpback chub and the Colorado River squawfish are not reproducing successfully and will disappear from the river within the Complex as the present adult population dies. It is very likely that only those native species, such as speckled dace, bluehead, and flannelmouth sucker, which are adapted to tributary streams, will survive.

The variety of physical habitats within the Grand Canyon Complex, interacting with the plants and animals that have come to live in them, have produced definite and characteristic assemblages of plants and animals called biotic communities. Each of these communities, with its distinctive floral and faunal makeup, gives diversity and life to the landscape and illustrates variations in lifeforms in response to differing physical environments. These communities are best defined and delimited by their plant species as many of the animals can occupy more than one plant association. The biotic communities are thus not exclusive and many of the plants and animals that characterize a community merely reach their greatest abundance there.

Many physical factors are involved in delimiting such biotic communities: temperature, precipitation, slope exposure, rock and soil types, elevation, and humidity are just a few. Although all of the plant communities except for the spruce-fir and mountain grassland are duplicated north and south of the Colorado River, there is much isolation caused by the river and the Inner Canyon.

The riparian community along the Colorado River and its major tributaries is characterized by such plants as cottonwood, willow, desert willow and the exotic tamarix. Some of the mammals which can be expected within the riparian community and in the desert scrub community of the Inner Canyon are the spotted skunk, ringtail, rock pocket mouse, long-tailed pocket mouse, raccoon, beaver, Yuma myotis and perhaps even the rare river otter. Rising from the riparian community along the

GRAND CANYON MAMMALS

SHREWS

- Merriam's Shrew (*Sorex merriami*)
Arid areas of sagebrush or bunchgrass above 7,000 ft.; both rims;
- Dwarf Shrew (*Sorex nanus*)
Meadow, Coniferous Forest; North Rim above 8,000 ft.; rare.
- Desert or Gray Shrew (*Notiosorex crawfordi*)
Shrub Desert, Evergreen Woodland; South Rim, in Canyon;
-

BATS

- California Myotis (*Myotis californicus*)
Chiefly a crevice dweller; common in Park and Monument; nocturnal.
- Long-eared Myotis (*Myotis evotis*)
Thin forests, buildings, occasionally caves; South Rim; nocturnal; uncommon.
- Small-footed Myotis (*Myotis subulatus*)
Caves, crevices near forested areas; South Rim; nocturnal; uncommon.
- Long-legged Myotis (*Myotis volans*)
Buildings, crevices; South Rim; nocturnal; uncommon.
- Silver-haired Bat (*Lasionycteris noctivagans*)
Solitary, tree-dwelling bat; South Rim; nocturnal; uncommon.
- Western Pipistrelle (*Pipistrellus hesperus*)
Caves, crevices, buildings near watercourses; common in Canyon; nocturnal.
- Big Brown Bat (*Eptesicus fuscus*)
Caves, crevices, buildings near wooded areas; common on both rims; nocturnal.
- Red Bat (*Lasiurus borealis*)
Solitary tree-bat; uncommon in Canyon; nocturnal.
- Hoary Bat (*Lasiurus cinereus*)
Solitary tree bat; uncommon in Canyon; nocturnal.
- Lump-nosed Bat (*Plecotus townsendii*)
Caves, buildings; common on South Rim and in Canyon; nocturnal.
- Pallid Bat (*Antrozous pallidus*)
Caves, crevices, buildings, trees; common in Park and Monument; nocturnal.
-

BEARS

- Black Bear (*Euarctos americanus*)
Coniferous Forest, Evergreen Woodland; uncommon on South Rim, rare on North Rim.
-

RACCOON and RINGTAIL

- Raccoon (*Procyon lotor*)
Riparian; in Park and Monument except North Rim; nocturnal.
- Ringtail (*Bassariscus astutus*)
Shrub Desert, near water, rocky areas; uncommon in Park and Monument; nocturnal.
-

GRAND CANYON MAMMALS

COYOTES and FOXES

- Coyote (*Canis latrans*)
Abundant in Park and Monument; nocturnal-diurnal.
- Gray Fox (*Urocyon cinereoargenteus*)
Shrub Desert, open forest; common on both rims and in Monument; . . . in Canyon; nocturnal-diurnal.
-

CATS

- Mountain Lion (*Felis concolor*)
Rugged mountains and forests; uncommon in Park and Monument, nocturnal-diurnal.
- Bobcat (*Lynx rufus*)
Shrub Desert, rimrock; common in Park and Monument; nocturnal.
-

SQUIRRELS, GROUND SQUIRRELS, CHIPMUNKS, PRAIRIE DOGS

- Whitetail or Gunnison's Prairie Dog
(*Cynomys gunnisoni*)
Shrub Desert, Grassland, Evergreen Woodland; rare on South Rim; diurnal.
- Golden-mantled Ground Squirrel (*Citellus lateralis*)
Coniferous Forest; common on North Rim; diurnal.
- White-tailed Antelope Squirrel (*Citellus leucurus*)
Shrub Desert; uncommon in Canyon, common in Monument; diurnal.
- Rock Squirrel (*Citellus variegatus*)
Rocky areas; common in Park and Monument; diurnal.
- Cliff Chipmunk (*Eutamias dorsalis*)
Evergreen Woodland. common on both rims and in Canyon; Monument . . . diurnal.
- Least Chipmunk (*Eutamias minimus*)
Evergreen Woodland, Coniferous Forest; common on North Rim; diurnal.
- Uinta Chipmunk (*Eutamias umbrinus*)
Coniferous Forest, rocky areas; common on North Rim; diurnal.
- Abert Squirrel (*Sciurus aberti*)
Coniferous Forest (Ponderosa Pine); common on South Rim; diurnal.
- Kaibab Squirrel (*Sciurus kaibabensis*)
Coniferous Forest (Ponderosa Pine); common on North Rim; diurnal. Considered a separate species from Abert Squirrel by Hall and Kelson.
- Red or Spruce Squirrel (*Tamiasciurus hudsonicus*)
Coniferous Forest; common on North Rim; diurnal.
-

PORCUPINES

- Porcupine (*Erethizon dorsatum*)
Evergreen Woodland, Coniferous Forest; common on both rims; diurnal.

GRAND CANYON MAMMALS

WEASEL, BADGER, OTTER, SKUNKS

Long-tailed Weasel (*Mustela frenata*)

All land habitats near water; uncommon on South Rim, common on North Rim; nocturnal-diurnal.

River Otter (*Lutra canadensis*)

Riparian; uncommon in Canyon; diurnal.

Badger (*Taxidea taxus*)

Open grassland, desert; uncommon in Park, common in Monument; nocturnal-diurnal.

Spotted Skunk (*Spilogale putorius*)

Brushy or wooded habitat; common on South Rim, Monument and in Canyon; North Rim nocturnal.

Striped Skunk (*Mephitis mephitis*)

Semi-open country near water; common on South Rim, in Canyon nocturnal.

POCKET GOPHERS

Valley Pocket Gopher (*Thomomys bottae*)

Meadows, valleys, rocky areas; common on both rims; nocturnal-diurnal.

Northern Pocket Gopher (*Thomomys talpoides*)

Meadow, Coniferous Forest; common on North Rim; nocturnal-diurnal.

HARES and RABBITS

Blacktailed Jack Rabbit (*Lepus californicus*)

Shrub Desert, Evergreen Woodland, Grassland; uncommon on both rims.

Desert Cottontail (*Sylvilagus audubonii*)

Shrub Desert, Evergreen Woodland; common on South Rim.

Mountain or Nuttall's Cottontail (*Sylvilagus nuttallii*)

Coniferous Forest, Evergreen Woodland, Shrub Desert; common on both rims and Monument.

DEER, ANTELOPE, ELK BIGHORN SHEEP and BURRO

Elk or Wapiti (*Cervus canadensis*)

Meadow, Coniferous Forest; rare on South Rim; nocturnal-diurnal.

Mule Deer (*Odocoileus hemionus*)

Shrub Desert, Coniferous Forest, Evergreen Woodland; abundant in Park and Monument; nocturnal-diurnal.

Prong-horned Antelope (*Antilocapra americana*)

Open prairies, sagebrush; uncommon South Rim and Monument.

Desert Bighorn Sheep (*Ovis canadensis*)

Rugged, rocky terrain; uncommon in Canyon; diurnal.

Barro (*Equus asinus*)

Shrub Desert, Evergreen Woodland; common in Canyon; not a native.

BEAVER

Beaver (*Castor canadensis*)

Riparian; uncommon in Canyon; nocturnal.

GRAND CANYON MAMMALS

POCKET MICE and KANGAROO RATS

- Rock Pocket Mouse (*Perognathus intermedius*)
Rocky areas, sparse vegetation; common in Canyon;
nocturnal.
- Great Basin Pocket Mouse (*Perognathus parvus*)
Shrub Desert, Evergreen Woodland, Coniferous Forest;
Monument nocturnal.
- Merriam's Kangaroo Rat (*Dipodomys merriami*)
Shrub Desert, rocky areas; Monument nocturnal.
- Ord's Kangaroo Rat (*Dipodomys ordii*)
Sandy soil; uncommon on South Rim, Monument
nocturnal.

MICE, RATS and VOLES

- Western Harvest Mouse (*Reithrodontomys megalotis*)
South Rim and in Canyon nocturnal.
- Brush Mouse (*Peromyscus boylii*)
Rocky and arid areas; common in Park; nocturnal.
- Canyon Mouse (*Peromyscus crinitus*)
Rocky areas; in Canyon and on North Rim ; nocturnal.
- Cactus Mouse (*Peromyscus eremicus*)
Shrub Desert, rocky areas; abundant in Canyon; noc-
turnal.
- Deer Mouse (*Peromyscus maniculatus*)
Arid areas; abundant on both rims; nocturnal.
- Pinyon Mouse (*Peromyscus truei*)
Rocky areas, Evergreen Woodland; uncommon on both
rims; nocturnal.
- Northern Grasshopper Mouse
(*Onychomys leucogaster*)
South Rim nocturnal.
- White-throated Wood Rat (*Neotoma albigula*)
Rocky areas, brushland; common on South Rim and in
Canyon; nocturnal.
- Bushy-tailed Wood Rat (*Neotoma cinerea*)
Mountains, rocky areas, Coniferous Forest; common on
North Rim and in Canyon; nocturnal.
- Desert Wood Rat (*Neotoma lepida*)
Shrub Desert; common in Canyon and Monument; noc-
turnal.
- Mexican Wood Rat (*Neotoma mexicana*)
Rocky areas; common on South Rim and in Canyon;
nocturnal.
- Stephen's Wood Rat (*Neotoma stephensi*)
Common on South Rim; nocturnal.
- Longtailed Vole (*Microtus longicaudus*)
Riparian, meadows; common on North Rim; nocturnal-
diurnal.
- Mexican Vole (*Microtus mexicanus*)
Meadows, Coniferous Forest; common on South Rim and
in Canyon; nocturnal-diurnal.
- House Mouse (*Mus musculus*)
Not a native; around buildings; uncommon on South Rim.
-

river is the desert scrub community of the Inner Gorge. Its plants are characteristically catclaw, mesquite, saltbush, krameria and a few tenacious clumps of various cacti and grasses.

Above the Inner Gorge in the eastern and central portions of Grand Canyon National Park there is a bench or platform called the Tonto Plateau. This area contains the flattest continuum within this section of the canyon, extends along both sides of the river above the Inner Gorge and is a mile wide in some places. The Tonto Plateau is predominantly below an elevation of 4,500 feet and is cut by numerous canyons leading to the Inner Gorge. The predominant plant of this community is blackbrush. Other common plants are desert thorn, burro-brush, bursage, agave, and narrowleaf yucca. Some mammals commonly found within the desert scrub community of the Tonto Plateau are: white-tailed antelope squirrel, cliff chipmunk, canyon mouse, cactus mouse, desert wood rat, white-throated wood rat, Ord's kangaroo rat, desert shrew, silky pocket mouse, ringtail, spotted skunk, rock squirrel, spotted ground squirrel, Gunnison's prairie dog, black-tailed jackrabbit, grasshopper mouse, bighorn, and the exotic burro.

A woodland that consists primarily of pinyon and juniper trees occurs along each rim above the canyon walls and on some of the buttes and ridges within the canyon. This pinyon-juniper association forms a belt between desert scrub of the Inner Canyon and the yellow pine woodland on the rims. The pinyon-juniper community receives less water and warmer weather than the yellow pine woodland. Some plants of this community are pinyon, Utah juniper, cliff rose, broadleaf yucca, serviceberry, rabbit brush, ephedra, and blue grama. Typical mammals to be found in the pinyon-juniper association are pinyon mouse, Stephen's wood rat, desert cottontail, mountain lion, bobcat, rock squirrel, cliff chipmunk, gray fox and mule deer.

The yellow or ponderosa pine association is more extensive on the North Rim than it is on the South Rim. On the North Rim of the canyon this community is usually found between an elevation of 7,200 to 8,200 feet, and on the South Rim between 7,000 and 7,400 feet. The yellow pine forest is usually open and grasses are present. Rainfall is more than 20 inches annually and the mean temperature during the growing season is about 60°F. Yellow pines occur as an isolated stand on Shiva Temple within the canyon and in a nearly isolated state on Powell Plateau. The yellow pine forest is small within the boundaries of the park on the South Rim but extensive stands exist within the national forest contiguous with the park boundary. Some typical plants in this community are: yellow (ponderosa) pine, Gambel oak, locust, mountain mahogany, blue elderberry, creeping mahonia, and fescue. Mammals common to the yellow pine forest are the Abert squirrel on the South Rim and the Kaibab squirrel on the North Rim, Merriam's shrew, striped skunk, Uinta chipmunk, golden-mantled ground squirrel, Mexican wood rat, bushy-tailed wood rat, Mexican vole, porcupine, Nuttall's cottontail, mountain lion, bobcat, deer mouse, and mule deer.

The spruce-fir forest with an intermixing of aspens occurs on the North Rim and continues northward onto the Kaibab Plateau. It occurs mostly above an elevation of 8,200 feet and is an area of heavy snowfall, cold winters and a growing season of about three months. This area is isolated from other spruce-fir forests. The canopy of the spruce-fir forest is closed and there is little growth of herbs and grasses with an increased growth of mosses and lichens. Typical plants in this community are Englemann spruce, blue spruce, Douglas fir, white fir, aspen and mountain ash. Some mammals found in the spruce-fir community of the North Rim are: red squirrel, northern pocket gopher, dwarf shrew, long-eared myotis, long-tailed vole, porcupine, and Uinta chipmunk.

Grasses slow the surface runoff of precipitation, retard soil erosion, help maintain soil porosity and provide food for domestic animals and wildlife. Their surface growth is readily consumed by natural or man-caused ground fires, but their root systems usually remain viable and produce surface growth the following season. Elimination of fire from an area may actually cause a reduction in both the kind and amount of grasses capable of reproducing there. Grasses are the chief plants utilized for range rehabilitation and revegetation projects.

Grasses are widely distributed within the Grand Canyon Complex and are especially noticeable in the meadows of the North Rim. Both native and domestic grasses are found within the Complex as can be seen in the following list of genera:

<u>Agropyron</u>	Wheatgrass	<u>Hordeum</u>	Barley
<u>Agrostis</u>	Bentgrass	<u>Imperata</u>	Satintail
<u>Alopecurus</u>	Foxtail	<u>Koeleria</u>	Junegrass
<u>Andropogon</u>	Bluestem	<u>Lolium</u>	Ryegrass
<u>Aristida</u>	Threeawn	<u>Lycurus</u>	Wolftail
<u>Avena</u>	Wild Oats	<u>Muhlenbergia</u>	Muhly
<u>Beckmannia</u>	Sloughgrass	<u>Munroa</u>	Buffalograss
<u>Blepharoneuron</u>	Pinè Dropseed	<u>Oryzopsis</u>	Ricegrass
<u>Bouteloua</u>	Grama	<u>Panicum</u>	Witchgrass
<u>Bromus</u>	Brome	<u>Phleum</u>	Timothy
<u>Calamagrostis</u>	Reedgrass	<u>Poa</u>	Bluegrass
<u>Cenchrus</u>	Sandbur	<u>Polypogon</u>	Polypogon
<u>Cynodon</u>	Bermudagrass	<u>Phragmites</u>	Reed
<u>Danthonia</u>	Oatgrass	<u>Secale</u>	Rye
<u>Dactylis</u>	Orchardgrass	<u>Schleropogon</u>	Burrograss
<u>Deschampsia</u>	Hairgrass	<u>Setaria</u>	Bristlegrass
<u>Echinochola</u>	Barnyardgrass	<u>Sitanion</u>	Squirreltail
<u>Elymus</u>	Wildrye	<u>Sporobolus</u>	Dropseed
<u>Eragrostis</u>	Lovegrass	<u>Stipa</u>	Needlegrass
<u>Festuca</u>	Fescue	<u>Trichachne</u>	Cottontop
<u>Glyceria</u>	Mannagrass	<u>Tridens</u>	Tridens
<u>Heteropogon</u>	Tanglehead		

Meadows or mountain grasslands are present in limited numbers on the North Rim. They appear as open, shallow valleys, free of trees, with a large variety of grasses and forbs that are surrounded by spruce, fir and aspen. Soil moisture is high in the meadows from the melting of heavy snow cover. Some of the plants in the mountain grassland community are mountain muhly, blue grama, black dropseed, squirreltail and pine dropseed. Some of the resident mammals are the long-tailed vole, northern pocket gopher, long-tailed weasel, least chipmunk and Uinta chipmunk. Members of one of the largest deer herds in the United States can often be observed browsing at the edges of these meadows. Several of these meadows have been damaged by being cut by primitive roads.

No accurate vegetational maps have been prepared for the Grand Canyon Complex and little work has been done on the areal extent of vegetation types within the two national monuments. The following vegetational data is only for Grand Canyon National Park.

VEGETATION TYPE	AREAL EXTENT IN ACRES	
	Sub-Types	Types
Sagebrush: Areas on which sage (<u>Artemisia</u> sp.) is dominant to the exclusion of tree species.		
<u>Artemisia tridentata</u> , <u>Atriplex canescens</u> , <u>Cowania stansburiana</u> , <u>Amelanchier utahensis</u> , <u>Ephedra viridis</u> .	37,810	
Semi-barren	6,879	
		44,689
Sonoran Chaparral: Areas on which 80 percent of the vegetative cover consists of chaparral species characteristic of the Sonoran Life Zone and which are not capable of producing commercial stands of timber.		
Browsing species:		
<u>Amelanchier utahensis</u> , <u>Quercus gambellii</u> , <u>Atriplex canescens</u> , <u>Cowania stansburiana</u> , <u>Artemisia tridentata</u> , <u>Ptelea pallida</u> , <u>Shepherdia rotundifolia</u> , <u>Ephedra viridis</u> , <u>Quercus turbinella</u> , <u>Arctostaphylos pungens</u> , <u>Garrya flavescens</u> , <u>Cercocarpus ledifolius</u> .	15,504	
Semi-barren	11,397	
Non-browsing species:		
<u>Ribes inerme</u> , <u>Forsellesia nevadensis</u> ,		

Cercocarpus intricatus, Yucca sp., Robinia neomexicana, Gutierrezia sarothrae, Fallugia paradoxa, Rhus trilobata, Coleogyne ramosissima, Opuntia sp., Acacia greggii, Quercus undulata, Solidago sp.

35,076

Semi-barren

13,583

75,560

Timberland Chaparral: Areas on which 80 percent of the vegetative cover consists of chaparral species characteristic of the Transition Life Zone or on which commercial stands of timber could be grown.

Browsing species:

Quercus gambellii, Amelanchier utahensis, Artemisia tridentata, Ephedra viridis, Quercus turbinella, Shepherdia rotundifolia, Symphoricarpos parishii, Acer glabrum, Cowania stansburiana, Symphoricarpos oreophilus, Arctostaphylos pungens.

13,006

Semi-barren

738

Non-browsing species:

Quercus undulata, Garrya flavescens, Acer grandidentata, Robinia neomexicana, Holodiscus dumosus, Rhus trilobata, Ptelea pallida, Cercocarpus intricatus.

12,499

Semi-barren

216

26,459

Semi-Desert Chaparral: Similar in species composition to the chaparral type but differing from it by being characteristically open. This type usually occupies slopes either bordering the desert, or within the range of desert climatic influence.

Browsing species:

Ephedra viridis, Grass.

3,375

Non-browsing species:

Coleogyne ramosissima, Opuntia sp., Yucca baccata, Yucca sp., Fallugia paradoxa, Rhus trilobata, Quercus turbinella, Acacia greggii, Gutierrezia sarothrae.

91,126

Semi-barren

31,120

125,621

Woodland-Chaparral: Areas on which 80 percent or more of both broadleaf trees and chaparral

species are present, each being present to at least 20 percent of the entire type.

451

Woodland: Areas consisting of 80 percent or more of broadleaf tree species.

4,218

Pinon-Juniper: Areas on which 20 percent or more of pinon pines or junipers are present, to the exclusion of commercial tree species.

Browsing species:

Pinus edulis, Juniperus osteosperma, Artemisia tridentata, Cowania stansburiana, Arctostaphylos pungens, Quercus turbinella, Shepherdia rotundifolia, Quercus gambellii, Amelanchier utahensis, Garrya flavescens, Atriplex canescens, Acer grandidentata, Cercocarpus montanus, Ephedra viridis, Ptelea pallida, Grass.

64,648

Semi-barren

4,924

Non-browsing species:

Pinus edulis, Juniperus osteosperma, Quercus turbinella, Coleogyne ramosissima, Fallugia paradoxa, Acacia greggii, Rhus trilobata, Quercus undulata, Cercocarpus ledifolius, Cercocarpus intricatus, Ceanothus greggii, Forsellesia nevadensis, Ribes cerum.

80,859

Semi-barren

3,914

154,345

Douglas Fir: Areas on which there is a dominance of Douglas fir to the exclusion of commercial pines.

Pseudotsuga taxifolia

401

Fir-Douglas Fir: Areas on which Abies sp., and Pseudotsuga taxifolia each occupy at least 20 percent of the stand of coniferous trees to the exclusion of Pinus ponderosa.

1,305

Abies concolor, Pseudotsuga taxifolia, Pinus edulis, Juniperus osteosperma.

37

Pseudotsuga taxifolia, Pinus edulis, Juniperus osteosperma.

37

Abies concolor, Pseudotsuga taxifolia, Abies lasiocarpa, Picea pungens, Populus tremuloides.

23

Abies lasiocarpa, Pseudotsuga taxifolia, Picea pungens, Populus tremuloides.

42

<u>Abies concolor</u> , <u>Pseudotsuga taxifolia</u> , <u>Populus tremuloides</u> .	198
<u>Abies concolor</u> , <u>Pseudotsuga taxifolia</u> , <u>Holodiscus dumosus</u> .	18
<u>Abies concolor</u> , <u>Pseudotsuga taxifolia</u> , <u>Quercus gambellii</u> .	37
<u>Abies concolor</u> , <u>Pseudotsuga taxifolia</u> , <u>Amelanchier utahensis</u> .	14
<u>Abies concolor</u> , <u>Pseudotsuga taxifolia</u> , <u>Robinia neomexicana</u> , <u>Quercus gambellii</u> , <u>Acer grandidentata</u> .	23
<u>Abies concolor</u> , <u>Pseudotsuga taxifolia</u> , <u>Pinus edulis</u> , <u>Juniperus osteosperma</u> , <u>Amelanchier utahensis</u> , <u>Arctostaphylos pungens</u> .	18
<u>Abies concolor</u> , <u>Pseudotsuga taxifolia</u> , <u>Picea pungens</u> .	5
<u>Abies lasiocarpa</u> , <u>Pseudotsuga taxifolia</u> , <u>Picea pungens</u> .	4
	1,761

Ponderosa Pine: Areas on which Pinus ponderosa occurs to the extent of 20 percent or more, to the exclusion of true firs and Douglas firs.

<u>Pinus ponderosa</u> .	19,272
<u>Pinus ponderosa</u> , <u>Populus tremuloides</u> .	10,244
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> (shrub).	11,111
<u>Pinus ponderosa</u> , <u>Pseudotsuga taxifolia</u> , <u>Populus tremuloides</u> .	92
<u>Pinus ponderosa</u> , <u>Picea pungens</u> , <u>Populus tremuloides</u> .	1,540
<u>Pinus ponderosa</u> , <u>Picea pungens</u> .	42
<u>Pinus ponderosa</u> , <u>Pseudotsuga taxifolia</u> , <u>Picea pungens</u> , <u>Populus tremuloides</u> .	111
<u>Pinus ponderosa</u> , <u>Populus tremuloides</u> , Grass.	267

<u>Pinus ponderosa</u> , <u>Pseudotsuga taxifolia</u> , <u>Quercus gambellii</u> .	64
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> , <u>Robinia</u> <u>neomexicana</u> .	668
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> , <u>Amelanchier</u> <u>utahensis</u> .	14
<u>Pinus ponderosa</u> , <u>Arctostaphylos pungens</u> .	369
<u>Pinus ponderosa</u> , Grass.	281
<u>Pinus ponderosa</u> , <u>Picea pungens</u> , <u>Populus</u> <u>tremuloides</u> , Grass.	32
<u>Pinus ponderosa</u> , <u>Pteridium aquilinum</u> , Grass.	5
<u>Pinus ponderosa</u> , <u>Picea engelmanni</u> , <u>Pseudotsuga taxifolia</u> , <u>Picea pungens</u> .	23
<u>Pinus ponderosa</u> , <u>Picea engelmanni</u> , <u>Populus</u> <u>tremuloides</u> .	23
<u>Pinus ponderosa</u> , <u>Picea engelmanni</u> , <u>Picea</u> <u>pungens</u> , <u>Populus tremuloides</u> .	120
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> , <u>Robinia</u> <u>neomexicana</u> , <u>Amelanchier utahensis</u> .	18
<u>Pinus ponderosa</u> , <u>Populus tremuloides</u> , <u>Quercus</u> <u>gambellii</u> , <u>Robinia neomexicana</u> .	14
<u>Pinus ponderosa</u> , <u>Robinia neomexicana</u> .	198
<u>Pinus ponderosa</u> , <u>Populus tremuloides</u> , <u>Robinia neomexicana</u> .	55
<u>Pinus ponderosa</u> , <u>Populus tremuloides</u> , <u>Quercus gambellii</u> .	23
<u>Pinus ponderosa</u> , <u>Pinus edulis</u> , <u>Juniperus</u> <u>osteosperma</u> .	7,372
<u>Pinus ponderosa</u> , <u>Cowania stansburiana</u> .	28
<u>Pinus ponderosa</u> , <u>Cowania stansburiana</u> , Grass.	42
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> , <u>Cowania</u> <u>stansburiana</u> , Grass.	23

<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> , <u>Cercocarpus ledifolius</u> .	46
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> , Grass.	64
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> , <u>Cowania stansburiana</u> .	1,568
<u>Pinus ponderosa</u> , <u>Artemisia tridentata</u> , <u>Cowania stansburiana</u> .	28
<u>Pinus ponderosa</u> , <u>Pinus edulis</u> , <u>Juniperus osteosperma</u> , <u>Cowania stansburiana</u> .	286
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> , <u>Artemisia tridentata</u> .	1,706
<u>Pinus ponderosa</u> , <u>Artemisia tridentata</u> .	1,489
<u>Pinus ponderosa</u> , <u>Pinus edulis</u> , <u>Juniperus osteosperma</u> , <u>Quercus gambellii</u> , <u>Artemisia tridentata</u> .	309
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> , <u>Artemisia tridentata</u> , <u>Cowania stansburiana</u> .	18
<u>Pinus ponderosa</u> , <u>Pinus edulis</u> , <u>Juniperus osteosperma</u> , <u>Quercus gambellii</u> .	217
<u>Pinus ponderosa</u> , <u>Quercus gambellii</u> (tree form).	69

57,851

Pine-Fir-Douglas Fir: Areas on which Pinus ponderosa, Douglas fir and Abies sp. each occur to the extent of 20 percent or more of the stand of coniferous tree species.

<u>Pinus ponderosa</u> , <u>Pseudotsuga taxifolia</u> , <u>Abies concolor</u> .	4,214
<u>Pinus ponderosa</u> , <u>Pseudotsuga taxifolia</u> , <u>Abies concolor</u> , <u>Quercus gambellii</u> .	438
<u>Pinus ponderosa</u> , <u>Pseudotsuga taxifolia</u> , <u>Abies concolor</u> , <u>Pinus edulis</u> , <u>Juniperus osteosperma</u> .	55
<u>Pinus ponderosa</u> , <u>Abies concolor</u> , <u>Populus tremuloides</u> .	7,815

<u>Pinus ponderosa</u> , <u>Pseudotsuga taxifolia</u> , <u>Abies concolor</u> , <u>Populus tremuloides</u> .	8,497
<u>Pinus ponderosa</u> , <u>Abies concolor</u> .	396
<u>Pinus ponderosa</u> , <u>Abies lasiocarpa</u> , <u>Picea</u> <u>pungens</u> , <u>Populus tremuloides</u> .	212
<u>Pinus ponderosa</u> , <u>Abies lasiocarpa</u> , <u>Populus</u> <u>tremuloides</u> .	9
<u>Pinus ponderosa</u> , <u>Picea pungens</u> , <u>Abies</u> <u>lasiocarpa</u> .	18
<u>Pinus ponderosa</u> , <u>Picea pungens</u> , <u>Abies concolor</u> , <u>Abies lasiocarpa</u> , <u>Populus tremuloides</u> .	64
<u>Pinus ponderosa</u> , <u>Pseudotsuga taxifolia</u> , <u>Abies</u> <u>concolor</u> , <u>Picea pungens</u> , <u>Populus tremuloides</u> .	120
<u>Pinus ponderosa</u> , <u>Picea engelmannii</u> , <u>Picea</u> <u>pungens</u> , <u>Pseudotsuga taxifolia</u> , <u>Abies concolor</u> .	101
<u>Pinus ponderosa</u> , <u>Picea pungens</u> , <u>Abies concolor</u> , <u>Pseudotsuga taxifolia</u> .	55
<u>Pinus ponderosa</u> , <u>Picea engelmannii</u> , <u>Pseudotsuga</u> <u>taxifolia</u> , <u>Abies concolor</u> .	217
<u>Pinus ponderosa</u> , <u>Picea engelmannii</u> , <u>Picea pungens</u> , <u>Abies concolor</u> , <u>Populus tremuloides</u> .	23
<u>Pinus ponderosa</u> , <u>Abies concolor</u> , <u>Pseudotsuga</u> <u>taxifolia</u> , <u>Amelanchier utahensis</u> .	37
<u>Pinus ponderosa</u> , <u>Picea pungens</u> , <u>Abies concolor</u> , <u>Populus tremuloides</u> .	166
<u>Pinus ponderosa</u> , <u>Abies concolor</u> , <u>Pseudotsuga</u> <u>taxifolia</u> , <u>Quercus gambellii</u> , <u>Amelanchier</u> <u>utahensis</u> .	175
<u>Pinus ponderosa</u> , <u>Abies concolor</u> , <u>Populus</u> <u>tremuloides</u> , <u>Robinia neomexicana</u> .	9
<u>Pinus ponderosa</u> , <u>Abies concolor</u> , <u>Pseudotsuga</u> <u>taxifolia</u> , <u>Quercus gambellii</u> , <u>Robinia neomex-</u> <u>icana</u> .	55
<u>Pinus ponderosa</u> , <u>Abies concolor</u> , <u>Pseudotsuga</u> <u>taxifolia</u> , <u>Arctostaphylos pungens</u> .	8

22,684

Fir: Areas on which there is a dominance of Abies sp., to the exclusion of commercial pines.

<u>Abies concolor</u> , <u>Abies lasiocarpa</u> , <u>Populus tremuloides</u> .	28
<u>Abies lasiocarpa</u> , <u>Picea pungens</u> .	18
<u>Abies concolor</u> , <u>Picea pungens</u> , <u>Populus tremuloides</u> .	23
<u>Abies concolor</u> , <u>Populus tremuloides</u> .	120
<u>Abies lasiocarpa</u> , <u>Picea pungens</u> , <u>Abies concolor</u> , <u>Populus tremuloides</u> .	78
<u>Abies lasiocarpa</u> , <u>Picea pungens</u> , <u>Populus tremuloides</u> .	14
<u>Abies concolor</u> , <u>Quercus gambellii</u> , <u>Robinia neomexicana</u> .	23
<u>Abies concolor</u> .	5

309

Spruce: Areas on which spruce is the dominant tree species, to the exclusion of ponderosa pine.

<u>Picea pungens</u> , <u>Populus tremuloides</u> .	881
<u>Picea pungens</u> , <u>Populus tremuloides</u> , Grass.	148
<u>Picea pungens</u> .	9
<u>Picea pungens</u> , <u>Abies lasiocarpa</u> , <u>Populus tremuloides</u> .	443
<u>Picea pungens</u> , <u>Abies lasiocarpa</u> , <u>Pseudotsuga taxifolia</u> , <u>Populus tremuloides</u> .	60
<u>Picea pungens</u> , <u>Picea engelmannii</u> , <u>Abies lasiocarpa</u> , <u>Populus tremuloides</u> .	286
<u>Picea pungens</u> , <u>Picea engelmannii</u> , <u>Abies lasiocarpa</u> .	46
<u>Picea pungens</u> , <u>Picea engelmannii</u> , <u>Abies concolor</u> , <u>Populus tremuloides</u> .	9
<u>Picea engelmannii</u> , <u>Picea pungens</u> , <u>Populus tremuloides</u> .	37

<u>Picea engelmannii</u> , <u>Abies lasiocarpa</u> , <u>Populus tremuloides</u> .	74	
<u>Picea pungens</u> , <u>Abies lasiocarpa</u> .	9	
<u>Picea pungens</u> , <u>Abies concolor</u> , <u>Pseudotsuga taxifolia</u> .	9	2,011
<u>GRASSLAND:</u> Areas on which 80 percent or more of the vegetation is herbaceous.	47,500	
<u>BARREN:</u> Areas which have less than 20 percent cover in vegetation.	10,000	
<u>Unclassified:</u> Developed and residential areas, roads, stream channels, other works of man, etc., not classifiable, or not surveyed (considerable acreage below the rim of the canyon remains unsurveyed).	<u>99,715</u>	
TOTAL	673,575	

Other plant communities occur in the former Grand Canyon National Monument and in the portions of Lake Mead National Recreation Area which were added to the Grand Canyon Complex. Greosote bush and saltbush along with such associated plants as bursage are found westward from the national monument along the Colorado River. Above this is found a short grass community with various grama grasses, June grass, burro grass, various cacti, banana yucca and ephedra growing on much of the elevated, nearly level terrain surrounding the Inner Canyon of the river. An extension of the Northern Desert Sagebrush community extends into Northern Arizona from the Great Basin and into the area of Grand Canyon National Monument. The dominant plant is big sagebrush in nearly pure stands with various grasses and a few scattered pinyon and juniper trees. A palo verde-cacti-bursage community occurs along the lower portions of Kanab Creek and along portions of the Colorado River near their junction. Other than a few rodent species, the kit fox and the pronghorn are the two conspicuous mammals that occur in the western sections of the Grand Canyon Complex that do not also occur in the eastern portions.

ENDANGERED OR THREATENED SPECIES

No endangered or threatened species of plants are known to exist within the enlarged park. Plant communities containing species endemic to the Complex or species much diminished in range or habitat, by definition rare, are known from the area, but systematic tabulations of these plants are not yet available.

The following animals, observed within the Grand Canyon Complex, are on the Official List of Endangered Native Fish and Wildlife, maintained by the Secretary of the Interior, and are threatened with extinction at this time:

Southern Bald Eagle	<u>Haliaeetus leucocephalus leucocephalus</u>
American Peregrine Falcon	<u>Falco peregrinus anatum</u>
Humpback Chub	<u>Gila cypha</u>
Colorado River Squawfish	<u>Ptychocheilus lucius</u>

The Kaibab Squirrel, Sciurus kaibabensis, the Spotted Owl, Stirix occidentalis, the California Brown Pelican, Pelecanus occidentalis californicus, the Prairie Falcon, Falco mexicanus and the Little Colorado Spinedace, Lepidomeda vittata, are described as Threatened Species in the 1973 "Redbook" on "Threatened Wildlife of the United States".

In addition, the following species are placed in the "status-undetermined" category in the "Redbook", because while it has been suggested that they face extinction, not enough information is available for a definite determination:

Ferruginous Hawk	<u>Buteo regalis</u>
American Osprey	<u>Pandion haliaetus carolinensis</u>
Prairie Pigeonhawk	<u>Falco columbarius richardsonii</u>
Humpback Sucker	<u>Xyrauchen texanus</u>
Gila Monster	<u>Heloderma suspectum</u>

Pending the completion of the Resources Management Plan, all plants and animals are protected according to policy guidelines for natural areas. Special programs deemed necessary for the perpetuation or maintenance of plant or animal species will be enunciated in the Resources Management Plan.

GRAZING

No land within Marble Canyon National Monument is grazed by domestic livestock. Three life tenure grazing permits exist for lands within the northern portion of Grand Canyon National Monument. At the present time approximately 250 head of cattle are being grazed on 26,560 acres of upland monument land. These grazing privileges were granted upon the establishment of the national monument. The members of the Havasupai Tribe hold grazing privileges on 56,000 acres within Grand Canyon National Park and the southern section of Grand Canyon National Monument. The tribe currently is permitted 138 head of cattle and 322 horses on this land.

There is prime desert bighorn sheep habitat on the northern portions of the Great Thumb and Tenderfoot Plateaus. In these two areas the Havasupai livestock are in direct competition with the desert bighorn for food and water. These two areas are considered to be essential to the continued existence of bighorn.

Grazing is a valid multiple use of Forest Service lands and is an acceptable use of recreational area lands under the jurisdiction of the National Park

Service. At this time there are three permittees using 19,700 acres for grazing within the Kanab Canyon addition. There are 11 permittees using 202,048 acres for grazing on the lands of Lake Mead National Recreation Area which were added to Grand Canyon National Park. All 11 of these grazing permits are connected with patented water rights.

The land being used by domestic livestock within the current park does not provide a bountiful harvest. The lack of naturally occurring surface water combined with the low productivity and regrowth of vegetation make this land poor to very poor under most grazing classifications. A few stock roads and trails and scattered stock tanks are the main evidence that these areas are being used for grazing. As lifetime permits expire the majority of these roads and trails will be abandoned. No new permits will be granted. The only known competition north of the Colorado River between domestic livestock grazing and wildlife is with a small herd of pronghorn in Grand Canyon National Monument. This competition is very minor.

Trespass grazing by stock belonging to individuals of the Navajo Tribe has been noted in the southeast corner of Grand Canyon National Park. Thin soils and moisture deficits, as with other areas in the complex, make the land and vegetation unresilient to this impact, and native plants are readily replaced by "nuisance" species such as Salsola kali (tumbleweed), an exotic indicator of disturbance.

WATER RESOURCES

Water is a vitally necessary natural resource, especially in the arid Southwestern United States. Here, legal and institutional systems are organized to control the use of water. In the Grand Canyon region the use of water is subject to Federal law, the laws of individual States, and interstate compacts and agreements to apportion the waters of interstate streams. Water rights are generally based on beneficial use of the water and on the appropriation doctrine in which first-in-time is first-in-right. Most of the readily available surface water, and even most of that which can be developed only with difficulty, has been assigned to specific applicants or users. The remaining supply is usually desired and actively pursued by numerous State and interstate groups as well as private individuals.

The Federal Government has asserted, and the courts have affirmed, that it has the right to sufficient water to develop Federal "reserved" land such as that reserved for national parks, provided that the water is used for the purposes of the reservation. The right is effective as of the date of the reservation action. The Federal Government thus has the use right to waters originating in, or flowing through, Grand Canyon National Park for the development of the park.

Because of the complex nature of water development projects, cooperation among water users is usually essential to make the projects possible. In 1922, the Colorado River States drafted the Colorado River Compact

to apportion the waters of the Colorado River. This compact was approved by Congress in the Boulder Canyon Project Act of December 21, 1928, and declared to be in effect by President Hoover on June 25, 1929. The compact divided the Colorado River into two drainage basins, Upper and Lower, with Lees Ferry, Arizona being used as the dividing line between them.

Most of the flow of the Colorado River through the Grand Canyon originates in the high mountain areas that rim the Upper Colorado Region. The estimated annual virgin runoff in the Colorado River at Lees Ferry, Arizona, at the head of Marble Canyon, has ranged from 5.6 to 24.0 million acre-feet. The 10-year means have ranged from 11.6 to 18.8 million acre-feet. Opinions thus differ concerning the period of record that best predicts future runoff. The significance is the fact that a period of about 25 years (1906-1930) of predominantly above-average runoff has been followed by a 40-year period (1931-1970) of predominantly below-average runoff.

In Article III, the Colorado River Compact requires that "the States of the Upper Division will not cause the flow of the river at Lees Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years." Projected depletion requirements for the Upper Basin to the year 2020 have been made by the Pacific Southwest Inter-Agency Committee for the U.S. Water Resources Council.

These indicate that by that year the streamflow at Lees Ferry will be reduced by 6.5 million acre-feet. Current usage accounts for much of the nearly complete utilization of the Colorado River, when the mean virgin flow at Lees Ferry is near the level at which it has been for the last 40 years, with the balance of usage caused by the initial filling of Upper Basin reservoirs. Although the flow of the Colorado River through Grand Canyon is thus assured, the daily, seasonal and yearly flow will fluctuate greatly as reservoir and energy commitments are met.

Downstream commitments in the Lower Basin below Lees Ferry are 2.8 million acre-feet for consumptive use in Arizona, 4.4 million for California, 0.3 million in Nevada, and 1.5 million for Mexico. Adding losses of 1.6 million (estimated for the year 2020) from the river and its existing reservoirs makes a total requirement of 10.6 million acre-feet per year. Only about 0.8 million acre-feet of water is supplied to the Colorado River by tributaries between Lees Ferry and Mexico. If only the 7.5 million acre-feet required by the Colorado River Compact were released to flow by Lees Ferry, the apportionments in the Lower Basin would exceed the streamflow by 2.3 million acre-feet each year.

California is currently using 0.5 million acre-feet of water in excess of its apportionment, as Arizona and Nevada do not have facilities for full utilization of their shares. Arizona has chosen to develop a portion of its unutilized share for the Central Arizona Project which

will deliver Colorado River water to the Phoenix and Tucson areas of central Arizona, to other portions of Arizona, and to New Mexico by exchange. The overdraft in groundwater in the Phoenix and Tucson areas is 2.5 million acre-feet annually. It is obvious that even with no increase in water use, the Central Arizona Project can do little to stop this overdraft as it nearly equals Arizona's apportionment from the Colorado River at Lees Ferry. Under present conditions there is essentially no outflow from the Lower Colorado River Basin beyond that required to meet the 1944 Mexican Treaty obligation of 1.5 million acre-feet annually. As the Upper Basin states develop their portion of Colorado River water, and the flow at Lees Ferry is reduced toward its minimum legal flow it is evident that the water picture below Grand Canyon will not brighten.

As shown in the following tables, springs and tributaries between Lees Ferry and Lake Mead contribute approximately 0.5 million acre-feet of water to the Colorado River. Because of the remoteness of most of the minor tributaries many of these figures are based upon short-term observations and must be considered only approximate maximum values.

MAJOR TRIBUTARIES
LEES FERRY TO LAKE MEAD

<u>Tributary</u>	<u>Flow in A.F./Yr.</u>	<u>TDS mg/l</u>	<u>Salt in Tons/Yr.</u>
Paria River	18,000	1,173	30,000
Little Colorado River	134,000	712	130,000
Blue Springs	161,000	2,499	547,400
Bright Angel Creek	25,630	300	10,457
Tapeats Creek	58,000	147	12,000
Kanab Creek	3,000	1,103	4,500
Havasu Creek	<u>50,000</u>	<u>500</u>	<u>34,000</u>
Total	449,630	-----	768,357

MINOR TRIBUTARIES
LEES FERRY TO LAKE MEAD

<u>Tributary</u>	<u>Maximum Flow Acre-Foot/Year</u>	<u>Total Dissolved Solids (mg/l)</u>	<u>Salt in Tons/Year</u>
3-Mile Wash	360	---	---
Vaseys Paradise	3,000	198	800
Nankoweap Creek	2,920	500	1,986
Lava Canyon Creek	1,095	750	1,117
Red Canyon Spring	2	44,835	122
Hance Canyon	2	---	---
Cottonwood Spring	8	387	4
Grapevine Spring	16	334	7
Clear Creek	1,460	309	613
Indian Gardens	480	305	197
Monument Creek	150	1,470	300
Hermit Creek	438	441	263
Boucher Creek	183	786	195
Crystal Creek	2,920	735	2,920
Shinumo Creek	5,000	200	1,360
Elves Chasm	200	588	160
Galloway Canyon	200	---	---
Stone Creek	250	367	125
Deer Creek	8,800	350	4,189
Matkatamiba Creek	44	1,139	68
Green Alcove	100	---	---
National Canyon	700	---	---
Fern Glen Canyon	360	---	---
Gateway Canyon	360	---	---
Lava Falls	4,380	845	5,037
Vulcan Springs	3,650	684	3,395
Spring Canyon	95	478	62
205 Mile Canyon	5	728	115
3-Spring Canyon	15	426	9
Diamond Creek	2,555	470	1,635
Travertine Canyon	365	742	369
Travertine Falls	37	937	47
Separation Canyon	10	441	6
Spencer Canyon	1,095	426	635
Lost Creek	50	---	---
Reference Point Creek	10	---	---
TOTAL	41,315	---	25,736

Despite the tremendous quantity of water flowing through the mile deep canyon, the history of water supply at Grand Canyon has been one of insufficiency. As the river cut a canyon through the rock units of the canyon the ground water drained into the canyon. Collections of surface water are temporary and rare because of the ease with which precipitation penetrates into the substrata. The principal settlements at the canyon prior to 1900 were those at Grandview Point and Grand Canyon Village.

Some water was carried by mules to the rim from the springs at Indian Gardens and other amounts were collected in natural or dug tanks and cistern catchments. The railroad to Grand Canyon Village was completed on October 12, 1901 and water was then brought to the canyon in tank cars. A sewage disposal plant was completed on May 28, 1926 and reclaimed effluent became available for non-potable uses. On August 26, 1932, the Santa Fe Railroad completed a pipeline to Indian Gardens, about 3,200 feet below the rim at Grand Canyon Village. Pumps were installed with a capacity of 278,000 gallons per day.

The amount of water lifted from Indian Gardens proved to be sufficient until the large influx of park visitors following World War II. Additional reservoirs were constructed on the rim to provide storage for water pumped during the slack winter season. Water storage was approximately 4 million gallons by 1958 and had reached 13 million gallons by 1968. Water consumption in that year reached 96 million gallons; virtually the entire flow of the springs at Indian Gardens.

For many years the developed area on the North Rim at Bright Angel Point had obtained its water through a pipeline from Roaring Springs, a major source of Bright Angel Creek. In August, 1970 a 16-mile long transcanyon pipeline was completed which connects Roaring Springs with the pumping facilities at Indian Gardens. The pipeline operates continuously except for shutdowns due to electrical storms and breaks in the line. The waterline has a maximum carrying capacity of 208.8 million gallons of water per year. Water in excess of pumping capacity or of needs on the South Rim is released into Garden Creek to return to the Colorado River. The springs at Indian Gardens are now allowed to flow freely into Garden Creek.

Bright Angel Creek is the fourth largest tributary to the Colorado River between Glen Canyon Dam and the Virgin River. The waters of this creek are low enough in total dissolved solids to dilute the salinity of the Colorado River by 1 to 2 parts per million. As Roaring Springs is one of the major sources of water for Bright Angel Creek, any reduction in its flow in effect increases the salinity of the Colorado River. All water transported to the South Rim is wasted through evaporation, use, or seepage into the subsurface where it leaves the Colorado River drainage and moves southward. Water removed from Roaring Springs for use on the South Rim reduces the amount available for downstream users and increases the need for such downstream storage facilities as dams.

The extracting capacity of the transcanyon waterline amounts to 641 acre-feet per year which is 2.5 percent of the normal flow of Bright Angel Creek. The flow of Bright Angel Creek consists of the flow from numerous other springs (contributing approximately 61 percent of the total flow) and the runoff from 98 square miles of drainage basin which receives from 8 to 26 inches of precipitation a year. If the flow of Roaring Springs is as much as 10 cubic feet per second, then the waterline at capacity would consume 10 percent of its flow averaged out over the year. During the winter months the entire flow of Bright Angel Creek normally drops from 13 to 15 cubic feet per second.

Water commitments within the park will probably stabilize at approximately 162.3 million gallons per year by the late 1970's. The unincorporated village of Tusayan, just outside the south entrance to the park, on private property, does not have an adequate water supply and must haul its water by truck from Williams, Arizona. Businessmen within that community have proposed that the regulations prohibiting sale of water to consumers outside the park be reversed and that a pipeline be constructed to Tusayan for their use. As this proposal would have far ranging effects if implemented, it is covered in the alternatives section of this impact statement.

High levels of dissolved mineral salts in the Colorado River is a major water quality problem in Arizona. The Colorado River enters Grand Canyon with a total dissolved solids concentration averaging 586 milligrams per liter. This amounts to 8.7 million tons per year. The water is primarily of the calcium-sodium sulfate type.

Grand Canyon contains several springs which are high in total dissolved solids and thus contributes to the total load of the Colorado River. Water quality is also affected by large amounts of sediment entering from flooding tributary streams. The watershed areas drained by streams tributary to the Colorado River through Grand Canyon contribute from 0.5 to 1.0 acre-feet of sediment per square mile per year. Long-term records show an average annual sediment discharge of about 10 million tons into the Colorado from the Little Colorado River. Heavy loads of sediment occasionally are carried into the Colorado River at Lees Ferry by the Paria River. Recorded sediment concentrations in Kanab Creek at Fredonia, Arizona, north of the park, have reached 700,000 parts per million and concentrations of up to 500,000 parts per million may often be found in this stream during periods of intense rainfall.

Substantial amounts of oil and gasoline can be spilled into the Colorado River at Lees Ferry from boat servicing facilities. Ruptured gasoline tanks can also leak during motorized trips through the canyon. On the average, an estimated 20 to 35 percent of the fuel used in outboard motors is wasted in the exhaust. Laboratory studies of pollutants from outboard motor exhaust indicate that approximately 0.23 pounds of oil, as measured by nonvolatile suspended solids, are wasted per gallon of fuel consumed. The turbulence caused by the propeller creates condi-

tions ideal for dispersion of the waste material into the water. The rest enters the air as an air pollutant in the canyon. No estimate is available for the total amount of fuel used within the Grand Canyon by motorized trips each year.

Preliminary chemical and bacteriological surveys have been made in the Grand Canyon section of the Colorado River to assess possible health hazards to river travelers and hikers. The water quality of the main Colorado River channel is relatively stable with only slight increases in ionic concentration and bacterial load with respect to distance from Lees Ferry. The bacteriological contamination in the main river channel is normally at or below the standards for drinking and recreational use set by the states of Arizona and Nevada and by the Federal Water Pollution Control Administration. This does not preclude the necessity of treating water taken from the main channel for drinking purposes but it does indicate that proper chlorination, boiling or other treatment will easily make the water safe for drinking.

Many of the side streams present quite another picture, at least with respect to recreational primary contact. The bacteriological contamination in most of the popular streams and swimming pools is in excess of the levels recommended for primary contact. The tributary streams show extreme temporal variability in chemical water quality and bacteriological contamination as a result of the summer rain and flood patterns. Bacteriological contamination of Havasu and Kanab Creeks may be the result of poor domestic waste treatment practices. Fredonia, Arizona and Kanab, Utah are the probable sources of fecal contamination load in Kanab Creek. The 2,500 inhabitants of Kanab use a single trickling filter unit for secondary treatment of fluid wastes. The 800 persons in Fredonia use septic tanks for the disposal of domestic wastes. Tremendous increases in bacteriological activity in the waters of Kanab Creek occur during flood periods.

Water samples from Havasu Creek show evidence of human fecal contamination. The source of this contamination is the village of Supai on the Havasupai Indian Reservation. There is a significant increase in bacteriological activity in Havasu Creek as it passes through the village of Supai. Supai lacks waste treatment facilities and has a considerable population of domestic animals. The waters of tributary streams must be considered to pose a potential health hazard to hikers and river travelers.

HYDROELECTRIC POTENTIAL

The Colorado River develops approximately 1940 feet of head between Glen Canyon Dam and the slackwater of Lake Mead. At least 25 sites have been surveyed within the 277 miles of Grand Canyon between Lees Ferry and the Grand Wash Cliffs for the possible construction

of dams to utilize the fall of the river as a hydroelectric resource. These potential dam sites and their river mile distances below Lees Ferry are given below.

Marble Gorge	4.5	Specter Chasm	130.0
Redwall, Upper	29.0	Havasu	156.6
Redwall	30.0	Prospect Canyon	190.1
Vaseys Paradise	32.2	Diamond Creek, upper	225.5
Marble Canyon	39.5	Diamond Creek, lower	225.9
Mineral Canyon	77.8	Travertine Canyon	228.6
Clear Creek	84.4	Bridge Canyon	236.3
Granite Wall	85.1	Hualapai	237.5
Cremation	86.3	Spencer Canyon	246.2
Pipe Creek	89.0	Devils Slide	255.6
Ruby Canyon	103.9	Flour Sack Rapids	266.0
Hakatai	110.7	Pierces Ferry	277.3
Big Bend	113.3		

Three of these sites, Marble Canyon, Prospect Canyon and Hualapai, have received serious consideration and proposals for dam construction have been made by various entities. The most current of these proposals will be discussed here.

The Arizona Power Authority proposes that the Marble Canyon Dam consist of a constant-radius arch section, 700 feet in length along its crest, including a two-bay submerged spillway at each end of the arch dam. The dam would be approximately 400 feet high from the lower point of the excavated foundation and 90 feet wide at that same point. A dam of this size would have a gross head of 293 feet with the maximum normal reservoir elevation of 3,130 feet. The reservoir capacity would be 480,000 acre feet, have a surface area of 5,300 acres and lose approximately 29,000 acre feet of water through evaporation each year. The reservoir would flood all of Marble Canyon to the mouth of the Paria River.

An indoor-type powerhouse would have a total installed capacity of 510,000 kilowatts in six units. The average annual energy production and peaking capability delivered to the load centers is estimated at 2,359,000,000 kilowatt hours and 549,000 kilowatts, respectively. This is the heating energy equivalent of 3.56 million barrels of oil per year. The average annual revenues, based on Colorado River Storage rates, which would accrue to the Arizona Power Authority from the sale of electrical power from this project would be approximately \$15,500,000.

Under the U.S. Bureau of Reclamation plan the Marble Canyon Dam would consist of a double-curvature, concrete-arch structure, with a crest length of approximately 750 feet. It would have a structural height of 415 feet of which 105 feet would be below the stream bed. A dam of this size would have a gross head of 303 feet with the maximum normal reservoir elevation of 3,140 feet. The reservoir

capacity would be 363,000 acre feet, have a surface area of 4,000 acres and lose approximately 10,000 acre feet of water through evaporation each year.

An underground powerhouse would have a total installed capacity of 600,000 kilowatts in four units. The average annual energy production and peaking capability delivered to the load centers is estimated at 2,255,000,000 kilowatt hours and 540,000 kilowatts, respectively. This is the heating energy equivalent of 3.40 million barrels of oil per year.

The Arizona Power Authority proposes that the Hualapai Dam consist of a double-curvature arch section 1,110 feet in length, and a 243-foot spillway structure. The dam would be 480-feet high from the lowest point of the foundation. This dam would have a gross head of 390 feet with the maximum normal reservoir elevation of 1,610 feet and provisions made for rising to 1,866 feet. The reservoir capacity would be 820,000 acre feet at the lower reservoir elevation, have a surface area of 6,400 acres and lose approximately 37,000 acre feet of water through evaporation each year.

