

# **COLORADO RIVER MANAGEMENT PLAN**

September 1989

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## **Grand Canyon National Park**

National Park Service  
United States Department of the Interior



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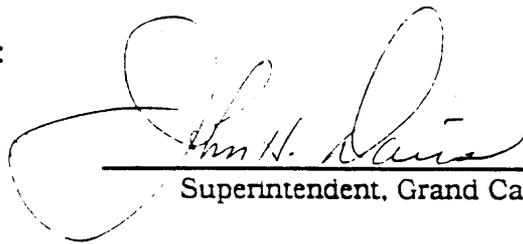
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COLORADO RIVER MANAGEMENT PLAN

FOR

GRAND CANYON NATIONAL PARK

RECOMMENDED BY:



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Superintendent, Grand Canyon N.P.

9/5/89  
Date

APPROVED BY:

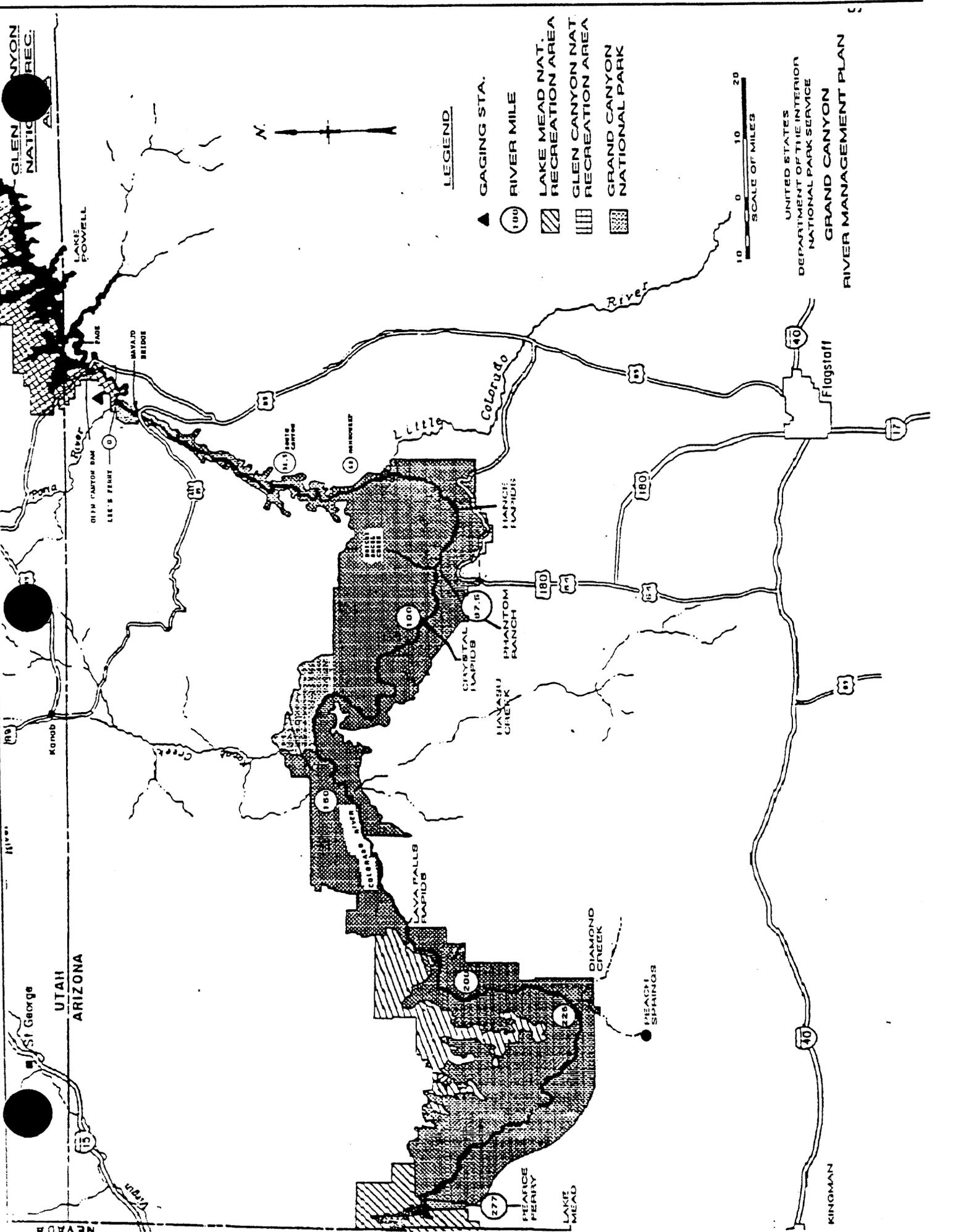


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ACTING Regional Director, Western Region