An indoor-type power plant would have an installed capacity of 960,000 kilowatts. The yearly average energy production and peaking capability delivered to the load centers is estimated at 3,210,000,000 kilowatt hours and 903,000 kilowatts, respectively. The average annual revenues, based on Colorado River Storage rates, which would accrue to the Arizona Power Authority from the sale of electrical power from this project would be approximately \$23,500,000. The electrical energy produced by this project would equal 4.85 million barrels of oil each year.

The Los Angeles Department of Water and Power proposes that the Hualapai Dam be a thin-arch concrete structure with a crest length of 1140 feet and a height above the foundation of 466 feet. The dam would have the same gross head, reservoir elevation, and surface area as the APA proposal. The reservoir capacity would be 20,000 acre feet greater but evaporation losses from the reservoir would be reduced to 24,000 acre feet per year.

The indoor-type power plant would have an installed capacity of 1,200,000 kilowatts. The yearly average energy production and peaking capability delivered to the load centers is estimated at 3,220,000,000 kilowatt hours and 1,279,000 kilowatts, respectively. This is the heating energy equivalent of 4.86 million barrels of oil per year.

The U.S. Bureau of Reclamation plan for this site would be for a conventional variable-radius, concrete-arch structure with a height of 736 feet above the foundation and having a crest length of approximately 1,650 feet. The dam would have a gross head of 649 feet with the maximum normal reservoir elevation of 1,866 feet. The reservoir capacity would be 3,710,000,000 acre feet, have a surface

area of 16,700 acres and lose approximately 85,000 acre feet of water through evaporation each year.

An underground power plant would have an installed capacity of 1,500,000 kilowatts. The yearly average energy production and peaking capability delivered to the load centers is estimated at 5,250,000,000 kilowatt hours and 1,350,000,000 kilowatts, respectively. This is the heating energy equivalent of 7.93 million barrels of oil per year.

The Arizona Power Authority also proposes the Prospect Canyon Dam at river mile 190.1 to develop the head lost because of their low dam height proposed at the Hualapai site. The Prospect Canyon Dam would be of the constant-radius arch type with a crest length of 900 feet, and a height from the foundation of 315 feet. This dam would have a gross head of 256 feet with the maximum normal reservoir elevation of 1,866 feet. The reservoir capacity would be 420,000 acre feet, have a surface area of 3,330 acres, and lose approximately 22,000 acre feet of water through evaporation each year.

An indoor-type power plant would have an installed capacity of 510,000 kilowatts. The yearly average energy production and peaking capability delivered to the load centers is estimated to be 2,110,000,000 kilowatt hours and 475,000 kilowatts, respectively. This is the heating energy equivalent of 3.19 million barrels of oil per year. The average yearly revenues, based on Colorado River Storage rates, which would accrue to the Arizona Power Authority from the sale of electrical power from this project would be approximately \$13,600,000.

The Kanab Creek Tunnel project has been proposed to develop the head between Marble Canyon and the Hualapai sites to provide 1,505,000 kilowatts of hydroelectric power.

The economic costs of any or all of the above projects and their associated transmission lines and facilities are not available at this time. All of the proposed hydroelectric developments would also require from 1 to 4 dams to be built on streams tributary to the Colorado River as back-up sedimentation reservoirs.

A site on the Little Colorado River, halfway between Cameron, Arizona and the confluence of the Little Colorado River with the Colorado River, has been considered by all three of the above agencies variously as a pumped-storage site, for sediment retention, and for desalination purposes. Called the Coconino Project, it would differ from the conventional pumped-storage project in that the generating head would be about twice that of the pumping head. The net gain in head is possible because the water is pumped from the river upstream from the power plant and then transported to the plant by a canal. Under the designation of Lee Reservoir Project it would be a conventional pumped-storage project. As a desalination project the river would be dammed

below Blue Springs, water pumped to the rim by a nuclear or coal-fed power plant, the salt removed from the water and the fresh water sent via aqueduct 80 miles overland to the Verde Valley drainage system. Further study of this project has not been funded.

There is a 500-kilovolt power transmission line planned for construction in 1980, which would apparently cross the southeastern portion of the proposed national park. The line would connect the Kaiparowits thermal power plant with the existing transmission system.

Although there are presently no hydroelectric generating projects within the Grand Canyon Complex, or in any area proposed for addition to the complex the potential must be realized as being part of the environment just as would any other untapped natural resource. If any portion of this resource is eventually realized through development it will cause extensive changes in the resource management of some areas and eliminate the need for it in others.

The Little Colorado site would be highly visible from the eastern approach to Grand Canyon National Park. The Marble Canyon site is within Marble Canyon National Monument and the high dam proposed by the U.S. Bureau of Reclamation at the Hualapai site would back water approximately 30 miles into the present complex and inundate the mouth of Havasu Canyon. The low dam proposals for the Hualapai site would not back water into the present Grand Canyon Complex. However, the reservoir would lie almost wholly in that portion of Lake Mead National Recreation Area which is proposed for addition to the complex. The normal reservoir elevation of 1,610 feet for the low dams at the Hualapai site would back water to approximately river mile 192. The westernmost boundary of Grand Canyon National Monument is at river mile 184.4, eight miles upstream. The modification of river gradient by the reservoir would, however, cause heavy silting of the river for many miles upstream just as it has at Lake Mead.

Applications were filed with the Federal Power Commission by the Arizona Power Authority and the City of Los Angeles for licenses to develop the Marble Canyon and Hualapai sites. Subsequently, the Colorado River Basin Project Act, Public Law 90-537, enacted in 1968, withdrew the Commission's licensing authority for the reaches of the main stream of the Colorado River between Hoover Dam and Glen Canyon Dam until otherwise provided by Congress. As a consequence, the Commission dismissed the pending license applications. The Act also specifically prohibits the study or the construction of any dams on that section of the Colorado River.

Due to the energy crisis currently being experienced in this country, there have been recent political moves to change the laws prohibiting construction of these dams. Permission to construct the Hualapai low dam is particularly being sought. In 1968 the Hualapai project was dropped as a funding source for the Central Arizona Project with the agreement of the Arizona Congressional delegation. The Hualapai site lies outside of the Boulder Canyon Project Act area and all

evaporative losses from the reservoir, would be taken from Arizona's allocation of water from the Colorado River, which is already too low for the State's water needs. In 1974, the House Committee on Interior and Insular Affairs of the United States Congress defeated amendments to the Grand Canyon boundary bill which would have allowed for the construction of the Hualapai Dam. The Master Plan for the Grand Canyon Complex does not address itself to the contingency that the legal restrictions prohibiting this and the other described dams will be lifted.

HAVASUPAI INDIAN RESERVATION

On June 8, 1880, President Rutherford B. Hayes established the first Havasupai Indian Reservation. A technical problem in the Executive Order resulted in a second Order on November 23, 1880 but the reservation's boundaries remained unchanged. The reservation consisted of 34,240 acres in the Cataract Canyon - Havasu Creek area. The intent of reserving these lands for the use and occupancy of the Havasupai was to guarantee the Indians a land base for their livelihood and to guarantee white settlers peaceful entry into portions of the Coconino Plateau for homesteading.

With the homesteaders, however, came prospectors and in 1882 President Chester A. Arthur addressed the problem of mineral rights by reducing the Havasupai Indian Reservation to 518 acres. These 518 acres were the Havasupai's traditional farming lands in the bottom of Havasu Canyon, where they grew their crops during the spring and summer months of the year. The stock grazing lands and the hunting and gathering lands on the plateau above the village were excluded from the new reservation. The Havasupai, however, still retained the rights to traditional uses of non-reservation lands.

In 1944, the Tribe was awarded 4 sections of released railroad land which were exchanged for available state lands in the bottom of Cataract Canyon, 30 miles south of the present reservation. These 2,560 acres of land have poor access, no water and little agricultural or grazing potential. In 1969 the Indian Claims Commission awarded the Havasupai Tribe \$1.24 million for lands "seized" without compensation. The award (Docket 91, 1969) included a quit claim to future claims against the government for the same lands.

The Havasupai Tribe's rights to use non-reservation lands within Grand Canyon National Park for agricultural purposes were expressly recognized in the 1919 Act establishing the park. These recognized rights have been confined to 56,000 acres in the western part of the park adjoining the reservation. These lands have been used by a small number of cattle and horses for grazing. The grazing capacities on this range are low as stock water is minimal, forage of low quality, and the soils are of such poor quality that range "improvements" would result in little additional yield. The soil is porous and limey, occurs

mainly as patches between outcrops of bedrock and is less than 20 inches deep. Precipitation is less than 10 inches per year and the low humidity restricts any forage growth above that naturally existing there. Based on the capability of the land to produce at least 50 pounds of air-dry forage per acre the land will support one cow for every 3,000 acres. The rim and plateau lands are not capable of maintaining a viable cattle industry, especially one of such magnitude as to be economically productive for the entire Tribe.

The green oasis of Supai with its famed waterfalls has been the goal of increasing numbers of tourists and hikers over the years. In 1972, more than 14,000 visitors made the 11-mile trip from the rim by horseback or on foot. The primary economic industry of the Havasupai is tourism. Each visitor to the reservation pays an entry fee and many individuals of the Tribe work as mule skimmers or packers.

The Havasupai desire a larger land base from which to develop their tourist industry, provide housing for an expanding population and to answer the emotional need for ancestral lands devoted to raising cattle and horses. The amount of land required to satisfy these needs varies with the intensity of the desires.

Public Law 93-620 deleted 83,809 acres from the park to become part of the Havasupai Reservation and provided special use grazing permits for the tribe on approximately 95,300 acres of park land.

The National Park Service recognizes the desire and the need of the Havasupai Indians for a larger land base as well as its own Congressional mandate to protect from encroachment all national park lands of outstanding quality. Full information must be the basis for future land uses so that these lands may be managed in such manner as to provide environmental protection and use compatible with the purposes of Grand Canyon National Park, as stated in the Grand Canyon Enlargement Act of 1975.

VISITOR USE

The whitewater wilderness experience of running the Colorado River through Grand Canyon National Park has become increasingly popular in recent years. In 1972, there were 89,000 visitor use/days used by the 21 concessioner boat operators, and 7,600 visitor use/days used by private parties. This amounts to approximately 16,400 visitors who "ran" the river in 1972. Beginning in the 1973 season and extending through the 1976 season, a new River Use Plan is holding river use at or below this level until present research programs are completed and the appropriate environmental evaluation work prepared. Target dates for these projects are in 1977. The River Use Plan is updated on an annual basis.

Beginning with the 1973 season, strict standards of safety, sanitation, licensing, and interpretation are being demanded of all commercial river operators. The maximum commercial use days allotted each month will be no greater than 25 percent of the operator's annual allotment. A maximum of 200 commercial passengers, and one party of up to 30 private users were permitted to depart from Lees Ferry on any single day. Beginning in 1974, these numbers were reduced to 150 and 25 respectively. The maximum number of commercial passengers per boat range from 4 to 20 and the maximum number of passengers per commercial trip is 40. Commercial trips cannot travel more than an average of 40 miles per day.

Companies providing motorized service are being encouraged to also offer oar service.

Ecological and sociological studies on the river will continue under the Master Plan, and be expanded both in scope and intensity. Indications of environmental degradation will be cause for immediate cut-backs on an annual, monthly, or daily basis so that environmental and wilderness qualities can be maintained to provide a quality wilderness experience for river users.

The canyon proper is the heart of the national park, and it is the view of this spectacle which draws millions of visitors to the park each year. Present visitor use patterns show that a majority of park visitors view the canyon from the developed areas on both rims. These areas of development will remain focal points of visitation, and no new areas of rim or Inner Canyon development are contemplated in the Grand Canyon Complex Master Plan.

The protection and maintenance of natural conditions and a wilderness atmosphere have been paramount management objectives and practices on backcountry lands. Nothing in the way of human use has been permitted that would damage, impair, alter, or intrude upon the natural environment. Hiking trails are not maintained by motorized equipment. They are maintained only to those standards required for human safety. Wildfire is controlled as necessary to prevent unacceptable loss of wilderness values, loss of life, damage to property and the spread of wildfire to lands outside the primitive areas. Motorized equipment is used in emergency situations involving the health and safety of persons, and to meet recognized management needs. To protect the resource from overuse, both hiking and camping registration and use limits have been established for these primitive areas. Current limitations on camping along the trail

system within the canyon are as follows:

Indian Gardens	- 75 campers	Tonto East	- 15 campers
Phantom Ranch	- 75 campers	Horseshoe Mesa	- 15 campers
Cottonwood	- 40 campers	Hance Creek	- 15 campers
Roaring Springs	- 15 campers	Tanner Creek	- 15 campers
Clear Creek	- 20 campers	South Bass	- 15 campers
Hermit Creek	- 25 campers	Boucher	- 15 campers
Tonto West	- 20 campers		

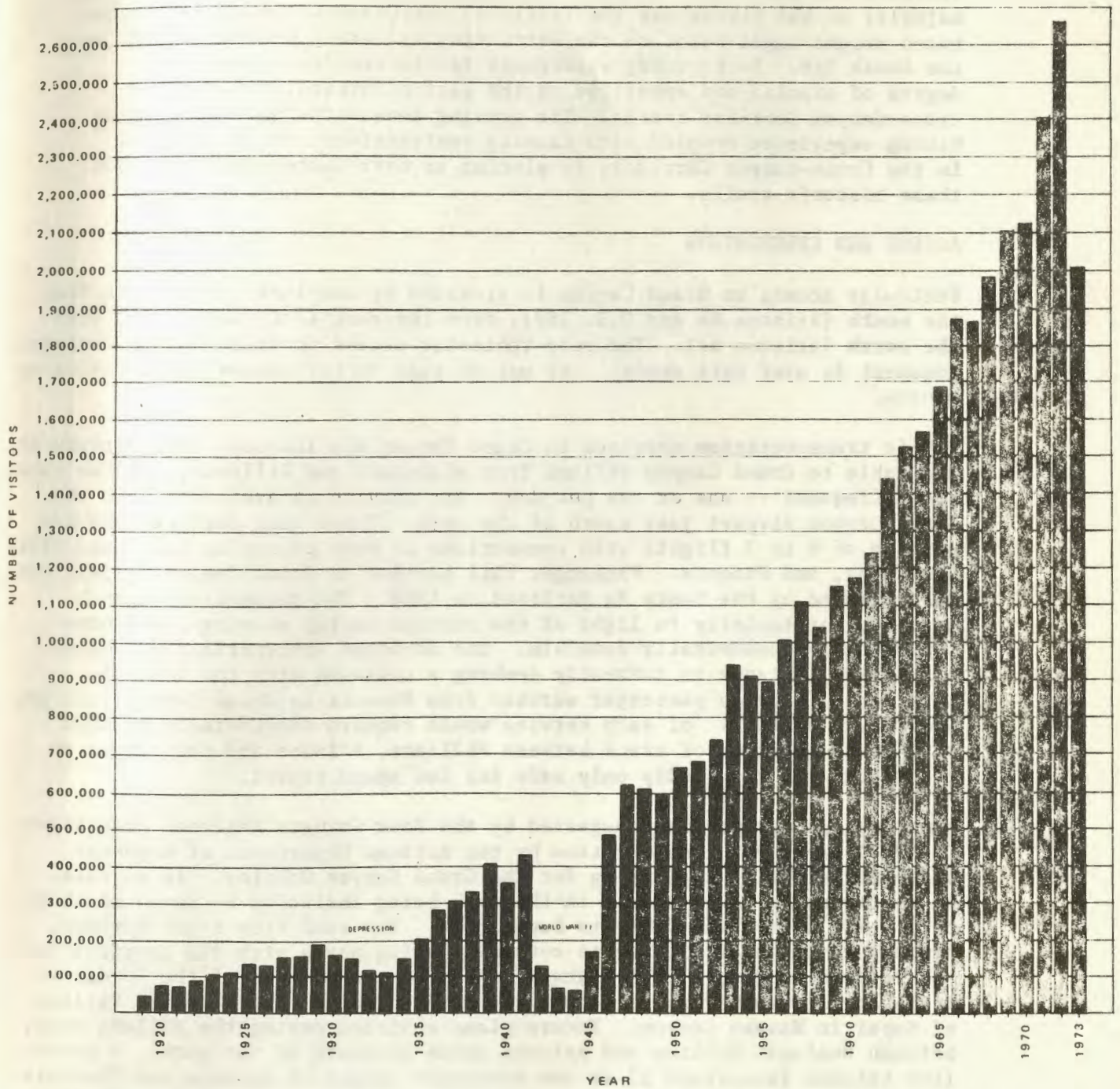
Visits to the National Park Service areas in the Grand Canyon region doubled in the decade of the 1960's to 4.8 million, and will probably double again during the 1970's. Travel to Grand Canyon National Park has also doubled in the last decade and approached 2-3/4 million visitors in 1972. By the end of the decade, it may easily reach the 4 million mark. The park is a major stop on the itineraries of summer travelers in the Southwest and West. A large number of foreign visitors make Grand Canyon National Park one of the principal stops on their tours of the United States. See page 86 for travel data.

Most visitors to the Grand Canyon stay less than a day - just long enough to view the canyon from several viewpoints along the South Rim road system. During peak periods of travel, most visitors arrive and leave during daylight hours. Within the park are substantial overnight accommodations on the rims, capable of handling 3,500 people, and developed campgrounds with a total of 500 campsites. Approximately 500 rooms are available at Moqui Lodge and at the village of Tusayan, just outside the south entrance to the park in the Kaibab National Forest. Motel additions in the village of Tusayan will add 250 rooms by 1974. Camping sites are available 10 miles south of the park at the United States Forest Service's 10-X Campground. Several camper parking sites and campgrounds are being developed along Arizona 64, south of the park toward the city of Williams.

Private motels and campgrounds at and near Flagstaff and Williams, Arizona, can accommodate a sizeable number of visitors. Further expansion of campgrounds outside the park can be expected in proportion to the demand. This is exemplified by a 300-site campground currently being proposed for the Apex Siding area on the Santa Fe Railroad, just south of Grand Canyon Village and west of the Village of Tusayan. Cameron and Gray Mountain, 60 miles to the east of the park, have modest overnight accommodations. Although the tourist-oriented towns of Flagstaff and Williams are only 1 to 2 hours drive away from the park, hundreds of campers park along roads leading into the park during peak periods of visitation.

The undeveloped portions of the rim areas and the Inner Canyon have been managed as natural areas. A network of primitive fire and access roads are used by management and by the solitude-seeking visitor to reach remote, backcountry rim areas. Access to the Inner Canyon is by foot,

Total Visitation 1919 - 1973 Grand Canyon National Park



horse, muleback, and by boat from Lees Ferry. In 1971, more than 40,000 visitors reached the Inner Canyon by foot or muleback, and 11,000 users entered the canyon by boat. By contrast, an estimated 34,000 visitors saw the canyon from commercial, tourist air flights. The vast majority of the hikers use the trails in the Cross-Canyon Corridor between Bright Angel Point on the North Rim, and Grand Canyon Village on the South Rim. Backcountry wilderness trails require a greater degree of stamina and expertise on the part of hikers, than do the Cross-Canyon Corridor trails. The growing demand for an Inner Canyon hiking experience coupled with camping restrictions and limitations in the Cross-Canyon Corridor, is placing an ever-increasing load upon these historic trails.

ACCESS AND CIRCULATION

Vehicular access to Grand Canyon is provided by two-lane paved roads from the south (Arizona 64 and U.S. 180), from the east (Arizona 64) and from the north (Arizona 67). The only vehicular access to Grand Canyon National Monument is over dirt roads. See map on page 88 for access and circulation routes.

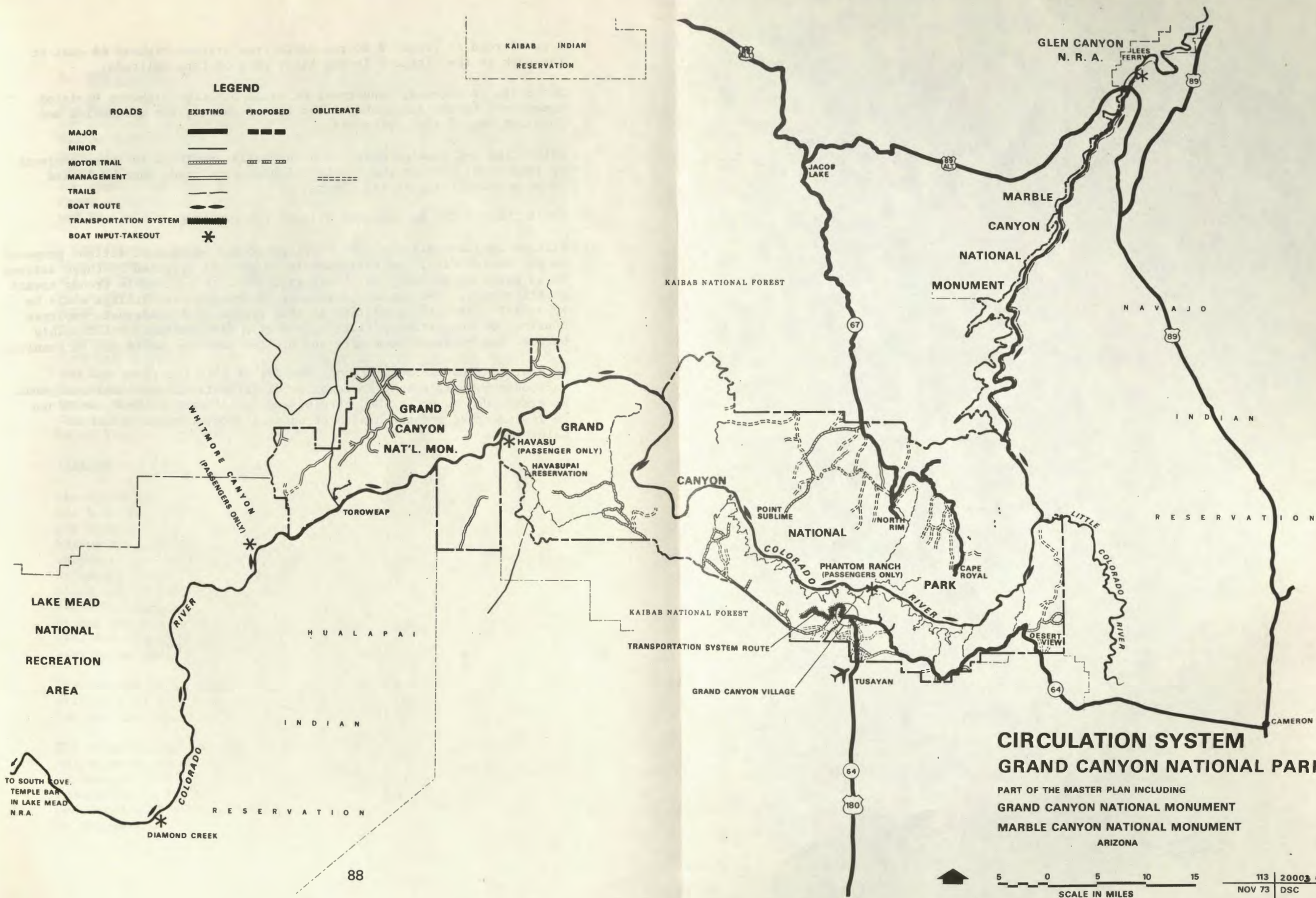
Public transportation services to Grand Canyon are limited. Bus service is available to Grand Canyon Village from Flagstaff and Williams, but the runs are infrequent -- one or two per day. Air service is available from the Grand Canyon Airport just south of the park. Three main carriers provide service of 6 to 7 flights with connections to such points as Salt Lake City, Las Vegas, and Phoenix. Passenger rail service to Grand Canyon Village was discontinued by the Santa Fe Railroad in 1968. The resumption of such service, particularly in light of the current energy shortage, may once again become economically feasible. The Saratoga Transportation Company of Phoenix, Arizona is currently seeking a contract with the Santa Fe Railroad to provide passenger service from Phoenix to Grand Canyon Village. The reestablishment of such service would require considerable roadbed work on the section of track between Williams, Arizona and the canyon as the tracks are reportedly only safe for low speed travel.

Numerous road proposals (suggested by the Four Corners Regional Commission in 1968) are under consideration by the Arizona Department of Highways which may effect the planning for the Grand Canyon Complex. In essence these proposals would result in the park being encircled by paved highways only a few miles away from its boundaries. The road from Peach Springs, Arizona to Hualapai Hilltop is currently being paved with BIA coordination and Federal funding. This highway will give the members of the Havasupai Tribe an all-weather route to the trailhead 11 miles south of the Village of Supai in Havasu Canyon. Future plans envision paving the Willaha Road, between Hualapai Hilltop and Arizona Route 64 south of the park. A paved link between Interstate 15 in the northwest corner of Arizona and Fredonia, Arizona has also been proposed. A short paved road would lead south from this highway to the northern boundary of Grand Canyon National Monument.

KAIBAB INDIAN
RESERVATION

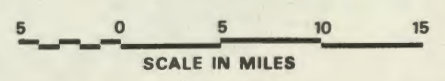
LEGEND

ROADS	EXISTING	PROPOSED	OBLITERATE
MAJOR			
MINOR			
MOTOR TRAIL			
MANAGEMENT			
TRAILS			
BOAT ROUTE			
TRANSPORTATION SYSTEM			
BOAT INPUT-TAKEOUT			



**CIRCULATION SYSTEM
GRAND CANYON NATIONAL PARK**

PART OF THE MASTER PLAN INCLUDING
GRAND CANYON NATIONAL MONUMENT
MARBLE CANYON NATIONAL MONUMENT
ARIZONA



A paved road is proposed to run north from Arizona Highway 64 east of the park to the Little Colorado River east of Cape Solitude.

See State of Arizona, Department of Transportation, Highways Division commentary in the final chapter of this document, for discussion and location map of these projects.

Priorities and funding have not been wholly committed to these projects at this time; however the construction of such roads must be looked to as a possibility in the future.

THE FUTURE OF THE ENVIRONMENT WITHOUT THE PROPOSAL

Without implementation of the development and management actions proposed in the Master Plan, the environments to be most affected by these actions would continue to exist as at present, but with noticeable trends toward deterioration. The human environment of Grand Canyon Village would be subject to further degradation in that problems of inadequate employee housing, of congestion/pollution, and of a disfunctional relationship between the resident community and visitor services would not be resolved.

Without visitor-use regulations, overuse of both the river and the backcountry would result in resource deterioration. Resource management programs such as prescribed burning and feral burro control, would not be implemented, and the health of natural ecosystems could not be maintained.

3. ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

The Master Plan for the Grand Canyon Complex provides a general guide for the use, development, interpretation and preservation of Grand Canyon National Park. It provides the metes and bounds within which specific plans for the area will be developed. Many of the environmental impacts implied by specific actions proposed in the Master Plan are readily apparent. The impacts generated by secondary effects or from conceptual direction given in the plan are seen much less acutely and may be far removed in time.

A development concept plan will be prepared for each area of concentrated development action within the park. A separate environmental analysis will be prepared to accompany each of these documents. Areas for which such plans will be developed include Grand Canyon Village, the North Rim, Indian Gardens, Phantom Ranch and Desert View. Public review and comment will be solicited as these plans are formulated; however, some of the impacts generated in these areas by the Master Plan can already be seen and will be outlined below.

The overall, anticipated impact of the Master Plan is that it will insure that the complex natural and cultural resources within the Grand Canyon will retain their integrity in the future and yet still be utilized and enjoyed by the visitor.

IMPACTS ON CULTURAL RESOURCES

The historical scene of the older buildings within Grand Canyon Village has been drastically altered by the construction of newer structures and facilities. The Master Plan proposal envisions removing all non-historic buildings and non-interpretive facilities from the rim of the canyon. This will reestablish the historic relationship between those buildings within the rim area. A restructuring of the village will not alter the historic scene of such railroad-related structures as the Santa Fe train depot and the El Tovar Hotel. Other historic structures within the old village will receive added protection as they are included within a historic district that has been nominated for listing on the National Register of Historic Places.

The removal of the private automobile from the historic district of the village will be a positive move toward re-creating the historic scene, but service vehicles and public transit will continue as an intrusion.

The original use for many of the historic structures in the park is no longer required and more relevant uses will be considered for the buildings. The change in usage to meet a more modern need and internal remodeling or decor changes within the historic structures should not detract from their full interpretation as examples of earlier times in the park.

Elderly structures which possess no historical or architectural merit and which serve no useful function will be razed to create open space or to make way for more functional buildings. These will be structures which have been deemed by professional historians to lack the significance for National Register status. This action will be considered adverse by individuals who consider the structures vital to the interpretation of the development stages of Grand Canyon Village.

The effect of the proposed action on Bright Angel Point will be to retain the traditional and historic flavor through the exclusion of inharmonious modern structures. This will restrict concession growth and profit in the vicinity of the Grand Canyon Lodge but will allow more modern structures and moderate expansion of capacity near the Grand Canyon Inn through a more efficient utilization of land.

No known archeological sites within developed areas will be impacted by construction. Archeological sites and historic structures outside of developed areas will also receive better protection and preservation because of the recognition and emphasis given to their values in the Master Plan. Park managers will devote more time and resources to these stated objectives. The greatest impact of master planning to date has been to cause historic and archeological surveys to be made at a much earlier date than they normally would have been done.

Retention and additional studies resulting from Public Law 93-620 will undoubtedly uncover additional cultural resources of importance which will receive further preservation and protection.

IMPACTS ON EARTH RESOURCES

The effect of the proposed action upon the geologic understanding of the canyon will be to insure that research and interpretation funded or encouraged by the National Park Service will encompass the whole of the Grand Canyon. Piecemeal research limited by political boundary lines or interpretive extrapolations from less than the whole canyon lead to inadequate understanding by the park visitor of the geologic significance of Grand Canyon.

Fragile geologic features such as caves will be protected from destruction through visitor use limitations. Paleontological material of unknown value will be lost during the excavations of trenches for utility and sewage lines, excavation along heavily used and maintained trails, and excavation for sanitary landfill operations.

As described under Description of the Environment, the potential for fuel and mineral resources within the park is low. The low tenor of ore bodies, small size of the deposits, difficulty of access, and

lack of water prohibit the economic withdrawal of the known mineral resources in Grand Canyon. The proposed action will not allow the extraction of or exploration for fuels or minerals on park lands, but will allow access to private inholdings containing such deposits.

IMPACTS ON WATER AND AIR QUALITY

The current water supply delivery and storage system on both rims of the canyon is not expected to meet the extrapolated demands of the 1980's. The reclaimed water used for non-potable purposes will find increasing uses as the demand for water increases the strain on the amount of potable water available. Also by not allowing overnight accommodations to increase, the park's Master Plan has the impact of stretching this valuable and essential resource further into the future and allows for the accommodation of many more day-use visitors in the park.

River and backcountry use limitations proposed in the Master Plan and the regulation of the method of disposal of human wastes will aid in preventing contamination and pollutive materials from entering the park's naturally occurring waters.

The public transit system will reduce air and noise pollution within the village and along the West Rim Drive caused by great numbers of private automobiles.

IMPACTS ON THE BIOTA

Research within the complex will provide knowledge of the current condition of the natural environment. From this knowledge the probable primeval condition of these resources can be established and the most feasible methods developed for reestablishing the natural evolution of that earlier state. It is obvious that native species cannot be successfully reintroduced or habitats restored without significant research programs aimed at determining the probable quality, components, and extent of ecological elements in the park in its naturally evolving state. Trends in resource degradation must be identified as well so they may be halted or minimized.

The major impact of research will be to enable the National Park Service to more accurately, and thus more efficiently, manage the Grand Canyon Complex as a naturally evolving complex of ecosystems.

Soils and Vegetation

The impact upon the remnant natural environment within the village area by the relocation and construction of facilities will be moderate to severe depending upon the type of development and areas selected within the 100 acres to be modified. The village is located in an

area of both pure and mixed stands of pinyon and juniper woodland and ponderosa pine forest. Both forest types are open and dry with much exposed, bare and rocky ground. Grasses and forbs of several species form the principal ground cover. Irregular patches of big sagebrush seem to appear as an indicator of past fires or human disturbance. The shallow soils have been formed in place and are derived primarily from the underlying Kaibab Formation. The soils under both forest types are quite similar and differ primarily in water holding capability. The texture of the soil changes with depth from a sandy loam at the surface to a clay loam and then back to a sandy loam near bedrock. The water retention in the soil is determined by the depth to, and the thickness of, this layer of clay loam, the amount of protecting litter on the surface, and the amount of shade provided by trees and other plants.

During the spring and early summer months the soil moisture decreases and may remain below the permanent wilting percentage for several months. In this period the perennial plants must depend upon deep and extensive root systems to provide water as there is no water table near the surface for them to tap. Any disturbance of the clay loam layer, or the removal of surface litter which reduces soil temperatures and controls evaporation, will make the area essentially sterile for perennial plant growth. The movement of heavy construction equipment and the clearing of trees and further opening of the tree canopy will seriously impair natural revegetation.

The majority of trees in the South Rim areas where construction activities are planned are relatively young. Although all age groups are represented, the average age of the mature pinyons and junipers is about 300 years and that of mature ponderosa pines about 250 years. Thus, the present forest established itself during a period of increased precipitation in the southwest in the late 1600's and early 1700's. The adult trees of both species are drought resistant but their seedlings are not and the forest could not establish itself today under the adverse strictures of the present climate on the South Rim.

The biomass present in the pinyon and juniper forest along the South Rim has been estimated as approximately 200,000 kilograms per hectare, with slightly more than three quarters of this being contained in the trees and their root systems. The biomass in the ponderosa forest with its larger trees and greater amount of litter is significantly higher. Man's activities within the area of Grand Canyon Village over the past 100 years have made significant inroads into this forest and continued construction activities and further forest clearing will essentially eliminate any remaining regenerative powers.

Only a semblance of a natural environment now exists within the village area and by selectively retaining screens of trees and through artificial revegetation and maintenance, the Master Plan seeks to retain an air of quasi naturalness. The area of the village is only 0.3 percent of the total park acreage and thus the impact of construction and relocation activities will be relatively small, even though nearly total in the affected areas. By intensively developing small areas such as the village for visitor use facilities, the remainder of the park may remain free from intensive human use and impact.

The expansion of the campground on Bright Angel Point will result in little damage to the environment as no formal site clearing will be done and all sites will be reached by walking rather than by vehicle.

The upgrading of trails and primitive roads for visitor safety will cause little or no impact upon the environment through which they pass and will not be done to the extent that it would encourage increased visitor use.

Solid waste disposal will continue to be problematical in a natural area. The selection of a site scarred by old borrow pits has resulted in a sanitary landfill potential that will allow for the combination of waste disposal for Desert View and Grand Canyon Village. When this site becomes fully utilized in a projected ten years, the problem will be reevaluated. The present dumping operation at Desert View will be eliminated and the solid waste from that area will be transported to the Village landfill site by compactor truck. A similar operation is planned for the North Rim involving a suitable, previously impacted area.

The goal of ecosystem management is to reestablish the trend the environment of the park would have had if man had not interfered with it. Many of the immediate impacts of ecosystem management will be adverse but the long-term impacts are considered to be beneficial. Controlled burning, for example, will have the immediate destructive appearance of any burned-over area. With the exception of large trees, all vegetation will be burned and ground litter consumed by the fire. All surface mammals, birds, and reptiles will abandon the area or be destroyed in the fire. If the burning is done under properly controlled conditions it will be but a few short years until natural ecosystems are able to establish themselves and the scars of the fire are obliterated. One of the major impacts of controlled burning will be to eliminate excessive fuel buildup and allow for natural fires to run their course in the future without developing into holocausts. A beneficial impact of controlled burning is that it frees vital nutrients that are otherwise locked away in the forest litter.

Bare ground on the South Rim will attain temperatures of 120 to 140 degrees F during the summer and exacerbate evaporation from the soil. Surface litter and the shade from plants ameliorate the rate of evaporation and help retain moisture in the soil. Therefore, controlled burning on the South Rim and allowing natural fires to burn within limited areas could produce severe impacts to the regenerative capability of the forest by creating bare soil areas. Such action will not be done without prior and intensive research studies.

A more detailed description and environmental analysis of prescribed burning projects within Grand Canyon National Park will be made in the environmental analyses accompanying the Natural Resource Management Plan and the park's Integrated Fire Management Plan which are now being prepared for public review.

Wildlife

One of the most significant impacts of resource management programs within the park will be that native plant and animal populations will have a much greater opportunity for survival than would be possible without these programs. This is especially true of rare or endangered species of animals. Native species such as the prairie dog that have disappeared from the park because of man's activities will be, to the extent possible, reintroduced into their native habitats. Predators will not be reintroduced unless there is sufficient natural prey nor will animals be reintroduced whose natural predators no longer exist to control their population.

The impact of eliminating exotic species, such as the feral burro, from the park and reestablishing native species is considered to be a beneficial impact in developing a naturally evolving environment. Exotic and feral species compete with the native species and are by definition unnatural within the park. Elimination or reduction of exotic species will not be done when the methods involved are inhumane or endanger native species. Eliminating the feral burros and horses from park lands will not conflict with Public Law 92-195 of December 15, 1971. Commonly known as the Wild Horse Act, this law states in Section 2(e) that the public lands under the jurisdiction of this act are ". . . any lands administered by the Secretary of the Interior through the Bureau of Land Management or by the Secretary of Agriculture through the Forest Service."

IMPACTS ON RESOURCE AND ENERGY UTILIZATION

For the most part, resources and energy will be drawn from outside of the park for the redevelopment of Grand Canyon Village. Fossil fuels

and electricity will be used in increasing amounts as the village grows in population and handles increasing numbers of day-use visitors.

However, the public transit system will decrease the amount of fuel consumed per visitor driving his private car. Remodeling and reorganization of the village will allow for a more efficient utilization of energy needed for heating, lighting, and air-conditioning. The amount of fuel savings will depend upon the degree to which energy conservation is considered in the location and design of specific buildings.

The Grand Canyon Enlargement Act of 1975 (Public Law 93-620) did not affect the status of hydroelectric potential on the Colorado River. The act of February 26, 1919, which established Grand Canyon National Park, was amended to include the additional lands in the provision which allows the Secretary of the Interior to permit utilization of areas within the park for the development and maintenance of a government reclamation project. However, Section 605 of Public Law 90-537, shall not apply to the portions of the Colorado River between Hoover Dam and Glen Canyon Dam unless otherwise provided by Congress. Public Law 90-537 precludes the Federal Power Commission from licensing, construction or operation of non-Federal hydroelectric power developments in the same area which includes all of the Grand Canyon Complex.

The effect of Public Law 90-537 is to preclude construction of hydroelectric dams in the Grand Canyon Complex without specific consent of Congress. Public Law 93-620 does not change this provision and specifically states in Section 9 that "Nothing in this Act shall be construed to alter, amend, repeal, modify, or be in conflict with the provisions of Sections 601 to 606 of Colorado River Basin Project Act, approved September 30, 1968."

Non-utilization of the hydroelectric potential of the Colorado River, as it flows through the Grand Canyon Complex is an irreversible impact only in the sense that the power that could be generated from it is not utilized at this point in time and at this specific geographic location. As long as the hydrologic cycle continues to function and as long as the Colorado River is allowed to flow into the canyon, the potential for hydroelectric generation exists. Should Congress decide that the national need to consume energy is greater than the national need for this national park to remain in a natural and unimpaired state then the Grand Canyon could be utilized as an energy resource.

Should the Congress of the United States so decide, then the permanent, long-term adverse environmental impacts of proposed dams and their benefits to the human environment would be properly weighed in the

appropriate impact statements which would be required. As the physical resource remains untouched by the proposal of the Master Plan, its potential use as an energy producer remains unaffected--only its current legal status is affected.

IMPACTS ON VISITOR USE

The current use pattern within the complex will change very little as a result of the Master Plan proposals. Heavily impacted areas will receive increasing amounts of visitor use and areas which currently receive little visitor use will continue to be little used by the vast majority of visitors. With increasing visitation, all areas will of course receive greater use but it will be one of degree rather than type.

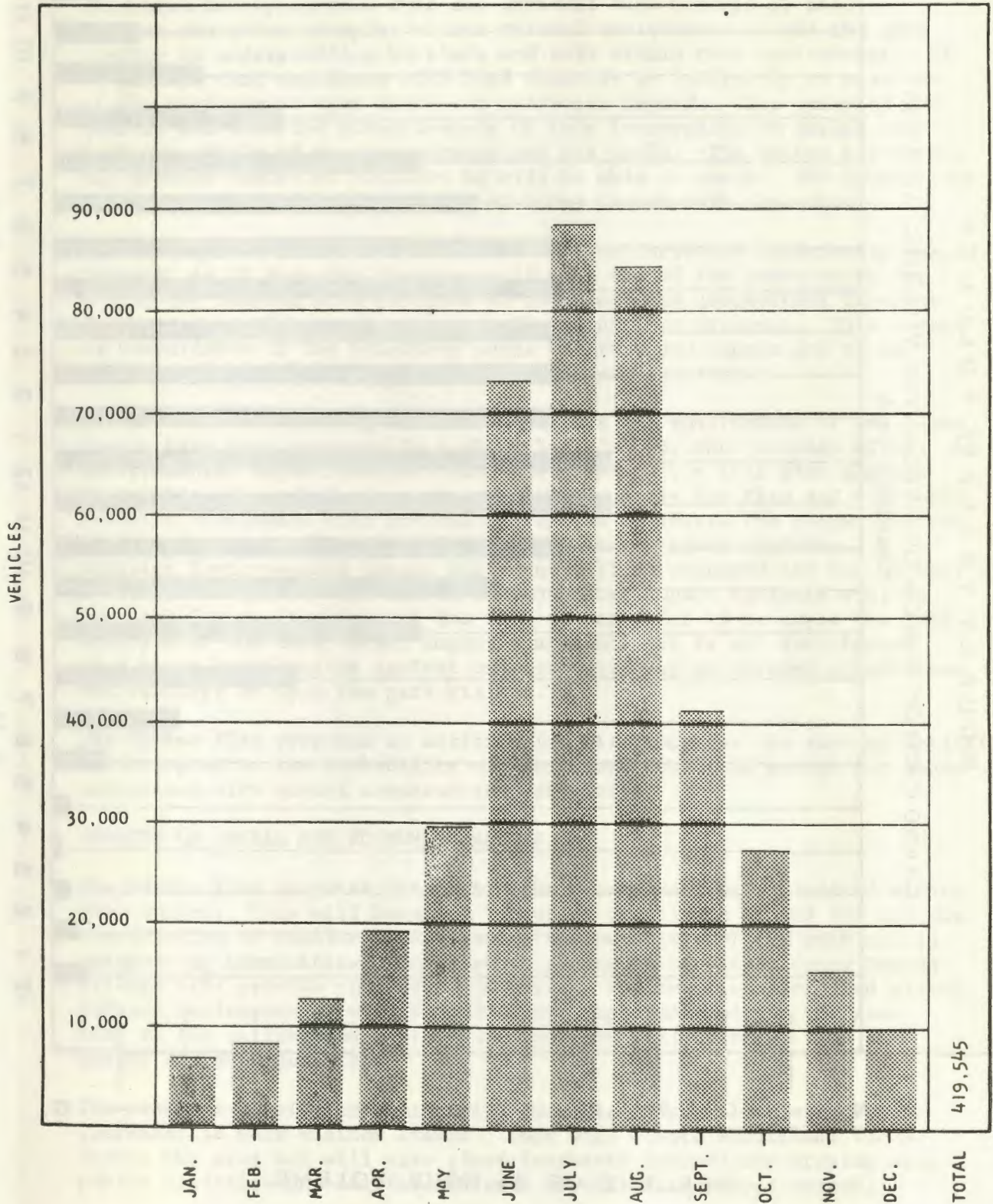
No studies have been done, and thus no data is available for the intensity of the present visitor load upon specific areas within the park. Therefore, no reasonable projection of the amount of visitor use spreading can be made at this time. That the visitor use load is very dependent upon the hour of the day and the season of the year can be seen from the traffic data shown on pages 98 and 99. Utilizing portions of the park in different seasons, than they are currently being used, seldom has the effect of spreading visitor load more evenly as far as impact upon the resource is concerned. The increased visitation in normally slack seasons is not withdrawn from the heavy use season and merely increases total impact.

The facilities within Grand Canyon Village, along the South Rim from Hermits Rest to Desert View, within the Corridor Unit from the South to the North Rim, and on Bright Angel Point are the present areas of large visitation and intensive visitor use. The major impact of the Master Plan will be to spread this visitor use more evenly within these areas and confine it to these areas. The Master Plan seeks to reduce the impact per visitor upon the village by organizing related facilities into clearly and easily defined zones and by tying these zones together with a public transportation system. This will allow for a greater number of visitors to use the area without further degrading its remnant of naturalness.

By stabilizing the overnight facilities within the park, the Master Plan will eliminate the need for building ever-increasing numbers of motel and lodge units within the park, but will increase the demand for such facilities on the outskirts of the park.

The construction of a multi-media interpretive facility on the South Rim at Yavapai Point and increased emphasis on interpretation by all appropriate means outside and within the complex, including the river, will have its greatest impact upon the park visitor. It is through

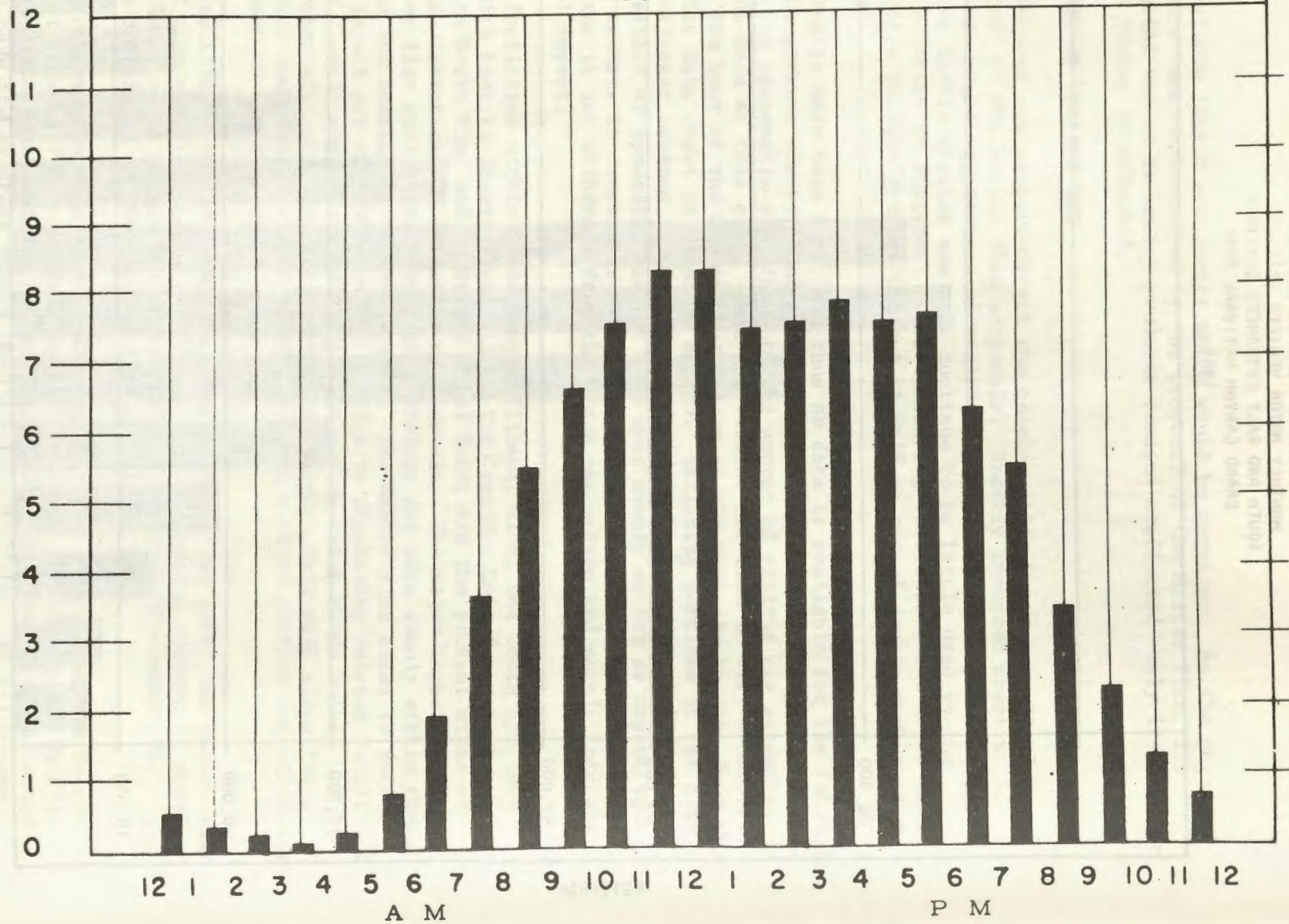
PATTERN OF TRAFFIC VOLUMES
 MONTHLY MOTOR VEHICLE ENTRIES
 SOUTH AND EAST ENTRANCES COMBINED
 GRAND CANYON NATIONAL PARK
 1965



HOURLY TRAFFIC VOLUMES

GRAND CANYON PARK & GRAND CANYON VILLAGE, ARIZONA
AUGUST 1965

PERCENT OF 24 HOUR VOLUME



effective interpretation that the National Park Service is able to utilize the prime examples of our natural environment to aid the park visitor in understanding his place and role within that environment. It is assumed that awareness will lead directly or indirectly to wise use of the environment upon which our existence depends. The quantity and quality and thus the effectiveness of this interpretation depend upon both the skills of the interpreter and his tools. The better his tools, the greater number of visitors he will be able to reach. The Master Plan seeks to provide the interpreter at Grand Canyon with these tools.

The Master Plan does not create or encourage increased backcountry use. However, as it does not discourage it, the use of the backcountry for hiking and camping will continue to increase with concomitant increase in the amount of human impact upon the natural environment. This impact is unavoidable if the primitive areas within Grand Canyon are to be utilized for the active recreation of the park visitor.

Use restrictions and regulations to protect the environment of the Inner Canyon have been prepared in a River Use Plan for the Colorado River. An Environmental Impact Analysis has been prepared for this plan and its impact has been adjudged as minor. A Backcountry Use Plan and a Natural Resource Management Plan are being prepared to insure the proper use and protection of park lands not devoted to intense human activity. A separate Environmental Impact Statement will be prepared for the Natural Resource Management Plan and an Environmental Impact Analysis will be prepared for the Backcountry Use Plan to determine if it needs the full analysis of the more formal impact statement. It is not anticipated that these restrictions against overuse will have an adverse effect upon the resource or upon the park visitor.

The Master Plan proposes no action which will increase the risk of natural catastrophes or the probability of man-caused accidents except for those associated with normal construction activities.

IMPACTS ON SOCIAL AND ECONOMIC FACTORS

The Master Plan proposes that overnight accommodations be limited within the complex. This will have the impact of creating a demand for and the construction of similar facilities on the outskirts of the park and in neighboring communities. Development construction within Grand Canyon Village will provide contracts for various construction firms and allied service businesses as well as additional employment within the area. Many of the skilled and semi-skilled workers will be drawn from the nearby Indian population.

The resident service community will increase in size in proportion to increases in park visitor travel. This will create additional income within the area but will also place increased demands and strains upon public utilities and services as well as the local school system.

No estimate of increased management or operating costs has been made for the Master Plan. However, the efficiencies provided through this plan are expected to reduce the cost per visitor served.

The economic cost of redevelopment and construction are, of course, unavoidable impacts as are those disturbances of the human environment normally involved in any construction project. Noise, dust, esthetic impairment, litter, smoke and traffic problems are all impacts commonly associated with construction activities. These disturbances of the human environment will be localized and temporary in any one area but will probably be going on somewhere on an almost continuous basis throughout the life of the plan. No financial estimates have been made for the total cost of the plan.

The known resources on the land base withdrawn from mineral and fuel extraction and from timber harvesting by the Enlargement Act of 1975 is minor and will result in very little potential economic loss. An adequate minerals inventory has not been made for park lands as prospecting, mineral entry, and mineral extraction are prohibited within Grand Canyon National Park.

The grazing potential on park lands is poor at best and there will be little economic loss or product loss as grazing is eliminated from the park. Lifetime permits will be allowed to expire naturally and permittees using park lands at the time of their addition to the park by Public Law 93-620 will be allowed ten year extensions of their permits.

Presently existing restrictions on river and land use prevent full exploitation by various entrepreneurs and thus result in a loss of potential income. It goes without saying that the public lands entrusted to the National Park Service are not to be devoted to the full exploitation or profit of private enterprise. Thus this impact upon potential economic gain is considered to be minor.

The social implications of the park's Master Plan and its impact upon the resident population of Grand Canyon Village and the village of Tusayan are documented in the Final Environmental Impact Statement for the Development Concept Plan on the Grand Canyon Village. The social and economic impact of the Master Plan upon the people living on the Havasupai Indian Reservation cannot be quantified at this time. The studies of park land added to the Havasupai Reservation by Public Law 93-620 will produce a land use plan which may have an impact upon park lands. The impacts generated on these lands and upon park lands where Havasupai land use is permitted cannot be determined until thorough resource studies have been made.

There will be no impact upon traditional Indian religious uses within the park, as the National Park Service honors such use and protection will be given to all shrines and sacred areas within the park.

Park interpretation as well as resource management must be based upon a sound research program. Research will thus have a direct influence upon the validity and effectiveness of the park's interpretive program. Sociological research will add the human element and have the effect of more accurately defining the park visitors' needs and discovering what he obtains from his exposure to the environment of the park.

Another significant impact of ecological and environmental research within the complex will be the proliferation of knowledge that can be the basis for resource management in areas outside of Grand Canyon National Park. Non-resource oriented research is also to be encouraged for the sake of increasing our knowledge of the earth. The park will thus serve as a great outdoor natural laboratory for research in such fields as geology, meteorology and hydrology which have ramifications far beyond the park's boundaries.

4. MITIGATING MEASURES INCLUDED IN THE PROPOSED ACTION

Information will be provided at regional information centers located at major arterial junctions near the park as well as at the major developed areas within the park. The information provided will enable the park visitor to avoid many of the vacation conflicts which mar an otherwise enjoyable trip. Information will be provided on backcountry use of the park where the environment can present a hazard to the inexperienced or unformed. Both resource protection and visitor safety will be enhanced through properly oriented educational and interpretive programs within and outside the park.

Use limitations, carrying capacities, and regulations for visitor use of the park resources have been and are currently being developed. These carrying capacities and use limitations are designed to provide protection and to mitigate visitor use of the resource within the complex. They will be modified only as a result of sound ecological and sociological research studies.

For the park visitor who wishes to do more than just view the canyon from one of the overlooks, but who is unable or unwilling to hike into the backcountry, there will be many options. Beyond the motor trails, paths, and interpretive programs on the rims, commercial river trips will continue to provide access through the center of the Inner Canyon wilderness. Mule rides in the Corridor Unit, concession operated 4-wheel drive trips in certain backcountry areas, and scenic air flights will provide the non-hiker with additional opportunities to experience the canyon. The heart of the canyon, the Colorado River and the backcountry have not been reserved for the exclusive use of the hiker or backpacker.

Scientific studies by non-service scientists will continue to be encouraged. The ongoing ecological and sociological studies on the river will be expanded both in scope and in intensity. Indications of environmental degradation will be cause for immediate cut-backs on an annual, monthly, or daily basis so that environmental values can be maintained.

Efforts will continue to be made to reduce the effects of scenic air flights on the backcountry and wilderness areas of the complex. The Grand Canyon National Park Voluntary Flight Procedures agreement is an example. River running concessioners will be encouraged to phase in the use of oars on river craft as soon as this is economically feasible. The concomitant reduction in motor use will enhance the wilderness and backcountry experience for both the river runners and the hikers and backpackers near the river.

Endemic infestation of forest insects or diseases and wildfires that threaten an unacceptable loss of environmental values, loss of life, damage of property, or which threaten to spread to adjacent public or private lands, will be controlled under National Park Service management policies. Where such occur on areas designated as wilderness, they will be controlled under provisions of the Wilderness Act of 1964, subject only to any Secretarial limitations imposed.