9/14/89  
Date





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St George

NEVADA

LAKE POWELL

NAVAJO BRIDGE

LEE'S FERRY

017M FANTOM DAM

ROMBO

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COLORED RIVER

LAVA FALLS RAPIDS

DIAMOND CREEK

PEACH SPRINGS

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## COLORADO RIVER MANAGEMENT PLAN

### I. PREFACE

The Colorado River in the Grand Canyon provides a thoroughly unique combination of thrilling whitewater adventure and magnificent vistas of a remarkable geologic landscape deeply incised by remote and intimate side canyons. The river's flow is regulated by Glen Canyon Dam, located just upstream from the Grand Canyon. The combination of erratic snowfall patterns and summer monsoons make the river corridor an extremely dynamic environment. The floor of the Grand Canyon is a narrow channel of Sonoran Desert life, snaking along a mile beneath the rim's coniferous forests. The flora and desert creatures that inhabit the inner canyon are beautifully adapted to the rigors of their harsh, variable environment. For these reasons a Grand Canyon river trip is perhaps the most sought after backcountry experience in the country, and nearly 21,000 visitors share that experience annually.

The purpose of the Colorado River Management Plan (CRMP) is to address and resolve major issues surrounding the management of recreational use activities within the Colorado River corridor of Grand Canyon National Park and mitigate the environmental impacts associated with those activities. The purpose of this plan is to supplement existing management guidelines and directives, including but not limited to the 1976 Master Plan for Grand Canyon National Park, the Backcountry Management Plan, the Natural and Cultural Resources Management Plan, the Aircraft Management Plan, the Water Resources Management Plan, the Land Protection Plan, the Supplement to the Regional Contingency Plan for the Colorado River for oil and hazardous substance spills, and other significant management guidelines identified on page 7 of this document. Furthermore, this plan will serve to update and revise the 1981 Colorado River Management Plan.

The Colorado River Management Plan is organized into six sections. The first five sections cover the historical perspective, goals of the plan, management objectives, summary of management changes, and a summary of the CRMP review. The sixth section consists of eight appendices. These appendices are part of the CRMP and have been separated for organizational purposes. Appendix C, the Commercial Operating Requirements, is a legally binding document which is referred to in the concession contracts.

COLORADO RIVER MANAGEMENT PLAN (CRMP)  
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## A. INTRODUCTION AND HISTORICAL PERSPECTIVE

The Colorado River drains nearly one-twelfth of the continental United States as it cuts west at the southern edge of the Colorado Plateau and traverses the Grand Canyon area. For the next 277 miles, the Colorado River courses through some of the most spectacular scenery in North America. As a scientific resource, Grand Canyon is a mecca for geologists, geographers, and biologists throughout the world. It is also a place of tremendous natural and historic interest; a place of beauty, peace, quiet, or exciting adventure.

Best known for its geologic significance, the Grand Canyon offers a beautifully layered record covering the first three eras of geological time, nearly 2 billion years. It is one of the most complete continuous records of geological history anywhere in the world. Other important resources include scenic vistas, unique wildlife and vegetation, and historic and archaeological artifacts. The Colorado River through Grand Canyon National Park, the longest stretch of recreational whitewater in the world, offers one of the most sought-after river trips in the United States as well.

Recreational use along the Colorado River in the Grand Canyon is concentrated within the riparian zone and on beaches. The time and location of visitor use in the river corridor is uneven, causing high density levels at certain locations throughout the river corridor. Crowding and congestion at attraction sites have not only impacted resources, but also the river trip experience for many visitors. Popular sites include geologic features, side canyons, archaeological and historical sites, caves, waterfalls, and unusual vegetation. The most popular attraction sites are marred by multiple trails, trampled vegetation, and compacted soils.

The desire of the American public to experience this unique area has dramatically increased over the last 20 years. In 1967, 2,100 people traveled the river through Grand Canyon National Park. The number of recreational river users rose dramatically to 16,500 in 1972. This sudden rise in use was noticeably impacting the vulnerable inner canyon ecosystem. Trash, charcoal, and human waste were accumulating, multiple trails were developing to points of interest, and the numerous prehistoric and historic sites near the river were being damaged.