Archeological surveys have been made for several projects and plans for the park. These include a school residence; the public transportation route; the Grand Canyon Village as outlined in its Development Concept Plan (under contract no. CX800030014(9), Museum of Northern Arizona); and a helicopter landing pad. The National Park Service will continue to conduct archeological surveys prior to any plan or action which might involve archeological values. Should archeological values be discovered through an action, all work will cease on the project until the significance of the values can be ascertained and the archeological site avoided, if possible. If a newly discovered site has significant historic or archeological merit it will be considered for nomination to the National Register. Salvage archeology will be undertaken only as a last resort.

In compliance with Section 2(b) of Executive Order 11593, the National Park Service, Western Region, is exercising caution until inventories and evaluations are completed to insure that Federal property is not transferred, sold, demolished or substantially altered. The Master Plan does propose to continue to conduct historical and archeological research in accordance with the Administrative Policies for the Historic Areas of the National Park Service, Historic Preservation Policy and the Activity Standards, National Park Service, Part IV Professional Services, Historic Resource Studies and Management. Historic and archeological stabilization and repair will be accomplished at significant sites in accordance with Historic Structures Handbook, Part II, Ruins Stabilization; the Administrative Policies for the Historical Areas of the National Park System Preservation Policy; the Act to provide for the Preservation of Historic American Sites, approved August 21, 1935, (49 Stat. 666); and the Act for Preservation of American Antiquities, June 8, 1906, (34 Stat. 225). All stabilization and repair work will be accomplished under the direct supervision of professional archeologists or historic architects of the National Park Service.

The approval and implementation of this Master Plan will be in accordance with Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 13, 1971, and the National Historic Preservation Act of 1966, with the Criteria for Effect of Section 106 being applied to Federal actions affecting historic or archeological sites or properties.

All of the major development projects within Grand Canyon Village will be built upon or within areas which are already under some degree of development. Insofar as possible, utility lines and roadways will also follow old scars or disturbed areas. This will minimize the number of trees which must be removed from the area and the amount of ground cover which is altered. In all areas where the shade canopy is broken through the removal of trees or where the soils and ground cover are disrupted by construction and construction equipment movement, the ground will be replaced with a suitable material and in many instances revegetation procedures instigated. All revegetation work will be maintained for a number of years until the growth has taken and can survive and evolve without further help. This will in many cases require the use of reclaimed water during drought periods, surface mulching and the importation of commercial but native species of plants. Plants for revegetation purposes will not be obtained from less visited portions of the park but may be obtained from sites to be cleared for construction.

Construction projects such as those on Bright Angel Point will not only observe the protection of the natural environment and the esthetics involved in building within a natural area, but will also attempt to retain the traditional aspects of rustic cabin camping within the national parks. This has been a long-established facet of the visitors' experience on the North Rim, and is an historic aspect which is fast disappearing from the National Park System.

As a result of the Grand Canyon National Park Enlargement Act, several studies will be undertaken to determine the suitability of lands for retention within and addition to the park. Archeological values will be evaluated for Tuckup Point, Slide Mountain and Jensen Tank. Natural and cultural resources, as well as mineral potential, will be determined for Upper Kanab Creek, portions of Parashont and Androus Canyons, Whitmore Wash, and portions of the Shivwits Plateau.

The National Park Service will study those lands within the park designated as Havasupai Use Lands to determine the appropriate degree of use and to mitigate the effects of cattle grazing.

5. ADVERSE EFFECTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

Overflow camping and overnight accommodation pressures will be thrown on the areas surrounding the park. This would be as a direct response to camping and overnight limitations within the park. To the extent that this increased demand exceeds the ability of the nearby communities and camping areas to supply such services, it would be considered an adverse impact and one which is hardly unavoidable if the park is not to become overrun with campgrounds and overnight facilities.

The costs of operating and constructing an enlarged and renovated village are quite unavoidable as is the utilization of materials and energy involved in this increased operation. Although mitigated, there will be some loss of forest and woodland in the Grand Canyon Village area. This is unavoidable because occasionally the functional placement of a facility will not coincide with a previously disturbed area.

Short-term disturbances from construction activities are unavoidable in any plan which proposes redevelopment. Noise from such activities will be localized but still quite disturbing to those in the immediate vicinity. Dust and smoke abatement activities cannot be 100 percent effective and localized air pollution will certainly occur. The visual esthetics of construction areas will be impaired by construction activities and by litter related to those activities. Small amounts of vegetation will be destroyed surrounding the construction sites and the areas will have a raw or scalped appearance until natural or assisted revegetation can cover them. The movement of heavy, slow moving construction equipment will occasionally have to be done along the main roads of the park. Such movement will cause traffic congestion and concomitant irritation for the entrapped park visitor. Although these are short-term impacts for any single area, there will be a project going on some place in the park at almost any given time throughout the life of the Master Plan.

The loss of non-park uses such as mining, grazing, timbering, and hunting on lands added to the Grand Canyon Complex is unavoidable, but minor when viewed in the light of the amount of such resources or activities involved. This impact will be considered to be adverse by a few hunters, prospectors, and timber merchants.

The increased demands for public services and utilities caused by an expanding park support and service base are unavoidable. These demands are adverse, only to the extent that they exceed the availability of these resources in the region and the region's tax base.

The elimination of feral burros and free-roaming horses from the park will have an unavoidable impact upon the population of animals involved and the impact that these animals are now having upon the natural environment of the area. Direct reduction is a doubtful method at best for eliminating the entire population of these animals. Chemo-sterilants offer the best and most humane solution to this problem. The impacts upon the soil, biota and air quality by the proposed program of controlled burning will be unavoidable but will be short term.

The loss of non-part uses such as mining, grazing, timbering, and hunting on lands added to the Grand Canyon National Park is unavoidable, but minor when viewed in the light of the amount of such resources or activities involved. This impact will be considered to be adverse by a few hunters, prospectors, and timber workers.

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6. THE RELATIONSHIP BETWEEN LOCAL, SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The preservation of the unique combination of scenic, biotic, geologic, archeologic, and historic values in the areas covered by the Master Plan for the Grand Canyon Complex is a long-term gain for the environment and for this and future generations of Americans. Short-term, consumptive uses such as revenue-producing hydroelectric sites, lumbering, mining, or intensive visitor use and facility development would severely curtail long-term productivity of its educational and inspirational resources as well as its natural recreational resource.

Necessary roads, trails, buildings, and other developments designed to make the park accessible constitute a commitment to visitor convenience and may be looked upon as short-term uses. However, the small amount of land devoted to this purpose does not overshadow the long-term productivity potential of the complex as an outstanding scientific, educational and recreational resource. The long-term productivity potential of the area can only be fully brought out through certain short-term uses which maintain the resource, interpret it, and facilitate its use by the park visitor.

The short-term unavoidable disturbances from construction activities will be off-set by the long-term gains of a more functionally flowing visitation pattern and use within the areas of construction and the more adequate housing provided park employees.

As the Master Plan for the Grand Canyon Complex is, in the main, a conceptual document, there is no data base from which to postulate detailed, quantitative estimates of the trade-offs involved between short-term use and long-term enhancement of the natural resource's productivity. This relationship will be more readily perceived as the detailed planning stimulated by the concepts in the park's Master Plan evolves.

7. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

The proposals in the Master Plan result in few irrevocable uses of resources except where new facilities are proposed. New roads, buildings and other facilities brought about by the relocation and enlargement activities in Grand Canyon Village will disturb the native plant cover and the soils. The possibility of returning any abandoned or disturbed site to its original condition is remote.

Those lands added to the park will be permanently unavailable for multiple use or development for strictly economic benefit. This is an irreversible commitment of resources unless Congress later reverses its action.

There is no commitment of nonrenewable resources such as historic sites, rare plant or animal communities, animal habitats, minerals or mineral fuels. If archeological salvage is undertaken, loss of some cultural information is inevitable, which constitutes an irreversible commitment.

8. ALTERNATIVES TO THE PROPOSED ACTION

During the Master Plan studies and after public meetings on the Master Plan, various alternatives were investigated and analyzed. It is evident that the permutations of proposals for an area as large and complex as the Grand Canyon can be practically limitless. Only significantly different alternatives will be considered in this impact statement.

A. NO ACTION

The major elements of this alternative are:

- Retain the various management policies within the former boundaries of Grand Canyon National Park, Grand Canyon and Marble Canyon National Monuments and Lake Mead National Recreation Area;
- Retain visitor and park support facilities in their present locations with necessary replacement and improvement to maintain a standard of adequate quality;
- Continue to implement changes in operational procedures in response to observed needs to preserve resources and to better serve visitors. These changes would be restricted within present broad management policy;
- Continue to coordinate and consult with others in the management of park resources and the provision of visitor services within the present framework.

IMPACTS

Lands now included within the enlarged park have been managed under differing legislative provisions and administrative policies. To retain these policies would result in continuation of difficulties in managing this ecological and geophysical entity and managing the use of the Colorado River through the canyon. Research programs, resource management practices, visitor and public use regulations would continue to be discontinuous across the various boundaries. This will result in delay or impossibility in discovering needed changes in resource management causing unknown and unquantifiable harm to ecosystems. The establishment of visitor use monitoring and control will be hampered causing over and under utilization of various areas of the Grand Canyon. These impacts can be mitigated somewhat through close cooperation among the land managers to coordinate activities such as funding of research, implementation of common resource management practices and visitor use regulations and surveillance.

Retention of visitor and park support facilities in their present locations will result in a continuing increase in present impacts.

- The visitor experience would continue to be compromised and lessened due to improper location of facilities.
- Land presently impacted by heavy use would continue to be opened to heavy use.
- No new areas would be opened to heavy use.
- Disruption of soils, vegetation and wildlife due to construction and new and increased use would not occur.
- No increase in day-use capacity with resultant increased demand on water supply, sewage disposal and other supporting land use would occur.
- Social conflict among park day users, park overnight users and park residents would continue.
- Aesthetically and physically intrusive development would continue to restrict visitor use and enjoyment of the canyon rim.

Implementation of the no action alternative will cause a continuation of present resource management practices with only some change. Irreversible major resource damage caused by overuse would not be permitted to occur. Visitor use would be restricted to ensure resource preservation. Increased levels of maintenance funds would be expended to compensate for or ameliorate resource damage.

Unavoidable impacts to the park resources would be:

- The integrity of historical and other cultural resources would continue to be compromised by noncompatible and conflicting use. Re-creation of the historic scene would not be possible.
- Deterioration of the river ecosystem that cannot be mitigated without major change in present practices would continue.
- Failure to accelerate elimination of adverse management practices would result in irretrievable damage. E.g., present fire policy and feral burro control policy would continue causing unquantified harm to vegetation, soils and wildlife.

Coordination with others inside and outside park boundaries would continue within the present framework.

Encouragement of development outside the park would continue without definite criteria, resulting in less orderly and poorly planned private development.

B. REMOVAL OF SOUTH RIM VILLAGE ACCOMMODATIONS AND SUPPORT FACILITIES

The principal elements of this alternative are removing all visitor and park support facilities except those directly related to rim access, interpretation or protection, and relocating them outside the park boundary. Historic buildings and interpretive structures which are required for the effectiveness of visitor appreciation of resource values would remain. Mass transit using existing roads would be the only means of mechanized access to the rim.

Relocation of government facilities would occur on public land (U.S. Department of Agriculture, Forest Service) outside the park. Most concessioner facilities would also relocate to public land, however, some of the presently provided services may relocate to private land, e.g. in Tusayan or Williams.

IMPACTS

Removal of development and associated relatively intensive use directly affect the land area presently occupied.

Resource management techniques will permit this land through time to revert to a natural or near natural state.

--Facilities and uses that presently conflict with visitor resource appreciation will be eliminated. This includes automobile traffic with its visual, noise and air pollution intrusions; lodging, housing and food service with its visual intrusions and its use conflict;

--Relocation of the development and associated use would affect receiving land and its present use. The magnitude of this impact would obviously depend upon where it would occur. U.S. Department of Agriculture, Forest Service land within the Kaibab National Forest and private land in Tusayan are closest to the South Rim and would probably be most heavily impacted.

---Land in a relatively natural state would be developed with resultant impacts of vegetation, soil, water runoff, and wildlife.

--Domestic water is not available in any appreciable quantity on the South Rim or adjacent to it. Water would either be shipped from where it is available or the present South Rim supply from Roaring Springs extended to serve the new community.

--The economy of Tusayan would be stimulated principally through the supply of services to park visitors.

--The permanent and transient population of Tusayan would greatly increase causing an increase in the need for community services such as schools, police and fire protection.

Most of the structures and the existing utility infrastructure and many of the roads on the South Rim would be obliterated and new construction provided at the new location. Economic inefficiency would result causing an increase in Federal, concessioner and other private spending. Economic impact on the Federal Government will be relatively minor. However, the impact upon the concessioner and private sector would be severe resulting in a lesser quality and quantity of service and in higher costs to park visitors.

Transporting visitors from the area of relocation to the canyon rim would result in additional impacts.

It is estimated that by 1980, 40,000 visitors will arrive daily at peak periods. It would require a fleet of 21 100-passenger buses, operating on 1.5-minute intervals to adequately accommodate the visitation, during the busiest period. Operation on a reduced schedule would be required for an additional 8 hours per day. Total bus-miles per day to transport the 1980 projected visitation would be 5,500. The cost of 21 buses would be approximately \$1.4 million. Additional equipment and operating facilities would bring the initial expenditure to at least \$2 million. The annual operating expense would be about \$900,000.

At present day visitation, annual operating costs would approximate \$675,000.

C. REMOVAL OF ACCOMMODATIONS AND SUPPORT FACILITIES FROM THE NORTH RIM

An alternative similar to alternative B. was considered for the North Rim. Part, or all, of the developments could be removed from Bright Angel Point and reestablished outside the park on what is presently national forest land. The North Rim would then be managed for day-use only.

This idea was rejected on grounds similar to those rejecting the alternative of moving Grand Canyon Village outside the park boundary. Such wholesale movement and relocation of developments and facilities would be almost prohibitively expensive and little would be gained from such a massive relocation. Potable water would have to be pumped at least an additional 17 miles to the new development from Bright Angel Point. Park visitors would be denied the opportunity of staying overnight on the rim of Grand Canyon. The scars left behind would be difficult to revegetate, and it would be many years before any semblance of a natural environment reestablished itself on the point. If the relocation were total, it would mean that the North Rim Lodge would be razed. This is one of the few remaining "Grand" lodges in a National Park Service area.

The Forest Service was unable, at that time, to participate in joint planning with the National Park Service to establish possible site locations for this alternative. However, the destruction and disruption of the natural environment caused by such a massive relocation of developments and facilities to any reasonable site would be quite severe.

D. INTENSIFY USE OF PARK

A greater utilization of the park for visitor use and accommodations can be made than is proposed in the Master Plan for the Grand Canyon Complex. Overnight accommodations could be allowed to meet increasing demands, entertainment facilities could be developed, the number of paved roadways increased, mechanical transportation to the bottom of the canyon attained, developed areas such as Bright Angel Point and Desert View expanded and new development areas created along the rims, unlimited motorized access allowed on the Colorado River and aircraft restrictions lifted.

Increasing developments outside the currently developed areas would consume and impact upon increasing amounts of the natural and human environment of the park. Even if the developments are kept small and the access roads to them narrow, they cut the natural environment into smaller and smaller pieces and destroy its integrity as a viable ecological unit. Any development or facility which would detract from the natural scene of the canyon as viewed from the rims or from within the canyon would be considered undesirable and destructive to the resource protected within the park. Motors both on the river or in the air detract from the natural wilderness preserved in the canyon and are perhaps worse than visual impacts as you cannot simply close your ears to escape from their noise. Unrestricted use of the back-country and the river would soon produce problems in sanitation, human health, and resource degradation. None of the many environments preserved within the complex can be considered sturdy and capable of withstanding heavy visitor impact without degradation.

1. The North Rim

If the developments and facilities on Bright Angel Point were to be expanded apace with those in Grand Canyon Village, then some method of increasing and encouraging travel to the North Rim would have to be found. Some form of mass transit system could be developed from Jacob Lake to Bright Angel Point. There are no major cities nearby from which to draw visitors; therefore, it is unlikely that such a transit system would be effective in increasing travel to the North Rim. At the present level of visitation, and in view of projected trends, it is doubtful if the expense of a lengthy transit system could be justified on the grounds of efficiency, economy, or protection of the natural environment.

Assuming that an effective means of encouraging visitation to the North Rim were devised and that increased visitation warranted expanded services

and support facilities, the resultant developments would totally change the character of the North Rim. Its value as an outstanding scenic resource, with opportunities for both relaxed viewing and the more primitive backcountry experience, would be lost.

2. The Canyon

It has been suggested that an increase in the use of the canyon could be accomplished by some efficient type of people-moving device such as a cog railway, a tramway, or an elevator. The only means of access into the canyon, at present, is by foot or mule.

A tram was considered for the South Rim, beginning at Yaki Point, just east of the Kaibab Trail, and terminating across the river 1/4 mile from Phantom Ranch. The two-car tram system would follow the Kaibab Trail to the Tonto Plateau, halfway down the canyon, continue along the trail alignment, and cross the river to shore level. The system would require 4 towers: the first recessed in the rim, a second on the Tonto Plateau, another below, and the last across the river. Major construction would be necessary to house the cable and power source at the rim and for the tower and viewing platform on the plateau, as well as for the anchorages below.

A tramway would impinge upon the naturalness of the canyon view for the majority of park visitors. Although only slightly visible from the South Rim development and the Bright Angel Trail, it would be impossible to hide even in the recess of a side canyon as it would, of necessity, have to cross the broad and open Tonto Plateau to reach river level. It would be highly obtrusive to those hiking the Kaibab Trail. It is assumed that the tram would allow many more people to experience the inner canyon and to bring the visitor closer to the resource. However, the tram itself could become the attraction, rather than the opportunity of viewing the resource.

The concept of a tram in Grand Canyon National Park is in conflict with National Park Service policies for the administration of natural areas in that only those recreational activities "that can be accommodated without material alteration or disturbance of environmental characteristics or the introduction of undue artificiality into a natural environment are to be encouraged." The canyon is the prime resource, in terms of both esthetics and naturalness. Towers, cables and scars were not considered appropriate in this instance. A more appropriate use of a tramway was considered for the Glen Canyon NRA. The tram system for Glen Canyon was proposed to originate below the dam. The visitor, in this instance, would view the manmade structure, as well as experience the ride from the rim to the river. In terms of regional planning, the opportunity of providing the visitor with this specific experience would not be lost if the tram in Grand Canyon were not constructed.

Further advantages of the tram, however, were considered. In the event that the tram were constructed, the possibility of phasing out or eliminating mule use along the Kaibab Trail would become feasible.

At present, the requests for mule trips each year outstrip their capability. The trip by muleback is strenuous, and those not in good physical condition, the poor, the young, and the heavy are prohibited from making the trip.

On the other hand, hiking use has increased and a conflict between these uses has arisen. The environmental condition of the trail does not always meet the expectations of the visitor. An obvious solution is that of the tramway. Not only could the same or a greater number of persons be accommodated, but supply to Phantom Ranch could be achieved without the use of the mule. Eliminating mules from the canyon would render obsolete two concessioner barns, a blacksmith shop, and 34,000 square feet of corral space from Grand Canyon Village. The National Park Service would be able to eliminate a barn, a blacksmith shop, and 7,400 square feet of corral space. The accident potential between mules and automobiles in the village or between mules and hikers on the trails would be eliminated. Resupply to Phantom Ranch which is now done by mule strings could easily be done by tram which could operate during the night.

However, with all advantages in mind, the mule trip to the bottom of the canyon is still considered an unusual experience and one not readily provided in other units of Federal, State, or local park systems. Further consideration of the mule problem will be discussed in the Development Concept Plan for the North Rim.

An elevator was considered as a compromise to an exposed tramway. This elevator would utilize the shaft of the Little Orphan Mine just west of Grand Canyon Village. The shaft would be deepened to the base of the Redwall Limestone and a lateral tunnel driven to gain access to the Tonto Plateau. Used primarily for access to the rim from the canyon, it would eliminate 3,300 feet of climbing for the hikers, and thus encourage many more people to enter the canyon on foot within the limits of such an elevator's capacity. The exit at the base of the Redwall would be hidden from all South Rim viewpoints, and because of the distance, from the North Rim as well. It would, thus, not be intrusive upon the canyon view. The technology is available for this project at the present time but at high cost. The Little Orphan Mine property will not be available until 1987 when it will become the property of the National Park Service.

E. LESSER LAND ACQUISITION AND DELETIONS

The boundary realignment proposed in the Master Plan was made with the view that the Grand Canyon is the resource that is to be protected within the park. The minimum requirement for this is the 277 miles of river canyon from near Lees Ferry, Arizona to the Grand Wash Cliffs with all

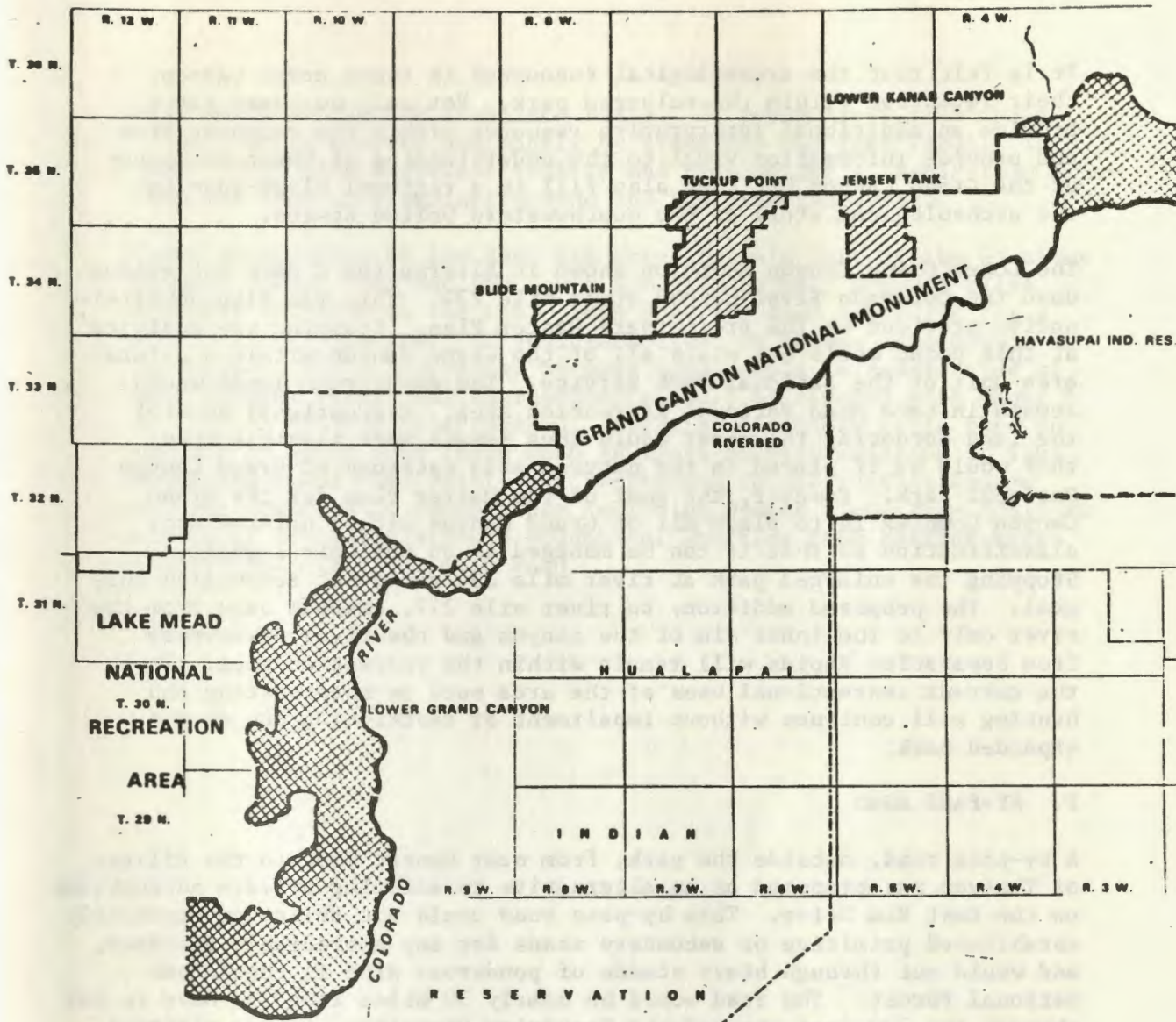
of the land included from rim to rim. Land is required back from the rims on which to view the canyon and the maintenance of a natural park environment is necessary here as well. This means that the rim lands must extend back from the rim a sufficient distance to provide protection from man's other intrusions and a sufficient distance so that the natural environment of the rims can maintain itself against man's actions outside the boundaries. Lands not having National Park quality and not required for access, interpretation, protection or any of the above reasons should be deleted from the park and put to more suitable purposes.

One of the possible configurations for the park boundary is shown as alternative C. on page 118. This was considered as a viable alternative to the present plan during the preparation of the preliminary Master Plan. This alternative would delete three parcels of land totaling 38,080 acres from Grand Canyon National Monument from the enlarged national park.

Jensen Tank (9,000 acres), Slide Mountain (5,380 acres) and Tuckup Point (23,700 acres) are upland areas well back from the main canyon. The vegetation is dominantly composed of stands of pinyon and juniper trees with intervening areas of sagebrush and grass. Portions of all three areas are currently being grazed under lifetime permits. In the early planning stages for the Grand Canyon Complex it was felt that this land was better suited for grazing and other multiple uses than as part of the Grand Canyon Complex. The majority of the land would be placed under the jurisdiction of the Bureau of Land Management which presently controls the adjacent land use. Some of the land would be traded with individuals for inholdings within the monument.



Archeological surveys and preliminary excavations, however, indicate that these areas are very rich in Pueblo cultural remains. These studies have been done, and are being done, primarily by archeologists and students from the College of Southern Utah. As an example of the site density in these areas, eighty-five sites have been found in the fifteen percent of the Jensen Tank area that has been surveyed. There are no comparable sites in the rest of the Complex which provide information on this particular time span of human occupation in the area. Significant sites can be excavated, stabilized and interpreted to the park visitor.

Studies of bighorn sheep indicate that these upland areas are crossed and used by these animals. Deletion and boundary fencing of these lands would deny the bighorn access to these areas. This was not known during the earlier stages of master planning. As shown in the map of Alternative C, Tuckup Point and Slide Mountain would be shaved from the edge of the monument. However, Jensen Tank would protrude as a salient of non-confirming uses into the proposed enlarged park. Thus, any incompatible use such as vegetation chaining, rodent extermination, or hunting, would have far more impact upon the surrounding park lands than it would if this boundary were tangential to the park.



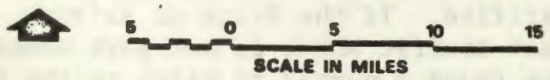
ALTERNATIVE C

MASTER PLAN

PROPOSED ADDITIONS  | PROPOSED DELETIONS 

TUCKUP POINT	23,700
JENSEN TANK	9,000
SLIDE MOUNTAIN	9,380

113	40,036
DSC	OCT 75



It is felt that the archeological resources in these areas warrant their retention within the enlarged park. Not only do these sites provide an additional interpretive resource within the monument area and provide information vital to the understanding of human occupancy of the Grand Canyon but they also fill in a regional blank-spot in the archeological story of the southwestern United States.

The Lower Grand Canyon Addition shown in Alternative C does not extend down the Colorado River beyond river mile 234. This was also an alternative provided by the preliminary Master Plan. Stopping the addition at this point would not place all of the Grand Canyon within a natural area unit of the National Park Service. The downstream lands would remain in Lake Mead National Recreation Area. Recreational uses of the land bordering the river would thus remain more flexible than they would be if placed in the natural area category of Grand Canyon National Park. However, the goal of the Master Plan for the Grand Canyon Complex is to place all of Grand Canyon within natural area classification so that it can be managed as an ecological whole. Stopping the enlarged park at river mile 234 would not accomplish this goal. The proposed addition, to river mile 277, extends back from the river only to the inner rim of the canyon and the river downstream from Separation Rapids will remain within the recreation area. Thus, the current recreational uses of the area such as motorboating and hunting will continue without impairment or restriction due to the expanded park.

F. BY-PASS ROAD

A by-pass road, outside the park, from near Desert View to the village of Tusayan was proposed as an alternative to allowing private automobiles on the East Rim Drive. This by-pass road could not follow any presently established primitive or secondary roads for any appreciable distance, and would cut through heavy stands of ponderosa pine in the Kaibab National Forest. The road would be nearly 30 miles long and have to cut through the 800-foot rise of the Grandview Monocline. Those visitors who wished to view the eastern portion of the park and travel east-west across the park as well would have to leave their automobiles at one end of the East Rim Drive, make the trip out and back by a public transportation system, and then take the by-pass road in their cars.

This alternative was not considered feasible because of the expense of such a by-pass road, the loss in time and energy created by making the trip a triple-transit of the 30-mile stretch of country, and the necessity of needlessly destroying 30 miles of the natural environment by a new roadway. Also, as has been discussed under alternative B. above, mass transit is a significant economic burden that should not be undertaken unless amply justified. If the State of Arizona desires a road to link east-west traffic which is not park bound, then a much better route may be found a number of miles to the south of this area. A 16- to 17-mile-long road could link Routes 89 and 180

just north of the San Francisco Peaks. It would cross relatively level country covered dominantly by grassland and lava flows. This route would link east-west traffic and provide for a scenic loop drive from the city of Flagstaff around the San Francisco Peaks.

Close examination of the East Rim Drive reveals that of the 23 miles between Desert View and the South Rim Village only about 3 miles actually encroach on the rim. This does not seem excessive for a scenic drive. However, if vehicle congestion became intolerable in the future, short individual by-pass roads could be constructed at each problem area. All encroachments could be removed with about 6 or 7 miles of road construction. Existing overlooks could then be reached by short spur roads such as those already existing at Yaki Point and Grand View Point. If increasing future traffic caused serious overflow of these areas including Desert View, they could be served by short, relatively economical shuttles from parking areas constructed along the main road.

9. CONSULTATION AND COORDINATION WITH OTHERS:

1. Consultation and Coordination in the Development of the Proposal and in the Preparation of the Draft Environmental Statement

Public meetings on the Preliminary Draft Master Plan and its Draft Environmental Statement were held in Phoenix, Arizona on July 13, 1974, in Flagstaff, Arizona on July 15, 1974, in Kanab, Utah on July 16, 1974, and at Grand Canyon National Park on July 17, 1974. In addition, public comment was solicited by legal notice in the local newspapers of Tucson, Phoenix, Flagstaff, Williams and Prescott, Arizona and in Kanab, Utah. The preliminary plan packet was mailed to organizations and individuals to solicit their comments and/or attendance at the public meetings. The proposal was also available for public inspection at the following locations: Grand Canyon National Park, National Park Service offices in Page and Phoenix, Arizona, National Park Service Western Regional Office and in college and public libraries throughout the State.

Participation in the public meeting process was light, with 54 organizations and 30 individuals making oral or written comments. All responses to concepts and actions proposed in the draft Master Plan have been taken into consideration in the preparation of the final Master Plan on which this Environmental Impact Statement is written.

Statements made at the public meetings on the proposed Master Plan by the Governor, State of Arizona, indicate that the State objects to the inclusion of potential dam sites within the enlarged national park. The State remains interested in the building of the Bridge Canyon and Marble Canyon dams as a means of generating revenue for other water development in the State, to assist the Hualapai Indians and to help balance the State's water supply and demand. The State feels that hydro-electric energy will reduce the quantity of fossil or nuclear fuels otherwise needed to generate electricity. The State also opposes the proposed boundary changes on the grounds of encroachment on lands claimed by the Havasupai Indians. The State favors a Master Plan which says whether or not Grand Canyon National Park will supply water to out-of-park users. The State opposes any redesignation of portions of Lake Mead National Recreation Area to that of a natural area such as Grand Canyon National Park for fear of loss of mineral potential, hunting lands and grazing uses.

The Hualapai Tribe shares the Governor's feeling about the Bridge Canyon (Hualapai) dam. The Tribe states that it is a partner with the Arizona Power Authority and, "insists upon reserving the right to construct, or allow to be constructed, a dam across the Colorado River at the Bridge Canyon dam site." The primary concern of the Navajo Tribe at the public meetings was to preserve traditional religious entry in Grand Canyon National Park, as well as grazing in the Cedar Mountain area near Desert View. The Hopi Tribe expressed concern for the protection of shrines within the park, and the preservation of the entire area.

The Sierra Club, the National Parks and Conservation Association and a number of national and local conservation organizations favored the proposed Master Plan with a more extensive boundary change. Areas suggested for inclusion in the enlarged national park were an upstream boundary at Lees Ferry or the Paria River, a downstream boundary at Grand Wash Cliffs to include Andrus, Whitmore and Parashont Canyons, and the Shivwits Plateau. The Kanab Canyon addition extended to include side canyons to the upper rim; Blue Springs on the Little Colorado River; and plateau lands on both the North and South Rims. It was suggested that the Federal Government acquire Tusayan, private land within Kaibab National Forest, for the purpose of visitor accommodations.

The community of Tusayan favors the export of park water to their area for business and residential uses. Scenic Airlines and Grand Canyon Airlines fear a loss of overflight privileges. Equal numbers of river outfitters support and oppose the removal of motors from the Colorado River.

Requests for written responses and testimony at the public meetings resulted in participation from the following agencies and organizations:

Department of Agriculture

Forest Service

Department of the Interior

Geological Survey

Bureau Mines

Fish and Wildlife Service

Environmental Protection Agency

Federal Power Commission

State of Arizona

Governor

Clearinghouse

Arizona Outdoor Recreation Coordinating Commission

District IV, Council of Governments

Office of Economic Planning and Development

Department of Economic Security

Center for Environmental Studies

Department of Health Services

Department of Highways, Environmental Planning Division

Indian Affairs Commission

Department of Land

Department of Law, Civil Rights Division

Mineral Resources Department

Bureau of Mines

Parks Board

Power Authority

Southwestern Minerals Exploration Association

Water Commission

DNA People's Legal Services
Hopi Tribe
Navajo Tribe
Hualapai Tribe

Coconino County Board of Supervisors
Mohave County Planning and Zoning Commission

Arizonans for Quality Environment
Desert Protective Council
Mearns Wildlife Society
National Parks and Conservation Association
Northern Arizona University Hiking Club
Sierra Club
Southern Arizona Hiking Club
Tucson Audubon Society

Arizona Daily Star
Arizona River Runners, Inc.
Canyoners, Inc.
Community of Tusayan
Fred Harvey Co.
Grand Canyon Airlines
Grand Canyon Tramways, Inc.
Harris Boat Trips
Hughes Airwest
Sanderson River Expeditions
Santa Fe Railroad
Scenic Airlines
Tusayan Water Development Committee
Verkamp's, Inc.

Arizona Academy of Science
Gilbert Associates, Inc.

2. Coordination in the Review of the Draft Environmental Statement

On June 7, 1974, the Draft Environmental Statement was mailed to each of the organizations and individuals listed below for review and comment:

Advisory Council on Historic Preservation
Department of Agriculture
 Forest Service
 Soil Conservation Service
Department of the Interior
 Geological Survey

Bureau of Indian Affairs
Bureau of Land Management
Bureau of Mines
Bureau of Outdoor Recreation
Bureau of Reclamation
Fish and Wildlife Service

Environmental Protection Agency
Federal Power Commission
Department of Transportation
Federal Aviation Administration

State of Arizona Clearinghouse
State of California
Colorado River Board
State of Utah
Governor

DNA-People's Legal Services
Havasupai Tribal Council
Hopi Tribal Council
Hualapai Tribal Council
Navajo Tribal Council

Coconino County Board of Supervisors
Coconino County Planner and Director
Mohave County Planning and Zoning Commission

Mayor, Flagstaff, Arizona
Mayor, Kanab, Utah
City Manager, Williams, Arizona

Cocopai Resource Conservation Development Project

Advisory Commission of Arizona Environment
 Arizona Conservation Council
 Arizona Desert Bighorn Sheep Society, Inc.
 Arizona Friends of the Earth
 Arizona Mountaineering Club
 Arizona Parks and Recreation Association
 Arizona Wildlife Federation
 Arizona Wildlife Society
 Arizona-New Mexico Wildlife Society
 Arizonans for Quality Environment
 Citizens for a Best Environment
 Colorado Plateau Environmental Advisory Board
 Desert Protective Council
 Environmental Conscience Corporation
 Federation of Western Outdoor Clubs
 Lord's Earth Committee
 Maricopa Audubon Society
 Mearns Wildlife Society
 National Parks and Conservation Association
 National Wildlife Federation
 Saguaro Conservation and Ecology Club
 S.A.V.E.
 Save the Grand Canyon Committee
 Sierra Club, Southwest Office
 Sierra Club, Palo Verde Chapter
 Southern Arizona Hiking Club
 Tucson Audubon Society
 Utah Environment Center
 Wilderness Society

 American River Touring Association
 Arizona Cattle Growers Association
 Arizona Daily Star
 Arizona Daily Sun
 Arizona Public Service Co.
 Arizona River Runners, Inc.
 J.R. Babbitt, Attorney-at-Law
 Babbitt Brothers Trading Co.
 Canyon Food Mart
 Canyon Squire Motel
 Canyoneers, Inc.
 Colorado River and Trail Expeditions, Inc.
 Cross Tours and Explorations, Inc.
 Flagstaff Chamber of Commerce
 Fort Lee Company
 Four Corners Regional Commission
 Fred Harvey Company
 Georgie's Royal River Rats
 Globe Ranch
 Grand Canyon Airlines

Grand Canyon Airport
 Grand Canyon Dories
 Grand Canyon Expeditions
 Grand Canyon Gas Company
 Grand Canyon Scenic Rides
 Grand Canyon Schools
 Grand Canyon-Tusayan Chamber of Commerce
 Grand Canyon Youth Expeditions
 Harris Boat Trips
 Hatch River Expeditions, Inc.
 Hughes Air West
 Kane County Record
 Kolb Studio
 Moki Mac River Expeditions
 Moqui' Lodge
 Mountain States Telephone
 O.A.R.S., Inc.
 Outdoors Unlimited
 Recreation Equipment, Inc.
 Red Feather Lodge
 ROMA
 Salt River Project
 Sanderson River Expeditions
 Santa Fe Railway Co.
 Scenic Airlines, Inc.
 Skidmore, Owings and Merrill
 Spencer, Lee, Stypula and Busse
 Tour West, Inc.
 Tri-State Flight Operations
 Valley National Bank
 Verkamp's
 Western River Expeditions, Inc.
 White Water River Expeditions
 Wilderness World
 Williams Chamber of Commerce
 Williams News
 Wonderland Expeditions

Durward L. Allen
 Arizona Academy of Science
 Ben Avery
 Stan Brickler
 J. Harvey Butchart

John Davis
 Loren C. Eisely
 Fred B. Eiseman, Jr.
 Lorne Everett
 Bernard L. Fontana
 Joe B. Frantz

Joseph G. Hall
 Emil Haury
 David Hood
 Stephen C. Jett
 Eugene P. Kiver
 A. Starker Leopold

Paul S. Martin
Charles O. Minor
Museum of Northern Arizona
Roderick Nash
Navajo Tribal Museum

School of American Research
William G. Shade
Howard Stricklin
Richard A. Thompson

David W. Ballie, Jr.
E. Y. Berry
Carl Bowman
Anthony A. Burford
Lewis Swift Eaton
Paul J. Fannin
Ed Fike
Jean E. Ford
Barry Goldwater
Lanphere B. Graff
Carol Haman
Frank M. Hanna
James R. Hooper
G. Donald Kucera
Lawrence W. Lane, Jr.

O. Dock Marston
Peter C. Murphy, Jr.
Linden C. Pettys
John Rhodes
Steven Rose
John P. Schafer
Sam Steiger
Malcolm D. Taylor
Morris K. Udall
John Walston
Ted Watkins
John Wettaw
Steve Woodcock
C. Clifton Young

The following is a list of those who made written comments on the draft environmental statement. A copy of each comment is included in Appendix A of this chapter.

Advisory Council on Historic Preservation

Department of Agriculture

Forest Service

Department of the Interior

Geological Survey

Bureau of Land Management

Bureau of Mines

Bureau of Outdoor Recreation

Bureau of Reclamation

Fish and Wildlife Service

Bureau of Indian Affairs

Environmental Protection Agency

Federal Power Commission

State of Arizona

Governor

Clearinghouse

Outdoor Recreation Coordinating Commission

District 4, Council of Governments

Office of Economic Planning and Development

Department of Economic Security

Center for Environmental Studies

Department of Health Services

Department of Transportation, Highways Division

Indian Affairs Commission

Department of Law, Civil Rights Division

Mineral Resources Department

Arizona Bureau of Mines

State Parks Board (State Historic Preservation Officer)

Southwest Minerals Exploration Association

DNA - People's Legal Services, Inc.
Seymour Tso, Navajo Tribal Council

Coconino County Board of Supervisors
Community of Tusayan
Hughes Air West
Mohave County Planning and Zoning Commission

Arizonas for Quality Environment
Desert Protective Council, Inc.
National Parks and Conservation Association
Northern Arizona University Hiking Club
Sierra Club
Tucson Audubon Society
Arizona Daily Star
Arizona River Runners, Inc.
Canyoneers, Inc.
Harris Boat Trips
Sanderson River Expeditions
Fred Harvey, Inc.
Grand Canyon Tramways, Inc.
Scenic Airlines, Inc.
TWA Services Inc.
Arizona Academy of Sciences
Gilbert Associates, Inc.
Jeffrey Ingram
Stephen C. Jett
William N. Matteson
Charles O. Minor
Carl B. Bowman
Tom Clawson
Steven L. Coleman, Kristin L. Coleman
Rev. John Faustina
Catherine P. Harris
Mr. and Mrs. Dal Herring
Thomas E. Horobik
Seymour H. Levy
Gordon M. Luepke, Janice Luepke, Cynthia L. Becker, John C. Luepke,
Barbara Sulig
Jerry Oxford
Pat Rusin
William C. Seagle
John R. Swanson

Specific comments and responses follow:

Advisory Council on Historic Preservation

The Memorandum of Agreement has been approved which completes the process for compliance with the "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

Forest Service, USDA

Comment : The Forest Service disagrees that the land transfer in the Kanab Creek area will improve management.

Response: The National Park Service regrets any implied quality difference in management ability between the Forest Service and the National Park Service. For specific changes in wording or explanations of meaning, please see pages 4, 22, and 23.

Comment: The proposed Kanab Creek addition is being managed as a roadless area and could become wilderness under Forest Service management.

Response: The lands in question were added to the national park by Public Law 93-620. These lands are presently being studied for wilderness suitability as mandated by an amendment to the Enlargement Act of 1975. The Forest Service will be consulted during the study to ensure compatible wilderness management throughout the Kanab Canyon area.

Comment: Visitor capacity seems to be predicated solely on traffic flow systems.

Response: Carrying capacity parameters will be the basis for deriving park visitation levels for areas within Grand Canyon National Park. See pages 16, 17, and 103.

Comment: The problem of accommodation pressures on surrounding lands should be discussed.

Response: Increased demand for overnight facilities outside the park is discussed on pages 97 and 106.

Comment: The Forest Service suggests that interagency liaison is lacking on the basis of the Master Plan's list of Study Participants.

Response: Numerous planning discussions have taken place between Grand Canyon National Park staff and personnel of the Kaibab National Forest. Continued coordination is assumed to resolve any management difficulties arising from the implementation of the proposals.

Geological Survey, USDI

Comment: The Geological Survey notes the lack of discussion of geological hazards in the plan and its impact statement.

Response: Please see pages 41 and 42 for an expanded discussion of geological hazards in the Grand Canyon Complex.

Bureau of Land Management, USDI

Document reviewed, with no critical comment.

Bureau of Mines, USDI

Comment: The Bureau of Mines finds an inconsistency in the discussion of the Orphan Mine shaft between the environmental statements of two related plans - the Master Plan and the Development Concept Plan.

Response: The Little Orphan Mine elevator to the Inner Canyon is an alternative to the proposal, regardless of reasons for rejecting it. The Final Environmental Statement has been altered, however, to reflect the more specific reasoning in the Development Concept Plan Environmental Statement. See pages 42, 43, and 116.

Comment: Another inconsistency is found where the market price of uranium is discussed.

Response: The point is well taken, and the market price discussion has been eliminated from the statement made on page 43.

Comment: The Bureau of Mines points out that the Master Plan does not recommend repeal of the Reclamation Provision in the Act Establishing Grand Canyon National Park, although the Environmental Statement indicated otherwise.

Response: Subsequent legislation (P.L. 93-620) has retained the subject reclamation provision for the enlarged park and prohibits the construction of dams between Glen Canyon Dam and Lake Mead without the specific consent of Congress. Please refer to page 96 for further discussion.

Comment: Mineral status of Indian lands to be incorporated in the park is not clear.

Response: No lands belonging to the Havasupai or Hualapai are proposed for addition to Grand Canyon National Park. Lands added on the Western Boundary of the Navajo Reservation consist of vertical cliff faces to the rim of Marble Canyon. If mineral potential did exist behind these cliffs, natural area status is all the more necessary to protect the integrity of Grand Canyon. No lands are proposed for addition along the rim in the Navajo Tribal Park.

Comment: The Environmental Statement is inadequate because it does not contain the necessary information for an evaluation of impacts on mineral resources.

Response: An adequate evaluation of impacts on mineral resources can only be done subsequent to thorough geological, geochemical, and geophysical investigations, and a mineral resource inventory derived from onsite and field investigations. Because mineral entry and extraction is prohibited on park lands, little interest has been generated for such studies.

Comment: The Bureau of Mines recommends a joint study by that agency and the Geological Survey to identify mineral potential in lands proposed for addition to the park.

Response: The National Park Service will welcome a joint study to identify the mineral potential on lands to be studied for addition. As a result of Public Law 93-620, the Upper Kanab Creek, Parashont and Androus Canyons, Whitmore Wash, and portions of the Shivwits Plateau were recommended for study.

Bureau of Outdoor Recreation, USDI

Comment: The Final Environmental Statement should include a map showing the pattern of private ownership within the proposed park boundary.

Response: Please see Appendix B for Land Ownership Map.

Bureau of Reclamation, USDI

Comment: We do not question the management objectives of the National Park Service to consolidate adjacent scenic areas into a single unit for efficient administration. However, the impact of this action in effectively closing off total development of a resource for the single purpose of recreation should be carefully evaluated.

Response: Public Law 93-620 sets aside the adjacent scenic areas primarily for preservation and for the enjoyment of the public.

Comment: Enlarging the proposed national park by inclusion of the area downstream to Grand Wash Cliffs that is now in the Lake Mead National Recreation Area should be closely considered from a Reclamation policy standpoint.

Response: Section 9(a) of Public Law 93-620 retains the existing reclamation provisions, including the Lower Grand Canyon Reclamation withdrawal.

Comment: Lake Mead would extend into the national park. This "unnatural" or manmade condition appears contrary to what seem to be objectives of keeping the park in its natural state.

Response: The master plan did not propose to include the slackwater reservoir of Lake Mead in the enlarged park. Public Law 93-620, however, does include the reservoir upstream of Grand Wash Cliffs as part of the national park.

Comment: Establishment of the park could create controversy on regulating the elevation of Lake Mead.

Response: Maximum reservoir levels have been established for Lake Mead which were considered during the development of the proposal. No conflicts are anticipated.

Comment: It is not clear what restrictions there would be on recreational use of that portion of Lake Mead within the park. At the present time, Grand Wash is used extensively for camping and fishing from the shore and, as time passes, more people probably will use the lake above Grand Wash Cliffs.

Response: Camping and fishing are appropriate uses of national park lands, and these activities will be continued.

Comment: The thrust of the plan to consolidate areas under a more efficient management plan seems to be a synthetic approach to eliminate the Reclamation provisions of the Act of February 26, 1919, and Public Law 90-537, September 30, 1968, and to curb, or at least not fully recognize, the Indians' full right to develop their natural resources. We are not in a position to evaluate the effects of denying an option to the Indians to develop their resources through the sale of energy. The documents project the thought that by allowing the Indians to develop a tourist business and increase revenue from their land base (other than sale of energy) then FNP can manipulate the Indians and the local environment in such manner to enhance the visitor's Grand Canyon experience.

Response: Because proposals relating to the reclamation provisions of both the Act of 1919 and Public Law 90-537 would be subject to Congressional consent, there is no need to eliminate the provisions of the Act of 1919, and the master plan has been changed accordingly. Public Law 93-620 retains the reclamation provisions of 1919 for the enlarged national park and continues the preclusion of hydroelectric dams under Public Law 90-537.

The Master Plan for Grand Canyon National Park does not curb the Indians' full right to develop their natural resources nor does it deny the Indians an option to develop their resources through the sale of energy. The option to develop Indian lands for the sale of energy was denied the Arizona Power Authority and the City of Los Angeles when applications for licenses to develop the Marble Canyon and Hualapai Dams were dismissed by the Federal Power Commission as a result of the Colorado River Basin Project Act of 1968, Public Law 90-537. In view of the intent of Congress--to prohibit the study or construction of any dams within Grand Canyon National Park--the National Park Service will continue to offer recreational planning assistance to those Indian peoples who wish to develop their resources. The National Park Service will also provide assistance to the Havasupai in developing their Land Use Plan for the enlarged reservation.

Comment: Several points for consideration are:

1. Possible restriction on amount of Colorado River water that the FNP can use within the park.
2. There are no provisions for controlling high-salinity springs in the park which degrade the Colorado River. We assume that project development will comment on the pump-storage aspects of the proposed Coconino Project in relation to the reconstruction of national park boundaries.
3. There are pending proposals to establish wilderness areas in the Lake Mead National Recreation Area which embrace land within the contemplated national park enlarged boundary. Designation of wilderness areas over a manmade lake would seem to jeopardize the concept of a wilderness area.
4. Wild burros and horses are protected by the States of Arizona and Nevada. Hopefully, biologically sound data are available to the individual states to justify extermination of these animals by whatever means possible.
5. Public Law 93-620 enlarged the size of the Grand Canyon National Park; perhaps that change will have some impact on these statements.
6. Control problems mentioned concerning river runners could be solved by interagency agreements rather than by park enlargement.

Response: 1. At present, the National Park Service obtains water from springs within the park. Federal and State law place no restrictions on such withdrawals within a Federal reserve.

2. Controlling the high-salinity springs within the park and possibly reducing the amount of salt entering the river by 25,000 tons, or less than 3 percent of the total salt load, would not substantially improve the quality of Colorado River water. The Colorado River enters Grand Canyon National Park carrying an annual salt load of 8.7 million tons. This condition is largely the result of water impoundments, mining, agriculture, and other activities that contribute to the salinity of the river in Utah and Colorado. Provisions for controlling salinity should more properly originate in the above areas. The proposed Coconino Project would not be affected by the enlarged park. The site is located outside the park boundary on the Navajo Indian Reservation.

3. An amendment to Public Law 93-620 requires that the National Park Service study those lands within the enlarged park for inclusion in the National Wilderness Preservation System and that a recommendation be submitted to Congress within two years. Lands previously judged suitable for wilderness preservation within the former boundaries of Lake Mead National Recreation Area will likely be included in the wilderness study for the park. Although Lake Mead itself is manmade, vast stretches of terrain surrounding the lake are relatively untouched by man's influence and are considered to have wilderness qualities.

4. Feral horses and burros within Grand Canyon National Park are not protected by State or Federal law. Control of these exotic animals will be based on sound ecological data. The National Park Service is also currently considering humane methods of control, such as chemosterilants.

5. The Enlargement Act affected various master plan proposals, and the document has been revised accordingly.

6. The National Park Service believes that single-agency control provides for less visitor confusion and a more economical management system than multi-agency control, which may involve various conflicting management goals.

Fish and Wildlife Service, USDI

Comment: No mention is made of contingency management plans to preserve "endangered species."

Response: The National Park Service is mandated to preserve and protect all flora and fauna native to the park. A Resource Management Plan is being prepared which will directly address the problems of endangered species. Please see page 70 of the Final Environment Statement for an expanded discussion of this subject.

Comment: Proper habitat management can result in co-existence of wildlife and livestock on a given range.

Response: While the comment may be generally true, desert bighorn specialists report that this species is nervous about the presence of large mammals, including man. It is doubtful that habitat management would result in compatibility between desert bighorn and livestock in the Great Thumb and Tenderfoot Plateau areas.

Comment: Breaching of stock tanks when grazing permits expire can have a serious impact on wildlife.

Response: This point is well taken and the discussion in the Final Environmental Statement has been altered accordingly on page 71. Details of the stock tank - wildlife situation will be more specifically explored in the Resource Management Plan which is currently being prepared.

Comment: Wildlife management can affect species on both sides of a boundary line. Coordinated management is thus necessary and should be considered in the plan.

Response: This subject will be fully addressed in the Resource Management Plan.

Bureau of Indian Affairs, USDI

Comment: The park planning documents are inadequately detailed for the proposed actions.

Response: The Master Plan for the Grand Canyon Complex is the framework of concepts upon which, and within which, the logic and details of contingent development and management plans will be developed. As these detailed and specific and contingent plans evolve, they will be accompanied by detailed and specific Environmental Assessments and Environmental Impact Statements. These plans have yet to be developed and, therefore, the specific details of many actions and impacts generated by the Master Plan for the Grand Canyon National Park cannot be ascertained for this document.

Comments: Changes in the Environmental Statement will have no effect on the planning documents unless they too are changed.

Response: Both the plans and their EIS's have been changed in the finalization process as the result of public meetings, interagency reviews, and other input.

Comment: In view of the above two comments, the BIA is considering the two plans and the accompanying environmental statements as integral parts of a Master Plan for the Grand Canyon Area.

Response: The National Park Service is in agreement with this comment.

Comment: Statements from the Hualapai Tribe and the Governor, State of Arizona, should be considered with the BIA comments as parts of an integrated response.

Response: Commentary by the Hualapai Indians and the Governor of Arizona has been considered separately as presented in the public meetings on the Grand Canyon Master Plan and Development Concept Plan, Grand Canyon Village.

Comment: The status of Congressional legislation, pertinent to the Havasupai Tribe, should be discussed.

Response: A discussion of the enlarged boundary is to be found on pages 4 - 6 of the Final Environmental Statement, Grand Canyon Master Plan. Lands added to the Havasupai Reservation include 185,000 acres of park and U.S. Forest Service land, adjacent to the rim of Grand Canyon. Another 95,000 acres of Inner Canyon lands are designated as Havasupai "Use" lands, in exchange for the discretionary agricultural privileges stated in Sec. 3, Act of February 26, 1919, establishing Grand Canyon National Park.

Comment: The "No Action" alternative to the proposed Master Plan seems retaliatory to the Havasupai.

Response: "No Action" means that the Master Plan proposals, such as major management and development actions, would not be implemented. No retaliation to anyone is implied in considering a "No Action" alternative.

Comment: "Tribal agricultural privileges" should be defined.

Response: Sec. 3, Act of February 26, 1919, states that at the Secretary's discretion, lands in Grand Canyon National Park may be used by the Havasupai Indians for agricultural purposes. In the arid Grand Canyon Region, these purposes have been the grazing of horses and cattle. It is not the intention of the National Park Service to revoke the present grazing privileges from the Havasupai Tribe.

Comment: The National Park Service states its intention to remove motors from the Colorado River, an action which would put the Hualapai Indian Tribe's river-running enterprise out of business. This restriction seems questionable since the Hualapai Reservation boundary extends to the midline of the Colorado River. The Indian Assistance objective of the Master Plan could be construed to mean "interference."

Response: The use of motors on the Colorado River will be addressed in 1977, following completion of ecological and social studies of river-running activities. The use of oar-powered river craft is a viable economic alternative to motor use, and it is assumed that the Hualapai river-running business could convert to oar use as other river companies have done. The question of boundary location is beyond the scope of the Master Plan, and is subject to varying legal interpretations. The original language establishing the Hualapai Indian Reservation appears to place this boundary on the south bank of the Colorado River. Despite the location of the Hualapai boundary, the National Park Service, as in the past, will in the future continue to assist the Hualapai Tribe in their river-running activities planning, and in the management and enforcement of tribal wishes regarding the river access and exit point at Diamond Creek. It is also the intention of the National Park Service to attempt assistance in other areas which neighboring Indian Tribes might deem desirable.

Comment: The Research Natural Area on Great Thumb should be discussed in terms of effects on the Havasupai Tribe.

Response: The subject Research Area, established in 1938, was set aside as land closed to most visitor use. The intention is for such areas to remain in their natural state for future study by geneticists and other scientists interested in the plant or animal communities of the area. The Great Thumb Research Natural Area has been deleted from the park and added to the Havasupai Reservation by Public Law 93-620. It will undoubtedly receive further attention during the development of the Havasupai Land Use Plan being prepared by the Bureau of Indian Affairs.

Environmental Protection Agency

EPA lacks objections to the Environmental Impact Statement, and considers it to be adequate.

Federal Power Commission

Comment: A 500-kilovolt power transmission line is proposed which may cross the southeastern portion of the park.

Response: The National Park Service has noted this information on page 81 of the Final Environmental Statement.

Comment: The head between the Marble Canyon and Hualapai damsites could be developed by the Kanab Creek Tunnel project to provide 1,505,000 kilowatts of hydroelectric capacity.

Response: Additional information on this subject has been incorporated on page 80 of the Final Environmental Statement.

Comment: The Federal Power Commission explains the effect of P.L. 90-537 which prohibits the construction of dams between Glen Canyon Dam and Lake Mead.

Response: The information has been included on page 81 of the Final Environmental Statement.

Governor, State of Arizona

Comment: The Environmental Impact Statement is inadequate in its treatment of the probable economic loss to the Hualapai Indians and the State of Arizona in terms of the Master Plan's recommendations against the building of the Hualapai dam.

Response: It is difficult to quantify the probable economic losses to the Hualapai tribe and the State of Arizona without extensive guesswork. The letter of comment from the Federal Power Commission (A-22) notes that "applications were filed with the Federal Power Commission by the Arizona Power Authority and the City of Los Angeles for licenses to develop the Marble Canyon and Hualapai sites. Subsequently, the Colorado River Basin Project Act, Public Law 90-537, enacted in 1968, withdrew the Commission's licensing authority for the reaches of the main stream of the Colorado River between Hoover Dam and Glen Canyon Dam until otherwise provided by the Congress. As a consequence of this legislation, the Commission dismissed the pending license applications. The Act also specifically prohibits the study or the construction of any dams on that section of the Colorado River."

Comment: The statement ignores beneficial impacts of the Hualapai Dam.

Response: The National Park Service does not propose the Hualapai Dam project. Should the Congress of the United States authorize such projects, then the permanent, long-term adverse environmental impacts of proposed dams and their benefits to the human environment would be properly weighed in the appropriate impact statements which would be required.

Comment: The Environmental Impact Statement has been written to insure that hydroelectric projects will not be built in the Grand Canyon Complex.

Response: The Master Plan for the Grand Canyon Complex does not address itself to the contingency that the pre-existing legal restrictions prohibiting the Hualapai Dam and the other described dams will be lifted.

Comment: The Statement does not describe how the boundary proposal will not encroach on lands claimed by the Havasupai Indians.

Response: The boundary extension proposed by the Master Plan does not give any lands to the National Park Service which are claimed by the Havasupai Indians. See Proposed Additions on the Map on page 5 and the discussion on pages 4 and 6. The last paragraph on page 23 describes the status of Havasupai land claims.

Comment: The Governor notes that water supply problems must be dealt with for the community of Tusayan if the Master Plan is viewed as a viable course of action. References in the plan merely acknowledge that the problem exists.

Response: Legal problems prevent the National Park Service from suggesting that water be supplied outside the park resources. See also the discussion on pages 71 to 72. A number of issues characterize the supply of park resources to out of park users. One is the availability of reasonable alternative supplies. The existing Tusayan system using trucked water from nearby communities appears to be a reasonable alternative from the standpoint of the willingness of investors to back continuing developments. Another issue is the question of precedent which could result in a demand for park water by all and sundry outside the park. At issue too is the frailty of the transcanyon pipeline which requires constant and extensive attention, making a continuous delivery of water from Roaring Springs an uncertainty.

Comment: Enlargement of the park to include areas and resources administered by the State will interfere with State management duties.

Response: Federal and State agencies are ultimately responsible, and should be responsive, to the people. Congressional action, as a reflection of the will of the voter, decides which agency will be responsible for what function on the public lands. Any action changing the boundaries of Grand Canyon, and thus perhaps some functions, is an indicator of the will of the people and affected agencies should be able to adjust and respond accordingly.

Comment: The Environmental Impact Statement does not discuss reimbursement to ranchers who will lose their grazing rights if the park is expanded.

Response: In accordance with Public Law 93-620, the Secretary of the Interior shall permit persons holding legal grazing privileges to continue until 1985. Grazing privileges may be renewed during the life of the holder within the former boundaries of Grand Canyon National Monument. Permits will expire with no compensation.

Comment: Inclusion of Lake Mead National Recreation Area lands in an enlarged national park will remove recreational hunting from the people of Arizona.

Response: Hunting is not a major use in the areas recently added to the national park. As is often the case, withdrawal of some lands from hunting use may enhance hunting values on adjacent lands by a "spill-over" effect of the protected animal population.

Comment: Areas to be consolidated under a single jurisdiction are already under the jurisdiction of Interior, National Park Service.

Response: Several proposed additions to Grand Canyon National Park were under various jurisdictions. Please refer to pages 4 and 6 for a discussion of lands added by recent legislation.

Arizona State Clearinghouse

No critical comment on the Draft Environmental Statement.
State agency comments are listed separately below.

Arizona Outdoor Recreation Coordinating Commission

Comment: Support Governor's position as stated in 1971. No new comments.

District #4, Council of Governments

Proposal is supported as is written.

Office of Economic Planning and Development

Comment: The Havasupai Indian Tribe has been ignored in the Grand Canyon planning process.

Response: The park staff has met with the Havasupai Tribal Council on a number of occasions throughout the preparation of the Master Plan. Coordination on the most recent draft of the Master Plan is reflected in the listings on pages ii and 122 in the Final Environmental Statement.

Comment: No effort was made to coordinate the Grand Canyon Master Plan with the Havasupai Comprehensive Plan.

Response: The National Park Service sincerely regrets the absence of an invitation to participate in the formulation of the "Havasupai Comprehensive Plan" and was unaware that such a plan existed until receipt of OEPAD's letter.

Comment: The Havasupai Indians will have an impact on the Master Plan and should be considered.

Response: Public Law 93-620 requires that a plan be prepared to determine the use of those lands added to the Havasupai Reservation. The National Park Service will consult with the Havasupai and the Bureau of Indian Affairs during the preparation of the plan and the environmental analysis. The impact of the Havasupai Indians on the Master Plan proposals can be better delineated at that time.

Department of Economic Security

Comment: Interests of the neighboring Indian Tribes should be respected.

Response: Please see pages 6 and 7 of the Final Environmental Statement for a statement on the status of the Havasupai Reservation. See also page 4 for recognition of Indian religious interests in the Grand Canyon Complex.

Center for Environmental Studies

No critical comment on the Master Plan Environmental Statement.

Arizona Department of Health Services

The Division of Environmental Health Services supports the proposed Noise Reduction Program and measures to protect the air quality in Grand Canyon National Park.

Comment: Information on solid waste disposal plans should be provided.

Response: Please see pages 2 and 94 of the Final Environmental Statement for a brief discussion of sanitary landfill plans for the immediate future. More detailed information will appear in the environmental statements accompanying the Development Concept Plans for the park.

Arizona Department of Transportation, Highways Division

Comment: Copies of the Five Year Construction Program have been sent for informational purposes.

Response: The National Park Service has noted the subject information and included it in the Master Plan files.

Comment: The Arizona State Highway Department maintains highways only to the park boundaries, and this should be considered if the park enlargement proposal includes any existing highways.

Response: The Master Plan boundary proposal does not include any portions of existing State highways.

Comment: Road proposals mentioned in the Draft Environmental Statement as being considered by the State Highway Department were actually proposed by the Four Corners Regional Commission in 1968. Only the Peach Springs to Hualapai Hilltop road has been funded and is underway.

Response: This information has been included in the Final Environmental Statement on page 87.

Indian Affairs Commission

No critical comment on the Draft Environmental Statement.

Civil Rights Division, Department of Law

The proposal is supported as written.

Mineral Resources Department

No critical comment on the Draft Environmental Statement.

Arizona Bureau of Mines

No critical comment on the Draft Environmental Statement.

Arizona State Parks Board

The proposal is supported as written.

Southwest Minerals Exploration Association

Comment: All parks and monuments should have a detailed mineral survey made within them.

Response: The prohibition of prospecting in national parks would need to be changed, and funding found for such surveys.

DNA - People's Legal Services, Inc.

Comment: The Master Plan does not express itself strongly enough on the question of Indian religious interests in Grand Canyon National Park.

Response: The National Park Service feels that the recognition of traditional Indian religious uses, as stated in the Master Plan and its Environmental Impact Statement, will adequately ensure continued respect for such uses. An example of park respect for traditional Indian interests is the closure to visitation of the Hopi Salt Mines on the Colorado River.

Comment: DNA feels that Native Americans should have free access to the park without having to pay entrance fees.

Response: The national parks are open to all people on an equal basis regardless of race, color, creed, or place of national origin. Entrance fees were established under Public Law 93-303, which does not provide for the exception of special interest groups. However, known religious sites may be reached by Native Americans living within or adjacent to the park without their having to pass through fee collection points at park entrance stations.

Comment: The Master Plan would classify the southeast corner of the park, from Highway 64 to the Cape Solitude area, as a Primitive Area. No grazing or watering of livestock would be allowed. DNA feels this area could be better utilized for grazing.

Response: The Cedar Mountain, Cedar Canyon area is classified as Class III, Natural Environment. North of Cedar Mountain to Cape Solitude is Class V, Primitive Area. The boundary between these two land classes is along the north edge of the loop road around Cedar Mountain. Substantial overgrazing is in evidence in portions of these areas, but particularly in the lower part of Cedar Canyon, near the park boundary. Livestock grazing use in this area of the national park is at present a trespass situation, regardless of land classes or the Master Plan.

Comment: The boundary is not fenced, but it is assumed that when the Master Plan is finalized, a fence will be built between the park and the Navajo Reservation. DNA presents an alternate fence location, and requests additional study of the situation.

Response: Fencing along the Eastern Boundary is a problem of funding priorities. Should money become available for this project, an evaluation of fence location would be done at that time.

Comment: The National Park Service could negotiate with the Navajo Tribe to make a Tribal Park out of the rest of the Little Colorado River Canyon, not already part of the two tribal parks in the area.

Response: The National Park Service appreciates this comment and it has been incorporated in the Final Environmental Statement under "Related Proposals" on page 25.

Comment: An advisory committee of Navajo and park people should be established to exchange ideas and input on plans.

Response: The National Park Service feels this is a valuable suggestion and considers it a part of the Planning Assistance Objective in the Master Plan.

Seymour Tso, Navajo Tribal Councilman

Comment: The primary interest of the Navajo is that lands in the eastern part of the park be open to grazing use.

Response: The Master Plan and its Final Environmental Statement do not address the idea of opening national park lands for grazing use. As with most other areas of the park, the land in question is very low in grazing productivity and even minimal use results in damage. The Master Plan does recognize Traditional Indian religious uses and will continue to honor them.

Comment: Mr. Tso has heard that fencing the park is based on the younger generation of Navajo being uninterested in grazing livestock. He feels this is unfair because many young Navajo wish to continue the traditions of their parents and grandparents.

Response: Fencing of the park appears to be necessary to protect it from overgrazing. Lands in the area are so poor from the standpoint of range productivity, that almost any livestock use amounts to overuse.

Comment: The Councilman feels that meetings between the park and neighboring Navajo would be desirable to help resolve the question of conflicting uses.

Response: The National Park Service finds substantial merit in this suggestion and has placed a high priority on a program of continuous liaison with the Navajo, as well as other Indian Tribes in the Grand Canyon Region.

Comment: The park should conduct an investigation to determine if grazing use is in conflict with wilderness use.

Response: Investigations of grazing use have been conducted in conjunction with the U.S. Forest Service in the eastern corner of the national park. The question is not one of incompatible uses, but of damage and deterioration of the resource. As an example, heavily grazed lands in Cedar Canyon have been invaded by tumbleweed to the exclusion of grass and other forage species. This results in the affected land becoming useless to grazing by wildlife or livestock, and is considered to be a serious environmental impact.

Coconino County Board of Supervisors

Similar Comment from Community of Tusayan

Similar Comment from Hughes Air West

Comment: The National Park Service should supply water to the community of Tusayan on a planned basis because Tusayan provides services in short supply in the park (such as housing and recreation).

Response: P.L. 91-383 bases the exportation of water from park sources on two conditions: that the subject recipient provide visitor services, and that reasonable alternative supply sources are unavailable. Housing or recreation facilities are not viewed as visitor services by the National Park Service since all employees, including support personnel from public utilities, school teachers, and clergy, necessary to operate the park are housed within the park. Reasonable alternative supply sources (trucked water) are apparently available since tourist facility expansion has taken place entirely with trucked water.

Mohave County Planning and Zoning Commission

Comment: Insufficient regard has been shown for the social economic well-being of neighboring Indian Tribes in the planning process.

Response: Ongoing park programs to enhance the social and cultural well being of native Americans will be continued under the proposed master plan. Equal opportunity employment practices, preferential training, living history sales and demonstrations, and historic interpretation combine to emphasize the concern of the National Park Service for both its visitors and the Indian population of the Grand Canyon region. The National Park Service feels that other Federal and State agencies are better able through function and mandate to propose programs for direct economic assistance and development.

Arizonans for Quality Environment

Comment: The organization feels the Master Plan's "deletion of unnecessary lands" objective is too vague, and that any deletions should be studied and aired in the public meeting process.

Response: The National Park Service agrees that any deletion proposals should be very carefully evaluated, and in accordance with Public Law 93-620 will study the suitability of those lands described on page 6 for retention in the park.

Comment: To "encourage" river outfitters to convert to oar operation is not a strong enough statement.

Response: Until the motors are prohibited on the river, the National Park Service can only encourage or advise river outfitters to convert to oar operation.

Comment: The discussion of dams in the Environmental Statement is out of place because dams do not belong in Grand Canyon.

Response: The threat of dams and the details of this threat are presented in the Environmental Statement because at various times these proposals have seemed quite real. See the final paragraphs in the section on "Resource and Energy Utilization," pages 95 and 96.

The Desert Protective Council, Inc.

Comment: The Council approves of the boundary proposal which would place the Colorado River from Lees Ferry to Grand Wash Cliffs in the national park, and urges rapid removal of motor use on this river.

Response: Economic considerations appear to be the major factor in attempts to remove motors from the Colorado River. Please see pages 83-84 of the Final Environmental Statement for a full discussion.

Comment: The Desert Protective Council recommends a more extensive boundary change than the Master Plan proposes.

Response: Please see pages 6-8 for an expanded discussion of boundary proposals.

National Parks and Conservation Association

Comment: NPCA recommends a more extensive boundary change than the Master Plan proposes.

Response: More extensive boundary changes will be studied as a result of Public Law 93-620. Please refer to pages 6 and 8 for location of the study areas.

Comment: It is pointed out that concurrence of the Hualapai Nation with boundary changes in the Lower Grand Canyon is unnecessary, since no lands belonging to the Hualapai Indians are proposed for addition to the park.

Response: The point is well taken and the subject "concurrence" statement has been removed from the Master Plan and its Environmental Statement.

Comment: There is no need to retain the Lower Grand Canyon Reclamation withdrawal since Lake Mead cannot be practically filled to occupy this withdrawal. The area should be added to the park.

Response: This area has been added to the park by Public Law 93-620. Section 9(a) of the act preserves the existing reclamation provisions, including the Lower Grand Canyon Reclamation withdrawal.

Comment: The possible transfer of park lands to the Havasupai Indian Reservation should include the requirement that the new reservation be managed in a manner consistent with park values. Scenic easements are thus an important Master Plan objective.

Response: The National Park Service concurs with this comment and will be participating with the Bureau of Indian Affairs in the cooperative planning for the Havasupai Reservation with those objectives in mind.

Comment: The discussion of dams in the Environmental Statement is unnecessary and conveys an "aura of desirability" to the building of dams in Grand Canyon.

Response: The discussion of dams has been evaluated and the decision reached to allow it to stand as illustrative of a controversial and irreversibly impacting use of Grand Canyon. No "aura of desirability" is intended.

Comment: NPCA recommends that the discussion of dams in the Final Environmental Statement be written to include the many adverse impacts of a dam or dams in Grand Canyon.

Response: Please see the response to a similar comment by the Governor of Arizona on page 140.

Comment: The plan provides for enlarged campgrounds at Desert View and, at the same time, would abandon the Mather Campground in South Rim Village.

Response: The Mather Campground will be retained. Although there will be further land disturbance at Desert View, enlargement of the campground by not more than 50 sites will provide needed facilities for the 100 persons per night who presently must camp along or near the entrance road when the Desert View sites are filled.

Northern Arizona University Hiking Club

Comment: N.A.U. Hiking Club opposes the building of dams or tramways in Grand Canyon.

Response: The Master Plan is in agreement with this comment.

Comment: The suggestion is made for a system of hiker registration, vandalism control and trash clean-ups.

Response: The details and regulations for hiking use will be discussed in the Backcountry Use and Operations Plan for Grand Canyon.

Sierra Club

Comment: The Sierra Club hopes for a continuation of public involvement in the planning process.

Response: The National Park Service intends to continue its policy of public involvement in the planning process.

Comment: The Master Plan and its Environmental Statement fail to address the management of areas which may be added to the park.

Response: The management objectives in the master plan pertain to all lands within the park, including those recently added by Public Law 93-620. The new lands will be managed primarily as wilderness and primitive backcountry.

Comment: The Sierra Club suggests a boundary configuration which differs from the Master Plan proposal, and finds too few boundary alternatives examined in the Environmental Statement.

Response: The Final Environmental Statement discusses an adjusted boundary, based on Congressional amendments to the Grand Canyon Boundary Bill. Please see pages 6 and 8.

Comment: A restudy of wilderness potential should be conducted in light of the pending boundary modification by Congress.

Response: The National Park Service concurs with this suggestion and has stated it in the Objectives of the Master Plan.

Comment: The Sierra Club supports the proposed management of Grand Canyon National Monument and suggests similar management for lands to be added west of the North Rim Entrance road.

Response: The National Park Service concurs with this suggestion.

Comment: Emphasis should be placed on the control of aircraft noise over Grand Canyon.

Response: Efforts will continue in the directions noted on pages 23 and 48-50 of the Final Environmental Statement in order to preserve some areas of quiet in Grand Canyon.

Comment: More emphasis should be placed on private river trips in Grand Canyon.

Response: The private/commercial river allocation ratio appears to require further evaluation within the structure of the River Management Plan.

Comment: The Sierra Club is enthusiastic about the mass transit system at Grand Canyon, and suggests that it be extended to the East Rim Drive.

Response: The peak-use transit system presently excludes private vehicles from West Rim Drive, thus reducing traffic congestion to zero. East Rim Drive, as a through route from Arizona Highways 64 to 89, would have to operate in a continuing atmosphere of private vehicle congestion and pollution, and extension of the mass transit system would not appear to significantly alter traffic problems along the East Rim Drive. The question is considered, however, in the Development Concept Plan, Grand Canyon Village.

Comment: Expansion of campgrounds at Desert View and North Rim, and increases in lodging units on the North Rim should be evaluated in the appropriate environmental documents.

Response: Proposed changes at Desert View and on the North Rim will be detailed in the respective development concept plans and accompanying environmental documents.

Comment: The Sierra Club feels that land classifications should be re-examined, to include more primitive class V lands on the North Rim.

Response: Certain management activities, such as prescribed burning, currently prevent a more primitive classification for these lands. As more natural ecological relationships are reestablished, these areas will be evaluated for reclassification.

Comment: Majority of backcountry roads on the canyon rims should be closed.

Response: The National Park Service is in agreement with this comment, for the park as a whole. However, it is the intention of the Master Plan to retain "primitive motor nature trails" on the South Rim both for scenic access and patrol purposes.

Comment: The discussion of dams in the Environmental Statement includes information which is no longer current.

Response: Although several minor changes on dams have been made in the Final Environmental Statement, the discussion of hydroelectric potential in Grand Canyon remains similar to the Draft Section on dams. The interest in dams is principally historic in nature and simply intends to illustrate some uses which have been proposed for Grand Canyon.

Comment: Funding has not been authorized for the study of the Blue Springs desalinization project.

Response: This information is appreciated and is noted on page 81 of the Final Environmental Statement.

Tucson Audubon Society

Comment: The area west of Marble Canyon should be proposed for park status.

Response: The area west of Marble Canyon is presently under BIM jurisdiction. Through cooperative agreements, the National Park Service is confident of continuing protection of the integrity of Grand Canyon in that area.

Comment: The Park Service must control the canyon from rim to rim.

Response: With the Master Plan objective to work with the Hualapai Tribal Council in managing their part of Grand Canyon, it is hoped that similar values can be achieved for land management for the entire Grand Canyon. Please see page 22 of the Final Environmental Statement.

Comment: Human pollution of the Colorado River should not be permitted.

Response: Strict regulations in the River Use Management Plan, such as requiring chemical toilets on river trips and a "carry-in/carry-out" policy on garbage, have been effective in controlling pollution of the river environment.

The Arizona Daily Star

Comment: Plans for Grand Canyon Village sound like a proposal to build a "miniature Flagstaff" on the rim of Grand Canyon.

Response: It is the intention of the plan to reorganize the South Rim Village into a more coherent unit, eliminating tendencies toward urban sprawl.

Comment: No manmade structures should be located within one mile of the canyon's rim, including overnight facilities and automobile use.

Response: The El Tovar has been nominated to the National Register and will thus remain in place on the rim. Other facilities which are not historic properties will not be replaced on the rim when they reach obsolescence. This information will be reflected in the South Rim Village Development Concept Plan and its Environmental Statement. It is felt that overnight use near the rim is an important part of the visitor experience. Automobile use at the rim is to be replaced in most instances by public transit.

Comment: The Coconino Plateau is not unique in vegetation or appearance and could be better managed by the Forest Service. The National Park Service would remain to manage the canyon itself.

Response: The comment is respected as a personal opinion but it is interesting to note the vegetation difference outside the line at many points along the park boundary. While the canyon proper is recognized by the Master plan to be the heart of the park the rims set the canyon off from the rest of the landscape and complete the geological and life zone series displayed in the park. No plans are proposed to change jurisdiction on the South Rim, with the exception of the Coconino Plateau Addition noted on page 4 of the Environmental Statement.

Comment: The buffer zone on the rim should be wide enough so that the visitor can exclude civilization while viewing the canyon.

Response: This subject is under active consideration at this time.

Comment: The road system along the South Rim should be removed and the area revegetated.

Response: There is no plan to remove the Rim Drives in the near future.

Comment: "Town Center" should not be on the rim, but on private lands and run by private enterprise.

Response: The nearest private land base of sufficient size to handle the park's visitor facilities is about twenty miles south of the South Rim area, and lacks utilities and development. New lands would thus be vastly altered by development, rather than the more environmentally sensitive plan to redevelop on already impacted areas.

Comment: The North Rim should also have a buffer zone and "Town Center."

Response: Details of North Rim plans will be available for public input in the North Rim Development Concept Plan.

Comment: All utilities systems and structures should be removed from the Inner Canyon.

Response: There are no plans to remove the utilities from the Inner Canyon Corridor, a strip already heavily impacted by the maintained trail complex.

Comment: The Colorado river should be included in Wilderness status, and motors prohibited.

Response: Social and biological studies are underway to attempt to assess impacts of river running activities on the Colorado River. Outfitters are being encouraged to phase in oar use as their economic situations permit, and park management is making increasing use of rowing rigs for patrol purposes on the river. It is the intention of the National Park Service to manage the Colorado River as wilderness, whether or not it is formally included in the Wilderness Preservation System, and motors removed.

Arizona River Runners, Inc.

Similar Letter from Canyoneers, Inc., Harris Boat Trips, and Sanderson River Expeditions

Comment: The river concessioner offers a number of suggestions for change in the management of river running activities.

Response: The Final Environmental Statement discusses river running activities on pages 83-84. Specific suggestions for changes have been referred to the River Management planners.

Fred Harvey, Inc.

Comment: Limiting overnight accommodations conflicts with the Master Plan's objective to handle more people visiting the park with less environmental impact. Overnight accommodations are inadequate now and expansion should not be ruled out.

Response: Limiting overnight accommodations within the park does not conflict with the master plan's objective to handle more people with less environmental impact. This objective is to be reached by providing for more day-use visitation, which is less consumptive of park resources. Expansion engenders a growth spiral and facilities will always be inadequate to meet demand. The master plan suggests that such demand be met by providing facilities outside the park.

Comment: The Master Plan removes all facilities from the rim area in ten years. Fred Harvey agrees in the case of the Bright Angel Lodge, but disagrees with the Kachina and Thunderbird Lodges, and the El Tovar Hotel.

Response: The details of removal and relocation of facilities are discussed in the Development Concept Plan for Grand Canyon Village. The time frame described is a projected twenty-five years, not ten, consistent with economic realities. The El Tovar Hotel, nominated to the National Register of Historic Places, would probably not be removed in any case.

Grand Canyon Tramways, Inc.

(Law Offices, Jennings, Strouss, and Salmon)

Comment: A tramway proposal is presented, intended to be constructed from an unspecified point on the rim of Grand Canyon to the canyon floor.

Response: The idea of a tramway at Grand Canyon is contrary to current policy guidelines for national park natural areas. It is also in conflict with the Master Plan direction which would limit mechanical access below rims to emergency and management use. The subject is fully discussed on pages 115 - 116 of the Final Environmental Statement.

Scenic Airlines, Inc.

Comment: Scenic Airlines wishes to make the experiences of their customers known for consideration in the Master Plan process.

Response: The letter of Roberto Pancirolli has been included in this statement as representative of those people who have experienced scenic flights over the Grand Canyon.

TWA Services, Inc.

Comment: The North Rim concessioner notes that the master plan does not provide for a definite addition on visitor accommodation units on the North Rim, although the plan does discuss an increase in campsites.

Response: Any planned expansion in numbers of lodging units will be discussed in the North Rim Development Concept Plan and its accompanying Environmental Assessment.

Comment: Fewer limitations appear to be imposed on the South Rim than on the North Rim. TWA Services disagrees that increased development and visitation would impair the quality of the park experience on the North Rim.

Response: It is the intent of the master plan to retain the North Rim as a less developed canyon-viewing environment, while reorganizing Grand Canyon Village on the South Rim to accommodate higher levels of visitor use. The plan thus limits the park areas which will be intensely impacted to those which are already heavily disturbed.

Comment: The design and style of new lodging facilities should be clarified.

Response: Details of proposed development will not be available until the North Rim Development Concept Plan is refined to the level of specific site plans and alternatives.

Arizona Academy of Sciences

Comment: More interpretation of the canyon's natural features should be provided for visitors.

Response: The point is well taken and is discussed on page 97 of the Final Environmental Statement.

The Arizona Academy of Science spokesman presents an alternative boundary configuration.

Response: Please see pages 6-8 of the Final Environmental Statement for an expanded discussion of potential boundary changes.

Comment: The Arizona Academy favors the prohibition of dams and other man-made structures between Glen Canyon Dam and Lake Mead.

Response: The Master Plan, the National Park Service, and the law concur with this comment.

Gilbert Associates, Inc.

Comment: The listings of plant associations are in acres carried to the nearest hundredth, which seems like excessive detail.

Response: This comment is reflected on pages 61-69 of the Final Environmental Statement.

Comment: Suggestions are made for changes in the listing of Endangered Species.

Response: The section on Endangered and Threatened Species has been revised. Please see pages 67-70.

Jeffrey Ingram

Comment: The National Park Service should work with adjacent land administering groups in the Grand Canyon region to assist and assure protection and interpretation of lands within the Complex, but not part of the national park.

Response: In the form of stated objectives, the Master Plan is in full agreement with this comment.

Comment: The Master Plan must remain tentative at the present time due to legislative uncertainties regarding park boundaries.

Response: As a result of Public Law 93-620, the boundaries for the enlarged Grand Canyon National Park have been established. Please refer to the boundary map on page 7.

Comment: Motorized operations on the Colorado should cease.

Response: While it is in the purview of the National Park Service to not renew river concession contracts when the concessioner refuses to conform to management directives, it has become a political reality to challenge the management direction themselves. The National Park Service is thus in the process of reevaluating these directions, and no statement on motor use of the Colorado River can be expected until 1977.

Comment: Anti-park developments such as Tusayan should not be provided with the services necessary for their expansion.

Response: Public Law 91-383 presently prohibits the supply of services such as water to outside users.

Stephen C. Jett

Comment: All parts of the Grand Canyon and its tributaries, defined by the rim of Kaibab Limestone, should be within an expanded national park.

Response: In many areas, the boundaries of the enlarged national park are concordant with the rim of Kaibab Limestone. Four areas to be studied for future additions to the park are also defined by this limestone rim rock. Please refer to pages 6 and 8 for location of the areas.

Comment: Easements and agreements should be sought with adjacent Indian Tribes, but no tribal land should be condemned.

Response: Planning assistance, as a first step toward cooperative management agreements, is an objective of the Master Plan. There are no plans to initiate condemnation proceedings against tribal lands in the complex.

Comment: An area for further interpretive development may be in the area of Chemehuevi and Havasupai Points.

Response: The Master Plan proposed to retain these areas in their present state for primitive backcountry viewing of the canyon.

Comment: Most backcountry roads should be allowed to revert to their natural state.

Response: Management roads are being phased out whenever and wherever they are no longer needed.

Comment: No new facilities for visitors should be built within the park.

Response: Changes in facilities, and the rationale behind them, are to be found in the Development Concept Plan for specific areas within the park.

Comment: Motors on the Colorado River should be phased out.

Response: The National Park Service intends to continue to encourage rowing on the river, but is in a "holding pattern" from the standpoint of both amount of use and on motor use.

Comment: Natural predators should be restored to their positions in the park ecosystem.

Response: It is the policy of the National Park Service to restore extirpated species. This subject will be discussed in the natural resources management plan currently under preparation.

William N. Matteson

Comment: The suggestion is made to base planning on an evaluation of the land.

Response: The Master Plan is based on a relative land evaluation system. It is anticipated that as resource data accumulate, changes in classification will be made in some areas within the park. The BOR Land Classes used supply a frame of reference within the overall structure of the national park which by definition is valuable. Please see Appendix B-3 of the Final Environmental Statement.

Charles O. Minor

Comment: Prescribed fire should not be used at the expense of neighbors.

Response: A prescribed fire policy does not include jeopardy of neighboring landowners. The Final Environmental Statement addresses this consideration on pages 19, 84, and 94.

Comment: Concern is expressed for the treatment of the Havasupai Indians.

Response: Public Law 93-620 enlarged the Havasupai Reservation to include 185,000 acres of land. The Havasupai may also utilize 95,000 acres of park land for grazing and traditional uses.

Carl B. Bowman

Comment: An alternative boundary alignment is suggested, which would include portions of Lake Mead National Recreation Area and the Hualapai Reservation.

Response: As a result of Public Law 93-620, portions of the Lake Mead National Recreation Area are now included in Grand Canyon National Park. Additional lands will be studied for future inclusion. The Hualapai Nation is not amenable to any deletion of their land for park purposes at the present time. Please refer to pages 4 and 6 for boundary information.

Comment: Lack of water or space in the park may necessitate developments in Kaibab National Forest to the south.

Response: The National Park Service recognizes this possibility, although views it as remote. Developments in the national forest or on private land would more realistically be in addition to park facilities.

Comment: The park should arrange for additional camping facilities in Kaibab National Forest adjacent to the North Rim boundary.

Response: The U.S. Forest Service does have campground expansion plans for the area, but lacks funding to implement them.

Comment: More roads should be phased out in Grand Canyon National Monument on the North Rim.

Response: Further evaluation of road closure and use will be made as a part of the Development Concept Plan for the Toroweap area.

Comment: More environmental study areas should be established.

Response: The National Park Service is in agreement with this comment, and the subject is discussed on page 21 of the Final Environmental Statement.

Comment: Regional information centers should be established.

Response: The Master Plan proposes that information and interpretive facilities be established at such key locations as Jacob Lake, Page, Cameron, and Flagstaff.

Comment: East Rim Drive should include a mass transit option.

Response: This comment is discussed in the Development Concept Plan for Grand Canyon Village.

Comment: The alternative of an elevator to the inner canyon would degrade the wilderness experience.

Response: The National Park Service agrees with this comment.

Tom Clawson

Comment: The inner canyon, including the Colorado River, should remain wilderness.

Response: The Inner Canyon has been recommended for inclusion in the National Wilderness Preservation System, and it is the intention of the National Park Service to manage the Colorado River as wilderness.

Steven L. Coleman and Kristin L. Coleman

Comment: Oppose the building of a dam at Bridge Canyon.

Response: The National Park Service does not favor or propose the building of any dams between Glen Canyon Dam and Lake Mead.

Rev. John Faustina

Comment: "Parks are for people" seems to have been displaced by a policy of restriction for the protection of the park. New roads and facilities would open other areas in the park and alleviate the overcrowding in the Village area.

Response: Use of all areas of the park, both developed and back-country, has increased to the point where steps must be taken to protect the resource and the visitor experience of a natural area. The mandate to the National Park Service is to protect the resource as well as to provide for the enjoyment of that resource by people. Also please see the discussion of Related Proposals on pages 23 - 25.

Comment: Opening the North Rim in winter should not be a big problem.

Response: Snow removal operations are being actively considered, but the National Park Service lacks funds for this purpose at this time. The North Rim is available in winter to cross-country skiing and snowshoeing under special permit. The subject is more fully discussed in the Backcountry Use and Operations Plan.

Catherine P. Harris

Comment: The Colorado River should never be used for energy purposes and power boats should be removed from the river.

Response: Public Law 93-620 continues the prohibition of dams within the enlarged park. Because the phasing out of motors on the Colorado River is controversial, a River Management Plan and environmental assessment are being prepared. Public meetings and workshops will be held to ensure public input in the decisionmaking process.

Comment: Automobiles and airplanes should be excluded from the canyon.

Response: Noise and pollution abatement measures include restrictions but not total exclusion of both planes and cars from the South Rim area.

Comment: Visitor facilities (with the exception of historic buildings) should be situated behind a buffer zone, with park transit to the rim.

Response: These directions are explored in more detail in the Development Concept Plan for Grand Canyon Village.

Mr. & Mrs. Dal Herring

Comment: Object to the removal of campgrounds in Grand Canyon National Park.

Response: As the result of public input, camping facilities will be retained in Grand Canyon Village. Camping has not been proposed for phase-out in other established areas of the national park, or in the backcountry. Further discussion of this subject is to be found in the Final Environmental Statement for the Development Concept Plan, Grand Canyon Village.

Thomas E. Horobik

Comment: The Master Plan fails to provide for any wilderness management on the South Rim.

Response: The South Rim contains little acreage classed as "Primitive", but the Cape Solitude area in the southeastern corner of the park is so classified and will be managed as wilderness. As resource inventories proceed, other parts of the South Rim could be reclassified to "Primitive" status.

Comment: Cross-country touring in 4-wheel drive vehicles is damaging to the environment.

Response: Use of 4-wheel drive vehicles off designated roads is not permitted in the park, and the master plan does not propose cross-country vehicle use. Some existing roads will be retained for management and patrol purposes, and these roads will provide the network for primitive access to less visited parts of the park.

Comment: Proposed additions to the park which qualify as wilderness should be placed in Wilderness Reserve status.

Response: Land classification, and in some cases reclassification, will follow resource studies in the subject areas.

Seymour H. Levy

Comment: Wishes to include a newspaper report of studies involving petroleum pollution of water by outboard motors in the record for the Master Plan.

Response: The newspaper clipping, along with a covering letter, have been made a part of the public meeting record for the Master Plan.

Gordon M. Luepke, Janice C. Luepke, Cynthia L. Becker,
John C. Luepke, Barbara Sulig

Comment: Oppose dam in Grand Canyon.

Response: The National Park Service and the Master Plan concur with this comment.

Jerry Oxford

Comment: Navajo stock have been grazing in the southeastern corner of the park for over one hundred years, which shows that the Navajo do not destroy the land.

Response: The land continues to bear evidence of this use. When one area of forage is damaged, the herdsmen must move the stock to other pasture or the animals would starve for lack of adequate food on the damaged land. See also responses to DNA-People's Legal Service, Inc., on pages 145 - 146.

Comment: An alternative boundary is proposed for the southeastern corner of the park, to allow for grazing use in an area 10 miles long by 2 miles wide.

Response: No boundary changes are proposed for this part of the park. The area described as "10 miles long and 2 miles wide" forms virtually the entire national park in the rim area of Cape Solitude, and is considered significant to the preservation of this part of the park.

Comment: Questions the building of hotels, etc., in one part of the park, but the prohibition of Indian grazing in another.

Response: It is hoped that development can be confined to a relatively few acres. Intense grazing of minimal quality range results in widespread and continuing damage.

Pat Rusin

Comment: Boundary should extend from Lees Ferry to Grand Wash Cliffs.

Response: Congressional amendments to the Grand Canyon Boundary Bill would place the upstream boundary at the mouth of the Paria River, just below Lees Ferry, and the downstream boundary to include the Grand Wash Cliffs.

William C. Seagle

Similar Comments from George H. Shirk and George A. Tweedy

Comment: Optional use of motors on the Colorado River should be retained in the Master Plan.

Response: The question of motors on the Colorado River is expected to be resolved by 1977.

John R. Swanson

Comment: Greater enlargement of the park is suggested.

Response: Boundaries under consideration by Congress would substantially enlarge some of the Master Plan proposals.

Comment: Most of the backcountry roads should be obliterated.

Response: The Master Plan proposes the phase-out of some of these roads, and the use of others for management and limited access purposes.

Similar Comments from George H. ...
William C. ...

Response: The question of ...
to be resolved by 1977.

Response: The Master Plan ...
and the use of ...

Response: ...

Response: ...

Response: ...

Response: ...

Advisory Council
On Historic Preservation
1225 Vermont Avenue, N.W.
Washington, D.C. 20005

MAY 1 1975

Mr. Edward R. Chapman
Regional Director
Western Regional Office
National Park Service
Department of the Interior
510 Golden Gate Avenue, Box
San Francisco, California 94142

APPENDIX A

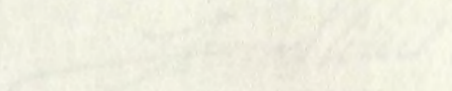
COMMENTS RECEIVED

Dear Mr. Chapman:

The Advisory Council is pleased to inform you that the Memorandum of Agreement for the Master Plan for the Grand Canyon National Park, Arizona, has been approved by Mr. Clement A. Peterson, Chairman of the Advisory Council. This complies the previous site conditions with the "Procedures for the Protection of Historic and Cultural Resources" (36 C.F.R. Part 60.00) of the National Park Service.

The Council appreciates your assistance in the development of the course of action that will avoid any adverse effect of the undertaking in Grand Canyon National Park.

Sincerely yours,



Louis S. Hall
Deputy Director
National Office of Historic
and Cultural Resources

Enclosure

APPENDIX A

CONSENT RECEIPTS

**Advisory Council
On Historic Preservation**

1522 K Street N.W. Suite 430
Washington D.C. 20005

MAY 6 1975

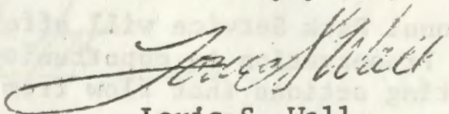
Mr. Howard H. Chapman
Regional Director
Western Regional Office
National Park Service
Department of the Interior
450 Golden Gate Avenue, Box 36063
San Francisco, California 94102

Dear Mr. Chapman:

The Advisory Council is pleased to inform you that the Memorandum of Agreement for the Master Plan for the Grand Canyon Complex, Arizona, has been approved by Dr. Clement M. Silvestro, Chairman of the Advisory Council. This completes the process for compliance with the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800). A copy of the Agreement is enclosed.

The Council appreciates your assistance in the development of the course of action that will avoid any adverse effect of the undertaking on Grand Canyon National Park.

Sincerely yours,



Louis S. Wall
for John D. McDermott
Director, Office of Review
and Compliance

Enclosure

**Advisory Council
On Historic Preservation**
1522 K Street N.W. Suite 430
Washington D.C. 20005

MEMORANDUM OF AGREEMENT

WHEREAS, the U. S. Department of the Interior, National Park Service proposes to adopt a Master Plan for the Grand Canyon Complex, Arizona; and,

WHEREAS, the U. S. Department of the Interior, National Park Service has determined that this undertaking as proposed would have an effect upon a number of properties in Grand Canyon National Park, Arizona, included in and determined by the Secretary of the Interior to be eligible for inclusion in the National Register of Historic Places, and pursuant to Section 106 of the National Historic Preservation Act of 1966 and Section 2(b) of Executive Order 11593, has requested the comments of the Advisory Council on Historic Preservation; and,

WHEREAS, pursuant to the procedures of the Advisory Council on Historic Preservation (36 C.F.R. Part 800), representatives of the Advisory Council on Historic Preservation, the National Park Service, and the Arizona State Historic Preservation Officer have consulted and reviewed the undertaking to consider feasible and prudent alternatives to avoid any adverse effect; now,

THEREFORE:

It is mutually agreed that implementation of the undertaking, in accordance with the following conditions:

1. The National Park Service will afford the Advisory Council on Historic Preservation an opportunity to comment on the subsequent implementing actions that flow from the proposed Master Plan for the Grand Canyon Complex pursuant to the procedures for compliance with Section 106 of the National Historic Preservation Act of 1966 and Executive Order 11593, "Protection and Enhancement of the Cultural Environment" issued May 13, 1971;
2. The National Park Service will inventory the cultural resources within the land area proposed for deletion from Grand Canyon National Park, seek a determination from the Secretary of the Interior of the eligibility for inclusion in the National Register of Historic Places for the cultural resources inventoried, and afford the Advisory Council on Historic Preservation an opportunity to comment on any undertaking that would result in the sale or transfer of properties determined eligible for inclusion in the National Register pursuant to Section 2(b) of Executive Order 11593, "Protection and Enhancement of the Cultural Environment," issued May 13, 1971;

will avoid any adverse effect on the above-mentioned properties.

Grand Canyon Complex
U. S. Department of the Interior, National Park Service

Page 2

MEMORANDUM OF AGREEMENT

Robert R. Garrow April 15, 1975
Executive Director
Advisory Council on Historic Preservation

Laura A. Chapman April 16, 1975
National Park Service
Department of the Interior

Dennis McAnally (date) 4-21-75
Arizona State Historic Preservation
Officer

Mr. Silvestro 4-29/75 (date)
Chairman
Advisory Council on Historic Preservation



UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Washington, D.C.



Mr. Bruce W. Shaw
Acting Superintendent
National Park Service, USDI
Grand Canyon National Park
Grand Canyon, Arizona 86023

Dear Mr. Shaw:

The Office of the Secretary has asked us to review the Draft Environmental Statement on the Grand Canyon Complex Proposed Master Plan, Arizona. We have the following comments to offer:

The loss of timber, mineral, and range resources and of hunting use will be minimal as stated in the draft EIS. However, we do not go along with the assumption that the land transfer will improve management.

The proposed Kanab land transfer is presently part of the Kanab Creek Roadless Area which may become Wilderness under Forest Service administration if it is not transferred to the National Park. We believe that all of this area with the exception of the Colorado River banks (Inner Gorge) can be managed more efficiently and be better coordinated with the rest of the proposed Wilderness if it is left under National Forest Service administration. Administrative facilities already exist at Fredonia and Big Springs. Trailheads will either be on the National Forest or the access to them will pass through National Forest land.

A visitor capacity within the Park is alluded to, but seems to be predicted solely on how many people may be efficiently moved through traffic flow systems. There is the statement that day-use will be emphasized; that little further development for overnight use will be undertaken. It is also implied by the Plan that "optimum" day-use levels have not yet been reached. It follows that if more people came to the Park for a day experience, they are going to want to stay reasonably close to the attraction. The surrounding lands, of whatever ownership, then become a bedroom and parking lot for the Park. It would

seem that open recognition of the potential problem should be discussed and treated in the Plan.

The lack of interagency liaison is evident in the list of Study Participants shown on page 29 of the Plan. It would seem proper that someone from surrounding impacted lands should be represented here.

We appreciate the opportunity to review and comment on this environmental statement.

Sincerely,

R. MAX PETERSON
Deputy Chief

We have reviewed the subject matter as requested in a memorandum of June 14 and will be pleased to discuss it with you at any time. Geologic conditions and possible geologic hazards appear to have been adequately considered in the draft statement on the proposed development concept plan for Grand Canyon Village. However, there are no indications in the draft environmental statement and preliminary draft of the water plan for the Grand Canyon Complex of significant environmental impact related to geologic conditions or potential geologic hazards. We believe these statements adequately describe the water resources of the project area.

Director





United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

OFFICE OF THE DIRECTOR

DES 74-62

Memorandum

To: Superintendent, Grand Canyon National Park, Grand Canyon, Arizona

Through: *Spec* Assistant Secretary--Energy and Minerals *Bentz*

From: Director, Geological Survey

Subject: Review of preliminary Development Concept Plan and draft environmental statement for Grand Canyon Village South Rim; and draft environmental statement for the Proposed Master Plan of the Grand Canyon Complex

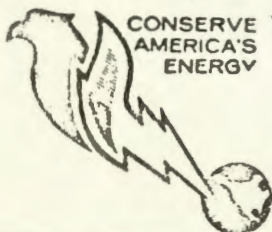
We have reviewed the subject documents as you requested in a memorandum of June 7.

Geologic conditions and possible geologic hazards appear to have been adequately considered in the draft statement on the proposed development concept plan for Grand Canyon Village.

However, there are no indications in the draft environmental statement and preliminary draft of the master plan for the Grand Canyon Complex of significant environmental impact related to geologic conditions or potential geologic hazards.

We believe these statements adequately describe the water resources of the project area.

J. B. Walley
Acting Director





United States Department of the Interior

BUREAU OF LAND MANAGEMENT

1792 (911)

State Office
3022 Federal Building
Phoenix, Arizona 85025

May 2, 1975

Memorandum

To : Director, Western Region, National Park Service,
San Francisco, California

From : **ASSOCIATE**
State Director, Arizona BLM

Subject: DES, Proposed Master Plan Grand Canyon Complex
and Proposed Development Concept Plan, Grand
Canyon Village

Last summer we reviewed the Grand Canyon Master Plan and Village Concept Plan as you requested. Unfortunately, we find that no reply was sent to you.

The draft environmental statements generally appear to be responsive to the National Environmental Policy Act. As there are no national resource lands directly involved, and Bureau programs will be affected only marginally, we have no further comments to offer.



United States Department of the Interior

BUREAU OF MINES
WASHINGTON, D.C. 20240

August 12, 1974

DES 74-62

Memorandum

To: Superintendent, Grand Canyon National Park, Grand Canyon, Arizona

Through: Assistant Secretary--Energy and Minerals

From: Director, Bureau of Mines

Subject: Master plan and draft environmental statement, Grand Canyon Complex, and development concept and draft environmental statement, Grand Canyon Village, Arizona, National Park Service

Our Intermountain Field Operation Center, Denver, has reviewed the master plan and draft environmental statement for Grand Canyon Complex and the development concept and draft environmental statement for Grand Canyon Village prepared by National Park Service. These reports address two separate, though related, topics: (1) the master plan and draft environmental statement for the entire Grand Canyon Complex (DES 74-62), consisting of 1,294,095 acres of land in the Grand Canyon National Park, Grand Canyon National Monument, Marble Canyon National Monument, and some adjacent areas; and (2) the development concept and draft environmental statement (DES 74-63) for Grand Canyon Village on the south rim of the Grand Canyon.

A myriad of proposed actions with far-reaching impacts are mentioned in the master plan and its draft environmental statement. The proposals are not discussed in detail, leaving such discussion to specific proposal reports and their environmental statements. The proposed development concept for Grand Canyon Village is one such report.

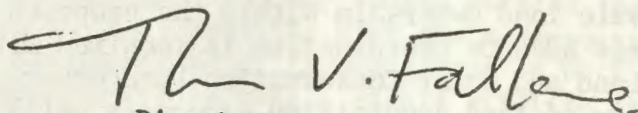
A comparison of the two environmental statements reveals some inconsistencies; for example, page 113 of the Grand Canyon Complex environmental statement proposes the use of the Little Orphan Lode mine shaft to provide tourist access to the Tonto Plateau, but page 117 of the Grand Canyon Village development concept draft environmental statement rejects this proposal because of high cost and limited visitor capacity. Another disparity occurs between page 41 of DES 74-62 and page 24 of DES 74-63, again where the Little Orphan Lode mine is discussed. The former concludes: "The depressed state of uranium market forced closure of the mine and it has not produced since December 31, 1969. Market prices would have to at least double before any profitable value could be associated with ore reserves in the mine." The latter reports: "The company is actively negotiating for the reopening of the (Little Orphan Lode) mine,"

**Memo. to Superintendent, Grand Canyon National Park, Grand Canyon, Arizona,
Subj: Grand Canyon Complex, and development concept and draft
environmental statement, Grand Canyon Village, Arizona, National Park
Service**

In addition, there are points of disagreement between the plans and their respective environmental statements. One appears on page 3 of the Grand Canyon Complex draft statement where it is stated: "The Master Plan recommends that legislation which enacts the boundary proposal also repeal the reclamation provision in the Act of February 29, 1919, which established Grand Canyon National Park." No such recommendation is contained in the copy of the master plan supplied to us.

It is apparent, from a review of these reports, that the proposed actions entail significant impacts on the mineral resources of private lands within the park and on mineral resources of proposed additions to the park. In addition, the mineral status of lands proposed for inclusion in the Grand Canyon Complex that belong to the Havasupai, Hualapai, and Navajo Indians is left unclear. These lands possess significant but presently unquantified potential for oil and gas, copper, uranium, and other mineral resources. Both environmental statements are inadequate because they lack the minimum information necessary to assess the impacts of the proposed actions on mineral resources of these lands.

We recommend a joint wilderness-type mineral study by the Geological Survey-Bureau of Mines of the proposed 399,710-acre addition to the park. Because our Department also has the responsibility for national mineral adequacy, we believe that you should consider a mineral study as an intergal part of any land withdrawal proposals. Completed prior to the revision of the draft environmental statement, a mineral study would permit the inclusion of impacts of the proposal on mineral resources.


Director



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF OUTDOOR RECREATION
PACIFIC SOUTHWEST REGIONAL OFFICE

IN REPLY REFER TO:

BOX 36062

E3035

450 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIFORNIA 94102

Memorandum

To: Superintendent, Grand Canyon National Park

From: Acting Regional Director

Subject: Review of May 28, 1974 environmental statements for the proposed Master Plan for Grand Canyon Complex, and Development Concept Plan for Grand Canyon Village, Grand Canyon National Park, Arizona (DES-74/62)

In response to your letter of June 7, 1974, we have reviewed the subject environmental statements. The Grand Canyon Village Development Concept Plan EIS appears to be very adequate.

The master plan EIS discusses the impacts in an understandably general fashion, considering the scope and overall objective and time span involved. We believe that this approach is reasonable. The proposed changes in the transportation system appear potentially quite significant. While the statement emphasizes your intent to cover all significant actions in subsequent EIS's, we are particularly interested in an expansion of the discussion of the specific changes as the information is compiled and development plans are formulated.

The master plan EIS should include a map showing the pattern of all private land ownership within the proposed park boundary expansion. Unless advance coordination is required with respect to possible use of Land and Water Conservation Fund money, we will withhold formal review of land acquisition proposals until requested by the Department of the Interior's Land Planning Group.

We would appreciate the opportunity to review all subsequent draft statements as they are completed.

Frank E. Sylvester





UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103



MEMORANDUM

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

FROM: Regional Director, Region 2

SUBJECT: Review of Draft Environmental Statement (DES-74-62)
Grand Canyon National Park Master Plan

We have reviewed the subject draft statement as directed and have the following comments to make:

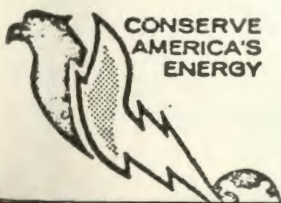
On page 66, there is mention of "endangered species" that have been found within the park, but no contingency management plans for their protection and propagation is mentioned.

Page 67 - With proper habitat management, livestock and wildlife can be compatible on a given range.

A stock tank can become an essential part of wildlife habitat and the breaching of these tanks when a permit expires could have a drastic effect upon the existing resident wildlife population.

Page 93 - A wildlife population is no respecter of an imaginary boundary and any manipulations of populations that may extend outside the boundaries of the park may not be compatible with the management of that habitat or population. Coordinated wildlife management on both sides of the park boundaries is necessary to provide a viable wildlife population and to maintain the habitat. A prey species will control the predator species, so the manipulation of one species may have significant impact on the management of a number of other species to correct resulting population imbalances. This concept needs consideration in the plan.

Jerry L. Stegma





United States Department of the Interior

BUREAU OF RECLAMATION
WASHINGTON, D.C. 20240

IN REPLY
REFER TO: 430
125.

JUL 25 1974

Memorandum

To: Ms. Astrid Schenk
National Park Service
Western Regional Office
450 Golden Gate Avenue
Box 36063
San Francisco, California 94102

From: **Acting**
Commissioner of Reclamation

Subject: Review of Two Draft Environmental Statements on
Grand Canyon National Park (DES 74-62, DES 74-63)

In response to your letter of June 7, 1974, to former Commissioner Ellis L. Armstrong requesting our review of the above statements, we have the following comments to offer for your consideration:

We do not question the management objectives of the National Park Service (NPS) to consolidate adjacent scenic areas into a single unit for efficient administration. However, the impact of this action in effectively closing off total development of a resource for the single purpose of recreation should be carefully evaluated.

The existing Bureau of Reclamation program will not be affected by the proposed action to consolidate Grand Canyon National Park and Grand Canyon and Marble Canyon National Monuments. However, enlarging the proposed national park by inclusion of the area downstream to Grand Wash Cliffs that is now in the Lake Mead National Recreation Area should be closely considered from a Reclamation policy standpoint. Following are some points for consideration if the national park is to be enlarged downstream to Grand Wash Cliffs:

1. Lake Mead would extend into the national park. This "unnatural" or manmade condition appears contrary to what seem to be the objectives of keeping the park in its natural state.



2. Establishment of the park could create controversy on regulating the elevation of Lake Mead.

3. It is not clear what restrictions there would be on recreational use of that portion of Lake Mead within the park. At the present time, Grand Wash is used extensively for camping and fishing from the shore and, as time passes, more people probably will use the lake above Grand Wash Cliffs, especially when the lake is near capacity or at such future time when sedimentation levels out the swift water at the head of the reservoir.

The thrust of the FNP plan to consolidate areas under a more efficient management plan seems to be a synthetic approach to eliminate the Reclamation provisions of the Act of February 26, 1919, and Public Law 90-537, September 30, 1968, and to curb, or at least not fully recognize, the Indians' full right to develop their natural resources. (The Act of February 26, 1919 (40 Stat. 1175), authorized the Secretary of the Interior to permit utilization of Grand Canyon National Park for a Government Reclamation project; Public Law 90-537 requires consent of the Congress and precludes hydroelectric dams in Grand Canyon.) Sections of the reports appear to concentrate more on these objectives than would appear desirable for a report that should weigh the fullest possible national scope of resource use and development of an area.