The above problems were a direct result of the increase in recreational use of the area. In 1973, twenty-one commercial boating companies and noncommercial river runners carried more than 15,000 people through the river corridor, an increase of almost 700 percent in 6 years. Colorado River use for 1972 alone exceeded the 100-year period from 1870 through 1969.

Until the completion of the first dam on the Colorado River, the river remained fundamentally unchanged. Then, in 1935, Lake Mead, behind Hoover Dam, flooded the lower sections of the Grand Canyon up to Separation Canyon. The upper reaches of the canyon remained in a natural state until Glen Canyon Dam was completed in 1963.

Both Hoover Dam and Glen Canyon Dam have had profound impacts on river running through the Grand Canyon. Lake Mead extended into the lower section of the

canyon, producing slack water that marked the end of the free-flowing Colorado. Formerly, river runners had been able to float the entire length of the river to Pearce Ferry. With the advent of Lake Mead, trips had to take out 55 miles upriver at Diamond Creek or traverse the slack water of the lake to Pearce Ferry.

Glen Canyon Dam's effects have been more dynamic and dramatic. The amount of sediment and driftwood carried naturally along the river's course through the canyon has been significantly reduced. Water releases from Glen Canyon Dam have created more predictable seasonal water levels, but have resulted in extreme daily fluctuations. As a result, canyon beaches, which provide campsites for river runners, no longer receive sufficient replacement sediments and are subject to erosion by the erratic daily flows. During periods of low water release from the dam, passage at certain rapids has become difficult, creating hazards and delays. Heavy spring runoff no longer scours the river's banks, and this has allowed a new ecosystem to develop in the pre-dam flood zone.

The attainment of National Park Service mandates and management objectives relative to managing the Colorado River are also dependent on evaluating the effects of alternative operational scenarios at Glen Canyon Dam on key resource conditions. Those include water, sediment, vegetation, channel morphology, and archaeological resources and their dependent uses: fish, wildlife, recreation, aesthetics, and education. To support this process, the second phase of Glen Canyon Environmental Studies are keyed to the scientific and economic evaluation of alternative management scenarios.

Prior to the influx of river runners and the advent of dams, the river required very little active management by the National Park Service (NPS). However, by the early 1970's it was apparent that a comprehensive river management plan was needed. In 1973 the NPS initiated a research program and planning process leading to the development of the Colorado River Management Plan in 1979. At this time the user day allocation concept was formulated and implemented. Any portion of a day a river user spends on a river trip is defined as a user day.

The 1979 Colorado River Management Plan and its associated Environmental Impact Statement (EIS) were finalized and approved by the NPS, through the process mandated by the National Environmental Policy Act of 1969 (NEPA). Congressional response to components of the 1979 Plan was negative when, in 1980, the Hatch Amendment was passed as an element of the Fiscal Year 1981 Department of the Interior Appropriations Bill. The amendment prohibited a reduction of summer season user days or passenger launches for commercial motorized craft below 1978 levels.

Based on passage of this amendment, the NPS developed the 1981 Colorado River Management Plan to allow a diversity of river running experiences in Grand Canyon National Park. While some re-evaluation of management goals has taken place, the preservation of the Grand Canyon and the Colorado River for future generations has remained a primary objective of this plan.

Scientific research, public input, historic considerations, and interpretation of legislative mandates have placed the current levels of commercial and noncommercial user days at an aggregate total of 169,950. One user day equals one person on the river for any portion of one day. The NPS reserves the right to add or subtract, allocate or reallocate user days based on review of all relevant factors. Current allocations are as follows:

Commercial Sector:	Primary Season -	106,156 user days
	Secondary Season -	<u>9,344</u> user days
	Total -	115,500 user days
Noncommercial Sector:	Primary Season -	43,920 user days
	Secondary Season -	<u>10,530</u> user days
	Total -	54,450 user days

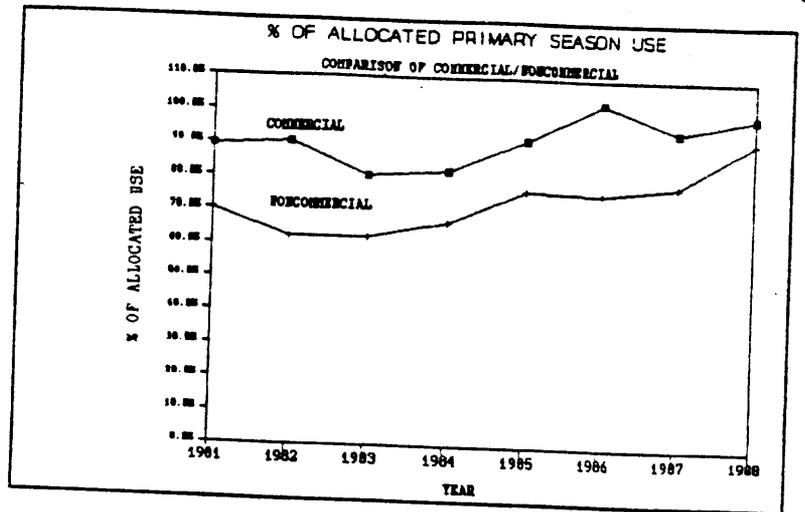
The seasons are defined as follows:

Commercial Sector:	Primary Season -	May 1 through September 30
	Secondary Season -	October 1 through April 30
Noncommercial Sector:	Primary Season -	April 16 through October 15
	Secondary Season -	October 16 through April 15

## B. GRAPHICS INDICATING USE TRENDS

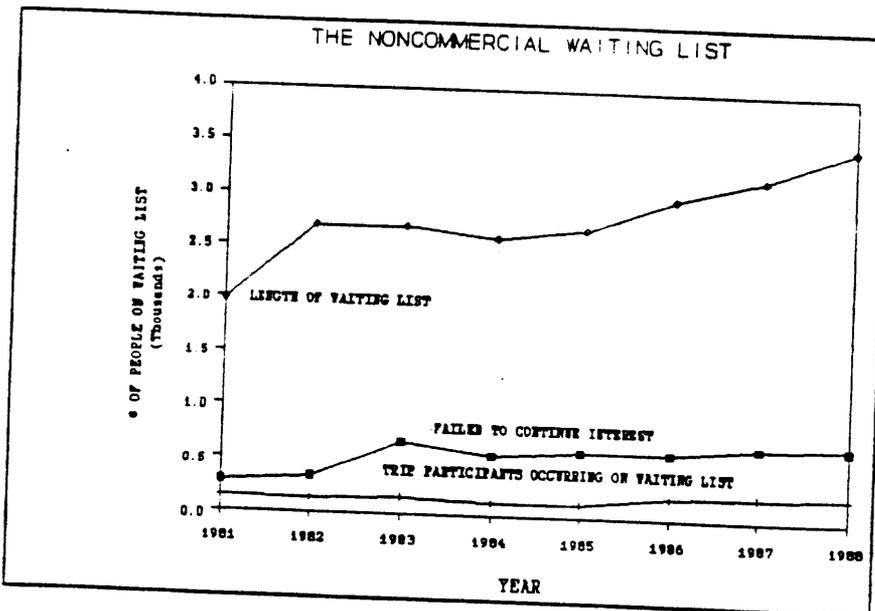
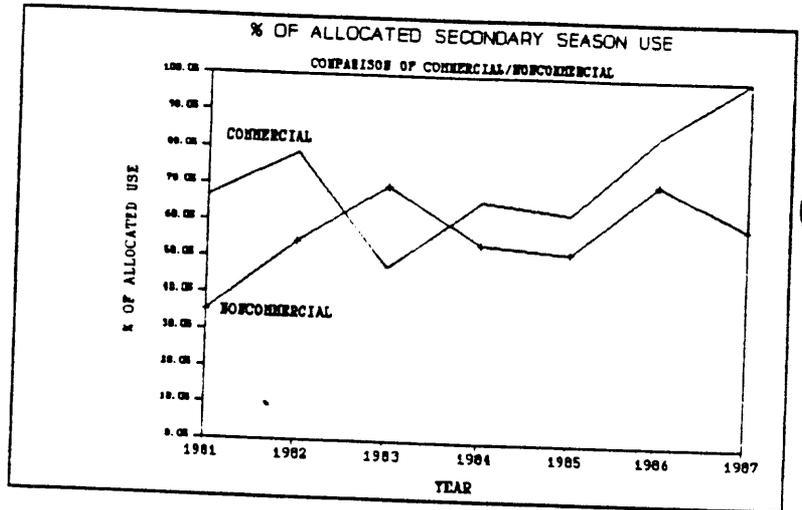
The following graphs indicate use patterns since the 1981 Colorado River Management Plan.