The Congress, by passage of the above-referenced acts, implied an interest in directing policy on hydroelectric development in Grand Canyon. It appears to be a requirement for the Department of the Interior again to fully place the question of hydroelectric development before the Congress so that creation of the national park will either clearly provide for or be against hydroelectric development, or, as an alternative, leave open a language passage for hydroelectric development in the park if required in the national interest. We are not in a position to evaluate the effects of denying an option to the Indians to develop their resources through the sale of energy. The FNP documents project the thought that by allowing the Indians to develop a tourist business and increase revenue from their land base (other than sale of energy), then FNP can manipulate the Indians and the local environment in such manner to enhance the visitor's Grand Canyon experience.

Several points for consideration are:

1. Possible restriction on amount of Colorado River water that the FNP can use within the park.



United States Department of the Interior

WILDERNESS RECLAMATION

WASHINGTON, D.C. 20240

2. There are no provisions for controlling high-salinity springs in the park which degrade the Colorado River. We assume that project development will comment on the pump-storage aspects of the proposed Coconino Project in relation to the reconstruction of national park boundaries.

3. There are pending proposals to establish wilderness areas in the Lake Mead National Recreation Area which embrace land within the contemplated national park's enlarged boundary. Designation of wilderness areas over a manmade lake would seem to jeopardize the concept of a wilderness area.

4. Wild burros and horses are protected by the States of Arizona and Nevada. Hopefully, biologically sound data are available to the individual States to justify extermination of these animals by whatever means possible.

5. Public Law 93-620 enlarged the size of the Grand Canyon National Park; perhaps that change will have some impact on these statements.

6. Control problems mentioned concerning river runners could be solved by interagency agreements rather than by park enlargement.

Thank you for the opportunity of reviewing the draft environmental statements.

EF Sullivan





United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
WASHINGTON, D. C. 20245

IN REPLY REFER TO:

Trust Facilitation
DES 74/62

OCT 18 1974

Memorandum

To: Assistant Secretary - Program Development and Budget
Attention: Office of Environmental Project Review

From: *Francis S. Kenney*
Acting Deputy Director, Office of Trust Responsibilities

Subject: Draft Environmental Statements for: (1) Proposed Master Plan for Grand Canyon Complex; (2) Proposed Development for Grand Canyon Village, Grand Canyon National Park, Arizona (DES 74/62)

General Comments:

There appears to be a theoretical problem associated with the above subject in that the two Draft Environmental Statements contain a more detailed and explanatory treatment of the proposed actions than do the other two booklets in the package, even though the two booklets are the actual planning documents.

In theory, environmental statements do not have enforcement status but merely serve as objective documents describing the environmental ramifications of proposed action. The plans themselves, on the other hand, should contain all the details of the proposed actions in order to provide guidance in the implementation of the plans and to allow for enforcement of the provisions of the plans if that becomes necessary.

The reverse is true in the case of the materials under review. The plans appear to be summaries of the information contained in the impact statements. Therefore, any number of corrections and changes to the impact statements will have no effect on the plans themselves unless they too are corrected and changed accordingly and only then if the plans contain the same details as the statements.

In view of the above, we recommend that the planning documents be revised to include the same degree of detail as the impact statements. In anticipation of this, we are regarding the four documents in the package as integral parts of a master plan for



the Grand Canyon Area and the provisions contained therein as equally binding on the project proponents.

Our review has been coordinated with the Hualapai and Havasupai Tribes. Mr. Sterling Mahone, Chairman, Hualapai Tribal Council, issued a statement at the National Park Service public hearing on the subject proposals held in Phoenix on July 13, 1974. Chairman Mahone's statement is included herein and is to be regarded as an integral part of the coordinated reply of this agency insofar as the Hualapai Tribe's interests are concerned. We are also enclosing the statement of the Governor of Arizona because of its pertinence to the proposal.

Specific Comments:

The Havasupai Tribe is opposed to the study provisions mentioned on page 7 and elsewhere in the Master Plan Impact Statement. The tribe's position is that the lands have been studied many times and further study is useless. They wish to have their land base expanded as soon as possible without having to wait for the results of a study. It should be brought out in the statement that legislation before Congress has been modified to eliminate the study provision. The most current status of pending legislation affecting the Havasupai Tribe should also be outlined.

The last sentence on page 7 of the Master Plan statement refers to the possible enlargement of the Havasupai Reservation in exchange for certain tribal agricultural privileges. Then, on page 108, paragraph 2, under the "No Action" alternative, it states that transfer of park land to the Havasupai Tribe would not be proposed, and that less restrictive use of park lands by the Tribe would not occur. This approach appears to be retaliatory in nature and must be explained more fully.

The "certain tribal agricultural privileges" noted on page 7 of the Master Plan statement should be detailed. If it is the intent of the Park Service to attempt to obtain from the Havasupai Tribe its 73,600 acres of park and monument land grazing privileges noted on page 67, paragraph 1, this fact should be so stated.

The situation with regard to control of commercial river runners is outlined on pages 15 and 80 of the Master Plan Impact Statement and page 13 of the Master Plan. The Park Service states that it intends to control the river downstream as far as River Mile 238.5, and by 1977 eliminate the use of motors on the river from that point north. The Hualapai River Running Enterprise is dependent upon motors for their operations, and launch their boats at River Mile 225.5. If the proposed restriction is instituted, it would probably

force the Hualapai enterprise out of business; however, we question the authority of the Park Service to impose this restriction on the Hualapais when the reservation's northern boundary is the middle of the Colorado River. This situation should be fully brought out in the impact statement together with an explanation of the Park Service authority for this action as it applies to Hualapai lands.

The type of cooperation offered to the Hualapai Tribe by the Park Service, as noted in the last sentence on page 13 of the Master Plan, should be explained. Since the area in question is private Indian land, that statement could be construed as interference rather than cooperation.

The areas included within the category "Research Natural Areas" as noted on page 21 of the Master Plan statement and page 26 of the Master Plan should be identified as to location and acreage involved. The Havasupai Tribe has been allowed to use the Great Thumb area for livestock grazing, and would like to know whether the designation of lands in the vicinity of Great Thumb will affect them.

Enclosure



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

100 CALIFORNIA STREET

SAN FRANCISCO, CALIFORNIA 94111

Mr. Howard Chapman
Regional Director
National Park Service
450 Golden Gate Avenue
San Francisco CA 94102

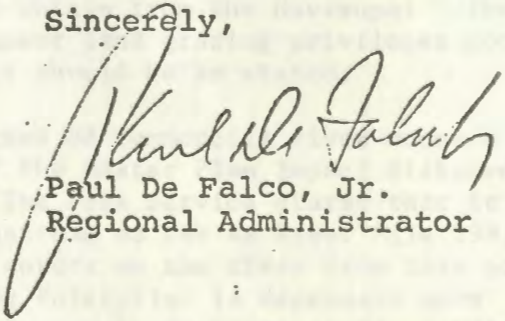
Dear Mr. Chapman:

The Environmental Protection Agency has received and reviewed the draft environmental impact statement for the following proposed project, Proposed Master Plan, Grand Canyon Complex, Arizona and Development Concept Plan, Grand Canyon Village, Grand Canyon National Park, Arizona.

EPA's comments on the draft statement have been classified as Category LO-1. Definitions of the categories are provided on the enclosure. The classification and the date of EPA's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions under Section 309 of the Clean Air Act. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and the adequacy of the impact statement at the draft stage.

EPA appreciates the opportunity to comment on this draft statement and requests two copies of the final statement when available.

Sincerely,


Paul De Falco, Jr.
Regional Administrator

Enclosure

cc: Council on Environmental Quality, Wash., D.C. 20460
Attn: Editor, 102 Monitor (10 copies)

Environmental Impact of the Action

LO--Lack of Objections

EPA has no objections to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action.

ER--Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to reassess these aspects.

EU--Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

Adequacy of the Impact Statement

Category 1--Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2--Insufficient Information

EPA believes that the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3--Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement.

If a draft impact statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make such a determination.

FEDERAL POWER COMMISSION
WASHINGTON, D.C. 20426

IN REPLY REFER TO:

Mr. Bruce W. Shaw
Acting Superintendent
Grand Canyon National Park
National Park Service
Department of the Interior
Grand Canyon, Arizona 86023

Dear Mr. Shaw:

This is in reply to your letter of June 7, 1974, addressed to the Commission's Advisor on Environmental Quality, requesting our comments on the preliminary draft of the master plan for the Grand Canyon Complex, the development concept plan for Grand Canyon Village, and their associated draft environmental statements.

As described in the Grand Canyon Complex report, the master plan would bring national park status, in a single park, to the existing 673,575-acre Grand Canyon National Park, the existing 198,280-acre Grand Canyon National Monument, the existing 26,080-acre Marble Canyon National Monument, the 25,600-acre Marble Canyon East addition, the 640-acre Coconino Plateau addition, the 36,280-acre Lower Kanab Canyon addition, the 2,700-acre Colorado River Bed addition, the 322,830-acre Lower Grand Canyon addition, and other lands amounting to 11,660 acres. Marble Canyon area lands, totaling 3,550 acres, would be deleted. The proposed new park would include a total of 1,294,095 acres of land. The land use plan for Grand Canyon Village, an area in the Grand Canyon National Park that provides services and accommodations to employees and visitors, would be reconstituted.

The Commission staff has reviewed these reports and environmental statements to determine the effect of the proposals on matters affecting the Commission's responsibilities. Such responsibilities relate to the development

of hydroelectric power and assurance of the reliability and adequacy of electric service under the Federal Power Act, and the construction and operation of natural gas pipelines under the Natural Gas Act.

The Commission staff review indicates that there are no existing hydroelectric power projects, steam-electric power plants, or bulk power transmission lines within the proposed national park. There are no known plans, actively being considered at this time, to construct hydroelectric projects or steam-electric plants in the area. There is, however, a future 500-kilovolt power transmission line, planned for construction in 1980, that apparently would cross the southeastern portion of the proposed national park. According to the Western Systems Coordinating Council's 1974 report, the line would connect the proposed Kaiparowits thermal power plant with the existing transmission system.

The draft environmental statement for the proposed master plan for the Grand Canyon Complex discusses the hydroelectric power potential that is available within the proposed national park boundaries. The draft statement indicates that a number of potential projects have been proposed by both Federal and non-Federal entities for the development of hydroelectric power in the area. The most current of these proposals, which have received serious consideration, would develop the Marble Canyon and Hualapai (Bridge Canyon) sites on the main stem of the Colorado River. The potential installed capacity of developments at these two sites totals 2,100,000 kilowatts. Review by the Commission staff shows that the head between the Marble Canyon and Hualapai sites also could be developed by the potential Kanab Creek Tunnel project to provide 1,505,000 kilowatts of hydroelectric capacity.

The staff notes that applications were filed with the Federal Power Commission by the Arizona Power Authority and the City of Los Angeles for licenses to develop the Marble Canyon and Hualapai sites. Subsequently, the Colorado River Basin Project Act, Public Law 90-537, enacted in 1968, withdrew the Commission's licensing authority for the reaches of the main stream of the Colorado River between Hoover Dam and Glen Canyon Dam until otherwise provided by the Congress. As a consequence of this legislation, the Commission dismissed the pending license applications. The Act also specifically prohibits the study or the construction of any dams on that section of the Colorado River.

The staff review indicates that there are no natural gas pipelines and no known deposits of natural gas in the proposed national park.

In summary, the staff review shows that, except for the proposed future power transmission line, there are no existing, or known plans to construct, bulk electric power or natural gas facilities in the proposed Grand Canyon Complex.

Very truly yours,

for James J. Stout
T. A. Phillips
Chief, Bureau of Power

REMARKS OF GOVERNOR WILLIAMS

HEARING ON MASTER PLAN FOR GRAND CANYON NATIONAL PARK

MARICOPA COUNTY SUPERVISORS AUDITORIUM

9 A.M., SATURDAY, JULY 13, 1974

74-69

Similar statement from State Land Department

Similar statement from State Water Commission

Similar statement from Arizona Power Authority

I WELCOME THE OPPORTUNITY TO SPEAK TO YOU TODAY AND SUBMIT THE FOLLOWING COMMENTS REGARDING THE PROPOSED MASTER PLAN AND DEVELOPMENT CONCEPT FOR THE GRAND CANYON NATIONAL PARK. THESE COMMENTS REFLECT THE OPINIONS OF SEVERAL STATE AGENCIES WHOSE MANAGEMENT AND REGULATORY RESPONSIBILITIES ARE DIRECTLY INVOLVED WITH THE PROPOSALS. THEY ALSO REFLECT MY OPINIONS AS GOVERNOR OF THE STATE OF ARIZONA. THESE COMMENTS AS WELL AS OTHERS MADE BY OTHER STATE AGENCIES WILL BE FORMALLY SUBMITTED TO YOU THROUGH THE ARIZONA STATE CLEARINGHOUSE WHICH IS CURRENTLY COORDINATING THE FORMAL REVIEW OF THE PROPOSAL FOR THE STATE OF ARIZONA.

THERE ARE MANY ISSUES OF CONCERN TO ARIZONA RAISED BY THE PROPOSALS. FIRST, THE PROPOSED ENLARGEMENT OF THE PARK INCLUDES THE HUALAPAI AND MARBLE CANYON DAM SITES AND RESERVOIR AREAS WITHIN THE PARK BOUNDARIES AND RECOMMENDS REPEAL OF THE RECLAMATION PROVISION IN THE 1919 ACT WHICH ESTABLISHED THE GRAND CANYON NATIONAL

PARK.

THE INTEREST OF THE PEOPLE OF THE STATE OF ARIZONA IN THE HYDROELECTRIC POTENTIAL OF THE COLORADO RIVER ANTEDATES THE ACHIEVEMENT OF STATEHOOD. ARIZONA'S ENABLING ACT RECOGNIZES THIS POTENTIAL BY WITHHOLDING POTENTIAL HYDROELECTRIC SITES FOR FUTURE USE. SINCE 1956, UNDER THE DIRECTION OF THE ARIZONA LEGISLATURE AND WITH THE FULL SUPPORT OF EVERY GOVERNOR OF ARIZONA IN THE INTERVENING PERIOD, THE ARIZONA POWER AUTHORITY HAS BEEN ATTEMPTING TO DEVELOP THE POTENTIAL HYDROELECTRIC POWER SITES ON THE COLORADO RIVER FOR THE BENEFIT OF THE STATE OF ARIZONA.

ONE OF THE MOST FEASIBLE SITES FOR CONSTRUCTION OF A HYDRO-ELECTRIC PROJECT IS THE HUALAPAI (BRIDGE CANYON) PROJECT. THIS PROJECT WOULD CONSIST OF A DAM 390 FEET HIGH. IT WOULD BACK WATER UP TO, BUT NOT INTO, THE EXISTING GRAND CANYON NATIONAL MONUMENT. THE RESERVOIR WOULD BE WELL DOWNSTREAM FROM THE EXISTING BOUNDARIES OF GRAND CANYON NATIONAL PARK AND WOULD BE CONFINED WITHIN THE NARROW INNER GORGE OF THE COLORADO RIVER. IT WOULD HAVE A WATER SURFACE AREA APPROXIMATING ONLY 4% OF THE SURFACE AREA OF LAKE MEAD AND ITS POWER PLANT WOULD HAVE A DEPENDABLE CAPACITY OF AT LEAST

74-69

1,366,000 KILOWATTS. RECENTLY UPDATED ENGINEERING STUDIES SHOW THAT THE PROJECT WOULD RETURN NET REVENUE OF BETWEEN \$25 MILLION AND \$45 MILLION ANNUALLY. THESE REVENUES COULD BE USED TO ASSIST THE HUALAPAI INDIANS, TO AID DEVELOPMENT OF WATER PROJECTS FOR THE STATE OF ARIZONA AND TO HELP THE STATE ACHIEVE A BALANCE BETWEEN WATER SUPPLY AND DEMAND.

THE HUALAPAI PROJECT WILL OFFER GREAT POTENTIAL BENEFIT NOT ONLY TO THE STATE OF ARIZONA BUT ALSO TO THE HUALAPAI INDIAN TRIBE. THE SOUTH PORTION OF THE DAM AND RESERVOIR ARE LOCATED ON THE HUALAPAI RESERVATION. THE STATE OF ARIZONA, REPRESENTED BY THE ARIZONA POWER AUTHORITY, HAS ENTERED INTO AN AGREEMENT WITH THE HUALAPAI TRIBE FOR THE EXCLUSIVE RIGHT TO OCCUPY AND USE TRIBAL LANDS FOR THE PURPOSE OF CONSTRUCTING, OPERATING AND MAINTAINING THE HUALAPAI PROJECT.

ELECTRIC ENERGY GENERATED AT THE HUALAPAI PROJECT WOULD REDUCE THE AMOUNT OF ELECTRIC ENERGY THAT WOULD OTHERWISE HAVE TO BE GENERATED AT FOSSIL FUEL OR NUCLEAR PLANTS. THE USE OF A SELF-REPLENISHING WATER RESOURCE TO GENERATE HYDROELECTRIC ENERGY WOULD

CONSERVE IRREPLACEABLE COAL, GAS AND OIL, AND, THROUGH ITS POLLUTION-FREE PRODUCTION OF POWER, WOULD MINIMIZE POLLUTION OF THE ATMOSPHERE. IT IS ESTIMATED THAT THE PROJECT WOULD SAVE 6,750,000 BARRELS OF OIL ANNUALLY OR 36,000,000 CUBIC FEET OF NATURAL GAS ANNUALLY, WHICH OTHERWISE WOULD HAVE TO BE USED TO GENERATE ELECTRICITY.

TO CONSTRUCT THE HUALAPAI PROJECT, ARIZONA AND THE HUALAPAI TRIBE MUST FIRST RECEIVE THE APPROVAL OF THE UNITED STATES CONGRESS, MUST ALSO COMPLY WITH THE NATIONAL ENVIRONMENTAL POLICY ACT AND WOULD HAVE TO OPERATE UNDER THE JURISDICTION OF THE FEDERAL POWER COMMISSION. THE ENVIRONMENTAL VALUES OF THE AFFECTED REACH OF THE COLORADO RIVER ARE ADEQUATELY PROTECTED UNDER SUCH CIRCUMSTANCES, AND THERE IS NO JUSTIFICATION FOR INCLUDING THE DAM SITE, RESERVOIR AREAS AND LAND NEEDED FOR APPURTENANT STRUCTURES WITHIN THE BOUNDARIES OF A NATIONAL PARK.

THE STATEMENT IS THEREFORE COMPLETELY AND TOTALLY INADEQUATE IN ITS TREATMENT OF THE ADVERSE EFFECT OF THE PROBABLE ECONOMIC LOSS OF THE HUALAPAI INDIANS AND THE STATE OF ARIZONA. THE STATEMENT ALSO IGNORES THE MANY BENEFITS, BOTH ECONOMIC AND RECREATIONAL,

WHICH WOULD FLOW FROM THE HUALAPAI PROJECT, IF DEVELOPED--IN FACT, THE CONTENT OF THE STATEMENT HAS BEEN PURPOSELY STRUCTURED SO AS TO VIRTUALLY INSURE THAT SUPPORTING LEGISLATION WOULD, FOR ALL PRACTICAL PURPOSES, ELIMINATE FOREVER THE POSSIBILITY OF CONSTRUCTING ANOTHER HYDROELECTRIC PROJECT ON THE COLORADO RIVER.

SECONDLY, MY OFFICE OF ECONOMIC PLANNING AND DEVELOPMENT IS CURRENTLY ENGAGED IN ASSISTING THE HAVASUPAI INDIAN TRIBE IN THEIR COMPREHENSIVE PLANNING PROCESS. THE PROPOSAL TO ENLARGE THE BOUNDARIES OF THE GRAND CANYON PARK IGNORES THE CLAIM OF THE TRIBE TO OVER 250,000 ADDITIONAL ACRES OF LAND NOW CONTROLLED BY THE NATIONAL PARK SERVICE. THEIR CLAIM TO THESE LANDS IS SUPPORTED BY THE PRESIDENT OF THE UNITED STATES. WHILE THE STATEMENT INDICATE A RECOGNITION OF THIS CLAIM, IT DOES NOT ADEQUATELY ADDRESS THE QUESTION OF HOW, BY ENLARGING THE BOUNDARIES OF THE CANYON PARK, THE NATIONAL PARK SERVICE WILL NOT FURTHER ENCROACH ON THE LANDS CLAIMED BY THE HAVASUPAI INDIANS. THIS CONFLICT NEEDS FURTHER DISCUSSION IN THE STATEMENT.

THE IMPLEMENTATION OF THE PLANS WILL UNDOUBTABLY AFFECT DEVELOPMENT AT TUSAYAN, ARIZONA, AND POSSIBLY OTHER AREAS OUTSIDE

THE PARK BOUNDARIES. BECAUSE ARIZONA IS A STATE WITH LIMITED WATER RESOURCES, IT IS ESSENTIAL THAT WATER SUPPLY PROBLEMS BE DEALT WITH DIRECTLY AND EFFECTIVELY BEFORE THESE OR ANY PLANS CAN BE VIEWED AS REALISTIC AND VIABLE COURSES OF ACTION. THE PROPOSED MASTER PLAN AND DEVELOPMENT CONCEPT PLAN DOES NOT SEEM TO APPROACH THE PROBLEM IN THIS MANNER.

AT NUMEROUS PLACES WITHIN BOTH PLANS, THE NATIONAL PARK SERVICE ACKNOWLEDGES THAT IMPLEMENTATION OF THEIR PLANS WILL RESULT IN CONSIDERABLE DEVELOPMENT PRESSURES BEING PLACED UPON THE COMMUNITY OF TUSAYAN AND OTHER AREAS OUTSIDE THE PARK. STATEMENTS IN THE REPORTS ALSO INDICATE THAT THE NATIONAL PARK SERVICE FEELS IT HAS AN OBLIGATION TO ASSIST IN THE COORDINATED DEVELOPMENT OF VISITOR FACILITIES OUTSIDE THE PARK'S BOUNDARIES. HOWEVER, REFERENCES TO THE TUSAYAN WATER PROBLEM DO LITTLE MORE THAN ACKNOWLEDGE THE FACT THAT THE PROBLEM EXISTS. AT NO POINT IS THERE A DEFINITIVE STATEMENT INDICATING WHETHER WATER FROM THE PARK WOULD OR WOULD NOT BE MADE AVAILABLE TO TUSAYAN. NOR IS IT ENOUGH THE DEVELOPMENT CONCEPT PLAN INCLUDE VAGUE CONDITIONS UNDER WHICH WATER FROM GRAND CANYON NATIONAL PARK MIGHT BE MADE AVAILABLE

74-69

TO TUSAYAN. BECAUSE THE AVAILABILITY OF POTABLE WATER IS CRUCIAL TO THE DEVELOPMENT OF VISITOR FACILITIES OUTSIDE THE PARK, THE FAILURE OF THE MASTER PLAN TO ADDRESS ITSELF TO THESE AND OTHER IMPORTANT QUESTIONS JEOPARDIZES THE VIABILITY OF THE ENTIRE PLAN.

THE ENLARGEMENT OF THE PARK TO INCLUDE STATE LANDS AND MINERALS WHICH ARE ADMINISTERED BY OUR STATE LAND DEPARTMENT WILL INTERFERE WITH THEIR MANAGEMENT DUTIES UNDER THEIR ENABLING STATUTE.

LANDS AND MINERALS WITHIN THE LAKE MEAD NATIONAL RECREATION AREA WILL BE TAKEN OUT OF EXISTING AND POTENTIAL PRODUCTION. NUMEROUS GRAZING LESSEES AND PERMITEES WILL BE VITALLY AFFECTED BY ENLARGING THE PARK AS GRAZING IS TO BE ELIMINATED. THERE IS NO DISCUSSION AS TO WHAT REIMBURSEMENT WILL BE GIVEN RANCHERS FOR THE LOSS OF THEIR GRAZING RIGHTS. POTENTIAL PRODUCIBLE MINERALS WILL BE EFFECTIVELY REMOVED FROM BEING MADE AVAILABLE UNDER THE MINERAL LEASING LAWS. ARIZONA IS KNOWN FOR ITS MINERAL POTENTIAL AND PRODUCTION. ESTABLISHMENT OF ENCLAVES OF NON-USE AS PROPOSED WOULD CAUSE VITAL NATIONAL MINERALS BEING FOREVER REMOVED FROM PUBLIC USE.

THE INCLUSION OF EXISTING NATIONAL RECREATION AREAS AND ADDITIONAL AREAS ADJACENT TO THE NATIONAL RECREATION AREA LANDS
A-30
WILL REMOVE A SIGNIFICANT RECREATIONAL ACTIVITY AVAILABLE TO THE

PEOPLE OF ARIZONA AT THE PRESENT TIME. THE NATIONAL PARK SERVICE REGULATIONS PROHIBITS RECREATIONAL HUNTING ON NATIONAL PARKS AND MONUMENTS. THE PROPOSALS ALSO COMPOUND THE PROBLEMS OF THE MANAGEMENT, ENHANCEMENT AND PROTECTION OF WILDLIFE SPECIES - ALL OF WHICH ARE RESPONSIBILITIES OF OUR STATE GAME AND FISH DEPARTMENT.

THE PROPOSALS INDICATE THAT ONE OBJECTIVE OF THESE PLANS IS TO CONSOLIDATE MANAGEMENT OF THESE AREAS UNDER ONE JURISDICTION. HOWEVER, THE AREAS ARE ALREADY CONSOLIDATED UNDER MANAGEMENT BY THE NATIONAL PARK SERVICE AND THE DEPARTMENT OF THE INTERIOR.

IN SUMMARY, THE PROPOSALS FOR THE GRAND CANYON NATIONAL PARK DO NOT MATERIALLY ENHANCE THE PROTECTION OF THE CANYON. THEY DO, HOWEVER, HAVE A SIGNIFICANT ADVERSE EFFECT ON THE STATE OF ARIZONA. IN LIGHT OF EXISTING RESTRICTIONS AND REGULATIONS GOVERNING THESE PRESERVES, REDESIGNATION AND ENLARGEMENT OF THE PARK IS UNNECESSARY. AND IN LIGHT OF PENDING NATIONAL LEGISLATION, THE NATIONAL PARKS SERVICE SHOULD BE INSTRUCTED TO WITHHOLD IMPLEMENTATION OF THESE PROPOSALS.

THANK YOU AGAIN FOR THE OPPORTUNITY TO PRESENT THESE VIEWS FOR
INCLUSION IN THE FORMAL RECORD.

ZONA

FICE
THE
RNOR



OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT

MAILING ADDRESS: 1645 West Jefferson • Room 428 • Phoenix, Arizona 85007

July 30, 1974

Mr. Lyle McDowell
Acting Regional Director
National Park Service
450 Golden Gate Avenue
Box 36063
San Francisco, CA 94102

Re: Project Title: Proposed Master Plan, Grand Canyon
Complex - and Master Plan (Preliminary
Draft)

State Application Identifier: 74-80-0038

Dear Mr. McDowell:

The Arizona State Clearinghouse has received and reviewed your notification of proposed action concerning the above project. The Clearinghouse review has generated several responses, copies of which are attached for your information.

In accordance with current requirements as set forth in the Office of Management and Budget Circular A-95, Revised, this letter will serve as the State Clearinghouse comment on the proposal.

Please include the above State Application Identifier in any future correspondence regarding this proposal. Thank you for providing Arizona with the opportunity to comment upon this proposal.

Sincerely yours,

Dennis A. Davis, Executive
Secretary for Federal Programs
DAD:CL:hh

encl.

ARIZONA

OFFICE
OF THE
GOVERNOR



OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT

1624 West Adams Street • Room 317 • Phoenix, Arizona
STATE CLEARINGHOUSE

Date: June 17, 1974

TO: Mr. Roland H. Sharer
State Liaison Officer, AORCC
4433 N. 19th Ave., Suite 203
Phoenix, AZ 85015

RECEIVED
JUN 20 1974
A.O.R.C.C.

FROM: Clearinghouse Staff Contact: Constance LaMonica

SUBJECT: Environmental Statement Review

Applicant: National Park Service

Project Title: Proposed Master Plan, Grand Canyon
Complex - and Master Plan (Preliminary
Draft)

State Application Identifier: 74-80-0038

A copy of a Draft Environmental Statement is attached for your review and comment in accordance with requirements of OMB Circular A-95. Please review the proposal as it affects the plans and programs of your agency and register your response below. Also note a staff contact within your agency in case further consultation is required. Please return this completed form within fifteen (15) days of your receipt of this request.

- No comment on the above project.
- Proposal is supported as written.

Comments are attached. *SUPPORT GOVERNOR'S POSITION STATE
IN 1971 ON THE GRAND CANYON MASTER PLAN. NO NEW COMMENTS.*

Please contact the Clearinghouse should you desire further information, or need additional time for review.

Review Agency Staff Contact

Economic Sec
Mineral Resources
Indian Affairs
Game + Fish
Civil Rights
Bureau of Mines
SW Mineral Expl
Anthropology
Highway

Power
Health
Water
Land
Parks
AORCC
OEPAD
Region III
Region IV

A-33

Authorized Review
Agency Signature

District #4, Council of Governments
377 Main Street, Room 202
Yuma, Arizona 85364
(602) 782-1886

REGIONAL CLEARINGHOUSE

DISTRICT #4, COUNCIL OF GOVERNMENTS

PROJECT NOTIFICATION AND REVIEW SIGN-OFF

The application for federal financial assistance described below has been reviewed by the District #4, Regional Clearinghouse.

S.A.I. NUMBER 74-80-0038

PROJECT TITLE: Proposed Master Plan, Grand Canyon Complex-and Master Plan (Preliminary Draft)

APPLICANT AGENCY: National Park Service

FEDERAL PROGRAM TITLE:

CATALOG NO.:

FEDERAL FUNDS REQUESTED:

APPLICATION IS SUPPORTED AS WRITTEN

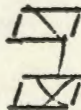
COMMENTS ATTACHED

DISTRICT #4, COUNCIL OF GOVERNMENTS

BY *[Signature]*

DATE 6-25-79

A-34



COPY TO OEFAD

COPY TO APPLICANT

ARIZONA

OFFICE
OF THE
GOVERNOR



OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT

MAILING ADDRESS: 1645 West Jefferson • Room 428 • Phoenix, Arizona 85007

July 24, 1974

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

Dear Mr. Stitt:

On July 17 I attended a public hearing on the Grand Canyon Master Plan at Grand Canyon. As per Mr. Eaton, I am submitting my comments in writing for the record.

Our agency has been working with the Bureau of Indian Affairs, Indian Health Service, U.S. Forest Service and National Park Service on a comprehensive plan for the Havasupai Indian Reservation. We were disturbed at the initial meeting of these agencies because no one representing the Park Service was present. Numerous attempts to contact someone from Parks were made by the tribe, but to no avail. Now the Park Service has drawn up a Master Plan for the Grand Canyon covering several thousand acres from Marble Canyon to the Grand Wash Cliffs in Mohave County, and totally ignored the Havasupai in their planning. The Havasupai are mentioned as being there at the bottom of a canyon, but no attempt was made to coordinate the Grand Canyon Master Plan with the Havasupai Comprehensive Plan or to obtain any input from the tribe. The Havasupai have been living here for several hundred years and they are not going to disappear if you just ignore them. It is our feeling that the Havasupai will have a tremendous impact on your plan and should be worthy of your consideration.

July 24, 1974
Merle Stitt

You have outlined 17 alternatives in your plan, and I respectfully request that you allow our agency, as the tribe's planners, to have some input into those alternatives.

Sincerely,

Abiano F. Moreno

Abiano F. Moreno
Planner

c.c. Mr. Paya
Mr. Willoughby
Mr. Goodfriend

July 24, 1974
Marie Britt

ECONOMIC PLANNING AND DEVELOPMENT

MAILING ADDRESS: 1275 West Jefferson • Room 428 • Phoenix, Arizona 85007

SUBJECT: Proposed Master Plan, Grand Canyon Complex - and Master Plan (Preliminary Draft), SAI 74-80-0038

Sincerely,

The proposal is supported with the proviso that any unresolved Indian land claims and undetermined Indian water rights are protected and honored. In particular, the stand taken by the Havasupai Tribe is supported. Interests of this tribe and the Hualapai, Navajo, and Hopi tribes in relation to this project must be respected and protected.

Mr. John P. Dickinson
Dept. of Economic Security
Post Office Box 6123
Phoenix, Arizona 85005

Dear Mr. Dickinson:

I am writing to you regarding the Grand Canyon Master Plan. I am writing for the record.

The Bureau of Indian Affairs, through the efforts of Mr. David Servino and Mr. Robert J. ... as a representative plan for the Havasupai Tribe Reservation. It was developed at the ... of the ... representing the ... to contact ... but to no ... Master Plan for the ... from ... and ... The ... of ... the Grand Canyon Master Plan ... the Havasupai ... have been ... and they are ... It is our ... of your ...

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OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT

1624 West Adams Street • Room 317 • Phoenix, Arizona 85007
STATE CLEARINGHOUSE

Date: June 17, 1974

TO: Dr. James Schoenwetter
Center for Environmental
Studies
Arizona State University
Tempe, AZ 85281

FROM: Clearinghouse Staff Contact: Constance LaMonica

SUBJECT: Environmental Statement Review

Applicant: National Park Service

Project Title: Proposed Master Plan, Grand Canyon
Complex - and Master Plan (Preliminary
Draft)

State Application Identifier: 74-80-0038

A copy of a Draft Environmental Statement is attached for your review and comment in accordance with requirements of OMB Circular A-95. Please review the proposal as it affects the plans and programs of your agency and register your response below. Also note a staff contact within your agency in case further consultation is required. Please return this completed form within fifteen (15) days of your receipt of this request.

- No comment on the above project.
- Proposal is supported as written.
- Comments are attached.

Please contact the Clearinghouse should you desire further information, or need additional time for review.

Review Agency Staff Contact

Economic Sec.	Power
Mineral Resources.	Health
Indian Affairs	Water
Game & Fish	Land
Civil Rights	Parks
Bureau of Mines	ARCC
SW Mineral Expl	DEPAD
Anthropology	Region III
Highway	Region IV

Will Maus for JS
Authorized Review
Agency Signature



ARIZONA DEPARTMENT OF HEALTH SERVICES

Division of Environmental Health Services

WILLIAMS, Governor

HAMADAN, M.D., Director

Subject: Proposed Master Plan, Grand Canyon Complex -
and Master Plan (Preliminary Draft)

State Application Identifier: 74-80-0038

The Division of Environmental Health Services staff has reviewed the subject report and submits the following comments:

The Bureau of Sanitation

Noise - The Bureau supports the planned Noise Reduction Program to insure visitors the utmost from their visit to the Grand Canyon.

Solid Waste - Millions of visitors come to the Grand Canyon each year. This results in large amount of solid waste that has to be collected and disposed in an ecologically sound manner. There has been no mention of the type of system that will collect and dispose of this solid waste. Therefore, the Bureau can't support the Proposed Master Plan until information on their solid waste systems is supplied.

The Bureau of Air Pollution Control

The Bureau of Air Pollution Control would like to emphasize the comments on page 45 relative to the pristine quality of the air quality in the Grand Canyon. It is vital that such areas be protected from degradation due to man made area sources. The Bureau supports measures designed to protect the air quality of this region.

7/17/74



ARIZONA DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

m. N. Price
stant Director
State Engineer

July 12, 1974

Ms. Constance LaMonica
Arizona State Clearinghouse
Office of Economic Planning
and Development
1624 West Adams Street, Room 317
Phoenix, Az. 85007

Re: Proposed Master Plan,
Grand Canyon Complex and
Master Plan (Preliminary Draft)
State Identifier: 74-10-0065

Proposed Development Concept Plan
Grand Canyon Village-
Grand Canyon National Park and
Development Concept
State Identifier: 74-10-0065

Dear Ms. LaMonica:

The Environmental Planning Services of the Arizona Highways Division has reviewed the Proposed Master Plan for the Grand Canyon complex and the Proposed Development Concept Plan for Grand Canyon Village.

The proposals, as outlined, should cause no adverse impacts upon Arizona State Highway projects underway or projected in the Five Year Construction Program. Several projects are either underway or are programmed during the next five years; however, they involve improving and upgrading well established routes (SR 64, SR 64-US 180, US 89, and US 89A). Copies of pertinent sections of the Arizona Highways Division Five Year Construction Program approved for fiscal year 1974-75 and of the Arizona Highways Division project numbering reference are attached for information. Copies of our fiscal year 1973-74 Five Year Highway Construction Program are also attached to show the location of some of the projects; but as the current construction program indicates, most projects have slipped a year on the time table.

Consideration is being given to improving SR 67, between US 89A and the North Rim of Grand Canyon; however, the project has not been developed and has not been funded.

A-40



Ms. Constance LaMonica

July 12, 1974

The purpose of these projects is to bring these roads up to modern standards, and to provide safer and more pleasant driving experience for the ever increasing number of United States and foreign travelers visiting the Grand Canyon.

Under past agreement, the Arizona State Highway Department maintains highways only up to the Grand Canyon Park boundary lines and this should be considered if future plans call for enlarging the park to include portions of these existing highways.

It is noted on page 83 of the Draft Environmental Statement, Proposed Master Plan Grand Canyon Complex, Arizona: "Numerous road proposals are under consideration by the Arizona Department of Highways which may affect the planning for Grand Canyon complex. In essence, these proposals would result in the park being encircled by paved highways only a few miles away from its boundaries." The routes mentioned in this paragraph are the routes proposed during a 1968 study by the federally appointed Four Corners Regional Commission.

The Four Corners Regional Commission conducted a study of highway needs in the less developed areas of the states of Arizona, Colorado, New Mexico and Utah. They worked closely with state highway commissions and departments of the four states. The attached documents show the road projects selected and the proposed sponsoring agencies. The purpose of the study was to "plan a system of development of roads and highways which will tie into federal and state primary, secondary and interstate routes which are in existence or on the drawing boards. The roads will fill in the gaps through Indian reservations, public domain land, national forests and parklands - gaps which have hampered the flow of commerce between the states, contributed to the isolation of residents of rural areas and delayed economic development of the region."

The Commission stated when starting the study that "more detailed studies may be necessary to support the Commission's preliminary conclusions, but at the moment, we are in agreement that a rather extensive system of roads is necessary to:

- "1. Remove present impediments to full economic development on Indian-owned land within the numerous reservations in the region.
- "2. Encourage increased flow of commercial traffic between the states by building direct-route roads where few or none now exist, roads which in many cases also serve the next point.
- "3. Permit the tourist business to attain its full potential by construction of adequate loops to serve the large number of outstanding scenic and archaeological

Ms. Constance LaMonica

July 12, 1974

"attractions, a variety of recreation areas and Indian settlements."

The projects proposed in the Four Corners Regional Commission Study involving the Grand Canyon area are as follows:

1. Peach Springs-Pierce Ferry-Temple Bar.
2. From north of Tuweep to Bunkerville and Mt. Turnbull to Littlefield.
3. Grand Canyon-Highway 67-State Route 89 to North Rim.
4. Cedar Ridge-west to Colorado River.
5. Page-Marble Canyon.
6. Arizona Highway 64-Lower Basin.
7. Kaibab Indian Reservation-Grand Canyon Park near Toroweap.
8. Peach Springs-Hilltop
9. Hilltop to Valle
10. Peach Springs to Diamond Creek.

Of these projects listed, only the road from Peach Springs to Hualapai Hilltop is funded and underway. It is being accomplished with 100 percent federal funding with the Bureau of Indian Affairs carrying on the coordination.

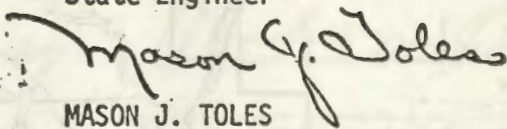
These roads were proposed to generally provide tourists better access to scenic areas, aid development of industries, tourist facilities and circulation which would improve the socio economic status of the Indian tribes located in this region. The attached annotated map shows the location of the routes mentioned above.

Funds available to the state and federal agencies will have a major bearing upon development of these selected routes. Increased traffic and development of out-of-park tourist facilities by commercial developers will also affect the priority and effort to improve these selected roads.

Thank you for the opportunity to review and comment upon your proposals for the Grand Canyon area.

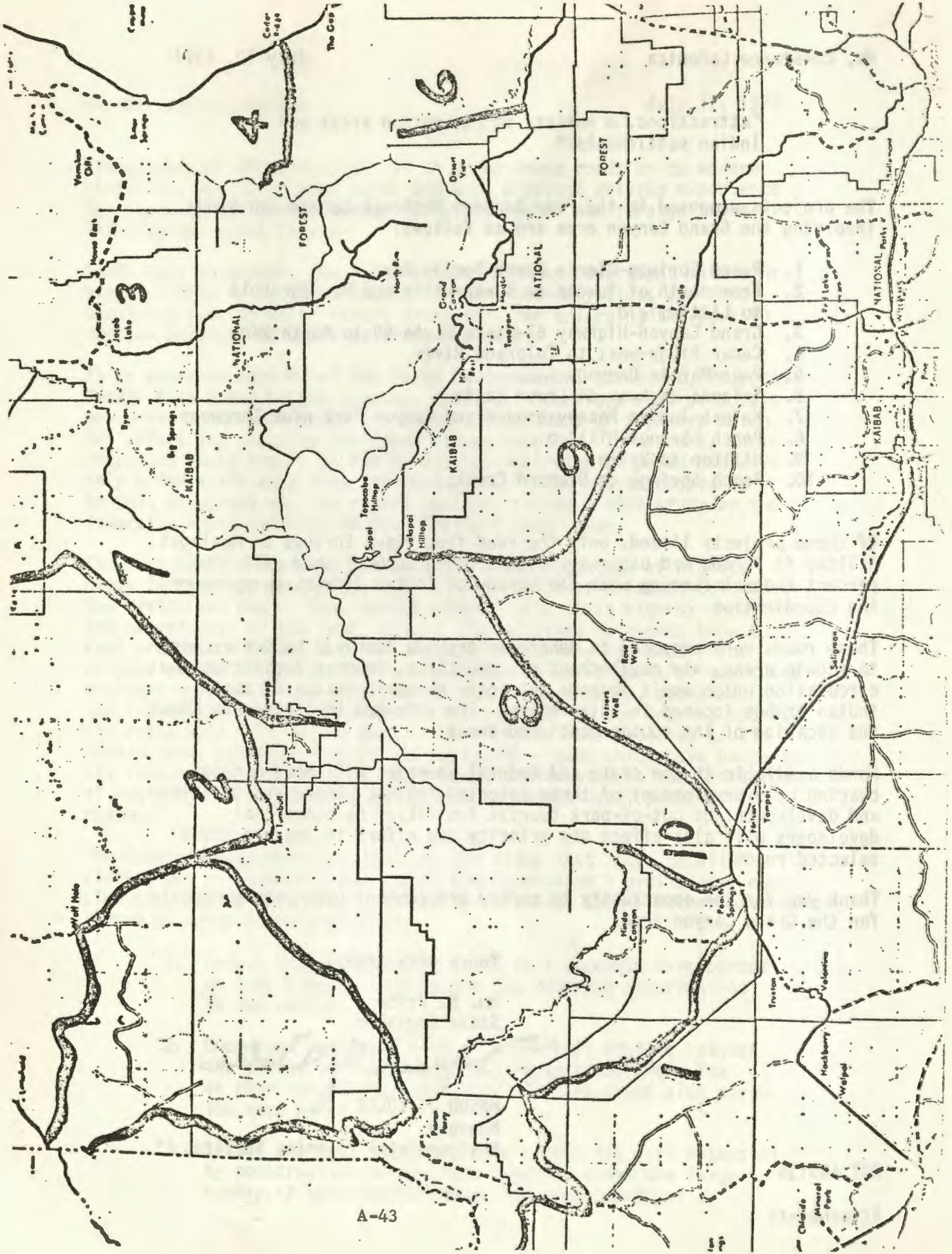
Yours very truly,

Wm. N. Price
State Engineer


MASON J. TOLES
Manager
Environmental Planning Services

MJT:ADG:jh

Attachments



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OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT

1624 West Adams Street • Room 317 • Phoenix, Arizona 85007
STATE CLEARINGHOUSE

Date: June 17, 1974

TO: Mr. Clinton M. Pattea
Executive Secretary
Indian Affairs Commission
1645 West Jefferson St.
Phoenix, AZ 85007

FROM: Clearinghouse Staff Contact: Constance LaMonica

SUBJECT: Environmental Statement Review

Applicant: National Park Service

Project Title: Proposed Master Plan, Grand Canyon
Complex - and Master Plan (Preliminary
Draft)

State Application Identifier: 74-80-0038

A copy of a Draft Environmental Statement is attached for your review and comment in accordance with requirements of OMB Circular A-95. Please review the proposal as it affects the plans and programs of your agency and register your response below. Also note a staff contact within your agency in case further consultation is required. Please return this completed form within fifteen (15) days of your receipt of this request.

- No comment on the above project.
- Proposal is supported as written.
- Comments are attached.

Please contact the Clearinghouse should you desire further information, or need additional time for review.

Review Agency Staff Contact

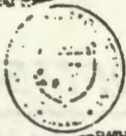
Economic Sec	Power
Mineral Resources	Health
Indian Affairs	Water
Game + Fish	Land
Civil Rights	Parks
Bureau of Mines	ACRCC
SW Mineral Expl	DEPAD
Anthropology	Region III
Highway	Region IV

Clinton M. Pattea

Authorized Review
Agency Signature

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OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT

1624 West Adams Street • Room 317 • Phoenix, Arizona 85007
STATE CLEARINGHOUSE

Date: June 17, 1974

TO: Mr. Ford Smith, Exec. Dir.
Civil Rights Div, Dept of Law
1645 W. Jefferson, Room 140
Phoenix, Arizona 85007

FROM: Clearinghouse Staff Contact: Constance LaMonica

SUBJECT: Environmental Statement Review

Applicant: National Park Service

Project Title: Proposed Master Plan, Grand Canyon
Complex - and Master Plan (Preliminary
Draft)

State Application Identifier: 74-80-0038

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Review Agency Staff Contact

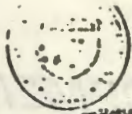
Economic Sec	Power
Mineral Resources	Health
Indian Affairs	Water
Game + Fish	Land
Civil Rights	Parks
Bureau of Mines	ACREC
SW Mineral Expl	OEPAD
Anthropology	Region III
Highway	Region IV

A-45

J. Ford Smith

Authorized Review
Agency Signature

Executive Director



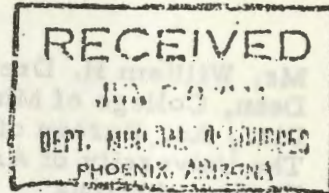
OFFICE OF

ECONOMIC PLANNING AND DEVELOPMENT

1624 West Adams Street • Room 317 • Phoenix, Arizona 85007
STATE CLEARINGHOUSE

Date: June 17, 1974

TO: Mr. John Jett, Director
Mineral Resources Dept.
Fairgrounds, Mineral Bldg.
1826 West McDowell Road
Phoenix, Arizona 85007



FROM: Clearinghouse Staff Contact: Constance LaMonica

SUBJECT: Environmental Statement Review

Applicant: National Park Service

Project Title: Proposed Master Plan, Grand Canyon
Complex - and Master Plan (Preliminary
Draft)

State Application Identifier: 74-80-0038

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- Comments are attached.

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Review Agency Staff Contact

Economic Sec	Power
Mineral Resources	Health
Indian Affairs	Water
Game & Fish	Land
Civil Rights	Parks
Bureau of Mines	ARCC
SW Mineral Expl	DEPAD
Anthropology	Region III
Highway	Region IV

J. H. JETT
John Jett
 Authorized Review
 Agency Signature

ZONA

OFFICE
THE
CLEARINGHOUSE



OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT

1624 West Adams Street • Room 317 • Phoenix, Arizona 85007
STATE CLEARINGHOUSE

Date: June 17, 1974

TO: Mr. William H. Drescher
Dean, College of Mines
Dir., Az. Bureau of Mines
The University of Arizona
Tucson, Arizona 85721

FROM: Clearinghouse Staff Contact: Constance LaMonica

SUBJECT: Environmental Statement Review

Applicant: National Park Service

Project Title: Proposed Master Plan, Grand Canyon
Complex - and Master Plan (Preliminary
Draft)

State Application Identifier: 74-80-0038

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Review Agency Staff Contact

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Mineral Resources	Health
Indian Affairs	Water
Game & Fish	Land
Civil Rights	Parks
Bureau of Mines	AORCC
SW Mineral Expl	DEPAD
Anthropology	Region III
Highway	Region IV

William H. Drescher
Authorized Review
Agency Signature



OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT

1624 West Adams Street • Room 317 • Phoenix, Arizona 85007
STATE CLEARINGHOUSE

Date: June 17, 1974

TO: Mr. Dennis McCarthy, Dir.
Arizona State Parks Board
1688 W. Adams St., Room 109
Phoenix, Arizona 85007

FROM: Clearinghouse Staff Contact: Constance LaMonica

SUBJECT: Environmental Statement Review

Applicant: National Park Service

Project Title: Proposed Master Plan, Grand Canyon
Complex - and Master Plan (Preliminary
Draft)

State Application Identifier: 74-80-0038

A copy of a Draft Environmental Statement is attached for your review and comment in accordance with requirements of OMB Circular A-95. Please review the proposal as it affects the plans and programs of your agency and register your response below. Also note a staff contact within your agency in case further consultation is required. Please return this completed form within fifteen (15) days of your receipt of this request.

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Review Agency Staff Contact

Economic Sec	Power
Mineral Resources	Health
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Game & Fish	Land
Civil Rights	Parks
Bureau of Mines	ADRC
SW Mineral Expl	DEPAD
Anthropology	Region III
Highway	Region IV

Charles R. Easley
Authorized Review
Agency Signature

COMMENT:

Much better section on geology and mineral resources. We still believe, that all National Parks and Monuments should have a detailed survey of the mineral resources within them.

Ted H. Eyde

**Mr. Ted H. Eyde, Secretary
Exploration Association
P.O. Box 49026
Tucson, AZ 85717**

DNA - PEOPLE'S LEGAL SERVICES, INC.

POST OFFICE BOX 765
TUBA CITY, ARIZONA 86045
TELEPHONE: (602) 283-5265

United States Department of Interior
National Park Service
Grand Canyon National Park
Grand Canyon, Arizona 86023

In the Public Hearings for the Proposed Master Plan for the Grand Canyon National Park; July 15, 1974, Business College Auditorium, Northern Arizona University, Flagstaff, Arizona.

STATEMENT MADE IN BEHALF OF INDIVIDUAL NAVAJO INDIANS WHO USE AND OCCUPY THE RESERVATION SIDE OF THE PENINSULA OF LAND CREATED BY THE CANYONS OF THE COLORADO AND LITTLE COLORADO RIVERS.

Presented by Robert C. Dawes, Law Clerk, for DNA - People's Legal Services, Inc., Post Office Box 765, Tuba City, Arizona 86045, (602) 283-5265.

Mr. Chairman; members of the National Park Service:

Our office has been asked by certain individuals who are Navajo Indians living on the reservation to present their position with respect to the proposed Grand Canyon National Park Master Plan.

Most of our clients reside near the eastern border of the Park in the Peninsula of land created by the canyons of the Colorado and Little Colorado Rivers. Most of these people use this area during the winter months ("winter camp") - returning to the top of Gray Mountain in the summer ("summer camp"). The border which our clients are particularly concerned about starts south of Desert View at the Kaibab National Forest Boundary, runs straight north until it reaches the Little Colorado River. The area is landmarked by Cedar Mountain.

In the previous hearings of the Master Plan, held by the National Park Service in 1971, this office represented many of these same individuals who were then particularly concerned with the possibility that they would be denied access to their sacred areas within the park. It is of utmost concern to our clients that they continue to be allowed access to their sacred areas. The Master Plan gives a passing acknowledgement to their interests and apparently would allow them to continue as before. However, we feel that the Master Plan does not express itself strongly enough on this point. In behalf of our clients, I would request that the National Park Service recognize more positively the religious interests of our clients (and other Navajos and other Native Americans who consider the area to be sacred).

Also, we feel that our clients or other Native Americans who consider the area sacred should not have to pay any entrance or other such park fees at any time when they go into the Park for the purpose of exercising their religious beliefs. This would include ceremonials or just routine pilgrimages. Further, we feel that any Native American whose ancestors have lived in the Grand Canyon area should never have to pay any entrance fees.

DNA's clients have more than just a religious interest in the Grand Canyon. As I just previously mentioned, many of our clients use and occupy the particular peninsula of land created by the canyons of the Colorado and Little Colorado Rivers. Some of our clients' families have lived as far west in the canyon as the Grand Canyon Village in times past. Some of our clients' families have hogans (houses) still standing inside the park in the peninsula of land. Some of our clients' families constructed earth "tanks" to catch and retain water for their livestock in this area. Most of our clients primary source of income is from the livestock they raise. They and their families used to graze over large areas that are now included in the Park. Now, the only area of land which they still are allowed to use is the eastern half of this peninsula.

The other half of the peninsula - the half inside the Park boundaries - includes Cedar Mountain, Cedar Canyon and numerous small creeks which have water in them in the winter months. It is these creeks - including the creek in Cedar Canyon, from which our clients have always watered their livestock. The available water on the reservation half of the peninsula is insignificant. Traditionally our clients' families not only watered their livestock in these creeks but also grazed them over the entire peninsula.

The Master Plan would classify the Park half of the peninsula as a primitive area. No grazing would be allowed. Presumably no watering of livestock would be allowed either. Currently there is no fence on this boundary, but we assume that once the plan becomes final, a fence would be erected on the boundary between the Park and the Reservation which would run straight down the middle of the peninsula dividing a whole area in half without any consideration given to the integrity of the whole area and the environment within. Frankly, to my clients and to anyone else who appreciates the integrity of the environment in this peninsular area, a fence erected down the middle of it makes no sense. Such a fence would not only divide it in half but, in effect, also deprive our clients full use of their land since they would not have access to water for their livestock.

In behalf of our clients, we would like to propose that this area be further studied. We feel the entire peninsula should be considered as a whole and that any and all alternatives for a resolution of the competing interests be explored. For example: the rim and immediately adjacent areas of the Grand Canyon along with the rim of the Little Colorado Canyon inside the park boundaries could be designated as primitive areas; Cedar Mountain and Cedar Canyon could also be designated as primitive

(with an access to the creek for the livestock allowed); and the remain part of the land surface open to limited grazing and watering of livestock. Further, the National Park Service might negotiate with the Navajo Tribe to make a Tribal Park out of the remaining Little Colorado River Canyon and adjacent rim. Thus, a continuous wilderness area would exist along the rims of both the Grand Canyon and Little Colorado River Canyon, Cedar Mountain and Cedar Canyon, while the surface of the peninsula could be used for limited grazing in the winters when there are few campers and tourists. During the summer months the entire peninsula might be used for park uses.

This example of a possible alternative to the current plan is one of several possible resolutions that could be reached. Our clients, in particular would like fences from the northwest end of Cedar Canyon to the rim of Grand Canyon and from the southeast edge of Cedar Canyon south to the National Forest (with a cattle guard on the road to Desert View from Cedar Mountain). This would stop their livestock from wandering over into the Desert View area.

They would like to have access to water for their livestock and they would like to be able to graze their livestock in the area on a limited basis. We believe this can be done consistant with the policies outlined in the Master Plan.

In behalf of our clients, I suggest that the entire peninsula might be better utilized than what the Master Plan would propose for the area. We would suggest that the National Park Service study the possibilities further. Our clients and the Cameron Chapter of the Navajo Tribe would be willing to cooperate with the Park Service in such a study and provide whatever assistance we can.

Before I conclude my comments, I would like to make one further suggestion: I feel the National Park Service and those people working on the Master Plan should seriously consider establishing an Advisory Committee which would meet from time to time to consider the plan and make suggestions to it. Not only would the Park Service receive valuable input from divergent groups - but it would also serve to educate these groups about each others' interests. In particular, my clients feel the Cameron Chapter of the Navajo Nation which borders the eastern boundary of the Park should have more information about and input into the operations and plans of the Park, especially since the Park can so profoundly effect their lives. My office also represents people from Bodaway - near Cedar Ridge, Arizona, - who live on the eastern side of Marble Canyon. They would also like more information about Park plans (especially with respect to Marble Canyon) and have some input therein.

There are a number of individuals here tonight from the Cameron Chapter of the Navajo Tribe. They have selected four or five people to speak

for them; when an interpreter is needed, Mr. Larry Nez of our office will interpret. If there are any questions, I would be happy to respond to them after these people have spoken.

Thank you.

COCONINO COUNTY BOARD OF SUPERVISORS

STATEMENT BY SEYMOUR TSO, TRIBAL COUNCILMAN
BEFORE THE U.S. DEPARTMENT OF THE INTERIOR,
NATIONAL PARK SERVICE, GRAND CANYON NATIONAL
PARK.

July 15, 1974

Ladies and Gentlemen:

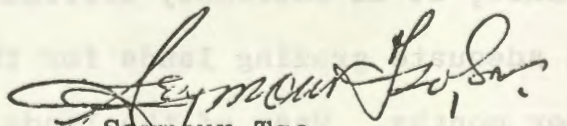
The purpose of this statement is to express an opinion on behalf of myself and the people who I represent regarding the master plan presented by the National Park Service, outlining the management policies, objectives and concepts of future development of the Grand Canyon National Park. I am aware that many persons oppose the concept of the plan for religious reasons and by reason of the duration of their use of the lands within the National Park.

I wish it to be known that I am not opposed to the concept of a wilderness area but I believe that the interest of the tourist and the interest of the people who have used the area within the park for many years, can be substantially satisfied. The primary interest of the Navajo people is that the lands within the park continue to be held open for their use and enjoyment, principally for grazing purposes. As you may know, it is extremely difficult for Navajo herdsmen to find adequate grazing lands for their livestock during the Winter months. Many of the lands within the park provide an excellent means of support for livestock during the harsh Winter period and therefore I believe this area should be made

available to the Navajo.

I have heard it said that the park should be entirely fenced, thereby excluding Navajo livestock from entering it, by reason of the fact that we are in a new generation and need no longer satisfy the needs of elderly people who are accustomed to using the park area for livestock. Such reasoning is neither true nor fair in that we can not disregard the needs of the elderly people and furthermore many young persons are desirous of continuing to use the area as it has been traditionally used by their forefathers.

I, therefore, make a proposal that before any final action is taken on the plan, a meeting or series of meetings be conducted between officials of the National Park Service and the Navajo Tribe in an attempt to satisfy the needs of the current users of the Park as well as the tourist. In addition, I suggest that the Park Service conduct a detailed investigation as to whether continued use of the park area for grazing purposes would conflict with the use of the park as a wilderness area. I, personally, do not believe that any serious conflict would result in allowing the Navajo stockmen to continue to use this area.


Seymour Tso
Navajo Tribal Councilman



COCONINO COUNTY BOARD OF SUPERVISORS

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JACK R. SMITH, COUNTY MANAGER
AND CLERK

August 13, 1974

Department of Interior
National Park Service
Grand Canyon, AZ

Re: Environmental Impact Hearing
Grand Canyon National Park Master Plan

Gentlemen:

We would like to commend you on your master plan for the canyon. It seems to have been well thought out and had considerable input from many people.

The only area that we see we would like to comment on is the Tusayan area just outside the park boundary.

This area we feel is performing a service to the park, and an important part of the overall planning effort. This is because they provide for services that are always in short supply in the park, and always have been, especially housing and recreation.

We would like to once again recommend that your supply of water, which seems adequate, be made available on some type of planned basis.

Thank you for allowing us to comment.

Very truly yours,

Peter J. Lindemann
Chairman, Board of Supervisors

PJL:kap

COCONINO COUNTY BOARD OF SUPERVISORS

WRITTEN STATEMENT OF THE
COMMUNITY OF TUSAYAN, ARIZONA
IN CONNECTION WITH
UNITED STATES DEPARTMENT OF INTERIOR
ENVIRONMENTAL IMPACT STATEMENT
- GRAND CANYON MASTER PLAN -

Pursuant to reservation verbally made by Mr. Patrick A. Sullivan on behalf of the Community of Tusayan, Arizona, we hereby provide a written statement on behalf of the businesses and citizens of the community of Tusayan, Arizona, relative to the Environmental Impact hearings held on July 17, 1974 at Grand Canyon, Arizona..

The Community of Tusayan wishes to go on record as basically supporting the Master Plan of the National Parks Service relating to the development and growth of the south rim of the Grand Canyon related visitor areas as specified in the Master Plan.

This community has worked diligently in connection with the National Parks Service and the State of Arizona to upgrade the facilities in both living accommodations, recreational accommodations and overall community development so that the Community of Tusayan can directly support visitors and tourists in accordance with the broad precepts of the Master Plan.

The concept of limiting development within Grand Canyon National Park and encouraging the development outside the Park on private land is a strong basic precept of the Master Plan.

In that connection, such developments outside the Park must be done in such a way as to provide total support to Grand Canyon National Park, rather than fragmented and sub-standard accommodations either esthetically or structurally.

For this reason, the Community of Tusayan, under the laws of the State of Arizona, have formed a Water District for local improvement. The community is now in the process of forming a Fire District and a Sewer District so that the entire development can go forward with advance planning and good community utility services.

The critical factor for the growth and proper development of any community in Arizona has been the need for an adequate, dependable water supply.

Several alternatives to the Master Plan have indicated a plan to provide the area of Tusayan with water from within Grand Canyon National Park.

Authority for the provisioning of such water is found in Title 16, United States Code, Section 1a-2(e) which reads as follows:

"Section 1a-2, Secretary of Interior's Authorization of Activities.

*In order to facilitate the administration of the National Park system the Secretary of the Interior is authorized under such terms and conditions as he may deem advisable to carry out the following activities:
...(e) services, resources, or water contracts.*

Enter into contracts which provide for the sale or lease to persons, states or their political sub-division who

(1) provide public accommodations or services within the immediate vicinity of an area of the National Park system to persons visiting the area; and

(2) have demonstrated to the Secretary that there are no reasonable alternatives by which to acquire or perform the necessary services, resources, or water;"

Historically, the Community of Tusayan has depended upon springs at Indian Gardens (within the National Park) for water. These springs provided water service to the Community of Tusayan and the National Parks via improvements and pipe lines that were installed and owned by the Santa Fe Railway Company. This water was sold to the residents of Tusayan on a contractual basis.

In October of 1953, the National Park Service purchased for a minimal sum (believed to be approximately \$1), the water rights and the entire system which has been developed by the Santa Fe Railroad Company. The National Park Service thereafter unilaterally discontinued the provisioning of water to the residents of Tusayan.

At that time, the residents of Tusayan were forced to begin hauling water by truck from the area of Flagstaff and Williams, a distance of between 110 miles and 140 miles round trip.

The issues as to whether or not water should be provided under Title 16 of the United States Code, as provided above, are two-fold:

(1) Do the residents and businesses of the Community of Tusayan fall within the definition of persons or political sub-divisions which the National Parks Service may provide water?

(2) Are there reasonable alternatives to the residents of the Community of Tusayan by which they can acquire the necessary water themselves?

Taking these points in order:

(1) DOES THE COMMUNITY OF TUSAYAN FIT THE DEFINITION OF THOSE PERSONS WHOM THE NATIONAL PARKS SYSTEM CAN PROVIDE WATER.

The Community of Tusayan, Arizona, including the Moqui Lodge, which is approximately 1 mile from the community on Forest Service land, provides approximately thirty (30%) percent of all the motel units in the Grand Canyon South Rim area. The Tusayan area also encompasses Grand Canyon National Park Airport; several camp grounds, both private and public; trailer parks; four of the five service stations; one of the two area grocery stores; three of the areas' six restaurants and the only community recreational facility for the entire area. (tennis, bowling, health club, etc.) Additionally, it provides the only living accommodations for non-government or non-government concessionaire support personnel and their families.

Those personnel living within the Community of Tusayan are personnel employed by the State of Arizona and it's sub-divisions to include airport personnel, State Patrol, Sheriff; utility personnel, including electrical and telephone and all personnel necessary to run the area business which directly support Grand Canyon National Park, the airport and visitor facilities.

We believe it is beyond dispute that the Tusayan area, indeed, fits within the definition of those persons and/or political sub-divisions which are entitled to consideration under the provisions of Title 16, United States Code, as quoted above.

* * * * *

(2) DOES THE COMMUNITY OF TUSAYAN HAVE A REASONABLE ALTERNATIVE WATER SUPPLY?

The water sources, after the elimination of the source from the Santa Fe Railroad in 1953 have been as follows:

(a) Williams, Arizona.

For many years the Community of South Grand Canyon has been forced to secure it's water from Williams, Arizona. However, Williams has a marginal supply of water for it's own use, primarily because it has not developed by initiative additional sources of water. For this reason, Williams has for years stated that it someday would require Grand Canyon community to find it's own water, and has, over the years, periodically suspended water supplies to the Tusayan area, including periods as recent as May through September of 1971. The Williams' source, because of it's high cost and location, has placed an economic burden above realistic proportions upon the village of Tusayan.

(b) Chino Valley

Chino Valley has an abundant supply of water; however, it also is too far distant from Grand Canyon to be practical since it is approximately 100 miles to this source of water and at 2,000 feet lower elevation. The costs of hauling this water are completely prohibitive.

(c) Wells

There are a few wells in the vicinity of Flagstaff and some slightly closer to Grand Canyon. These wells, however, are on Forest Service property and use permits have been denied the residents of Tusayan for this water. The existing permits are established for livestock use. These distances also are approximately 50 miles and are totally prohibitive and unreasonable as a source.

(d) Bellmont.

Bellmont is the current source of water and is approximately 70 miles from Grand Canyon, which makes it totally unreasonable and prohibitive to haul from as a permanent source.

* * * * *

NATIONAL PARK SERVICE SUPPLY.

The National Park Service has for years depended upon a supply of water approximately 3,000 feet below the edge of the rim of Grand Canyon at Indian Gardens. This supply of water has provided the National Park, together with its enterprises and tourist facilities continuously until 1970. In July of 1970 a new source of water was developed with public funds and has been providing water from the north rim at Roaring Springs.

This water supply has been available to the south rim of the Grand Canyon via the Trans-Canyon water pipeline completed in June of 1970. The National Park Service provides water to itself, the public and its concessionaires within the Park from this facility.

Since the Trans-Canyon pipeline has been put into use, the supply of water that was formerly received from Indian Gardens has been abandoned but remains available as a reserve source of water should the need ever arise. The reason for the abandonment is currently the abundance of Trans-Canyon pipeline water available to the south rim, and due to the surplus, it is not necessary to use any of the Indian Gardens water supply.

The Trans-Canyon pipeline was constructed at a cost of approximately \$5.5 million. The original financing for this came from a long-range capital improvement program of the National Park Service. Considerable portions of the \$5.5 million costs were paid by the Roads and Trails budget. Construction of the pipeline was a two-fold undertaking: (1) to provide the pipeline; (2) to improve the trail and bridge system.

In any respect, construction of the Trans-Canyon pipeline was funded in the same manner as improvements in trails and similar to other improvements in the National Park, i.e. visitors' center, roads, campgrounds, trails, etc.

NATIONAL PARK SERVICE CONSUMPTION

The prior source at Indian Gardens produced approximately 8 million gallons per month. The new source produces 25,000,000 gallons per month. The National Park Service has approximately 13 million gallons of water storage on the south rim.

We understand from the Master Plan that the usage of the National Park Service will peak out in approximately 1980, based upon current visitor facilities which are not planned for expansion.

The National Park consumed the following quantities of water in the months and years indicated below.

<u>Water Consumption</u>	
September, 1970	8,433,120 gallons
October, 1970	8,293,160 "
November, 1970	5,414,080 "
December & January, 1970-1971	10,821,760 "
February & March, 1971	10,480,520 "
April & May, 1971	16,838,640 "
June & July, 1971	25,458,800 "
August, 1971	<u>11,854.00</u>
Total	97,594,280 "
Total for the Year of 1973	126,750,000 Gallons

PROJECTED CONSUMPTION - COMMUNITY OF TUSAYAN (excluding Moqui Lodge, the Airport and Forest Service facilities)

It is estimated that by 1985, assuming full area development to include 500 motel units, supporting facilities, such as restaurants, campgrounds, service stations and necessary apartments or other necessary housing, the Tusayan area will consume a maximum of 20 million gallons per year.

There is available from the National Park Service supply in excess of 25 million gallons for any one month period, which, combined with Indian Gardens supply (if it were to be utilized by construction of a 5,000 foot, 6 inch pipeline parallel to the existing line lying on the surface of the ground) would produce a potential supply of at least 35 million gallons per month. The combination of available water and stored water supports the obvious solution that there is a satisfactory water supply at Grand Canyon for the present and for the projected future needs of both the National Park Service and the Community of Tusayan. This fact is further reinforced by the intent of the National Park Service in its Master Plan and overall concept of limiting development within the Park's boundaries for transient, overnight facilities which is the greatest consumer of water.

The Community Development Plan as specified herein programs a 3 million gallon storage facility at Tusayan. This storage facility would provide adequate reserves for any period of intermittent water from the National Park Service either as a result of overdemand by the National Park or breakdown.

ECONOMIC IMPACT IN CURRENT WATER STRUCTURES

A. NATIONAL PARK SERVICE

At the present time there are three basic rate structures for water within Grand Canyon National Park.

(1) All concessionaires in the park are charged a rate of \$2.90 per 1,000 gallons of water. This price includes distribution of the water to mains, laterals, individual service lines as well as metering, billing and collection services thereof. The concessionaires are responsible for all water going to the residential community and residents reimburse the concessionaires cost of water.

(2) National Park Service employees enjoy a lower individual rate for water service to their homes than any other employee living in the park. The rate for park service employees is established by an Equalization Committee which evaluates the rates in nearby residential cities, such as Flagstaff, and establishes a reasonable rate for the federal employees. Bi-annually, the Park Service returns, in the form of a subsidy, to each Park Service employee, the difference between local prevailing rates and the rates established by the Equalization Committee.

B. TUSAYAN COMMUNITY

The residents of Tusayan pay \$17.50 per thousand gallons of water, or approximately 7 times the rate that it is provided to the concessionaires of Grand Canyon National Park.

By way of comparison, water that would cost an average family in the United States \$5.50 per month, would cost a family in Tusayan approximately \$149.50 per month.

* * * * *

It can readily be seen that the cost of water has a material impact upon the ability of both the residents and the business to fully develop a totally integrated and esthetically pleasant community.

THE NATIONAL PARK SERVICE SHOULD PROVIDE WATER TO THE COMMUNITY OF TUSAYAN UNDER CONTRACT ON A REASONABLE BASIS.

In consideration of the provisioning to the residents and businesses of Tusayan, Arizona, in accordance with Title 16 of the United States Code as quoted above, the Community of Tusayan proposes as follows:

- (1) The residents of Tusayan have adopted a frugal and consistently conservative approach toward the use of water.
- (2) The community, through use of its local improvement district, will finance the development of adequate water storage, sewage treatment and water reclamation facilities and community fire facilities to provide a totally integrated community system supporting not only the community but the State of Arizona in it's operations at the Airport and the United States Forest Service Office and Housing complex bordering the Tusayan area.
- (3) The community will purchase and acquire facilities and equipment now owned by Thurston Trucking Service and until such time as a pipeline is constructed from the National Park to the Tusayan area, will haul water from the National Park Service's supply to the storage facilities at Tusayan, Arizona. This trucking would be supported and maintained by the community and done in such a way and at such hours as would have no impact upon the traffic congestion and control within the National Park.
- (4) The community would not use fresh water acquired from the National Park Service for any purposes broader than those requirements which are placed upon persons living with the park, and shall encourage the use of reclaimed water for such purposes as are consistent with the use of the reclaimed water, including the development of all new construction to encourage double piping to serve non-potable uses by reclaimed water.
- (5) Water would be distributed by the Community of Tusayan to those persons employed by the Federal government, State governments, County governments, private enterprises on the same rate basis without discrimination to any person for any reason, within the boundaries of the communities of Tusayan, the Airport, the Forest Service facilities and Moqui Lodge.
- (6) The Community of Tusayan is committed to an area development recognizing that man's environment must be compatible to the general ecological and natural environment in which he lives. Therefore, housing developments, apartment developments and new businesses will be placed in such a way as to blend into the existing environment and all facilities will be equipped with the latest devices to clean the environment, conserve and reuse water. Electrical development, telephone lines, and other utilities will be installed underground wherever possible.

An overall plan setting forth conceptual uses of the Tusayan Community in accordance with the precepts set forth herein is attached. (Exh.A).

CONCLUSION

1. The Community of Tusayan, as outlined on Exhibit "A", is geographically and economically integrated with Grand Canyon National Park, being bordered on all sides by Federal land and Grand Canyon Park National Airport.
2. The Community of Tusayan offers a major support service to Grand Canyon National Park through rooms, the airport, housing, restaurants, camping and visitor facilities.
3. The existing water supply is not a reasonable alternative either financially, ecologically or geographically.
4. The ecological impact of hauling water several times a day, in excess of 100 miles round trip, is considerably more adverse than hauling from within the Park.
5. An in-Park supply would have the following beneficial ecological impacts
 - A. Reduced consumption of critical fuels.
 - B. Reduced highway traffic.
 - C. Less pollution of air.
 - D. Reduce noise pollution.
 - E. Upgrading of the Tusayan Community and it's utility services.
 - F. Better Tourist facilities outside the Park.
 - G. Improve local public health conditions.

* * * * *

We request that the final version of the Master Plan and the Environmental Impact Statement contain the provisioning of water to the Community of Tusayan as part of the basic plan, and not an alternative.

Respectfully submitted,

The Citizens and Businesses
of Tusayan, Arizona.



HUGHES AIRWEST

Corporate Offices: San Francisco International Airport
San Francisco, California 94128 (415) 871 6000

July 16, 1974

U.S. Department of the Interior
National Park Services

Gentlemen:

Re: Environmental Impact Hearings -
Grand Canyon, July 17, 1974

This communication will support and endorse the efforts of the residents of Tusayan to secure water from within Grand Canyon National Park.

Hughes Airwest considers that its employees and their families, almost forty (40) in number, who are residents of the Tusayan community, provide a material support effort to not only the National Park Service itself but all of the guests and visitors of Grand Canyon National Park.

There has been a considerable hardship upon our employees at Tusayan not only due to the high cost of water but due to the inability of the community to grow into one of permanent and attractive homes and businesses.

We feel that the impact upon the environment would be for the better, rather than its detriment, by encouraging the growth and permanency of this area through the provisioning of water.

Sincerely,

E. N. Altman
Vice President-Operations

1m

MOHAVE COUNTY PLANNING AND ZONING COMMISSION

MOHAVE COUNTY ANNEX • 301 W. BEALE STREET • KINGMAN • ARIZONA 86401

PHONE 753-6126 or 753-5672

Chairman

Richard J. Maggio
Director



Mr. Bruce W. Shaw, Superintendent
United States Department of
the Interior
National Park Service
Grand Canyon National Park
P. O. Box 129
Grand Canyon, AZ 86023

RE: Grand Canyon Development Plan

Dear Mr. Shaw:

The Mohave County planning staff has been given the opportunity to review the preliminary draft of the Grand Canyon Village development concept and the Grand Canyon complex master plan. The following comments are offered to provide assistance to the planning process for the Grand Canyon National Park.

GRAND CANYON VILLAGE

Concerning the development concept proposed for the Grand Canyon Village, this department is in agreement with the basic concepts proposed as outlined in the three development stages. Furthermore, we recommend having specialists refine the development concepts into detailed site plans.

GRAND CANYON COMPLEX

Concerning the master plan for the Grand Canyon Complex, insufficient regard has been shown for the social economic well-being of Indian tribes whose reservation lands are part of the Grand Canyon or adjacent to it.

The National Park Service in revising the master plan should take the initial step to arrange a conference between the National Park Service and the Hualapai tribe concerning the specific types of assistance available to the tribe for

Mr. Bruce W. Shaw

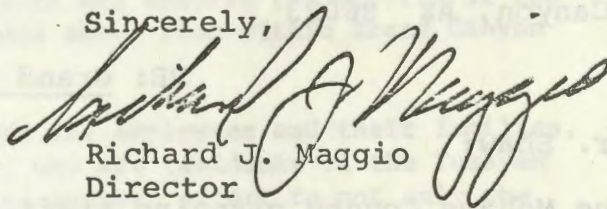
August 20, 1974

the recreational use of tribal land which is part of the Grand Canyon or adjacent to it. This conference could start a series of conferences to establish the types of assistance, development and research available to the tribe to help implement the proposed goals and objectives of the proposed project.

This department is willing to be a participant in these conferences if given the opportunity.

If you have any questions concerning these comments, please contact this department. We appreciate the ability to assist the National Park Service in planning for the Grand Canyon.

Sincerely,



Richard J. Maggio
Director

RJM/bb

GRAND CANYON VILLAGE

GRAND CANYON COMPLEX



Arizonans for quality environment

p.o. box 49022 tucson, arizona 85717

Formerly ARIZONANS FOR WATER WITHOUT WASTE

5464 E. Willard Ave.
Tucson, Arizona 85712

July 13, 1974

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Superintendent
Grand Canyon National Park
Grand Canyon, Arizona 86023

Subject: Statement on Master Plan, Grand Canyon Complex,
May 1974 and Development Concept, Grand Canyon Village,
April 1974.

My name is Dorcas Worsley. I live in Tucson, Arizona and I am testifying at today's hearing as a board member of Arizonans for Quality Environment, an organization active in the preservation and protection of the Grand Canyon for many years. We appreciate this opportunity to present our comments on the Master Plan and the Development Concept.

MASTER PLAN

1. We are in agreement with the three principal features, as given on page 2 of the preliminary draft document: a) combining into one national park the present park, Grand Canyon and Marble Canyon national monuments, and extending the park westward to Grand Wash Cliffs; b) managing the park to retain the primitive qualities of the canyon and using the South Rim developed area as the primary visitor center; c) using environmental controls based on research to protect the park environment.
2. As to the General Objectives, page 7, we are in agreement with most of them, but wish to ask for further information on the statement "Delete lands not considered necessary to protect the integrity of Grand Canyon." This is very vague and open-ended. Our point is that any deletions should be carefully studied and discussed at a public hearing, and in general, we would oppose them.
3. We are in general agreement with the Public-Use Management statements on pages 8-9, and are particularly in favor of:

"Remove from the rim of the canyon all non-historic and non-interpretative facilities

Encourage a slower pace at the North Rim and a more intimate involvement with the rim's environment

Provide a public transportation system on the South Rim

Limit mechanized access below the rims to emergency and management

Maintain a wilderness trail system"

We are primarily in favor of hiking and bicycle trails on the rims, and hope that the "primitive motor trails" can be kept to a minimum.

4. We are in agreement with the Natural and Historic Resources Management statements as given on page 9, and feel that they are basic to the entire concept.

5. We are also in agreement with most of the statements on Regional Planning and Cooperation, and believe that this is a key to protecting the park from further degradation and over-use. We particularly approve the statement "Encourage the tasteful and orderly development of visitor-use facilities outside park boundaries."

6. We are strongly in favor of the plan for the North Rim, as given on pages 20-21, with management of all lands outside the right of way as primitive backcountry. We not only support the phasing out of grazing rights in the Toroweap area but also the phasing out of as many roads as possible.

7. As given in the draft EIS statement, pages 79-80, we strongly support all steps and plans to minimize ecological damage while enhancing the wilderness experience on the river and its banks. This includes the restrictions as to carrying capacity and the phasing out of motors by 1977. The statement on page 80 of the EIS document "Commercial operators are being encouraged to begin conversion to oar operation" leaves much to be desired. To "encourage" is not enough. Management will have to take more positive action than that, for the vest^d interests will oppose this needed change.

8. We are surprised and dismayed to see in the EIS document a number of pages devoted to the hydroelectric potential of dams in the canyon. Dams in the canyon are prohibited now unless Congress repeals the pertinent section of Public Law 90-537. In our opinion, the discussion and data on dams is out of place here, particularly since the Park Service is not proposing any dams. We are unalterably opposed to any dams in the canyon. To build any would alter forever the canyon and the river, which we are dedicated to preserving as it is, rim to rim.

GRAND CANYON VILLAGE

1. We like the general concept and objectives as given, with certain exceptions noted below. The General Criteria for Future Design, pages 18-20, appear to be based on a land-use plan that will work, given the premise that the Village is really a year-round "small town." The separation of various types of use into functional areas, the proposed transportation plan, the natural environment zone, the removal of as many structures as possible from on or near the rim, are commendable.

2. We would like however, to support strongly the paragraph on page 18 about the enclave of Tusayan, which "may have future implications for the resident community as well as the visitor. If the water problem can be solved, home ownership as well as commercial services and even schools may be feasible." It is our opinion that this area should be all means be encouraged to these ends, and that work should go forward to solve the water problem.

It is noted that in the EIS document, pages 79-80, the sociological problems of the present resident community in the Village are clear; housing and schools in Tusayan may well be the solution. Further, the Tusayan area could handle much of the commercial use now present in the Village, thus eliminating some of the non-relevant park services now proliferating in the Village.

3. We note with concern that Mather campground is slated for elimination (page 29, EIS) during Phase III. This we deplore and request that you re-consider. Camping as an outdoor recreational experience is a natural for our parks, and appeals to countless numbers of people who would not or could not come in a mobile recreational vehicle, or stay at a lodge. Adequate provision for the camper must be provided.

4. As to the Historical Resources section of the EIS, pages 80-84, we agree that there is merit in preserving certain historic buildings. However, the fewer on or near the rim, the better. The Bucky O'Neill cabin, the El Tovar hotel, barns, stables and blacksmith shop, and the Hermit's Rest building are probably worth preserving. The railroad station, Kolb studio and Verkamp's store are also to be considered. None of the rest detailed in the document really merit preservation.

We are also doubtful that a "historic village" is really of much value. This smacks of Disneyland, and is not really important to the central aim of most visitors, to see and enjoy the canyon itself. It would also be expensive to construct and maintain.

5. The EIS document is very clear that there will be considerable damage to the natural environment if the plan is implemented as given. (Pages 96-97). While much of this is probably unavoidable in an area already damaged, native vegetation should be preserved if at all possible, even at the cost of adjusting plans to some extent. Re-vegetation must be a part of the plan, and should be written into construction contracts.

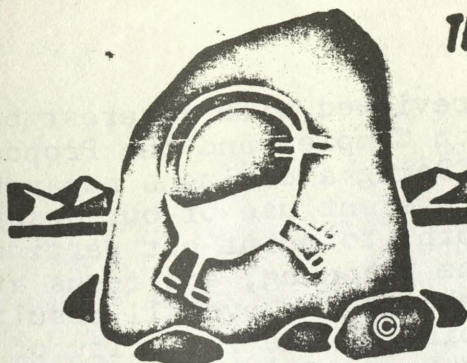
6. We offer these minimal comments in the spirit of the Development Concept itself, which on page 23 states that the concepts are presented "only to serve as guidelines for future development." The restructuring of the Village will take years (although we think 25 years is too long), and any plan must be adjusted to various factors. Refinements and improvements will need to be made. There are many complex factors at work: the future of private automobiles versus the need for a monster parking lot area is only one that will need re-study. Inflation, if it continues, will certainly lessen visitor spending on concessions and souvenirs, and hence the need to provide a lot of space for them; it will also increase the need for lower-cost overnight use facilities, such as campgrounds.

We expect, therefor, to be kept informed as plans progress, and to be called again to appear at similar hearings.

Thank you for hearing our comments and suggestions.

THE DESERT PROTECTIVE COUNCIL, INC.

A NON-PROFIT ORGANIZATION



To safeguard for wise and reverent use by this and succeeding generations those desert areas of unique scenic, scientific, historical, spiritual and recreational value and to educate by all appropriate means children and adults to a better understanding of the desert.

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Author

STATEMENT OF DESERT PROTECTIVE COUNCIL CONCERNING THE MASTER PLAN AND THE DEVELOPMENT CONCEPT FOR GRAND CANYON VILLAGE OF THE GRAND CANYON NATIONAL PARK

Glenn Vargas
President

Arthur B. Johnson
Executive Director

The Desert Protective Council has reviewed with interest both the proposed Master Plan for Grand Canyon Complex and the Proposed Concept Plan for Grand Canyon Village. Being a citizens non-profit organization dedicated to the wise and reverent use of our desert areas, we are compelled to comment on both, to point out pertinent features we feel that were omitted in the planning, and focus attention on items which we are sure would enhance the overall result. The overall result both from the standpoint of the integrity of the National Park and the more complete enjoyment of the Grand Canyon by even greater numbers and percentages of potential park users.

THE PROPOSED MASTER PLAN

The Master Plan by including the stretch of canyon from the Navajo Bridge to the Grand Wash Cliffs, or river mile 277, combining the Marble Canyon and Grand Canyon National Monuments and the upper end of Lake Mead National Recreation Area with the present Grand Canyon National Park into a grander Grand Canyon National Park is both farsighted and astute planning. Adding the Marble Canyon East to the rim of the canyon, the 36 or more thousand acres of the lower Kanab Canyon and extending the Park boundary to the south bank of the River above river mile 238.5 demonstrates wise planning in the extreme and cannot be too highly praised.

The Desert Protective Council highly approves the inclusion of the river into the Park and the Grand Canyon Wilderness and strongly urges the phasing out of all internal combustion engine powered boats and river travel facilities as soon as possible.

We feel that stopping the Park at Navajo Bridge can be likened to cutting off the end of an index finger to prove it can be done. The Grand Canyon begins at Lees Ferry, not Navajo Bridge. Extending the Park to Lees Ferry would allow the input checking of the boat traffic at a Park entrance, a realistic and logical point to the river traveling public, rather than several miles outside of the Park Service jurisdictional territory. "What are Park Rangers doing here, we are outside of the Park?"

The Desert Protective Council also finds the Lower Grand Canyon extension north boundary to be quite questionable. Placing the Park boundary along the upper rim below Andrus Canyon following a geologic feature, long preferred by the Desert Protective Council over a questionable land survey line, in this case leads to what can easily be classed as a ridiculously meandering boundary.

Instead the Desert Protective Council advocates that from the rim in Sec. 17, T. 32 N., R. 10 W., Gila and Salt River Base and Meridian, the boundary be extended west to the Lake Mead National Recreation Area Boundary on the west line of T. 32 N., R. 10 W., and follow the Recreation Area boundary to the Southwest corner of

Section 36, T. 32 N., R. 12 W. thence along the north line of Township 31 N. to the Northwest corner of T. 31 N., R. 13 W. to rejoin the boundary shown on page 11-12 of the Master Plan Preliminary Draft. We admit this would include four sections in T. 31 N., R. 12 W. that are outside the present Recreation Area. However, the Preliminary Draft Plan has included the most of eight sections in T. 31 N., R. 13 W., which are presently outside the Lake Mead National Recreational Area boundary. We call attention to the fact that above proposal dovetails with our previously taken position of including all the Shivwits Plateau within the Recreation Area into the National Wilderness Areas.

PROPOSED CONCEPT PLAN FOR GRAND CANYON VILLAGE

The Desert Protective Council pays their respect and praise to the illustrious members of the study team who devised the Grand Canyon Village development concept. Their recommendations to correct the mumbo-jumbo of the present situation are very well thought out. In general the future conclave as proposed and the progressive phasing is great planning.

The Desert Protective Council desires to present a few thoughts on items which may have been overlooked or, if considered, discarded without sufficient in-depth study.

Our first suggestion concerns the apparent complete phase-out of the railroad access to the South Rim. DO NOT lock yourselves out of a possible revival of rail travel with its requirement for hotel accommodations and corollary food, shopping, and intra park travel. The mass transit system is the answer to the latter only. It is not illusory dreaming to envision the revival of single self-powered chair or pullman cars operating under modern block system and automatic pilot with a one-man motorman-conductor-brakeman-porter-hustler crew. In tandem or three or four units they could very well intersperse between freight trains and become a realistic inter-city mode of travel. Budd Co. built such interurban units several decades ago. With the proven passenger mile per gallon of fuel consumption advantage of rail transit over other means of people transport, don't rule out such a possibility.

The Los Angeles metropolitan area involving parts of four counties once had a 900-mile high speed rail interurban passenger transit system. Worshipping the false prince of freedom of travel the people allowed all that blessed asset to decay into abandonment. As proven by a recent vote, several decades later, those people are now willing to spend billions to reestablish a fixed route transit system over only a fraction of the same miles where only millions would be needed if the rails and rights of way still existed to reestablish a viable system. For decades those same people resisted any diversion of gasoline tax funds from highway building, which wrote the death knell of that rail transit network. They, however,

recently voted to use gasoline taxes to underwrite the cost of a new, much amputated, "rapid" transit system.

Another concept of user preference the Desert Protective Council cautions against acting upon too hastily is that tent camping is dying and will be replaced by the self-contained "motor home." A high official of the Western Region of the National Park Service has admitted over public radio broadcasts that the "prior reservation" program of the National Park Service has just this summer confounded the planners. The average National Park visitor, instead of driving 500 miles and spending a couple of nights each in three Parks, is now traveling a couple hundred miles and spending a week in ONE National Park. No change in total man days of use, just a drastic change in pattern.

The Desert Protective Council would more readily accept the policy of excluding all overnight camping within the South Rim Complex than to entirely phase out the tent camper. We are cognizant of the fact that the cost of energy per passenger ton per mile of travel can and will become a dominant factor. We know that automotive fuel in the form of tar sands, oil shales and coal conversions can last far beyond the planning period of this plan concept. We also know future fuel costs will be high, very high. At six dollars a gallon for gasoline, travel pattern will be drastically different from the present. Laugh if you wish at the suggestion of \$6.00 gasoline. Three, yea even two years ago, you would as heartily laughed at anyone who said you would be paying 60 cents for gasoline today.

The third item we wish to comment upon is the off season use of the West Rim Road by private automobiles. This is eluded to in the Master Plan, but ignored in the Grand Canyon Village Development Concept. We suggest that this be more specifically spelled out in discussion of the mass transit system discussions. During periods of low density use it may well be a distinct cost saving item to allow private auto use on the West Rim Road and eliminate the mass transit buses.

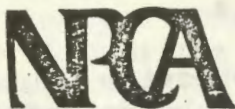
This brings up a very crucial psychological point. The point of regimentation. Regimented interpretation. This is not to detract from or belittle the excellence of the National Park Service personnel. There is no denying that there is a sizable portion of the Park visitors that may and do know as much of the history and natural processes of nature which created this wonderful exhibition of nature. They may well prefer to spend their sweet time in silent contemplation of the canyon and its hues and moods undisturbed by someone telling them what to look at and why and herding them off to the next "point of interest" which may, in fact, be personally uninteresting. Does the mass transit rim viewing plan allow one to stop at one spot and remain for a spell of his own choosing and catch a later bus? Or, if he so prefers, to amble along at his own

speed to the next stop and catch that later bus? As more and more of the people become ecology oriented and knowledgeable, the greater the percentage which will demand freedom of choice and resist, if not outright resent, regimented "interpretation."

The final thought or suggestion the Desert Protective Council wishes to express is that the backpacking camper should be considered and facilities, which will be meager, provided. No mention of this sector of the vacationing recreationists appeared in South Rim Complex plans.

The Desert Protective Council requests that a rim skirting trail be provided for the backpacker, with primitive camp sites at reasonable intervals from the point on the rim above the confluence of the Little Colorado River to at least Hermits Rest and even beyond to intercept one or more of the ends of the "jeep" primitive roads where the adventuresome could, by pre-arranged plans, be met and picked up. Reasonable spacing for campsites could be any distance from three to eight miles.

The Desert Protective Council does not object to pre-reservation or approval for permission to use such a rim backpacking trail and camp sites. Such arrangements and procedures are already practiced in several other units of the National Park System and condoned and approved by such prestigious groups as the American Alpine Club, the Mountaineers and the Sierra Club. To mention a few, they are Grand Teton, Yosemite, and Mount Rainier National Parks.



Route 8, Box 550-B,
Tucson, Arizona 85710,
July 13, 1974.

Superintendent,
Grand Canyon National Park,
Grand Canyon, Arizona 86023.

Subject: Master Plan, May 1974, and Development Concept for
Grand Canyon Village, April 1974.

Dear Sir:

My name is Robert L. Coshland. I reside in Tucson, Arizona and am testifying at today's public hearing on the above subject on behalf of National Parks and Conservation Association, of which I am the Arizona Representative. NPCA is a private, non-profit organization, educational and scientific in nature, with headquarters in Washington, D. C., and has supported and promoted the interests of the National Park Service for over fifty years.

It was my privilege to testify in 1971 on the first draft Master Plan and Wilderness Study. Forward-looking as those documents were, the Park Service is to be congratulated on the improvements reflected in the present Master Plan, as well as on the realistic approach of the plans for Grand Canyon Village unveiled at this time. We shall comment on them separately, and on their respective impact statements.

Throughout the following discussion, we must all keep before us and repeatedly remind ourselves that the Grand Canyon is one of the most unique natural wonders of the world, that it has been our good fortune to have it here, a Mecca to which all the world is attracted, an open book of the world's geologic history antedating all similar phenomena to be found anywhere, that we, the American people, are its chosen stewards to ensure that it will remain so, unadulterated, for all future generations to contemplate, study, appreciate and enjoy, and that the National Park Service is our dedicated agent to do so. There must be no compromising of that objective for any purpose. No development which could adversely affect attainment of that objective can be tolerated. Within those constraints, let us now consider the proposals.

A-77

I have visited the Grand Canyon many times, and just this week spent three days there to satisfy myself as to some of the aspects of the Park Service proposals under consideration today. Some of the comments in this statement reflect this latest visit.

The problems which confront the Park Service at Grand Canyon are clearly set forth on page 2 of the Master Plan, as well as the condensed statement of methods to resolve them. On pages 7, 8 and 9 is an excellent list of principal objectives, with which NPCA is in general agreement. As to the specifics, we would offer suggestions.

The basic premise must be that the Grand Canyon constitutes a geologic entity from rim to rim, from Lees Ferry to Grand Wash Cliffs. As such, it has been correctly pointed out that it should be under a single administrative agency, and for the most part that would be accomplished under the proposed Master Plan. The exceptions are readily corrected with certain reasonable boundary changes:

- 1) The Kanab Canyon addition should be extended northward and laterally to include all lands of all side canyons within the upper rim.
- 2) Similarly, the additions transferred from Lake Mead National Recreation Area fail to include all lands below the upper rim in Whitmore, Parashant and Andrus Canyons. For example, starting westward from the west boundary of the north unit of Grand Canyon National Monument in Township 33 N, elevation contour of about 6,000 feet constitutes the upper rim, in contrast with the approximate elevation of 4,200 feet in Township 32 N at the proposed boundary which is indicated on the map facing page 10. This differential between the above-stated basic premise and the Proposal boundary incloses a very substantial area of natural and valuable habitat which has been excluded. NPCA strongly urges that the boundary be extended to the upper rim of the Canyon in the entire area to be transferred from Lake Mead National Recreation Area. Plateau lands between the side canyons should also be added to the Park, as they constitute important opportunities for back country activities.
- 3) The Marble Canyon unit logically starts at Lees Ferry, about five miles upstream from Marble Canyon bridge. Lees Ferry is the point from which all downstream river distances are measured, is the site of a U. S. Geological Survey gaging station and is also the point at which the Upper and Lower Colorado River Basins divide for purposes of water allocation. This short stretch of the Canyon is at present part of Glen Canyon National Recreation Area, and it is recommended

that it be included within the new Park boundary.

NPCA strongly endorses the steps proposed to control use of the river, both as to restricting visitation to its carrying capacity and to phasing out the objectionable motor-powered boats which preclude a true wilderness experience within the Canyon. To effect full control, it is essential that the Park administration has jurisdiction over the entire riverbed to Grand Wash Cliffs. The statement of this objective in the fourth paragraph on page 13 is stated on the Proposed Boundary map to be subject to concurrence by the Hualapai Nation.

We understand that this has long been a bone of contention, and wish to call to the attention of the Park Service the specific language of the Executive Order by which President Chester A. Arthur created the reservation on January 4, 1883. The boundary was established by the following specifications: "Beginning at a point on the Colorado River, five miles eastward of Tinnakah spring; thence South 20 miles to crest of high mesa; thence South 40° East 25 miles to point of Music Mountains; thence East 15 miles; thence North 50° East 35 miles; thence North 30 miles to the Colorado River; thence along said river to place of beginning, .(unimportant)...".

Of particular significance are these two phrases:

- 1) "thence North 30 miles to the Colorado River". Obviously, that preposition "to" clearly precludes the boundary from extending northward beyond the south bank of the river.
- 2) "thence along said river to place of beginning". The preposition "along" equally obviously means that the boundary follows the south bank. There can be no other logical interpretation.

NPCA believes the Park Service to be fully supported in its position by the Executive Order and that it should insist that President Arthur's language prevail. It must be assumed that the referenced prepositions were selected deliberately and for excellent reasons.

Near the bottom of page 13, reference is made to exclusion from the Park of 300 feet vertically along the shoreline of the river below River Mile 238.5, on the assumption that Lake Mead could theoretically penetrate that far upstream. NPCA fully understands that the reason for this exclusion stems from the original Bureau of Reclamation withdrawal, made many years ago before subsequent experience revealed it to be an unrealistic, academic point. If and when the Lake should rise to the designed 1200-foot level, effectively arresting the river's flow,

siltation would occur so rapidly in that narrow gorge as to prevent most navigation up from the Lake. In fact, this stretch would become subject to dangerously shifting submerged sandbars. This was clearly demonstrated by the heavy siltation revealed in the broad Fierce Ferry basin when the Lake level was permitted to drop during the mid-1960's. There is no practical need for the Bureau of Reclamation to retain any influence in the Lower Granite Gorge, and the 300-foot-high strip should be added to Grand Canyon National Park.

On page 14, a brief third paragraph refers to the possibility of transferring Park lands to the Havasupai Nation. The rationale for such action is explained in detail on pages 78-79 of the Draft Environmental Statement. Whatever the outcome of the proposed study, it must be within the framework of the tenet that the Canyon extends from rim to rim, and that therefore no developments should be permitted on the rim which would be visible from points within the Canyon. If any land is to be transferred to the Havasupai, it should be administered according to Park Service standards for other natural areas in the Park; furthermore, visitation and use levels attuned to the carrying capacity should be enforced by the Park Service with violation penalties.

In this connection, reference is made to the last paragraph on page 6 of the Environmental Statement. The objective of providing scenic easement zones back from the rims of Marble Canyon is highly desirable, and the same principle should apply to any new development on any rims elsewhere in the Canyon.

NFCA recommends that a thorough review be made of the numerous references to possible new dams, which appear in the Draft Environmental Statement on pages 25, 74-77 and 97-98. Those passages on the whole convey an aura of desirability of such structures, especially in view of the public's recent emotional energy hysteria, which could influence a decision to build such dams. As pointed out on page 97, Public Law 90-537 which authorized the Central Arizona Project specifically prohibited new dams in the Grand Canyon. NFCA sees no reason for dwelling on this issue at such great length in the instant document, since dams are clearly a violation of the prime premise to preserve the Grand Canyon for posterity.

On the other hand, NFCA further recommends that the DES be revised extensively to include the many adverse impacts which dams would present. A partial list of such impacts would comprise evaporation, ultimate

uselessness due to siltation, seepage losses, elimination of the river-running experience, destruction of extensive natural areas by the construction activity, permanent removal of archaeological and geologic study areas of incalculable value, elimination of possible recovery of fossil specimens of great paleontologic value, impacts upon various wildlife and vegetation indigenous to the bottomlands, and extensive man-made alteration of a natural area which has been dedicated to preservation in its existing form.

We turn now to the Development Concept for Grand Canyon Village. NECA on many occasions has promoted the thesis that, in view of ever increasing visitation impact toward environmental degradation in our National Parks, the most logical relief would be obtainable by locating visitor facilities and support services outside the parks. At Grand Canyon we have a different type of situation, justifying some retention of development within the Park. We have a relatively small area which has already been severely disturbed during the 70 years of makeshift development to meet problems as they arose. We have an extremely high percentage of day use, accompanied by the opportunity to accomplish much on foot or on mass transit facilities.

In addition, the Park Service has presented here a plan which would accomplish many desirable objectives: an efficiently designed network of mass transit facilities, segregation of day-use and longer term visitors, provision of visitor services within practical walking distance for the patrons, separation of support and maintenance facilities and the operational personnel residential community from the visitor use area, and finally the elimination of most development from the interpretive zone along the rim. For the most part, use is made of areas which have already been badly disturbed and would be slow in reverting to a natural state. NECA therefore finds the plan generally good environmentally, and agrees with the reasons given for rejecting most of the alternatives considered in the DES. We do have some suggestions for your consideration.

In a few areas, the plan calls for some degradation of natural conditions. If the maintenance facilities and certain other support structures were to be located farther from the village, even though this would involve some destruction elsewhere it could provide greater flexibility in designing the village proper and thereby permit less degradation in the more important area.

The DES' points out cogent reasons for not building a by-pass road at Desert View, yet the plan provides for enlarged campgrounds there, which would be destructive and esthetically much less desirable than the existing campground in the village. At the same time, the plan would abandon the present attractive Mather campground, without indicating any alternative use for that area. Elimination of both the trailer village, with which NFCA fully agrees, and the Mather campground, would leave the village without any inexpensive overnight accommodations whatever. Only the concessioner benefits from this arrangement, which is unfair to the visiting public. We suggest reconsideration of the abandonment of Mather campground.

As to the return loop from Yavapai Point, any alignment which intrudes on the "Visitor Experience Zone" along the rim would be both undesirable and contrary to the Park Service's stated objectives. It should be rejected in favor of a 2-way alignment along a single route.

The one aspect of the plan which NFCA finds most disturbing is the 25-year period during which it would be implemented. With so many benefits to be gained from an accelerated schedule, and considering that inflation of construction costs has been running at the rate of 15% to 18% annually, which is considerably more rapid than the rate of amortization on buildings in place, a strong case can be made for a crash program to accomplish the entire project without delay, deferring only such items as may not be immediately required. This may involve some temporary inconvenience, which would be more than offset by the many advantages. Specifically, it is recommended that all overnight accommodations be suspended for one season, except for the El Tovar and Mather campground. During the summer of 1976, any road construction through unoccupied areas could be performed, as well as demolition of unused buildings, removal of Santa Fe tracks and site preparation for new construction of relocated facilities. Wherever feasible, actual construction could commence. Effective September 15, 1976, operations would cease at the Bright Angel Lodge complex and at Kachina, Thunderbird and Yavapai Lodges, but might continue at the Motor Lodge, which will not be affected. The trailer village would be immediately eliminated, Yavapai Lodge dismantled and the new staging area and parking lot prepared to be operational by the Spring of 1977, when mass transit would be available to the Yavapai Point interpretation center and the West Rim drive. Between

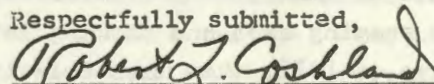
September 1976 and May 1978, all planned relocation of facilities would take place, including construction of new overnight accommodations and the two new visitor service centers - one for day-use visitors, the other in the overnight area, - and all planned demolition in the visitor experience zone. We believe there is sufficient lead time if planning, Congressional approval, and contracting were to be initiated immediately. Normal day-use operation would be continued throughout this period, with some temporary facilities for food and other peripheral services. The very substantial savings in construction costs would more than suffice to meet advanced amortization of Kachina, Thunderbird and Yavapai Lodges.

During my recent visit, I was very favorably impressed by the free mass transit system already in operation. The internal shuttle within the Village on a frequent schedule enables visitors to leave private automobiles parked and to travel to locations of essential services. Closure of the West Rim Drive to all private automobiles was found to present a host of advantages. The 3-car trams on 15-minute headway, with designated stops at the most popular viewpoints, provide excellent visibility, deposit visitors at viewpoints in an environment of serenity for contemplation in virtual solitude between buses, avoid traffic snarls, parking problems and people problems, and can transport with one vehicle the number of visitors which otherwise would require up to 30. Drivers supply interpretive commentary enroute, assisting visitors to understand their experience in a way which would not be possible in their own cars. Our only suggestion would be to install a refueling facility at the eastern terminus of the loop.

One final suggestion is to reduce drastically the proliferation of souvenir shops. One large one in the staging area and one convenient to the overnight visitor center should be sufficient. One shop offering better-grade merchandise of native Indian crafts would be acceptable; we found cheap imitations made in the Orient. Shoddy practices like this by concessioners should be forbidden.

NPCA appreciates sincerely this opportunity to express its views on this very important subject, and will be glad to expand on these concepts if requested.

Respectfully submitted,


Robert L. Coshland, Arizona Representative, NPCA.

Copy to:
Mr. Toby Cooper, A-83
NPCA Washington Headquarters

N.A.U. Hiking Club
C.U. Box 7534
Flagstaff, Arizona 86001 .

Park Superintendent
Grand Canyon National Park
Grand Canyon, Arizona

Dear Sir;

Concerning the Grand Canyon master plan;

We are firmly opposed to building any more dams. The proposed Bridge Canyon dam is not even a good recreation lake site, since the Indians charge \$5 to enter the area. A dam in Bridge Canyon, Marble Canyon, or the Little Colorado would flood a major portion of the wildest area of the canyon. With the increased use of the inner canyon near the village, those of us who wish to maintain a wilderness experience must use these very areas extensively. Arizona has quite enough lakes; if we would stop selling all our power to L.A. we'd have enough electricity, and there are other means of producing power.

We are opposed to a tramway or elevator. The area around Phantom Ranch is over-populated enough, and the presence of such a tram would destroy any vestige of wilderness experience remaining to the maintained trails complex.

We hike in the Grand Canyon a great deal. Lately due to rapid influx of hikers the regulations have become more restrictive. We can accept and respect reasons for limiting the number of hikers in an area and for not building fires. What we cannot accept is being told that hikes we plan to take are too ambitious for us. Most of our members have several years experience hiking in the canyon, and several hundred miles. We are better judges of our capabilities than rangers who are not in as good shape as we and who lack our experience in the inner canyon. We would suggest a system of hiker certification. Upon request of the hiker (to eliminate the casual hikers who will only hike there once) a file could be set up noting that he does have experience, even listing the trails. It would make some extra work, but it would eliminate endless debates, questions, and arguments with hikers who wish to do something the rangers feel is too hard. It could also eliminate some of the search parties and drag-outs for hikers who claimed to be experienced and who in fact were not. Most of our hiking is done during the school year, which is not your busiest season anyway.

To avoid the irritation of vandals who sign their names on the rocks, why not follow the example of Walnut Canyon, where at the head of the nature trail they have a large rock set aside just for idiots who have to write on the rocks, with an appropriate sign. If whenever possible hikers reporting back in from a hike would be required to bring in their trash that they were supposed to have carried out, it might discourage leaving it all at the bottom.

N.A.U. Hiking Club
Slim Niemer, editor

STATEMENT OF JOHN A. McCOMB, SOUTHWEST REPRESENTATIVE OF THE SIERRA CLUB, AT THE PUBLIC MEETING HELD IN PHOENIX, ARIZONA ON JULY 13, 1974 TO DISCUSS THE MASTER PLAN FOR THE GRAND CANYON COMPLEX AND THE DEVELOPMENT CONCEPT PLAN FOR THE SOUTH RIM VILLAGE AREA.

I am John A. McComb, Southwest Representative of the Sierra Club. I live in Tucson, and I have an office there located at 2014 East Broadway, Tucson, Arizona 85719. The Sierra Club's interest in the Grand Canyon is well-known and we have played an active role in legislative and administrative activities affecting the Canyon. My own personal interest in the Grand Canyon began in 1961, and since then I have traveled extensively in the Canyon and have participated in many earlier public meetings and hearings concerning the future of the Canyon. It is with pleasure that I submit the following comments on behalf of the Sierra Club. The Sierra Club currently has about 140,000 members in 44 chapters covering all 50 States. Approximately 1,700 of these reside in the State of Arizona and comprise the Club's Grand Canyon Chapter.

The meeting today begins the third series of public meetings which have been held to solicit public input into the National Park Service planning activities at Grand Canyon. The first of these was held in August 1969, while the second meetings were held in May 1971 in conjunction with the hearings on a wilderness proposal. We hope that there is a continuing program of public involvement in the management of the Grand Canyon as the plans evolve and change to meet future conditions. We believe that the past efforts to involve the public have been most worthwhile. The National Park Service is to be commended for this and we urge you to continue to do so.

The Master Plan and accompanying draft environmental statement discuss the proposed enlargement of Grand Canyon National Park, yet the remainder of these documents concerning management address only those portions which are now within Grand Canyon National Park, Grand Canyon National Monument, and Marble Canyon National Monument. There is no discussion of possible management of areas to be added. The Sierra Club believes that the entire master planning process should be expanded to cover any areas added to the Park by Congress. The proposed boundary map on page 11 of the Master Plan is relevant only insofar as it shows the official position of

o National Park Service. This is also the boundary adopted by the United States Senate last September. However, there is a very good chance that the House of Representatives may substantially amend this boundary in the coming few weeks. The overall decisions about the boundary are being made in another forum, i.e., the United States Congress, and it is questionable what relevance any input on that subject has at these meetings.

A few comments are in order. The proposed boundary shown on page 11 omits very substantial areas of land which are within the rim of the Canyon. Specifically, these include the upper portion of Kanab Canyon and its tributaries, the upper portion of Cataract (Havasu) Canyon, most of the Whitmore, Andrus, and Parashont Canyon systems. The areas proposed to be added do not include any rim lands that could serve as buffers for the canyon proper. The proposed boundary does not extend to the mouth of the Paria River which is the beginning of the Grand Canyon, nor does it include the river itself from Mile 238.5 to the Grand Wash Cliffs, the recognized end of the Grand Canyon.

The draft environmental statement, in discussing possible boundary alternatives, indicates only two trivial alternatives which have received some discussion in the past. These are (1) deletion of some lands from Grand Canyon National Monument, and (2) a lesser addition that that adopted by the Senate in the lower Grand Canyon. A wide variety of boundary alternatives certainly exists. These would range from a smaller park proposed by some hunting groups to a park that genuinely encompasses all of the Grand Canyon including a buffer strip along all the Rim. I would suggest that the National Park Service has two courses of action in proceeding with these planning documents. One is to omit all discussion of the boundary question other than some historical information about what is going on in Congress. The other, and perhaps preferable, course would be to indeed discuss a broad range of possible boundary alternatives along with their merits and demerits.

The Master Plan notes that a wilderness proposal has been submitted to Congress. However, in view of the probable boundary modifications in Congress, and the fact that

the earlier proposal took into account only the present boundaries, it would seem highly appropriate that a complete restudy of the wilderness potential of the Canyon be made after Congress completes action on the boundary legislation. The Sierra Club generally feels that the proposal submitted to Congress was deficient primarily in the omission of a number of rim areas which we feel also deserve protection as wilderness. I have attached a copy of a small map showing our recommendations at the time of the May 1971 wilderness hearings. Some slight modifications of the National Park Service position have occurred since that time.

The Sierra Club basically agrees with and supports most of the objectives outlined in the Master Plan document. Some of these which are particularly meritorious include the general policy of removing all non-interpretive and non-historic facilities from the Rim and restoration of this area so that the Park visitor approaches the Rim through a natural environment. We also approve of the general policy of continuing to emphasize the present developed South Rim area as the major visitor focus, with development on the North Rim restricted so as to preserve the more relaxed pace now available there.

The Sierra Club also strongly supports the proposed management of the present Grand Canyon National Monument designed to preserve the remote quality which visitors to the area now experience. We believe that similar management should apply to all of those areas to be added to Grand Canyon National park west of the present North Rim entrance road. The opportunity to get away from civilization in a large remote undeveloped region such as the Arizona Strip is nearly extinct in the United States outside of Alaska. We think it is something to which priority should be given to its preservation, even though only a few people may ever have an opportunity to use it. We believe that the Park Service and the Bureau of Land Management should work together to preserve this atmosphere now found on the Arizona Strip and should avoid developments such as paved roads or other facilities which would be destructive to that atmosphere. In our view, the management of this general area should be directed at the protection of the environment and not at encouraging or facilitating visitor use.

The Sierra Club believes that particular emphasis should be placed on controlling the high levels of aircraft noise now found in and over the Canyon. This noise affects the solitude both of those using the primitive backcountry in the Canyon itself, as well as that of the visitor in the more developed regions on the South Rim. The Sierra Club would be pleased to support any additional legislation that is needed to effect this control.

The management of the Colorado River in the Grand Canyon is of great interest to the Club. We have been actively involved in the present river management plan. We would like to take this opportunity to reaffirm our continuing support for eliminating the use of motors on boats running the Colorado River, thus helping to enhance a wilderness river experience. We also support efforts to limit the use of the river so as to provide both a wilderness experience for the visitor and to protect the river environment from the adverse effects of over-use. Lastly, we believe that a reassessment of the present allocation of river trips between those on commercial trips and those on their own private trips needs to be made with more emphasis given to self-reliant private trips.

We are enthusiastic about the institution of the public transportation system on the West Rim Drive. I have personally traveled on this system and I believe that it represents a major improvement in the visitor experience. Consideration should be given to extending this service to the East Rim Drive.

The Master Plan discusses the expansion of the campgrounds at Bright Angel on the North Rim, and also at Desert View. It also mentions the possibility of expanding the number of lodging units on the North Rim. The Sierra Club has serious reservations about both of these proposals. It appears to us that it could very well threaten the objective of retaining the more relaxed atmosphere on the North Rim, as well as raising the whole question of piece-meal development without any overall consideration of the impact of this activity. The Sierra Club asks that before any such changes are made in the

development of either of these areas that a development concept plan similar to that prepared for the South Rim Village area be prepared along with an accompanying environmental statement containing more detailed information so that the public can evaluate any such proposals.

The planning documents give high priority to the protection and restoration of natural ecosystems within the Park. We believe that several aspects of this deserve particular support. This includes attempts to restore a natural fire regime on the plateau lands adjacent to the Rim, and particularly those areas on the North Rim where 50 years of fire suppression have significantly altered the ecosystem. We support attempts to control non-native animal populations, including possible restoration of native species that are now extinct or limited in number. We also support attempts to protect and restore the meadows on the North Rim by elimination of the roads that traverse them.

At the end of the Master Plan document, there are two maps. The first map is the Land Classification map in accordance with the Bureau of Outdoor Recreation Land Classification System. Our major disagreement here is that a larger proportion of the lands on the Rim should be included in the Class V category (primitive areas). As we have indicated in our 1971 comments on the wilderness proposal we believe that very substantial portions of these rim areas have primitive qualities and that they should be included in the Wilderness System. In any event, they should be classed as primitive areas on the Land Classification map.

The Circulation System map proposes the obliteration of a large number of existing management roads within the present National Park and this has our complete endorsement. However, only a few roads are shown to be phased out within the Grand Canyon National Monument, although the text does indicate that some may be phased out upon expiration of the existing grazing leases. We believe that the vast majority of the roads within Grand Canyon National Monument should be phased out, with the possible exception

of a road leading to the trail down into Tuckup Canyon along with a road to an overlook near Boysag Point. The Circulation System map shows a minor road extending east from Toroweap. This road is not open to the public now and should not be open in the future.

Lastly, the plan classifies as "motor nature trail" a number of roads including the one to Point Sublime. We suggest that the alternative of closing the Point Sublime Road should receive serious consideration. We find particularly objectionable the prospect of constructing a new road there which avoids the meadows as is apparently indicated on the Circulation System map. Although we generally believe that it is desirable to retain the primitive roads to Topocoba Hilltop and to the head of the Bass Trail for access purposes, the other "motor nature trails" shown on the South Rim should be eliminated. I have indicated these changes on an attached copy of the Circulation System map.

Pages 74 through 77 of the draft environmental statement on the Master Plan contain a discussion of the hydroelectric potential of the Canyon. Although some discussion of the Grand Canyon's hydroelectric potential is appropriate in such a document, much of the information contained here is not current. Certainly the discussion of dams in Marble Canyon are only of historic interest now with virtually no political prospects of any such dam being constructed. Current interest has been focused on attempts to allow construction of the Hualapai Dam by either the Arizona Power Authority or the Los Angeles Department of Water and Power. The Bureau of Reclamation has expressed no significant interest in this proposal recently.

Regarding the possible desalting of the water at Blue Springs, it is worth noting that the recent legislation authorizing salinity control projects on the Colorado River did not even include an authorization for further study of this project, and it appears to be dead, at least for the time being.

The Development Concept Plan for the restructuring of the South Rim Village is certainly an example of the innovative far-ranging thinking which we hope will characterize all planning activities for the Grand Canyon. My own background does not include very

much expertise in urban planning, which is basically what is called for here on the South Rim. Thus my comments are necessarily limited in nature. The Sierra Club supports the concept of removing existing facilities from the Rim with the possible exception of a few historic structures. We are enthusiastic about the idea of separating visitors from their cars and utilizing public transportation systems. We generally approve of the concept of separating the various uses in zones which are generally isolated from each other by buffer zones.

A few specific comments are in order. We are opposed to the idea of constructing a new return loop for the public transportation system from Yavapai Point. We believe that alternative D.3. outlined in the draft environmental statement on the Development Concept Plan is preferable, and we would go further to suggest that the ideal return trip by the visitor should be made on foot, generally following a portion of the Rim and going through some of the undeveloped land through which the return loop would have been constructed. We are also concerned about the proposed development of an interpretive facility at Yavapai Point. In the the past plans have included some discussion of a fairly massive facility which would be blasted into the canyon wall. The Sierra Club finds this proposal objectionable. We certainly believe that additional information should be made available on the plans for this interpretive facility.

In a more general sense, and before we give any blessing to the overall plan for redevelopment of the Grand Canyon Village through Stage 3, we would like to see more careful examination of other alternatives. The draft environmental statement indicates that completion of this plan could cost on the order of \$100 million with one-half or more to come from the federal government. This is a substantial amount of funding and it will be difficult to obtain. If that sum is indeed available, and we hope that it will be and we will assist in obtaining such funding, then there is clearly a much broader range of alternatives concerning the redevelopment of the South Rim Village than that presented in the Development Concept Plan. We believe that a more thorough study of these

alternatives, including complete alternative plans, should be prepared with information on them with detail comparable to that presented for the proposal outlined in the Development Concept Plan.

Various alternatives for which I would like to see more information include a plan involving federal acquisition of the Tusayan area and location of a primary visitor focus in that general vicinity. It would include alternatives which give more emphasis on retention of inexpensive overnight accommodations, such as campgrounds. It should include several different alternatives for restructuring for both day use and overnight accommodations on the presently disturbed areas.

Alternative Plans should particularly include consideration of plans which would encourage use of alternate transportation systems other than the private automobile to bring the visitor to the Park from areas such as Flagstaff and Williams. The private automobile is probably at its peak. I expect the future will bring greater emphasis on other forms of public transportation, yet the Master Plan and Development Concept Plan are largely oriented towards removing the Park visitors from their cars once they have arrived at the Park. I think we should be encouraging people to arrive at the Park via other means of transportation, thus eliminating the need for a thirty-acre parking lot on the South Rim.

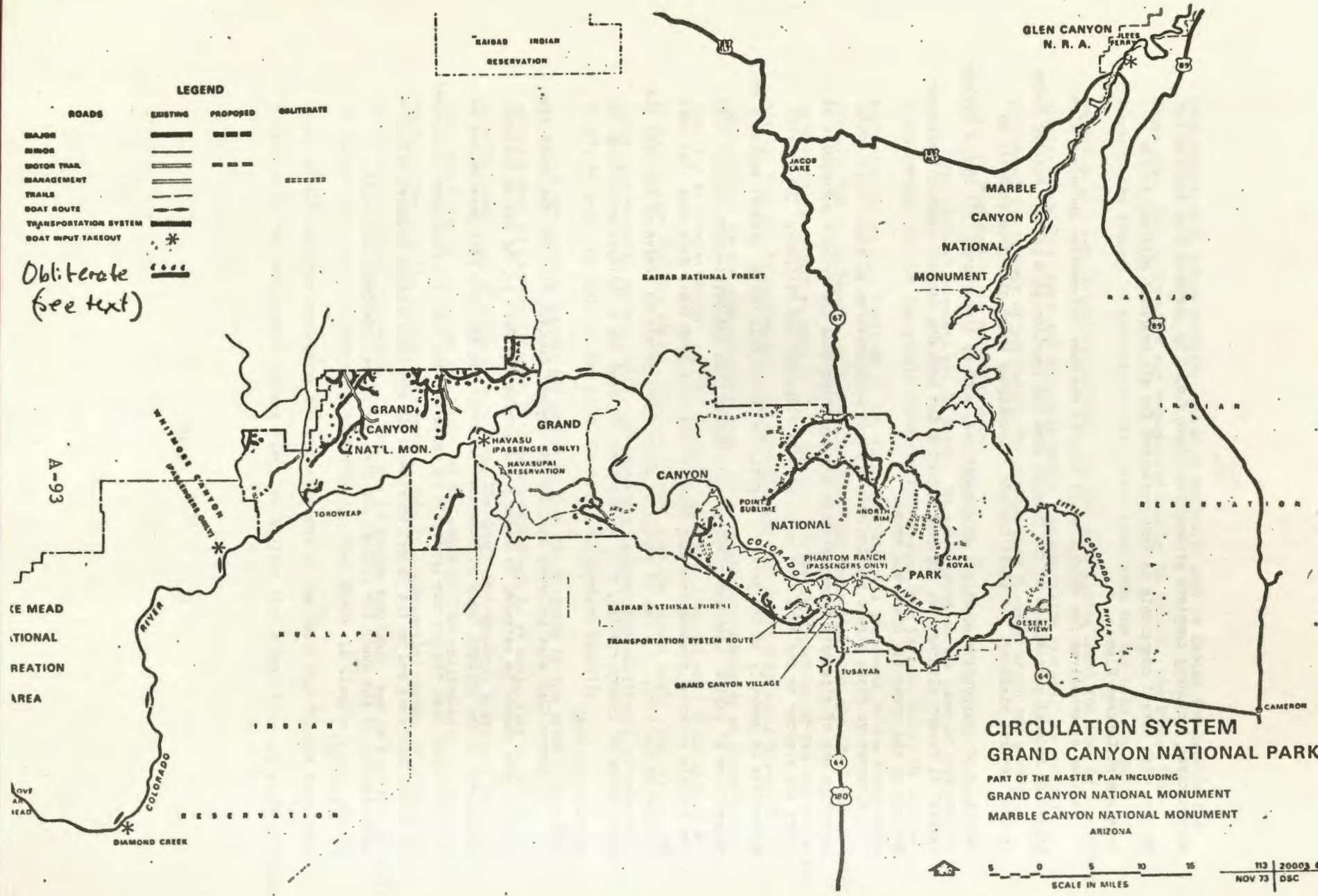
The Sierra Club also believes that the Development Concept Plan for the South Rim Village area should be extended to cover areas outside the Park in the Kaibab National Forest and on the private lands at Tusayan. Although the National Park Service has no direct control over the private lands, it is quite obvious that the developments planned for these locations and on the Forest Service lands are inextricably entwined with the redevelopment of the South Rim village and they should be considered as a unit.

Thank you.

LEGEND

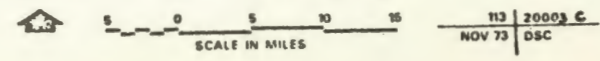
ROADS	EXISTING	PROPOSED	OBLITERATE
MAJOR			
MINOR			
SHOYR TRAIL			
MANAGEMENT TRAILS			
GOAT ROUTE			
TRANSPORTATION SYSTEM			
GOAT INPUT TAKEOUT			

Obliterate
(see text)









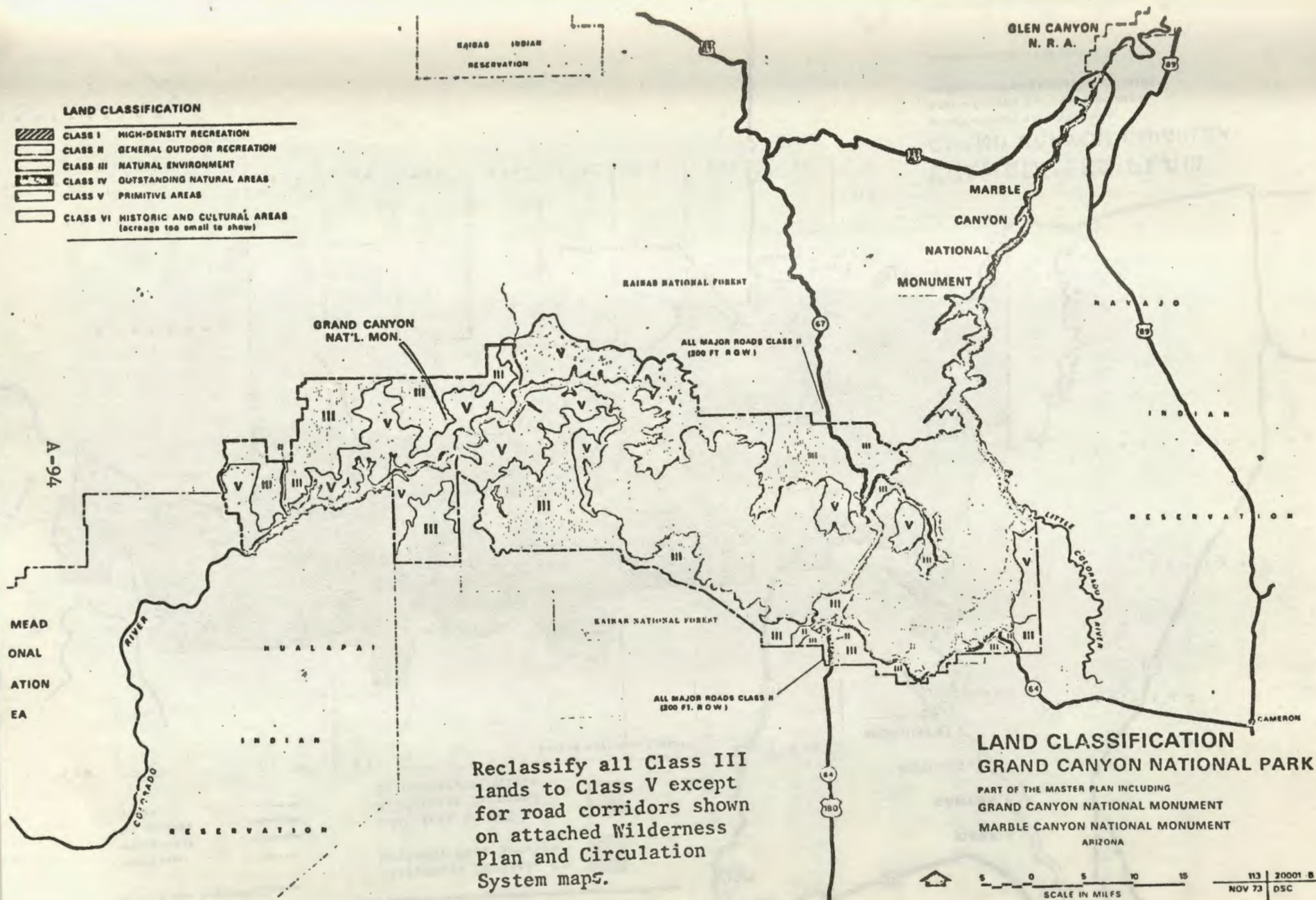
**CIRCULATION SYSTEM
GRAND CANYON NATIONAL PARK**

PART OF THE MASTER PLAN INCLUDING
GRAND CANYON NATIONAL MONUMENT
MARBLE CANYON NATIONAL MONUMENT
ARIZONA



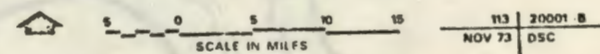
LAND CLASSIFICATION

-  CLASS I HIGH-DENSITY RECREATION
-  CLASS II GENERAL OUTDOOR RECREATION
-  CLASS III NATURAL ENVIRONMENT
-  CLASS IV OUTSTANDING NATURAL AREAS
-  CLASS V PRIMITIVE AREAS
-  CLASS VI HISTORIC AND CULTURAL AREAS
(acreage too small to show)



Reclassify all Class III lands to Class V except for road corridors shown on attached Wilderness Plan and Circulation System maps.

**LAND CLASSIFICATION
GRAND CANYON NATIONAL PARK**
PART OF THE MASTER PLAN INCLUDING
GRAND CANYON NATIONAL MONUMENT
MARBLE CANYON NATIONAL MONUMENT
ARIZONA



Sierra Club SW Office
July 11, 1974

LEGEND

EXISTING PARK BOUNDARY

UTILITY ZONE
 MAJOR ROADS
 MINOR ROADS
 TRAILS

Wilderness Proposed by
 National Park Service



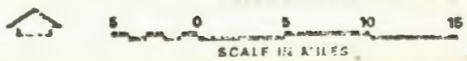
Additions to NPS
 Wilderness Proposed
 by Conservationists



**WILDERNESS PLAN
 GRAND CANYON COMPLEX**

GRAND CANYON NATIONAL PARK
 GRAND CANYON NATIONAL MONUMENT
 MARBLE CANYON NATIONAL MONUMENT

PRELIMINARY. SUBJECT TO CHANGE



THE STAFF OF GRAND CANYON NATIONAL PARK
GRAND CANYON , ARIZONA

Gentlemen,

Tucson Audubon Society is rapidly approaching 2,000 members now, so I speak to you with increasing moral support!

What I say to you and what I write to you will be somewhat different. There is never enough time to say it all nor does one always wish to say it all !

We should like to thank you for this opportunity to be heard and compliment you on a job well done. With few exceptions, we agree with you. We can not see, however, why the area west of Marble Canyon National Monument should not be proposed for Park Status. If it is going to take thirty years to rebuild Canyon Village then grazing can be phased out out in thirty years--if that's your problem !

We must re-emphasize that the Park Service should have control of the Canyon from Rim to Rim or there will be no control.

We must re-emphasize that human pollution of the Colorado River must cease. No National Park can go on permitting activities that spread diarrhea far and wide. River runners going native are a national disgrace

Now, let's look at the Indian Situation for a moment. It is a well-known fact that in pre-historic times there were peoples in and out of the waterways of America. They fought and killed each other. Some drove people out as they came in. Pre-historic people crossed Bering Strait when it was a land bridge, stayed in Alaska for a long time, then gradually made their way south little by little, until some of them made it to Tierra del Fuego, turned around and came back part way. Are we to believe that all this happened in a peaceful manner? Nobody got mad and fought to keep a spring near which his children lay buried? Did each pay the other for the land he took? We know darned well he didnt! Might might right and that was the law of the land when our forefathers set out to see what lay beyond the Mississippi or across the great ocean from Spain. Therefore, I ask, how many people did the Indians around Grand Canyon kill or what did they pay for their land that gives them the right to say we owe them for their land? Furthermore, how many times must we pay the Havasupais ? I have been informed by a former Chief Ranger at Grand Canyon that in the early 1900's the Bureau of Indian Affairs gave each Havasupai sixty acres of land and to the whole tribe was given 200-300 head of cattle. He says that within six months all the cattle had been swapped for horses ! They couldnt RIDE cows !. They probably couldnt have done much with only sixty acres apiece, but if they had combined it they would have had enough to do something with. They say they have no place to water their horses ? How many head of horses have they grazed in Pasture Wash these last 50 years?

Against their parents wishes Canyon children were sent to Indian Service Boarding Schools. They have been educated. They like Cold AND hot running water. They can take care of themselves. They do not care to return to the Reservation except to see their families and briefly enjoy the beauty of their former home. It was anticipated that Indians in Arizona like those in Oklahoma would enter the mainstream of America. Now Havasupai young people are doing that. We see no reason for elaborate plans for the few people who now live in the Canyon. We are striving for one World not hundreds of Indian Nations. A-96

The Arizona Daily Star

STAR PUBLISHING COMPANY
P.O. Box 26807 • 4850 S. Park Ave. • Tucson, Az. 85726

Aug. 1, 1974

Dear Supt. Stitt:

Thank you for sending the documents concerning the proposed Grand Canyon Master Plan and Development Concept and for inviting my comments. I could not attend any of the public hearings but please put these comments into the public record.

It is difficult for me to believe that the plan and concept for Grand Canyon, especially the village, were developed by personnel of the National Park Service. I would expect such a plan from the Fred Harvey organization but not the NPS. It seems to me the end result of the village plan would be the creation of a (perhaps not so) miniature Flagstaff at the very rim of the canyon.

What I envision for the year 2,000 at the South Rim of the Grand Canyon is as follows. No manmade "convenience" structures will be located within at least one mile of the rim. This means no El Tovar or Bright Angel Lodge, no visitor center or grocery store, no campground or employee housing, no bank or laundry or service station or any kind of "Town Center," no maintenance center or convention center or any other kind of center. Absolutely no overnight use would be permitted within one mile of the rim. No private automobiles would be permitted within one mile of the rim. All areas where such improvements now stand should be cleared and reseeded to native vegetation.

I do not consider the Coconino Plateau to be particularly unique vegetation or appearance; it is rolling grassland, juniper, pinon, oak, pine plus assorted forbs common to thousands of square miles of western United States. I believe the primary purpose of the National Park Service is to manage the Grand Canyon. That area of Grand Canyon National Park on the Coconino Plateau could be better managed by the Forest Service with the stipulation that the National Park Service will have "veto" authority over any use within at least one mile of the rim.

The one mile buffer is an arbitrary distance--I do not know how wide it should be. But it should be wide enough so that the visitor can leave behind the motel and the bank and the movie theater and the visitor center and feel nature closing in around him as he is slowly transported by some form of mass transportation toward the canyon rim. I do not know what kind of mass transit would be best; but it should be, above all things, quiet and the persons inside should be made to feel they can reach out and touch the trees. The mass transit system should not approach within at least 200 yards of the rim. Here the visitor disembarks and walks or is pushed in a wheelchair down a twisting nature trail to the rim. The only improvements on the rim would be the A-97

trail and the presumably necessary rock walls to prevent the unsteady from falling into the canyon. There would be no interpretive signing (the visitor can carry a pamphlet telling him what he is seeing), no picnic tables, no outdoor toilets, no garbage cans. The present road system which parallels the rim should be removed and the rightofway revegetated.

I really have no objection to the ultimate design of the Town Center or whatever the visitor convenience area is called. I am not a town planner. I do object to its location adjacent to the rim. I do believe it should be on private land and be run by private enterprise with supervisory architectural, construction, transportation, zoning and other controls by the MPS and other agencies involved. ~~Without~~ the buffer zone I do not see why there could not be controlled grazing, timber harvesting, hunting and other private uses of the public land.

Without (perhaps beyond is a better word) the buffer zone I see no reason why private vehicles could not drive west to Topocoba or east to Desert View--but the one mile buffer should extend all the way along the rim. Spur nature trails could drop down to the rim for people who would like to walk two miles.

I envision a one mile buffer zone for all of the South Rim and all of the North Rim with some kind of Town Center being built on the North Rim. All existing roads on both rims would terminate at the buffer zone with the possible exception of "mass transit" roads wherever they may be economical and necessary.

All water lines, powerlines, telephone lines and other utility structures should be removed from within the Grand Canyon. The new bridge across the Colorado River near Phantom Ranch must go. I do not object to mule trips into the Grand Canyon nor to a primitive Phantom Ranch for overnight use. The trail system should be left pretty much as it is with the MPS having control over the visitation into the back country.

The Colorado River must become a part of the Wilderness Preservation System and all motor-powered vessels must be prohibited, especially including those for the needs of management. Emergency search and rescue craft would be permitted.

In conclusion (I do have much more to say but already you are tiring of reading this) I think all NPS personnel should memorize and repeat at least three times a day the paragraph quoted on page 1 of the Grand Canyon Complex master plan preliminary draft as attributed to President Theodore Roosevelt. We should all work toward this end.

Sincerely yours

Pete Conzill

August 2, 1974

Merle Stitt
Superintendent
Grand Canyon National Park
Grand Canyon, Arizona 86023

SUBJECT: Grand Canyon Master Plan

Dear Merle:

Request the following comments be incorporated in the review of the Master Plan for the Grand Canyon: I recommend that both motor and oar trips be continued.

The past couple of years' operation has shown that offering both types of trips meets the requirements of the general public who desire to traverse the Canyon by river. While we must wait for the final studies, at this time there is no apparent damage being done to the environment. Our studies show that a majority of people would like to have both offered.

I believe a few administrative changes could be made that might allay the fears of those who would oppose motorized craft:

1. Reduce the size of the parties to 30.
2. Set a minimum number of days to Diamond which would reduce the time motors are running and allow time for floating and more hiking.
3. Use Phantom Ranch only for transfer of passengers.
4. Reduce percentage of passengers per month to 20% to avoid congestion.

A-99

Arizona **RIVER RUNNERS** Incorporated

P.O. BOX 2021 MARBLE CANYON, ARIZONA 86036

XX

Merle Stitt

August 2, 1974

As we do not know what the future will bring and we may at some point have to haul out all human excrement, continuance of motors will allow more flexibility.

One recommendation I would like to suggest if the motors are left on past 1976 is as follows: It is difficult for a small company below 3000 user days to furnish equipment for both types of trips. While a little motorized company may run one or two oar trips it is prohibitive to maintain enough equipment for 50% each. Therefore the small companies should be allowed to go all motor or all rowing. The large companies could go 75-25% as their 25% would be the same size as a small company.

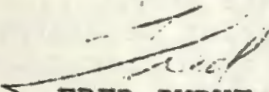
Historically there is justification to retain motors because motors were used on the river prior to the time the dam was built and the record of motor powered raft as relates to fatalities per passengers carried has been excellent. On many occasions the motor powered rafts have been able to help oar powered boats and as a result have averted tragedy. Some rowing outfitters have expressed a feeling of relief knowing motor craft were on the river to help them. Recent releases from the Park Service indicate there is a major concern for the safety of people visiting the parks since fatalities, particularly drownings, have been on the rise.

While it is not directly related to the Master Plan, I feel consideration should be given to funding the River Ranger at Lees Ferry from Grand Canyon and have him under their direct control. This would eliminate a large amount of confusion for both the Park and River Runners.

I have discussed the administrative suggestions above with some of the leading opponents of motors and they have indicated they could live with them and retain motors. Then we could both work together to maintain the Canyon as we would all like to see it.

Thank you for giving me this opportunity to express my views.

Sincerely,


FRED BURKE
President
Arizona River Runners

FB/cj

**GUIDED RIVER AND TRAIL TRIPS
MOUNTAIN AND DESERT CAMPING TOURS
R O W® RIVER OARSMANSHIP WORKSHOPS
FOLLOW-ME® FLOAT TRIPS
GUIDED WALKS, HIKES, TREKS, AND CLIMBS**

August 15, 1974

Merle E. Stitt, Superintendent
Grand Canyon National Park
National Park Service
Grand Canyon, Arizona 86023

Dear Merle:

Because I didn't attend the Master Plan and Wilderness meetings, and the 30-day comment period has closed with congress already having partially acted, I'd like to write you some things that may in a sense run beyond, or at least parallel to Master Plan considerations.

The announcement of a holding pattern through 1976 and the intention to complete the environmental studies is heartening. Certainly it is a sensible detente for all of the conflicting interests. Many of us thought the Park Service previously had its management feet "firmly planted in thin air" in basing a vital issue on arbitrarily selected numbers. Certainly, methodologically obtained data are an irreproachable basis if the studies are complete, competent, and without bias.

But looking beyond 1976, if these study findings support a lower level or even the present level of riverine Grand Canyon use, some outfitters are in trouble. Moreover, I think these outfitters are in trouble even if study findings support increased allotments and the increases go to them.

Whether 1977 allotments are reduced, unchanged, or increased, I think there must be (a) an elimination of some outfitters or (b) a very radical re-distribution of allotments among renewed permittees. I think the Service and Interior Department believe this, too, and it should be brought into open discussion in the 1974-1975 NPS-Outfitter meeting, if not sooner. It needn't involve the question of rowing vs. motoring, or increases or decreases in allotments; it could be discussed solely in terms of the present holding pattern levels.

I'd like to point out the high similarity between the river industry and the airline industry. Many parallels can be drawn, and perhaps some useful concepts borrowed.

CANYONEERS INC. FLAGSTAFF, ARIZONA 86001
POST OFFICE BOX 957, (602) 528-0924

The many outfitters, like the many airlines, are struggling to establish and maintain service over certain routes. There is high competition for the most popular routes, but since there are too many airlines, some are relegated to secondary routes, regional routes and feeder systems. To get the necessary market share, many lines have to offer service that is logistically or geographically impractical or costly.

Unsold seats, whether on a river boat or an aircraft, are totally perishable. Once the carrier leaves with an empty seat, the revenue from it is lost forever, and can only be compensated by charging the loss against the fares of those who did fill seats.

The CAB regulates the routes, number of carriers, frequency of departures in the same way the Park Service and other managing agencies regulate these factors on the rivers.

And the airlines, like the river outfitters, are all locked into a highly unchangeable fare structure, in the face of spiralling operating costs, a fare structure that risks having to price itself out of the market in the face of a "stagflation economy" yet is locked into the highly competitive carrier fares.

But sometimes the airlines and CAB partially resolve the airlines' problems through route consolidations, and I wonder whether the various interagency management entities and the river outfitters might not do the same. Two or more airlines, with CAB concurrence, sometimes trade routes or portions of routes. The result is that each line gets more passengers, over routes it can better serve.

While I don't think this would completely restructure the river industry in the western United States, I think it would help some outfitters, and perhaps simplify administration of specific rivers. It should give some outfitters more business on rivers they would prefer to serve, in trade for rivers less convenient for them to serve. At present many companies are having to grab for a few passenger days here, a few there, simply to stay in the river business. Route consolidation could produce more viable, less extended companies.

Related to this, I think the NPS position that passenger days are not saleable may have prevented some consolidation of companies and routes. I hope that position can be re-evaluated; I think it might narrow the field of outfitters in the long run.

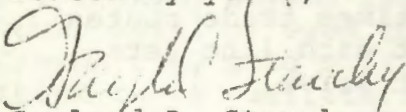
When I changed from rowboats to motorized pontoons in 1970 it was with literally years of deliberation. I saw I must try to structure the "river company of the future". The time to build the "largest river running company..." had passed, and it was time for safe, regularized service within the simpler, consistent logistics of two boats per week, inflated launching and takeout, and sewerage removal. In today's economic and environmental context, I feel that should be every outfitter's orientation.

Concurrently, I would like to see a more innovative approach by the managing agencies: more proposed alternatives, instead of so many "thou shalt nots". This could help outfitters achieve viability (or perhaps as useful - to stop struggling for viability and liquidate).

Innovative considerations might include the saleability of passenger days, the repurchase of possessory interest by the government as a way of reducing the number of outfitters, the outfitters being encouraged to explore route consolidation through passenger-day trades. Protecting rowing companies' viability by giving them the voluntary rowing market instead of forcing motorized companies into it, too.

I've had these things on my mind for some time without finding an opportunity to express them and am interested to know what merit you might find in them.

Sincerely yours,


Gaylord L. Staveley
CANYONEERS, INC.

HARRIS BOAT TRIPS

Member Western River Guides Association

P.O. Box 521 Kanab, Utah 84741

(801) 644-5635



August 16, 1974

MASTER PLAN STATEMENT CONCERNING THE COLORADO RIVER IN GRAND CANYON NATIONAL PARK:

We support the continuation of both rowing and motorized commercial river trips through Grand Canyon. However, we wish to emphasize that motors should be used with descretion, even if this means forcing outfitters to run longer trips or decreasing the mile per day average that a boat may travel, i.e. no less than seven days to Diamond Creek or no more than thirty five miles per day on the average.

The National Park Service should take into account that commercial outfitters depend on river running for a living and that further restrictions or cut backs in user day quota may well result in loss of livelihood for some, especially small outfitters who operate on a narrow profit margin.

Alan R. Harris

David J. Kloepfer

me Along To Adventure!

Sanderson



Down the Incredible Colorado — Through Grand Canyon

River Expeditions

August 16, 1974

Supt. Grand Canyon National Park
P. O. Box 129
Grand Canyon, Arizona 86023

Gentlemen:

I would like to have the following statement entered into the Wilderness Hearings.

My name is William A. Diamond, I am co-owner of Sanderson River Expeditions, Incorporated, a commercial outfitter conducting raft trips through the Grand Canyon.

I am opposed to banning motors in the Grand Canyon for the following reasons:

We at Sandersons feel motors are imperative to a safe trip. It is a proven fact that the larger, motor-powered boats are more stable in the large rapids of the Grand Canyon than the small, oar-powered boats.

Larger, motor-powered boats allow us to take a large segment of the American public through the canyon. We are now able to take young people, physically handicapped, elderly, college groups, scout groups, etc. If motors are banned it will mean using smaller boats. This will increase the length of the trip, the cost of the trip and the danger of the trip. It will severely limit the type of persons who can take the trip. It will be the young-to-middle-age groups, the wealthy, the physically able persons who can afford the time and cost.

It is our strong feeling that this magnificent Grand Canyon experience should not be restricted to so many, but should be shared by as many of our country's citizens as is possible without damage to this unique wonder.

We also feel that the larger, motor-powered boats are the only practical method of ensuring proper care of the canyon. These boats are designed and able to carry out all trash and litter that would otherwise accumulate on the beaches. We can, and often do, gather up litter left by other not-so-conscious groups. The beaches are admittedly cleaner now than at any time in the past, due to motor boats removing all litter out of the canyon. This cannot always be said of oar-powered trips.

A-105

Our Headquarters Overlook the Beautiful, Breathtaking Colorado River Gorge

August 16, 1974

We realize that motors do not add to a wilderness experience but, at the same time, we do not believe they take away enough to compensate for the side effects that will be caused by their removal.

We feel that banning motors will in no way help solve the problems with sanitation or human impact. Rather, it will mean more small, oar-powered boats on the river adding to river congestion as well as causing fewer persons to spend more time in the canyon per trip. This will increase beach camp impact. I do not feel this is what any of us want.

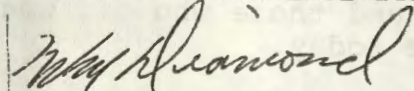
We contend that a person desiring a river trip through this great Grand Canyon should have his choice of the type of trip, length of trip, and means of power. All of these types of trips are available at this time. Our company conducts both types of trips in addition to several lengths of trips from which to choose and can see no need to place severe restrictions on the average citizen by banning motors in the Grand Canyon.

Surely there are more logical answers to any problems we may have in the canyon.

I respectfully submit this letter for inclusion in the Wilderness Hearings.

Sincerely,

SANDERSON RIVER EXPEDITIONS



William A. Diamond, Co-owner
WAD/pd



Grand Canyon National Park, Grand Canyon, Arizona 86023

Administrative Offices : Telephone (602) 638 - 2631

Reservations Office : Telephone (602) 638 - 2401

August 16, 1974

**Mr. Merle Stitt, Superintendent
Grand Canyon National Park Service
Grand Canyon, Arizona 86023**

Re: Proposed Master Plan

The Fred Harvey Company, since 1904 has strived to make visitation to the Grand Canyon a comfortable and enjoyable experience for the traveling public. When the National Park Service was created and joined Fred Harvey at the Grand Canyon, a partnership for Public Service was formed. This partnership still exists today. We, as a company, fully support the premise of satisfying the needs of both the park visitor and resident with the least amount of environmental impact now and for generations to come. We are providing necessary goods and services within the Park. Without these services, many people would hesitate to visit the park, and those who did would not be accomodated in the manner they are today.

The Master Plan refers to optimum visitor use and to re-designing the Park to handle more visitors with less impact on the environment. The limit set on overnight visitor accomodation is in direct conflict with optimum visitor use and handling more people. The Master Plan projects visitation doubled by 1980. How can expansion of overnight accomodation be ruled out when it is insufficient now and will be at least doubled by 1980? We submit that in the area projected in Phase III of the Master Plan for overnight accomodation, a facility could be built to meet the upcoming needs and demands of the public. We pledge that the facility will take less space and therefore have less impact on the environment than the present facilities spread all over the Park. We also pledge to build facilities aesthetically pleasing and harmoniously designed to blend with natural surroundings. Such a facility would indeed, as the Master Plan dictates, handle more people with less impact on the environment.



Grand Canyon National Park, Grand Canyon, Arizona 86023

Administrative Offices : Telephone (602) 638 - 2631

Reservations Office : Telephone (602) 638 - 2401

Merle Stitt

August 16, 1974

The Master Plan places all overnight accommodations off the rim in ten years (Phase III). In the Bright Angel area nothing would be more to our liking, in the Kachina and Thunderbird area, these would be wasteful and economically unfeasible. The Kachina and Thunderbird Lodges are our best buildings and have a minimum of twenty years life still in them. We would appreciate a stay of execution for the Thunderbird and Kachina Lodges.

The Master Plan indicates retaining the El Tovar as a 'Historical Exhibit'. The Fred Harvey Company intends a major refurbishing of the El Tovar. The refurbishing of the El Tovar includes not only cosmetics but a rebuilding of all mechanical systems. We will make the El Tovar the finest hotel in Arizona. The cost of refurbishing will be more than the cost of building a new hotel. We do not think that the value of the El Tovar lies in making it a museum, but in staying a fine hotel true to its tradition.

We at Fred Harvey hope you will give heavy consideration to our requests. We hope and request that as plans are finalized and we begin building, no services to guests are curtailed. We hope that the economic realities and visitor needs are weighed heavily. We pledge that if our requests are met and our needs considered, to give you our complete support and cooperation.

Sincerely,

**W.E. Maxwell
General Manager
Grand Canyon National Park Lodges**

WEM/sw

JENNINGS, STROUSS & SALMON

111 WEST MONROE
PHOENIX, ARIZONA 85003
TELEPHONE (602) 262-5911

CHARLES L. STROUSS (1891-1958)
RINEY B. SALMON (1902-1970)
IRVING A. JENNINGS (1896-1972)

J. A. RIGGINS, JR.
FRANK B. CAMPBELL, JR.
CHARLES L. STROUSS, JR.
EARL F. GLENN, JR.
CHARLES R. HOOVER
JOHN R. CHRISTIAN
ROBERT E. HURLEY
TIMOTHY W. BARTON
GARY G. KELTNER
LEE E. ESCH
JAY C. STUCKEY, JR.
W. MICHAEL FLOOD
I. DOUGLAS DUNIPACE
HAMILTON E. MERRAE III
M. BYRON LEWIS
STEPHEN A. MYERS
K. THOMAS FINKE
MICHAEL W. MULLANE
DAVID L. WHITE
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F. WILLIAM SHEPPARD
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RINEY B. SALMON II
CHARLES E. JONES
RICHARD L. LASSEN
T. PATRICK FLOOD
JON L. KYL
RONALD H. MOORE
GARY L. STUART
MICHAEL A. BEALE
LEO R. BEUS
PAUL E. GILBERT
ROGER T. MARTINDALE
ANTHONY J. PALUMBO
DAVID L. LANGE
JOHN D. HARRIS
JOHN B. WELDON, JR.

15 August 1974

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

Re: Proposed Tramway into the Grand Canyon -
Preliminary Draft of the Master Plan for
the Grand Canyon Complex

Dear Sir:

The undersigned represents, among others, Mr. Malcolm D. Taylor, who pursuant to your invitation, attended the public hearing on the above-referenced matter held in the Maricopa County Board of Supervisors Auditorium on July 13, 1974. At that hearing, we presented a basic conceptual idea for your consideration of a tramway or some type of an elevator system into the bottom of the Grand Canyon. At that hearing, it was suggested by the panel receiving comments on the master plan, that a written statement for consideration of this idea be directed to you. This letter constitutes our response to this request.

As you are aware, there is now no access into the floor area of the Grand Canyon except via a trail system, which is extremely time consuming and for most, requires a very strenuous hike. A review of the master plan and development concept of the Grand Canyon area and Grand Canyon Village indicates that no such tramway or additional access appears to be planned into this area of the Grand Canyon. The purpose of this written request is to outline in broad general terms the conceptual idea and advantages thereof to provide such a tramway or elevator system into the floor area of the Grand Canyon. It is not by any means intended, of course, to be a complete or full presentation of a plan, but merely to present for your consideration and comment this broad conceptual idea.

15 August 1974

After you have had an opportunity to examine the advantages of such a proposal, the undersigned will be more than pleased to pursue in substantial detail such a proposal and present it to you or the appropriate agencies for further consideration. However, the proposal at this stage is intended simply to provide the conceptual idea for your consideration and comment before further study and expense is undertaken by Mr. Taylor and others connected with him who are very interested in pursuing and developing such a project.

Necessity for Such a Tramway
System

As you are well aware, at present, the means of access to the floor area of the Grand Canyon is extremely limited and may only be accomplished after a very arduous and strenuous hike or riding on the back of a beast of burden to obtain access to the ground area. Such a trip is long, arduous and for most tourists, too burdensome to accomplish. In addition, the present means of access to the ground and floor area of the Grand Canyon for practical purposes precludes the majority of our citizenry over the age of 40. The ground floor area of the Grand Canyon presents a spectacular and awesome experience and provides some of the most breathtaking scenery in the entire Grand Canyon area. Although statistics are not available to us, it is submitted the portion of those visitors who visit the Grand Canyon as compared with those who actually take advantage of a trip to the Grand Canyon floor is minimal. The primary reason for this is due to the long, arduous hike and immensely time-consuming trip which is now necessitated due to the present lack of facilities in reaching the floor area of the Grand Canyon.

Although we are now in the process of attempting to gain more reliable statistics in this regard, our preliminary investigation reveals a great majority of people would prefer to not only view the Canyon from the top looking down, but wish to take full advantage of the Grand Canyon facilities and obtain access to the floor area, but are not inclined to seek access to the ground area due to the limited access facilities. In addition,

15 August 1974

the present access to the ground area consumes an immense amount of time which many of the visitors are not prepared to spend at the Grand Canyon. For example, many of the visitors simply wish to visit the Grand Canyon for one day or less, enroute to other points of interest in the scenic southwest. Therefore, due to the immense amount of time that is necessary in order to obtain access to the ground floor area, these visitors are being denied an opportunity to fully and completely experience the natural wonder of the Grand Canyon in its complete grandeur.

There has been much discussion lately involving the Havasupai Indians who are located on the floor of the Canyon. The existence of a tram and elevator concession would provide a means of transportation for the Indians and simultaneously provide the means of securing for them food, medical supplies and emergency transportation in and out of the Canyon. In addition to the Havasupai Indians located on the floor of the Canyon, such a tramway system would also provide the means for evacuating the people who frequent the area and need emergency evacuation, but who are unable to climb out of the Canyon of their own volition.

Based upon the statistics and information presented in your preliminary master plan concept, there is no question there is a great deal of interest on the part of the American Public, as well as people from other lands to visit the Grand Canyon and this growing interest will result in increased numbers of visitors to the Grand Canyon area. No doubt more and more of these visitors will want to go down into the floor area of the Canyon. It is apparent the extant facilities will not be able to handle the continued influx of people in the area and considerable damage and harm will result to the Canyon unless an alternative source of access to the Canyon floor is provided.

After checking with personnel at the Canyon, we are further informed numerous visitors in increasing numbers request a tramway or elevator system such as that proposed herein.

15 August 1974

It is apparent that at present, very few visitors are able to fully appreciate and feel the awesome significance of the Grand Canyon, due to the very limited accessibility to the Canyon floor area. A tramway ride into and out of the Canyon would substantially increase an appreciation for any visitor to the Grand Canyon area and would offer a most memorable experience. There is no question there is both a tremendous need and demand for this type of service facility and the present facilities are inadequate to meet the needs and demands for access to the floor area of the Canyon for the majority of the visitors who visit the Grand Canyon.

A tramway could be environmentally sound and in many respects, will substantially provide increased protection to the natural ecology of the Grand Canyon.

It is the intent of Mr. Taylor and those who are proposing this plan to insure the Grand Canyon is preserved as the natural wonder that it is. However, in recent years with the increased visitor use in the Grand Canyon, the continued increased hiking, camping, climbing, and crawling on the Canyon is presenting a substantial problem and providing an increasing challenge for the National Park Service to preserve the ecology of the area. A tramway system as proposed herein would provide an efficient access for the visitor to the floor area of the Canyon without the wear and tear due to increased climbing and hiking activity in the Canyon area. In addition, it would obviate the necessity of packing in large amounts of supplies for campers and others who must now, of necessity, spend more time in the floor area of the Canyon than would be necessary were a tramway system put into operation. In addition, removal of garbage, human waste and other refuse materials could be substantially eliminated by having such a tramway system providing access to the Canyon floor area.

The tramway system which we would propose could be, but need not be, modeled on the Guadalupe National Park Tramway. Modern technology allows for a self-propelled tram to travel tortuous route in such a manner that it can be completely disguised and engineered in such a way as to insure it will not damage the natural ecology and beauty of the Grand Canyon area. In addition, the tramway can be planned to be located in a place where it would not hinder any of the viewing of the Canyon from the top of the Canyon area. If basic approval for this plan is obtained, environmental impact studies, of course, can be prepared going into the details of such a tramway, which we are

15 August 1974

15 August 1974

confident will show such a tramway will not have a negative impact on the environment in the Canyon and may prove to be substantially beneficial to the ecology of the Canyon. In addition, the tramway could provide for a lecture on the Grand Canyon area explaining more about the Canyon itself for the visitor who rides on the tram. Such a geology lecture, pointing out the details of the Canyon and enabling a visitor to experience and observe on a first-hand basis the details and subject matter of the lecture, would substantially enhance a visitor's appreciation and understanding of the Grand Canyon area.

In short, a tramway would not need to mar the natural ecology and scenic wonder of the Grand Canyon, as modern technology could insure the ecology of the area would be preserved. Additionally, such a tramway, while providing a more significant experience for the visitors at the Grand Canyon, could also do much to further preserve and protect the existing ecology and environment in the Canyon area.

THE TRAMWAY SERVICE COULD BE PROVIDED AT
A COST WHICH THE AVERAGE VISITOR COULD AFFORD

As mentioned heretofore, the present facilities which service the floor area of the Grand Canyon are very limited and often involve touring the Canyon on a beast of burden. The majority of the visitors which come to the Grand Canyon area probably do not have the time nor the physical capacity and stamina to hike in and out of the Grand Canyon floor area, and/or securing the services of a guide of the area. For the average American family, as well as many other foreign visitors to the Canyon area, this presents a substantial budgetary impediment to fully experiencing the Canyon. A tram or railway system in and out of the Canyon would provide a cheap and effecient way of providing access to the floor area of the Grand Canyon.

SUMMARY

In summation, then, it is clear that at present, despite the fact that the floor area of the Grand Canyon provides one of the most significant experiences in truly appreciating the grandeur of this natural wonder, very few

15 August 1974

people can take advantage of this experience. The present facilities are time consuming and totally inadequate to satisfy the needs and demand for access to the floor area. In addition, in order to obtain access to the floor area of the Canyon, a significant commitment of time is now necessitated which is often in excess of what many of the visitors to the Canyon are prepared or willing to spend. Thus, despite the great demand for access to the floor area of the Grand Canyon, very few people at present are given a meaningful opportunity to experience the floor area of the Canyon.

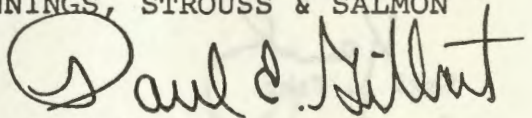
A tramway into the area provides an efficient, economic and viable solution to this problem. Such a tramway could be designed in such a way that it could fit into the natural ecology of the area and avoid blocking any view of the Canyon from those who are viewing the area from the Canyon rim. In addition, a tramway could also substantially preserve and protect the natural ecology of the area.

This proposal is, as you can appreciate at this point, a broad conceptual one. Accordingly, we are most anxious to receive some feed-back and additional response from the Parks Department. Assuming that a favorable response can be obtained from the Parks Department, my client and his associates are fully prepared to expend substantial additional monies to prepare more detailed studies concerning the plan as described above. Your prompt consideration and attention to this matter is sincerely appreciated.

Very truly yours,

JENNINGS, STROUSS & SALMON

By



Paul E. Gilbert

PEG/cjr

SCENIC AIRLINES, INC.
MCCARRAN INTERNATIONAL AIRPORT
P. O. BOX 11227
LAS VEGAS, NEVADA 89111

(702) 736-4041

KARL A. FAHR
VICE PRESIDENT
MARKETING

KAF:1104
July 25, 1974

Mr. Merle Stitt
Director
National Park Service
Grand Canyon National Park
P. O. Box 129
Grand Canyon, Arizona 86023

Dear Merle:

In response to your letter of June 7, and the invitation to contribute to the master plan for Grand Canyon. I would submit the enclosed folder which are comments made by aerial visitors to the Canyon.

Obviously there are many ways to experience the Canyon, but due to its size and relative remoteness, many visitors can only begin to understand the message Grand Canyon has for everyone. Those that are not as fortunate to be able to spend several days are usually content with an aerial visit.

We would like to submit the comments of these people so that they as a group can also be heard, their experiences taken into consideration for the master plan.

Sincerely yours,


Karl A. Fahr

KAF:sfw

Encl.

SERVICES, INC.

RECEIVED

MONZA, 25 October 1973

AIR MAIL

NOV 7 1973

TO THE PRESIDENT
SCENIC AIRLINES
P.O. BOX5368
LAS VEGAS, NEVADA 89102

Dear Sir.

In the last month of August I have been in U.S.A. for a tourist trip with my wife and two other friends.

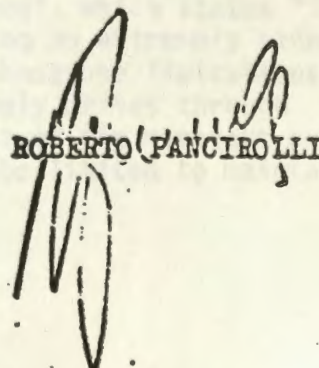
I visited San Francisco and Los Angeles, two wonderful towns, but the trip that I will not forget for the next part of my life has been the excursion in the Gran Canyon with your airlines.

I thank you very much your company to have had the possibility to see so near that wonderful natural picture of nature that is Gran Canyon.

I hope in the future to effect another excursion with us.

Many kind regard.

yours truly


ROBERTO PANCIOLOTTI

A-116

October 25, 1952

RECEIVED

AIR MAIL

Letters similar to the Robert Pancirolli letter from the following:

Sam Bloom
 Chris Santhouse
 Hiromichi Onizuka
 Barbara Poteat
 Ann Marie Rizzo
 Alice N. Gates
 Mr. & Mrs. M. Nowaczy
 Charles Scheffler
 Bob and Cathy Wendt
 Dr. & Mrs. Taft Antonio
 Fritz J. Richter
 Walter Wehrli
 Kathy Kolb
 Ed Gigliotti

Ken Keech
 Graham Booker
 Tatsuhiko Sato
 William J. Cors
 Fred L. Hartman
 Betty Thompson
 Juliette Gates Hubbard
 Michael F. X. Gigliotti
 Kay Moore
 J. P. Richardson
 William S. Chairsell
 Gregory L. Gornrley
 Sara Pacher
 Saul Seinfeld

Dear Sir:

In the last month of August I have been in U.S.A. for a tourist
 trip with my wife and two other friends. We have had a
 very pleasant trip and I would like to thank you for the
 information you have given me regarding the possibilities
 of a trip to the West Coast. I will be glad to see you
 in the future to effect another excursion with us.

Very kind regards.

Yours truly,

 ROBERTO PANCIROLI



SERVICES, INC.

PARKS DIVISION • P. O. BOX 400 • CEDAR
Zion, Bryce, Grand Canyon (North Rim) National Parks

September 19, 1974

Mr. M. E. Stitt
Superintendent
Grand Canyon National Park
Grand Canyon, Arizona 86023

Subject: Comments concerning the Master Plan Environmental Statement and
Development Concept Plan.

Dear Merle:

It is obvious that many hours of research, study and planning have gone into preparation of the preliminary draft of the Grand Canyon Complex "Master Plan". It would therefore be presumptive of me to express other than general opinions regarding the Plan in areas not directly related to visitor services.

While it is noted this Master Plan provides for a definite expansion of additional campsites, not to exceed one hundred, it does not provide for the definite addition of lodging facilities. However, paragraph four on page twenty two of the Plan does provide, "any expansion of the number of lodging units will be done through a more efficient utilization of land already affected by developments, with no significant loss of natural or traditional values". To meet the public demand and to provide a sound financial base we should have a total of approximately 400 rentable units which can be achieved and at the same time comply with this objective.

The Development Concept Plan deals primarily with Grand Canyon Village. My comments concerning this particular document will be included in general comments at the end of this letter.

It appears there are considerably fewer limitations imposed upon the South Rim as compared to the North Rim. A very good example of this is the last paragraph on page twelve of the "Draft Environmental Statement" of the "Proposed Master Plan - Grand Canyon Complex Arizona", which states "in contrast to the South Rim objective of accommodating an extremely high level of visitation, the North Rim objective will be to base use limitations primarily on esthetic judgment. The quiet, leisurely drives through the forest of the North Rim are considered a vital part of the visitors experience. Travel along these roads will, therefore, have to be limited to maintain the quiet atmosphere.

Mr. M. E. Stitt
September 19, 1974
Page 2

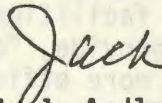
Page one hundred one, last paragraph, implies the construction projects will attempt to retain the traditional aspects of rustic cabin camping. Either I do not understand the statement or confusion exists as it is my understanding that any new lodging is to be modular type rather than new cabins. I would appreciate clarification of this particular item.

I wholeheartedly disagree with paragraph three, page one hundred eleven which states: Assuming that an effective means of encouraging visitation to the North Rim were devised and that increased visitation warranted expanded services and support facilities, the resultant developments would totally change the character of the North Rim. Its value as an outstanding scenic resource, with opportunities for both relaxed viewing and the more primitive backcountry experience, would be lost. I believe this is absolutely not true and that both visitation and facilities can be greatly increased without spoiling a thing, provided it is done properly.

I certainly agree that the increased campground sites are badly needed and it is wise to include them in this plan. I also agree that the information center at Jacob Lake would be beneficial.

I would be happy to discuss this with you in greater detail if you so desire.

Sincerely,



J. J. Audley
General Manager

cc: J.J. Dillon
C.T. Mace

JJA:gj

STATEMENT ON GRAND CANYON NATIONAL PARK MASTER PLAN

July 15, 1974, Flagstaff, Arizona

My name is William J. Breed and I am a resident of Coconino County. I am presently employed as Curator of Geology at the Museum of Northern Arizona in Flagstaff.

I would like to speak this evening as the President of the Arizona Academy of Science, *an organization of 800 scientists in the state*

Basically I would like to congratulate the Park Service for an excellent plan. One that I think most of us can live with.

I would like to see more interpretation of the Grand Canyon's natural features presented to the tourists. I feel that more people are coming to the Canyon, but they are learning less.

I would particularly like to congratulate the Park Service on their use of commercial transport to West Rim. This is a step in the right direction in excluding the hustle and bustle of private auto travel from the Park. Would also like to congratulate the Park Service in excluding mechanical access below the rim to management and emergency users.

The Grand Canyon is unique and is invaluable to scientists the world over. Because of its scientific as well as scenic importance the Canyon should be kept in as near a natural condition as feasible. To protect the Canyon then it is important that its physical boundaries coincide with its natural boundaries. I would like to see the entire Canyon from Lees Ferry to the bottom of Grand Wash Cliffs (Mile 278) included in the Park.

In particular I

Would also like to see the Shivwits Plateau, as well as all of Andrus, Parashant and Whitmore Wash and a larger segment of Kanab Creek added to the Park.

Would also like to call to the attention of the Hearing Board a resolution passed by the Academy of Science on April 19, 1974 at a meeting in Flagstaff:

Whereas the Colorado River from Glen Canyon Dam to the head of Lake Mead is the only remaining segment of a once extensive wild river and

Whereas this segment contains the sole remaining semblance to a natural ecosystem in the entire Lower Colorado River and is of great scientific and wilderness value:

Be it hereby resolved that the Arizona Academy of Science is in favor of keeping this section of the Colorado River free from dams and other man-made structures and in as nearly a natural condition as possible.



GILBERT ASSOCIATES, INC.

ENGINEERS AND CONSULTANTS

P.O. BOX 1498 / READING, PA. 19603

July 9, 1974

Superintendent
Grand Canyon National Park
Post Office Box 129
Grand Canyon, Arizona 86023

Dear Sir:

This is a comment for the record on the draft environmental statement regarding the proposed master plan for the Grand Canyon Complex, Arizona, and on the preliminary draft of the plan itself.

I write as a practicing, professional ecologist with a background of employment in both theoretical and applied research on resource use, emphasizing wildlife management. Beyond that, I have had experience in boating on the Colorado for over twenty years, and have conducted research in desert ecology for almost as long.

One cannot pretend pleasure at the limitation of his options, and it is especially distasteful to envision changes which will deny them entirely to his children. But in the face of change almost always for the worse, I feel that the proposal of the National Park Service for consolidating Grand Canyon National Park with Grand Canyon National Monument and Marble Canyon National Monument will on balance be for the better.

Among the most important provisions of the proposed plan is the repeal of the authorization for "reclamation" use of areas within the park. It is clear from the history of litigation over riparian rights in our West that only such a strong provision as is envisioned will serve adequately to protect the remnants of the Colorado system for generations yet to come.

I am wryly gratified to note the belated decision (p. 6) to manage the Inner Canyon "insofar as it is possible, to minimize the ecological changes caused by . . . Glen Canyon Dam." It was the manifest unwisdom of that bureaucratic boondoggle which caused a (perhaps quixotic) few to mobilize our wholly inadequate resources against the dam in 1955-1958. Perhaps the most important single accomplishment of enacting the Grand Canyon Complex plan should be to protect what little remains of the river from such avaricious and unthinking ruin as resulted from the battle of the Upper and Lower Basins in the 1950's.

The technical listings of species of plants and animals occurring in the area to be affected might be held up as examples of how limited biological information can still be assembled in a meaningful way. The principal suggestion I might offer would be to summarize plant associations along the acknowledged continuum of plant communities in somewhat less spurious detail than is implied by using a unit of 0.01 acre.



GILBERT ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

Superintendent
Grand Canyon National Park
July 9, 1974

The section (p. 66) on "Rare or endangered species" appears to be in error in that (i) it omits the prairie falcon (Falco mexicanus) which is listed both on p. 68 of the report and on p. 126 of the "Redbook"; and that (ii) it includes without identifying them as "status-undetermined" species the following, which are listed on pages 70 and 203 of the "Redbook":

- | | |
|---------------------|---|
| American Osprey | <u>Pandion haliaetus carolinensis</u> |
| Ferruginous Hawk | <u>Buteo regalis</u> |
| Prairie Pigeon Hawk | <u>Falco columbarius [richardsonii]</u> |
| Humpback Sucker | <u>Xyrauchen texanus</u> |

In summary, I can find no substantive basis for cavil against the proposed master plan; I urge that it be accepted without change.

Sincerely yours,

JON GHISELIN, Ph.D.
Terrestrial Ecologist

JG:cac

Statement by Jeffrey Ingram on the Master Plan, Grand Canyon Village Development Concept Plan, and their Environmental Impact Statements, of Grand Canyon National Park.

277 miles

As we consider planning for the Grand Canyon, I hope it is not amiss to mention that there is no way in which such planning can be complete. Even should a good National Park expansion bill be passed, large, important parts of the Canyon, from the river up onto the Canyon's plateaus, would remain in other ownership. Perhaps real cooperation is hopeless; certainly two of the Indian tribes have advisers who seem determined to keep anti-Park hysteria high. Let us not forget, however, that important parts of the Canyon south of the Colorado & west of the National Park are today adrift, cut loose from any joint planning process with the Park for the Canyon's sake. Let us hope that the future will see a human cooperation that accords with the topographic unity.

The Navajo Nation has already taken steps toward recognition of the Canyon with its Marble Canyon & Little Colorado Tribal Parks. I urge the present administration of the National Park to do all in its power to work with the Navajo toward proper presentation & protection of the Canyon, commensurate with the needs of the Navajo residents and other development needs. This is an item on which action will bring great rewards.

We might hope that an enlarged National Park will be established soon, though it might be accompanied by a tragedy for the Canyon & the Park System from which it will not recover. Nevertheless, it is clear that the Master Plan presented here must remain tentative because of legislative uncertainties. Even if a bill for expansion is not passed, it is not clear to me why joint planning with Lake Mead National Recreation Area personnel is not a top priority for the National Park.

I would urge that the Park administration think in terms of impact zones, areas that impinge on the Park &/or Canyon, but are administered by others. I have mentioned the three tribes and Lake Mead, but in addition there are several areas administered by the Forest Service and the Bureau of Land Management. Both of these agencies have already made public their ideas for certain of these impact zones, and they deserve to be commended. As with the Navajo Tribal Parks, I would urge the Park administration to be forward in working for proper Canyon protection & interpretation, commensurate with the other uses mandates for these lands.

The Park Service already recognizes cooperation as a desirable goal; I am urging that insofar as the Navajo, BLM, & Forest Service are concerned, that that goal be an urgent priority.

Testimony has been taken on Wildenress designation, both for the Park & Monuments, and the Recreation Area, and for some Forest areas as well. An integrated proposal may be possible, but awaits Congressional action. Nevertheless, it can be urged now that the Park Service get itself back on the track

Plan statement

as far as the Colorado River is concerned. I cannot believe that after all the public testimony over the past few years, the massive petitions, the decisions by the Park Service itself, that Wilderness status for the River, the very heart of the wild Grand Canyon, is threatened by the transient interests of a few corporate motor-boaters. The present interest of the concessionaires who use motors collides squarely with the ideals of the National Park. They are a temporal oddity, arising to their present level due to neglect by a previous Park administration, and deserve only that they be phased out as they phased in: quickly. Let us enter this nation's third century without the smirch of motors in the Grand Canyon. The action of keeping motors out, of banning them after 1976 is entirely up to the Park Service, regardless of whether there is Congressional action on Wilderness. There are contracts to be renewed; conditions to be set down. Let the abolition of motors be not just a goal, but a proudly-stated, and loudly supported goal.

The Park Service should, I feel, be pretty pleased with its new Master Plan. I have only a few specific points. One is that aside from the particular plans for the Grand Canyon Village, overnight accommodations are a regional situation, as is made clear by the developments at Tusayan, the Apex siding plan, the roadside parking during the peak season along state road 64, and strips along US 89 & I-40. With so many other problems pressing as mentioned above, I would hate to see the Park Service wrapped up in the problems to directing how these non-Park areas look. I would like the approach to the Park to be non-trashy, but if the residents & owners in Tusayan and the junction of 64 & 180 don't care, then I would urge the Park to be concerned with its own looks. Of course, all resistance should be made to providing the anti-Park developments at Tusayan with such services as allow them to expand. The best way to handle Tusayan would be a slight realignment of the highway to the east so that those who prefer ticky-tack can go to Tusayan, while those preferring the natural approach can go through the National Forest to the Park. I would urge this as a long-range solution.

At this point, I would like to note that though I do not mention the many favorable points of these documents, I am generally pleased. The North Rim, Toroweap, wildfire management, the backcountry plans, are examples of the good ideas put forth in the plans.

I would like to agree with the remarks on the tramway (pp 111-2 of the Master Plan EIS), mules (112-3), and by-pass road (p. 116). It is good to know of the opposition to the proposals for dams. The recognition of the noise problem, particularly as it is created by airplanes, is very welcome. The effort to regulate this menace deserves all our support; an effort that would be more realistic if the presently pending legislation passes.

STATEMENT OF STEPHEN C. JETT, ASSOCIATE PROFESSOR OF GEOGRAPHY,
ON MASTER PLAN PROPOSALS FOR GRAND CANYON NATIONAL PARK

I am Stephen C. Jett, Associate Professor of Geography, University of California, Davis. I am submitting this statement as an individual. I have published on tourism and scenic resources of the region,¹ and on the archeology of Grand Canyon.² I have visited the Grand Canyon many times, not only on the developed rims, but also at isolated points on the Navajo and Hualapai Reservations. I have run the river through the canyon, have traveled the Bright Angel and Havasu trails, and have twice backpacked in the Kanab Canyon system, where I collected plant specimens, including species which had not previously been collected in the Canyon.³ I have testified, in behalf of the Navajo Tribe, before House and Senate subcommittees considering proposed Reclamation projects for the Grand Canyon.⁴ I was an invited participant

¹Tourism in the Navajo Country: Resources and Planning (Navajo Tribal Museum, 184 pp. and map, 1967); Navajo Wild-lands (Sierra Club, 172 pp., photographs by Philip Hyde, 1967); etc.

²Grand Canyon Dams, Split-Twig Figurines, and "Hit-and-Run" Archaeology. American Antiquity, 33: 3 (1968), pp. 341-351; etc.

³Biogeographical Notes on the Kanab Canyon System, Mohave and Coconino Counties, Arizona. Plateau, 45: 1 (1972), pp. 1-16.

⁴House hearings: Lower Colorado River Basin Project, 1966, pp. 1581-1587; Colorado River Basin Project, 1967, pp. 490-516; Senate: Central Arizona Project, 1967, pp. 707-709.

in the Arizona Academy of Science conference on research needs in Grand Canyon National Park. This statement is based on the summary of the Park Master Plan published in the folder Grand Canyon Complex: Master Plan Preliminary Draft.

ADMINISTRATIVE AND BOUNDARY CHANGES

All of the Park Service proposed additions merit inclusion in an enlarged Park, but large and important areas are omitted in the draft Master Plan. Ideally, all parts of the Grand Canyon and its tributaries, defined by the rim of Kaibab Limestone, from Lees Ferry to the Grand Wash Cliffs, should be within an expanded and unified National Park, with the exception of Indian Reservation land (unless voluntarily donated or sold by the Tribes). In addition, substantial areas back of all rims should be included to protect the setting of the Canyon, as should the portion of Glen Canyon below Glen Canyon Dam as well as Paria Canyon. Scenic easements and cooperative management agreements should be obtained by the Park Service from the Indian tribes whose lands include portions of the Canyon, but no Tribal land should be condemned. Particularly important areas to be added to the Park, as wilderness, but not mentioned in the draft Plan, are the canyon areas south of the river between the Hualapai Reservation and the present Park, and the north-side rim

peninsulas in L.M.N.R.A. Other areas not now under Park Service jurisdiction that should be are north of Boundary Ridge and in the Pine Mountains. No Bureau of Reclamation exclusions should be made, nor any deletions of lands presently under Park Service administration (as behind the Marble Canyon rim). No land should be transferred to the Havasupai Tribe, although hunting and gathering on Park lands, using traditional techniques only, should be permitted to Tribe members. Acquisition of private and state inholdings should have top priority, over any development.

ROADS AND FACILITIES

No new roads should ever be constructed anywhere below the Kaibab Limestone rims. Very few new roads, or "upgrading" of existing roads should be undertaken elsewhere. The only potentially desirable major area of further rim viewpoint and interpretation development appears to be the vicinity of Chemehuevi and Havasupai Points. The ecological effects of fire-supression should be corrected; when this is accomplished, most management roads should be allowed to revert to a natural state. No new overnight, eating, or sales facilities other than primitive campgrounds should be built in Park areas; all such development should be outside the park, in cooperation with other agencies and coordinated by the Bureau of Outdoor Recreation,

and many existing in-Park facilities of these types should be eventually phased out.

Use of motors on the Colorado River should be phased out in the near future.

OTHER CONSIDERATIONS

With the qualifications enumerated above, the Park Service's Master Plan proposal is highly commendable. Particularly praiseworthy are the proposals to restore ecosystems to their natural functioning, to suppress burro populations, to limit visitation on the North Rim, to develop mass transport on the South Rim, to control strictly aircraft activity within the canyon, and to limit the number of river users. In addition, every effort should be made to restore natural predators such as mountain lions and wolves to their former position in the ecosystem.

P. O. Box 685
Grand Canyon, AZ 86023

August 3, 1974

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

Dear Sir:

Please include this letter as a part of the public hearing records concerning the South Rim Development Concept Plan, the Master Plan, Grand Canyon Complex, and the environmental statements for each.

I have heard of attempts to assign dollar values to something called the "park experience" or "wilderness experience". This idea apparently began as a means of rallying forces to balance the commercial interests which posed a threat to the national parks with the argument that they were "not producing anything." As most people would agree, the parks do produce something worthwhile. In fact, the product so transcends commercial matters that to some it is absurd or even profane to refer to it in the same breath with dollars. The idea, however, has always appealed to me as a practical method for justifying the preservation of natural landscapes.

Assigning a dollar value to the "park experience" is just a small step removed from assigning a dollar value to the landscape itself.

Land values, in terms of dollars, are predictable: the higher the population density, the higher the land value. A small piece of land in the downtown section of a large city may be worth a fortune. Conversely, a large piece of non-agricultural land in a sparsely populated area is nearly worthless.

Or is it? A new system of land values is emerging: certain sparsely populated areas are valued quite highly

by millions of Americans. Some economically worthless areas are considered by many to be "priceless" -- in other words, such places should be preserved as they are and never considered for any kind of development. National parks were established on this premise. The NPS employs many people who are dedicated to preserving natural landscapes.

In many ways we have done a commendable job. But there is room for improvement, and as conditions change, our methods must change.

The problem in managing land that is "priceless" is that we have no frame of reference. Thus, too often we treat our park land as if it were the exact opposite: worthless. In theory, "priceless" and "worthless" are an infinity apart, but in daily practice they may become one and the same.

I favor an attempt to place dollar values on the "real estate" managed by the National Park Service. Such an attempt, whether successful or not, might at least delineate between priceless and worthless.

I feel that I am in a unique position, having served at Grand Canyon as park engineer for a few years, to be aware of the amount of land that is covered by man-made developments, and of the rate at which development progresses. If the South Rim land is worthless, then we have not erred. But if it is truly priceless, then we have committed an atrocity in allowing the development of the village. I suspect that the pinyon-juniper forest, in the eyes of most people, would fall somewhere between the two extremes.

Just how valuable is this forest? We have acted thus far without even posing the question. I hope that our future actions will be based on some attempt to answer it.

Now I would like to make a proposal based on the assumption that the South Rim land is considered to have a rather high value. When land is high-priced, a lot of thought goes into using it in the most efficient way. In a large city, development proceeds vertically -- it becomes economically feasible because the land available is scarce and therefore valuable. Result: high-rise buildings.

It is time we considered the advantages and disadvantages of high-rise structures in the national parks. My lists are by no means complete, but I hope they will stimulate some serious study of the matter.

Disadvantages:

1. High cost. It is obvious that high rise buildings cost more, but how much more? We need to know the value of our land before a meaningful analysis can be made!
2. Visual impact of buildings protruding above the trees. This is entirely subjective. See No. 2 below.
3. "Urban" environment within the building. This would need some study. A tall building in a national park would probably have windows, however, and one could have a nice view of some virgin forest instead of many more buildings and streets.

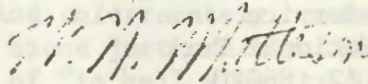
Advantages:

1. Preservation of highly valued "real estate." Three-storey buildings would use less than one-third the land area. Why? Because roads and utility lines would be shorter.
2. Visual impact -- no suburban sprawl. Anyone who has seen Grand Canyon Village from the air knows that there is a visual impact from the man-made developments. Not all of them are attractive!
3. Energy conservation. A large building uses far less fuel than many small ones because it presents less surface area to the outside for each unit of floor space. It would also save fuel by cutting travel.
4. Less pollution. Waste products can be more efficiently collected, handled, and treated when they are generated in one small area. There would be less air pollution because of the reduced energy consumption.
5. Manpower conservation. Maintaining a few large buildings would be more efficient than maintaining many small ones.
6. Service to park visitors. Has anyone tried to estimate the amount of time the average visitor wastes in going from one service to another? Or the amount of time he spends being lost or confused? Or the magnitude of his loss of enjoyment of the park because of that confusion? One large visitor services building could serve all his needs within an easy walk or elevator ride.

I hope that my suggestions will be seen as practical topics worthy of further study. To summarize: First, we should find a way to assign definite values to any park lands for which development is contemplated. Second, we should use the land as efficiently as possible, consistent with its value. High-rise buildings would be the natural choice in highly valued areas, and no developments at all would be the natural choice in "priceless" areas.

In the 1870's, only a few people had vision enough to see a need for preserving wild lands. Fortunately, they were determined and courageous. In those days, for example, it seemed ridiculous to set aside large tracts of wilderness -- there was plenty of it in the west. But now it is rare to find a game preserve large enough to contain the hunting circuit of a mountain lion. Will there be enough pinyon-juniper forest left, 100 years hence, to support a few deer and coyotes? In 2074, will we be remembered as run-of-the-mill developers reacting to current pressures, or as far-sighted stewards who could see the true value of this precious heritage?

Respectfully,



William N. Matteson



Northern Arizona University · FLAGSTAFF, ARIZONA 86001

SCHOOL OF FORESTRY
BOX 4098

OFFICE OF THE DEAN
(602) 523-3031

June 14, 1974

Mr. Bruce W. Shaw
U.S. Dept. of the Interior
National Park Service
Grand Canyon National Park
Grand Canyon, AZ 86023

Dear Mr. Shaw:

We appreciate receiving the Master plan and additional materials regarding Grand Canyon. These will be circulated to those of the forestry faculty available this summer for their possible comments. In addition the materials will be very useful for student studies of natural resource policy development.

I'll try to comment on a few aspects of the plan that are of personal concern:

1. I feel that the analyses and detail are outstanding and that the NPS deserves real commendation for these publications. I'm very impressed with the "Objectives of Management" and how well the proposals point to these objectives.
2. With regard to specific proposals, I'm pleased with the proposed uses of fire. Our experiences locally on our School Forest over the past 16 years, plus 15 years experience in the southern pine region have made me a firm believer in the use of fire in pine ecosystems. We've indicated before a fair amount of expertise within the School of Forestry (3 faculty with over 70 combined years of experience with fire) and are available for any assistance.

I do have one question with regard to the fire problem, and that is maintenance of adequate protection of neighboring landowners. The Saddle Burn of some years back should not be permitted to occur again! Mention of closing fire roads and taking action only when a threat leave me very dubious. The BIA foresters on the Apache Reservation (also Hualapai) have an excellent record in use of prescribed fire, but not at the expense of their neighbors!

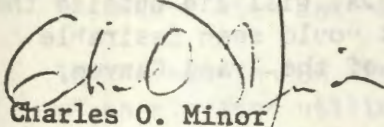
Mr. Bruce W. Shaw

June 14, 1974

3. My overriding concern centers on two areas only, the treatment of the Havasupai and Hualapai tribes. Over and over I find ambiguous statements of studying situations, assisting the local tribes, possible transfers of land, etc. Regardless of the selfish attitude of the Sierra Club and other conservationists (?), this land was not a national park first and an Indian possession second! While it would be a horrible desecration, I'd rather see the tribes building an amusement park on the rim of the canyon than to continue our roughshod treatments of the past 300 years. And unfortunately, paragraph after paragraph of this report sound just exactly like the usual arrogant, Anglo attitude of "to hell with the Indians," we know what is best and we're going to preserve it at all cost!" In spite of 33 years in natural resource management, I don't feel that omnipo~~tent~~ about trying to preserve anything to the detriment of a whole people who were there first!

Thanks again for this opportunity to comment.

Very truly yours,



Charles O. Minor
Dean

COM:lg

P. O. Box 182
Petrified Forest, Ariz. 86024
July 29, 1974

Bruce W. Shaw, Acting Superintendent
Grand Canyon National Park
Grand Canyon, Arizona 86023

Dear Mr. Shaw

Thank-you for allowing me to review the proposed Master Plan for Grand Canyon and the Development Concept for Grand Canyon Village.

Master Plan

I am generally in favor of the developments (or lack thereof) proposed in the Master Plan, especially the inclusion of the entire Grand Canyon within the National Park. That portion of the canyon south of the Colorado River and contained within the Hualapai Indian Reservation and Lake Mead N.R.A. is slated for no change of administration. Since the lands must be jointly administered at present, I would be in favor of transferring that section of Lake Mead N.R.A. to Grand Canyon N.P., which would then assume the joint administration with the Hualapai. It also appears that portions of Lake Mead N.R.A. will lie outside the proposed park to the north. In these areas it would seem desirable to extend the park boundaries to the upper rim of the Grand Canyon, rather than the inner rim as proposed.

The slight expansion of facilities at Desert View is needed. With the introduction of the campground reservation system many campers who were unaware of the lack of unreserved campsites at Mather Campground have been directed to the Desert View Campground. This greater utilization of the Desert View Campground requires an expansion of facilities in that area. However, a lack of water or space in the Park may necessitate developments in the Kaibab National Forest to the south.

Retention of the primitive area to the west of Hermit's Rest as outlined seems entirely satisfactory.

Expansion of North Rim developments should be held to a minimum, as outlined in the Master Plan. However, due to the inavailability of unreserved campsites within the Park, arrangements with the Kaibab National Forest should be made to provide these services close to the north boundary of the Park.

Upon reviewing the map of Grand Canyon National Monument, the number of roads to be eliminated is much too small. To retain the wilderness character of the western portion of the canyon, many, if not most, of these management roads should be abandoned on the North Rim. I am

referring specifically to those roads in the Tuckup Point and Jensen Tank areas. One main road with short spurs would seem to be much more acceptable to the mesh of roads proposed for retention.

The preservation of environmental areas for use as ESA's should be expanded from the present two sites. At least one site along the Colorado River, one on the Tonto Platform, and one on the North Rim should be established. It may prove useful to involve the IBP (International Biological Project) with these sites, as has been done in Rocky Mountain National Park.

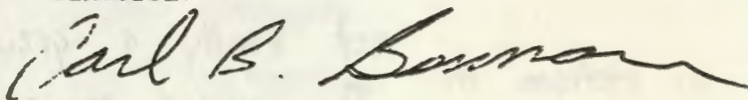
Regional Information Centers are a must for the Grand Canyon. Signs along major access roads (US 89, 180 and Arizona 64, 67) showing the availability of accommodations in and in the immediate vicinity of the Park would be of great assistance to potential Park visitors. From my own experience at Petrified Forest National Park it appears that surrounding National Park areas (Petrified Forest, Sunset Crater, Glen Canyon, Walnut Canyon and Montezuma Castle especially, due to their location near Interstate Highways) should be provided with detailed information concerning facilities in the park, so that they may pass this information on to visitors en route to the Grand Canyon.

The East Rim Drive should have some form of mass transit. Although it is used as an east-west highway, many visitors establish a "base" at Grand Canyon Village and return there at night. A mass transit system out the East Rim would eliminate many of these visitors car trips to Desert View and back.

In the section on alternatives to the proposed action, mention was made of an elevator utilizing the Little Orphan Mine shaft. In my opinion, this form of service is unneeded and would cause innumerable administrative headaches. The elevator could not accommodate all visitors wishing to visit the inner canyon easily. In addition, mechanized access to the inner canyon in any form would undermine the wilderness character of the inner canyon, not only by increased visitation, but merely the fact that access is by "the flip of a switch".

The establishment of a parallel road back from the east Rim Drive should be unnecessary. If visitation rose so high as to make the road "undrivable", mass transit should be inaugurated. The loop around the San Francisco Peaks may hold promise, but its construction is not within the administrative sphere of Grand Canyon National Park.

Sincerely



Carl B. Bowman

15 Aug

Dear sirs -

I attended a hearing in Kanab last month regarding the "Master Plan" for the Grand Canyon. At this meeting we were told that we could write our opinions & mail them to the South Rim & they would be included in the final minutes. I'm probably overdue, but I still feel that the "people in charge" ought to know how I, a citizen, feel regarding my park.

I'm a river guide on the Colorado & although I'm presently unemployed, I'm still very concerned about the status of the canyons. I'm sure that you gentlemen feel as strongly as I do about the need to protect the "wilderness" aspect about the Park. The beauty in the Grand Canyon comes from its appeal to the "inner self." It's not really a group place, deserts never are. The inner canyon ought to remain a wilderness as it has for the last 12 million

years. Access to the park is now only accomplished in 3 ways; plane, car & river boat. All 3 are motorized (for the most part) tours. The rim should be accessible to cars, buses & the like, just as they now are. & the planes should stay (although they should also be regulated) but the river should be declared wilderness & left to oars.

The Colorado River can hold its head up high with the mightiest rivers in the world. It is unique on the face of our earth. Because it is so remote & so inaccessible, it has basically remained untampered with & remains in its original condition, much like it was when Powell brought his men thru. Let's keep it that way & not lose something that we can't replace. (We've already lost Glen Canyon to the almighty dollar; let's be smart & not make that same mistake with something as important as the Grand Canyon.

My main objection to motors in the canyon (besides the obnoxious noise)

is that motors allow more people to "flood" the canyon at one time. During the peak months of the season there are literally hundreds of people to be found at such places as the Little Colorado & Elves Chasm, not to mention Havasu Creek. Obviously, just the fact that an area as delicate as the desert has to support this load scares me as to its overall effect on the canyon itself (ecosystem) & the passengers enjoyment. One doesn't take a river trip to get stuck in the crowd at Lava Falls! Cars would alleviate this strain. Granted, not as many persons per year could run commercially - so what?

The people who do run are going to have a "wilderness" experience that might influence their lives. I'm concerned with quality not quantity. Look at Yosemite, Yellowstone & the Tetons!

The safety factor has been introduced into the argument. This ones simple The boat is only as safe as its boatman.

Qualified boatmen run both types of trips. I've run both types of trips & personally I prefer oars as the spinning propeller scares me; "What if someone fell out in a rapid & was chewed by the Prop?" Oar-powered boats are by far the most conservatively run boats because there is an intimate relationship between the current, boat & boatman, hence, less likely hood of "unforseeable" errors in judgement. Dories running crystal did not look unsafe, Tour West running "the hole" did.

I say leave Nature to her own. She's done it for years without us, she can do it now. Let's be wise - if we declare the river to be a wilderness area, what have we got to lose. Nothing. If we don't?

Sincerely,
Tom Clawson

436 Chatham Park Drive, #1B
Pittsburgh, PA 15220
July 27, 1974

Office of the Superintendent
Grand Canyon National Park
P. O. Box 129
Grand Canyon, Arizona 86023

Dear Sir:

We are writing this letter to inform you that we are strongly opposed to the building of a dam at Bridge Canyon. We are Arizona residents and feel we have a big stake in the future well-being of our beautiful natural areas.

We sincerely hope that you share our opinion in this matter.

Very truly yours,

Steven L. Coleman D.D.S.

Steven L. Coleman, D.D.S.

Kristin L. Coleman

Kristin L. Coleman

WILLIAMS, ARIZONA 86046

Aug. 8, 1974

Mr. Bruce Shaw
National Park Service
Grand Canyon, Ariz.

Dear Mr. Shaw,

I am accepting your invitation for public comment on the Park Service's plans for the Grand Canyon. Since I have served in ministry for a number of years in the past at both the South and the North Rim, I have met and admired many dedicated people in the National Park Service and include many close friends in the Service.

It is with regret that I notice a subtle change of policy and attitude of the National Park Service over the past 22 years. Formerly, the purpose of the Parks was defined as "for the enjoyment and betterment of the people". This seems to have taken second place now to a policy of restriction and reservation for the protection of the Park.

Considering the vastness of the Grand Canyon, new roads, new viewpoints, new camp grounds, new access roads would open up a much larger and more adequate enjoyment of the Canyon and disperse the traffic jams of the El Tovar-Verkamps parking lot. The North Rim, Arizona's most beautiful area, has not seen a new mile of paved road for 30 years. Any facility of this great state that has not been expanded in 30 years cannot be anything else than overcrowded and inadequate. There really should not be a big problem in opening up the winter-beautiful vistas of the North Rim. Many areas of the Sierra receive a lot more snow and are still open most of the winter.

With best personal regards to you,

Sincerely,

Rev. John Faustina

Rev. John Faustina, Pastor

28 CHANNING ROAD
DEDHAM, MASSACHUSETTS 02026

August 2/74

Mr. Merle E. Stitt, Superintendent
National Park Service
Grand Canyon Nat'l Park
Grand Canyon, Arizona 86023

Dear Mr. Stitt:

Thank you for sending me the material
about the Grand Canyon.

It was in 1946 that I went there by
train and I realize things are quite different
today. Nevertheless I believe the quotation
by Pres. Roosevelt in the preliminary draft of
the master plan should always be the
objective for the Grand Canyon. I don't
believe it should ever be used for
energy purposes, i.e. the Colorado River.

I believe that all power plants should
be excluded from the river, and all
autos from the South Rim.

July 25, 1934

I also think that airplanes should not be allowed near the canyon.

Camping facilities, stores, etc. should be situated at least a half-mile from the canyon and the visitors could use only vehicles supplied by the Park Service to get them to the canyon rim.

I would have no objection to retaining the historic buildings near to the enlargement of the Park as long as the Indian reservations were not disturbed.

Yours very truly,
(Miss) Catherine T. Harris

July 25, 1974

Dal Herring
Rt. 1 Box 765
Big Spring, Tx. 79720

Gentlemen:

I have heard that there is a move underway to prohibit camping inside Grand Canyon National Park.

My wife and I were there in 1968, thoroughly enjoyed it, and thought the facilities in the park were extremely nice.

If the camping sites were moved out of the park and given to business interests, we think that this would be a travesty.

Hopefully you will defer to the best interests of the PEOPLE, your visitors, and retain the in-park sites as they now are.

Sincerely,

Dal Herring

Mr. & Mrs. Dal Herring

Dal & Donna

4000 4th Avenue, North
Great Falls, Montana 59401

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

July, 24, 1974

Dear Sir,

Please accept this statement as my testimony for the draft environmental statements pertaining to both the master plan and the the development plan for Grand Canyon Village.

The master plan is, in general a very well-written document which accurately portrays the environmental needs of the Park. I am particularly pleased to see the proposed Park additions as indicated in the draft statement. The major failing of the master plan as I read it is the failure to propose any Wilderness management on the South Rim; the erosion problems created by cross-country 4 wheel-drive tours is a significant degradation of the natural environment. Secondly, areas of proposed additions to the Park that otherwise qualify for Wilderness designation should be placed in a Wilderness reserve status to be automatically annexed as Wilderness upon their designation as part of Grand Canyon National Park. This action would eliminate the time-consuming and expensive process of study and passage of what would be essentially duplicate legislation.

Concerning the development plan for Grand Canyon Village, I have only one opinion, assuming you will not accept the alternative of eliminating the Village from the Park that is. On page 25, the 3rd paragraph, you state, "The historic El Tovar Hotel will remain as a conspicuous feature in this zone, but presumably will not be used for overnight accommodations, dining, or other visitor services." This building is admittedly conspicuous and will become more so upon completion of the development plan, it will serve no function that is expected to be provided within a Park; in short it will become a monument to human vanity. As such it is in opposition to National Park policy which encourages natural preservation and I request that it be removed and if it must be retained within the Park at all, that it be placed in a less conspicuous location.

Sincerely,

Thomas E. Horobik
Thomas E. Horobik

4615 N. Camino Nuestro
Tucson, Arizona 85705

June 10, 1974

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

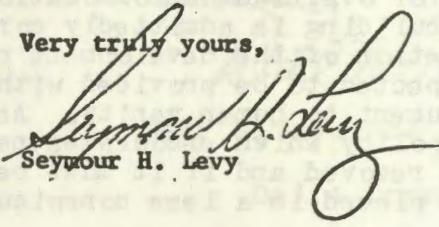
Dear Sir:

On June 7, 1974, I wrote you a letter giving my point of view regarding the use of gasoline outboard motors on the Colorado River within the Grand Canyon. I accompanied this letter with a newspaper clipping relating to this subject.

I have read in the paper today that you will be having hearings, starting in mid-July, regarding a master plan for the development and management of the Grand Canyon National Park.

I would appreciate it very much if my June 7 letter, along with the attached newspaper clipping, could be made part of that forthcoming hearing records. I would further appreciate receiving a copy of the master plan when it is finalized.

Very truly yours,


Seymour H. Levy

SHL:hml

Tucson, Arizona
July 22, 1974

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

Dear Sir:

We wish to state that we believe that the best interests of the public will be served by extending Grand Canyon National Park to include the Grand Wash Cliffs insuring that no dam will ever be built in this area.

We want to go on record as opposing the statements of Governor Williams and Senator Sam Steiger of Arizona that a dam should be built at Bridge Canyon.

Very truly yours,

Gordon M. Luepke
Gordon M. Luepke
Route 5, Box 724
Tucson, Arizona 85718
Janice C. Luepke
Janice C. Luepke
(Same address)

cc Mr. Roy Taylor
Chairman, Subcommittee on
National Parks and Recreation
House Office Building
Washington, D. C. 20515

Cynthia R. Becker
3644 N. Cactus Blvd.
Tucson, Arizona 85718

John C. Luepke
3638 N. Cactus Blvd.
Tucson, Ariz. 85719
Barbara Luepke
255 E. Rudasill
Tucson, Ariz. 85704

July 18, 1974

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

TO WHOM IT MAY CONCERN:

I would like to object to the prohibition of grazing in a certain area of Grand Canyon National Park (see attached map). If someone had asked me before I came to the Navajo Indian Reservation, if I would want to allow grazing in Grand Canyon National Park, I would have said no. I would have thought there are not enough "primitive" areas left today and we must save all such areas that we can. I would have thought grazing would destroy the environment.

After living and working with the Navajos for a while and talking to the individual Navajos concerned about the land in question and after seeing the land in question, I would have to say that my initial reaction would have been the result of being very uninformed about the whole situation. Navajos generally and certainly the ones in question know how to take care of the land and do not destroy the land. If Navajos were the kind of people who destroyed the land, then there would be no "primitive" area to preserve because the ancestors of the people now concerned about the area in question have lived in the area and grazed their livestock in the area for well over one hundred years.

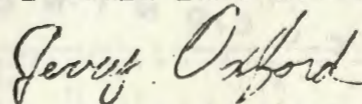
If one looks at the land (or looks at the map), he can tell that the park boundary was drawn without any consideration for the lay of the land. The Navajo People who live and graze their livestock in the area would like fences built (so that their livestock will not wander deep into the park and become lost) in two small areas which follow the natural boundaries of the area rather than down the established park boundary.

The area in question is approximately ten miles long and two miles wide. This may not seem too significant when one considers the whole Grand Canyon, but it is vitally important to the individual Navajos living in the area. The ancestors of the Navajos who graze their livestock in the area also grazed their livestock in the area, many years before white men came or a national park was established. Raising livestock is the way of life that has been passed down by the Navajos generation after generation. It is not a very plentiful life if one judges another's wealth by the material things one possesses, but it is the only way of life many Navajos know. This is changing as the younger Navajos become better educated and in a few years, after the older Navajo die, it is conceivable that no Navajos will want to graze in the area in question. However, this time has not yet come and I believe the Navajos who want to graze their livestock in the area should be allowed to continue to graze their livestock in the area.

A "primitive" area as far as white men are concerned would contain Indians. If one thinks that Indians and "primitive" areas do not go together, he need only visit Canyon de Chelly. What kind of reasoning allows hotels, shops, gas stations, and roads in one area of the Grand Canyon and would not allow Indians to graze their livestock a couple of miles away because that area is designated a "primitive" area? Along with all of the concern for tourists and the land, I would hope that the people who make the decisions concerning the Grand Canyon would have a little concern for the people who have lived there all of their lives.

I wish I could do more to help the people out, but I do not know how to. I do not make the decisions. I only hope that the people who do make the decisions really understand the situation and that people's lives are involved.

Thank you for listening, but I would like action.



Jerry Oxford



Area in question in yellow. Fences the Maxey's want in 049.

Tucson, Arizona
July 23, 1974

Dear Sirs:

I would like to see the boundary of the Grand Canyon National Park extended to include all of the Canyon from Lee's Ferry to the Grand Wash Cliffs, excluding Indian Reservations.

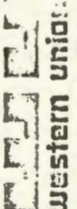
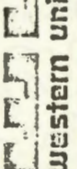
I believe this area should be protected for posterity.

Sincerely,

Pat Rusin

Pat Rusin
6301 Calle Mercurio
Tucson, Arizona
85710

P.S. Please be certain this letter goes on record as opposing the views of Governor Williams and Representative Sam Steiger.

Telegram  Western Union  Telegram

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130P MS

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RMS SUPERINTENDANT

GRAND CANYON NATL PARK AZ

PLEASE INCLUDE OPTIONAL USE OF MOTORS ON RIVER IN MASTER PLAN OF
COMMISSION

WM C SEAGLE

JOHN R. SWANSON
P. O. Box 922
Berkeley, California 94701

August 8, 1974

Superintendent
Grand Canyon National Park
Grand Canyon, Arizona 86023

Dear Sir,

Please add my comments, as follows, to your Official Records concerning the proposed Grand Canyon National Park Master Plan, Development Concept Plan and, Exhibit - Environmental Impact Statement for each such Plan. Also, Proposed Wilderness Classification

I generally agree with many of the Master Plan's objectives. Certainly with the prime and obvious need to substantially expand Grand Canyon National Park to include areas of high scenic, wilderness and wildlife values.

However, while a responsible expansion proposal is suggested, I am of the firm opinion that Grand Canyon National Park must be enlarged to include an even larger area than now officially proposed. And, in this regard, I strongly urge that most if not all of this general area prime outdoor resources be included in an expanded - Grand Canyon National Park of some 2,000,000 acres.

and I also suggest that most of this area roads be obliterated and returned to its natural condition as may be possible.

Concerning the Grand Canyon Village Development Concept, I do not believe that any National Park should include village or town-type facilities so they are a definite intrusion upon the integrity of our system of National Parks. and in this regard, I am of the firm opinion that such communities should be removed as rapidly as may be possible and, if necessary, relocated outside of the National Park in question, including then, Grand Canyon Village.

As to the Final Environmental Statement, Proposed Wilderness Classification Grand Canyon complex, I strongly urge that all roadless areas of the proposed expanded Grand Canyon National Park be included in the National Wilderness Preservation System to include nearly 2,000,000 acres. Also, obliterated roads be essentially included in such wilderness, as well.

Sincerely, J. R. Swanson

1871

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Handwritten notes below the top right section.

Main body of handwritten text, appearing to be a letter or report, written in cursive.

Handwritten signature or name at the bottom right of the page.

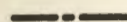
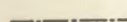

APPENDIX B

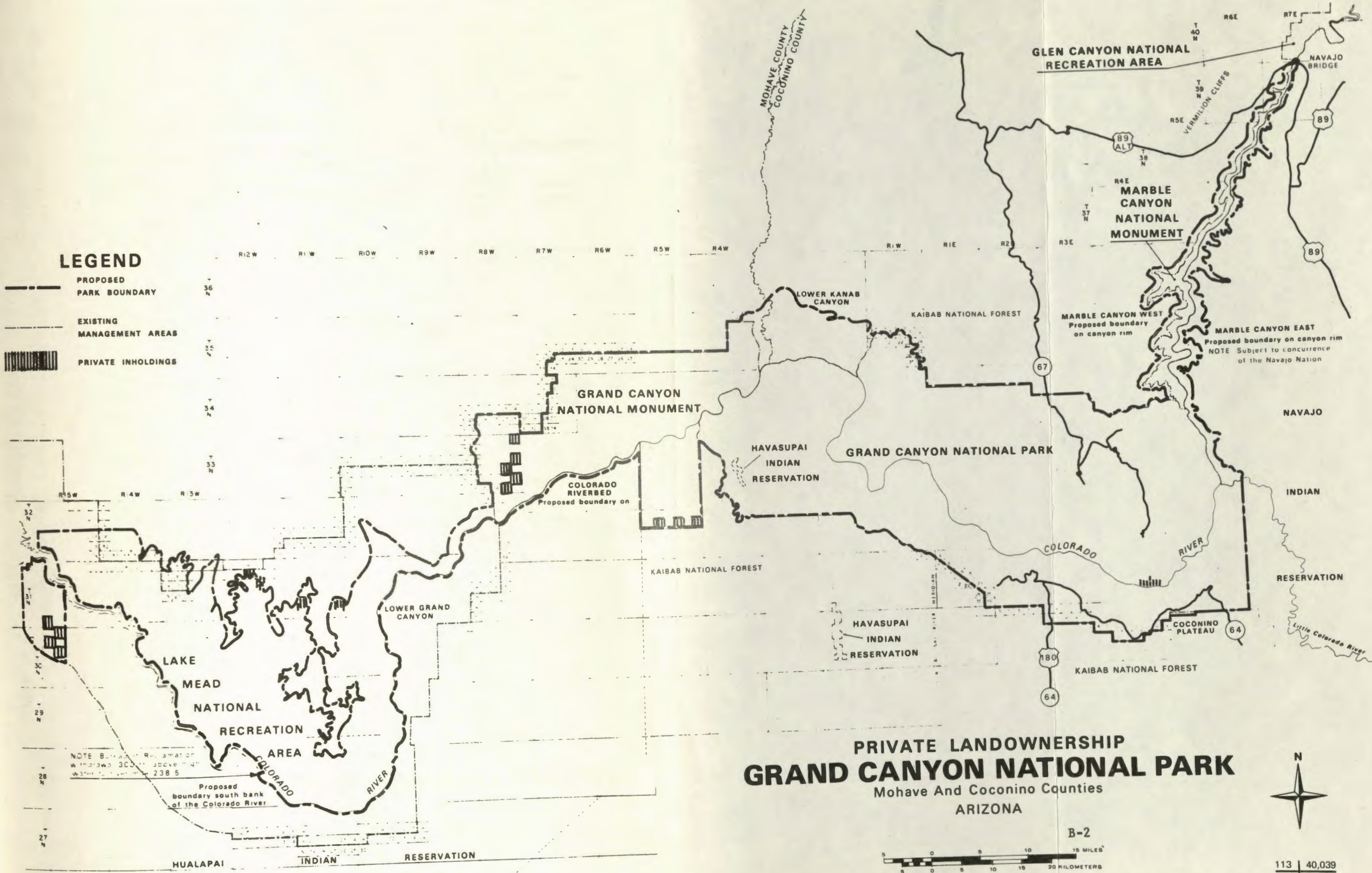
LAND OWNERSHIP MAP

LAND CLASSIFICATION MAP

APPENDIX B
LAND OWNERSHIP MAP
LAND CLASSIFICATION MAP

LEGEND

-  PROPOSED PARK BOUNDARY
-  EXISTING MANAGEMENT AREAS
-  PRIVATE INHOLDINGS

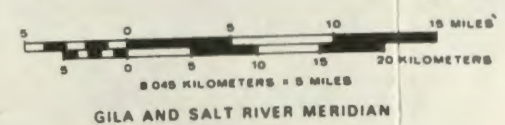


NOTE: Boundary of Recreation Area shown above 2385' water level. Proposed boundary south bank of the Colorado River.

MARBLE CANYON WEST Proposed boundary on canyon rim
 MARBLE CANYON EAST Proposed boundary on canyon rim
 NOTE: Subject to concurrence of the Navajo Nation

**PRIVATE LANDOWNERSHIP
 GRAND CANYON NATIONAL PARK**
 Mohave And Coconino Counties
 ARIZONA

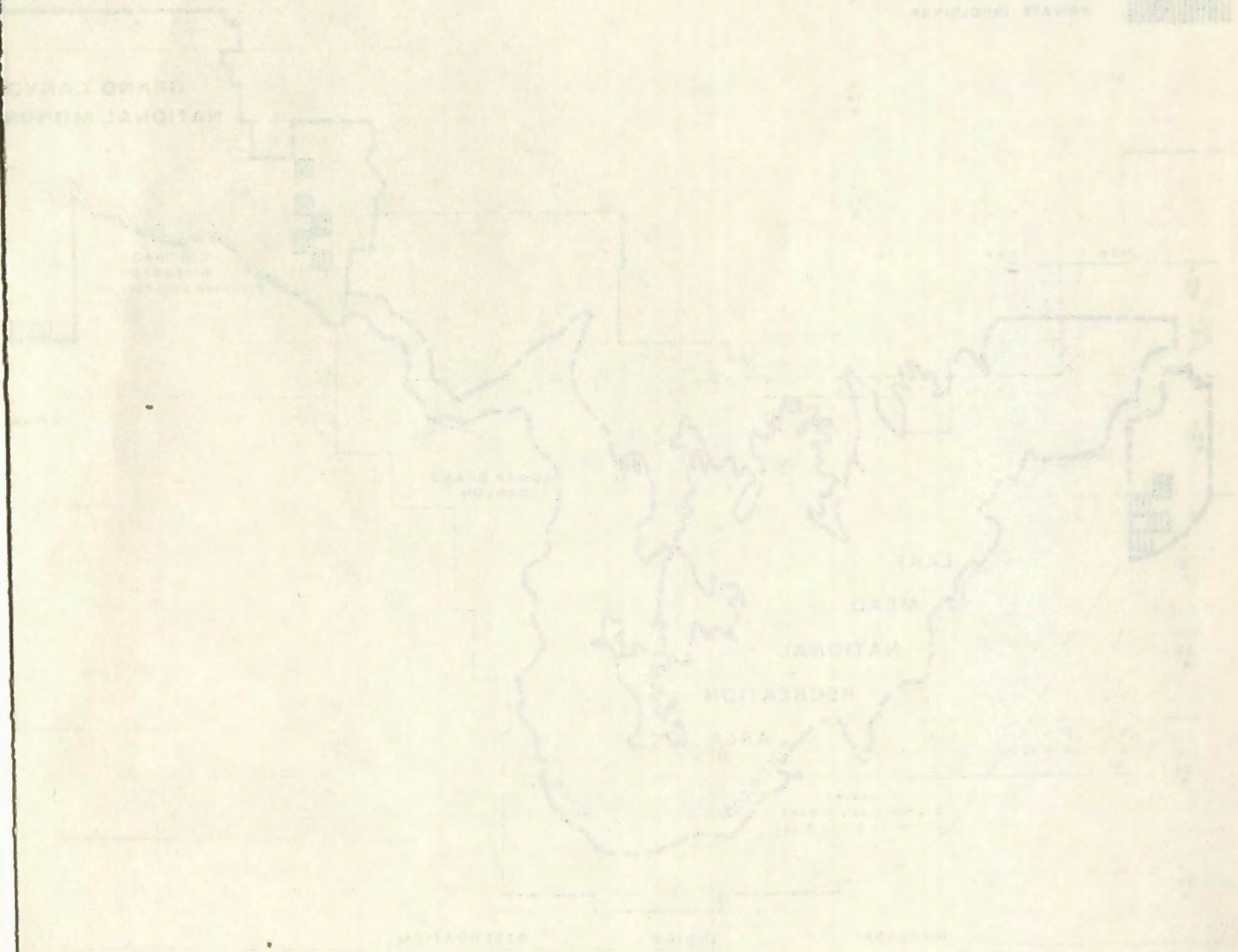
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LEGEND

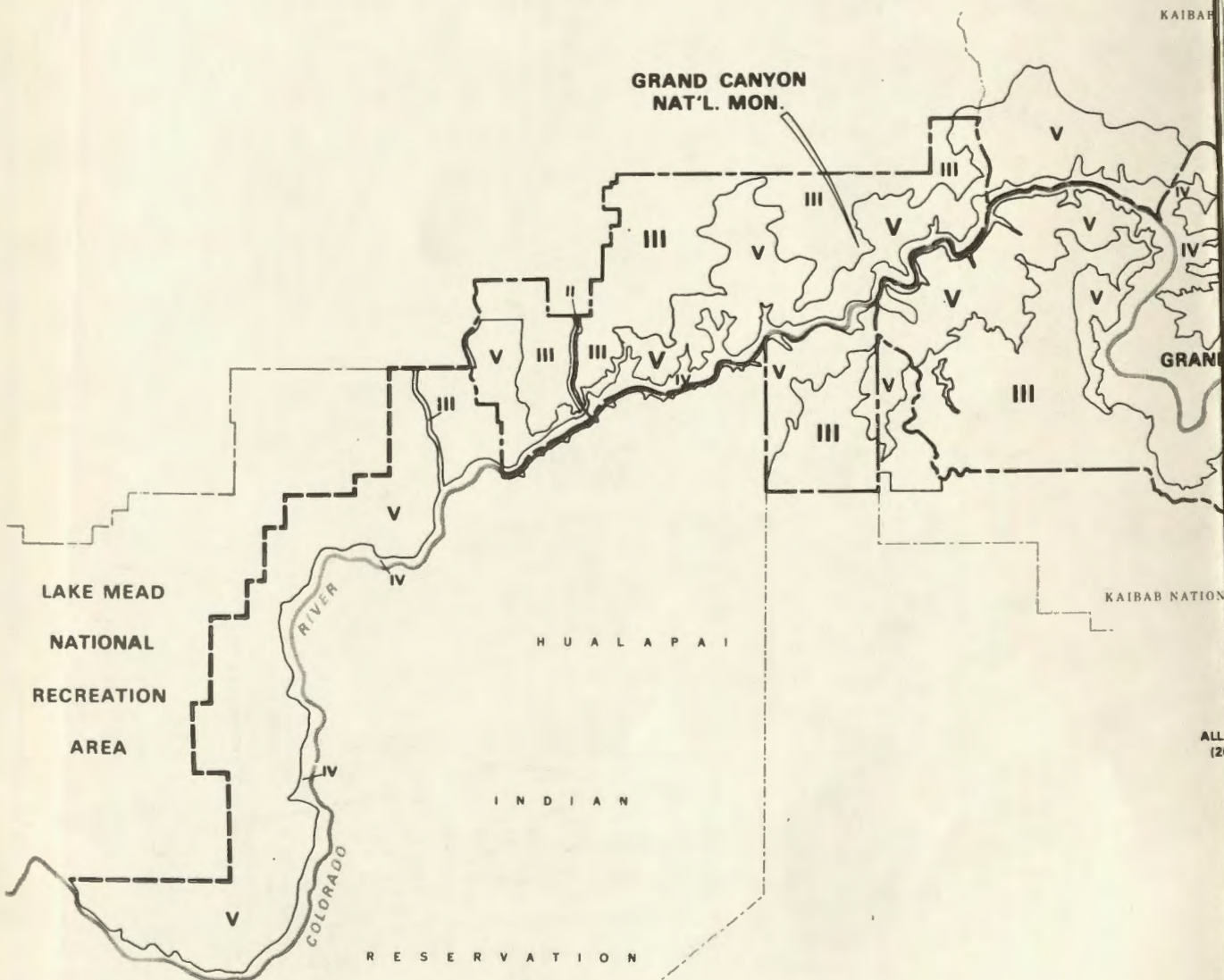
- PROPOSED PARK BOUNDARY
- EXISTING MANAGEMENT AREA
- PRIVATE LANDS



KAIBAB INDIAN
RESERVATION

LAND CLASSIFICATION

	ACREAGES		
	G.C.N.P.	G.C.N.M.	MARBLE C.N.M.
CLASS I HIGH-DENSITY RECREATION	3,100		
CLASS II GENERAL OUTDOOR RECREATION	17,200	90	
CLASS III NATURAL ENVIRONMENT	139,700	108,900	4,000
CLASS IV OUTSTANDING NATURAL AREAS	351,875	7,730	22,080
CLASS V PRIMITIVE AREAS	161,700	81,560	
CLASS VI HISTORIC AND CULTURAL AREAS (acreage too small to show)			
TOTAL	673, 575	198,280	26,080

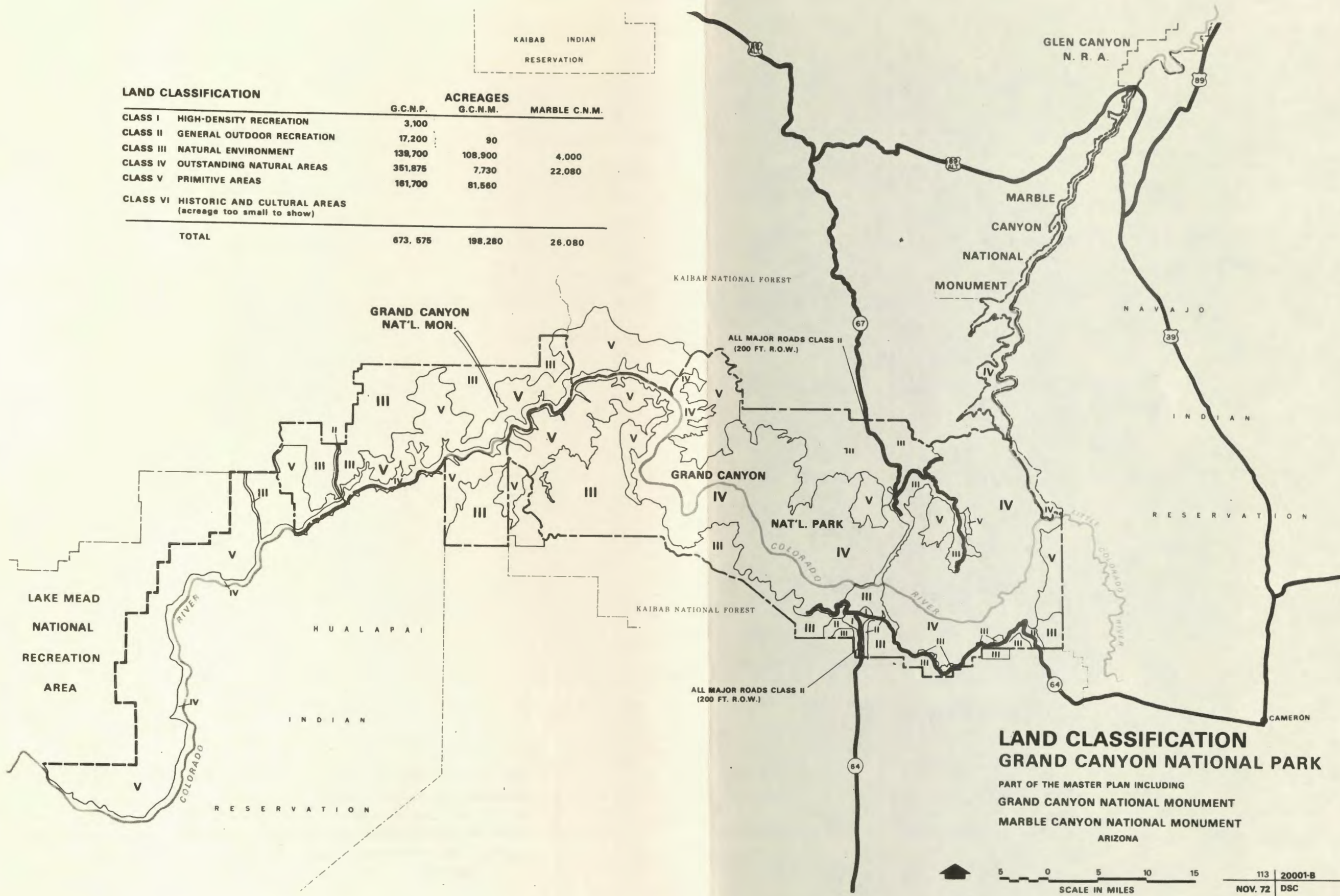


LAND CLASSIFICATION

		ACREAGES	
		G.C.N.P.	MARBLE C.N.M.
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CLASS IV	OUTSTANDING NATURAL AREAS	351,875	7,730
CLASS V	PRIMITIVE AREAS	181,700	81,560
CLASS VI	HISTORIC AND CULTURAL AREAS (acreage too small to show)		
TOTAL		673,575	198,280

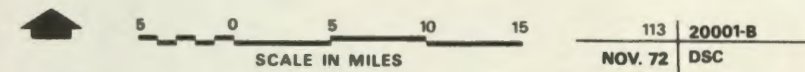
KAIBAB INDIAN
RESERVATION

GLEN CANYON
N. R. A.



**LAND CLASSIFICATION
GRAND CANYON NATIONAL PARK**

PART OF THE MASTER PLAN INCLUDING
GRAND CANYON NATIONAL MONUMENT
MARBLE CANYON NATIONAL MONUMENT
ARIZONA



As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, parks and recreation areas, and to ensure the wise use of all these resources. The Department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration. NPS 560

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