Refinement of scheduling processes and the establishment of a user-day pool in 1983 have resulted in maximization of allotted use for the commercial sector. The noncommercial sector has demonstrated the ability to use all of their allotted launch dates; however, 20% of the noncommercial allocation was not available due to the fixed number of launch dates. The review of the 1981 Colorado River Management Plan indicated the need to provide an equal means for the noncommercial sector to access their defined allocation.

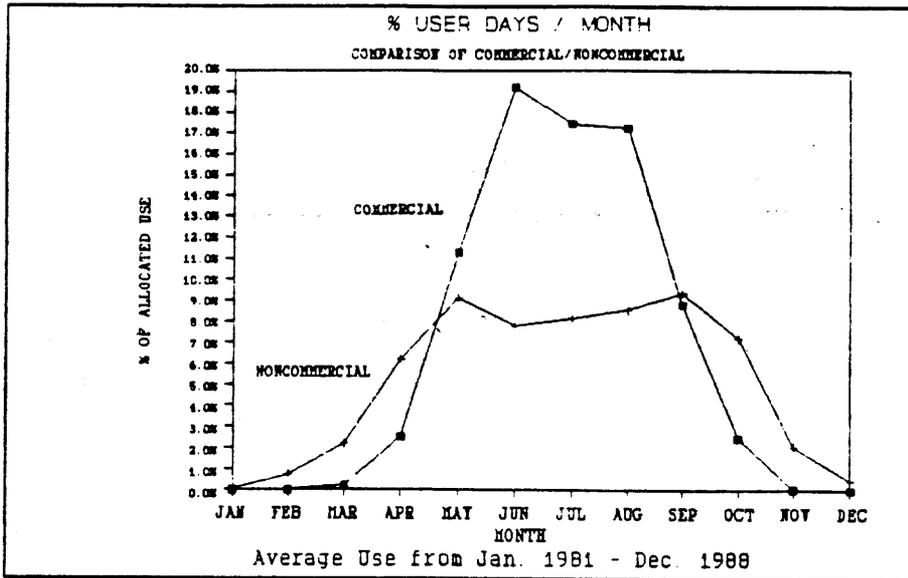


These two seasonal graphs indicate percentage of use based on each sector's allocation. User-day allocations are as follows:

	Primary Season	Secondary Season
Commercial	106,156	9,344
Noncommercial	43,920	10,530

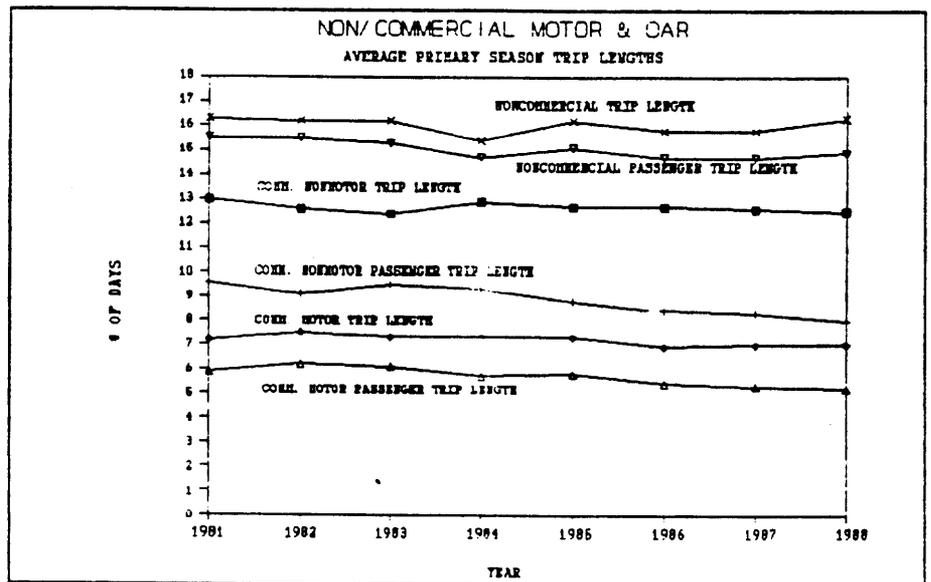


The waiting list has increased 77% since 1981, even though those on the list must continue their interest to remain on the list annually and those participating in other noncommercial trips are deleted from the list. The intent of the above policies is to promote integrity of the list; however, additional policies are needed. Therefore, a fee of \$25 will be required to be added to the list. A fee of \$50 will be required with the return of the application to ensure the noncommercial party will utilize their launch date.

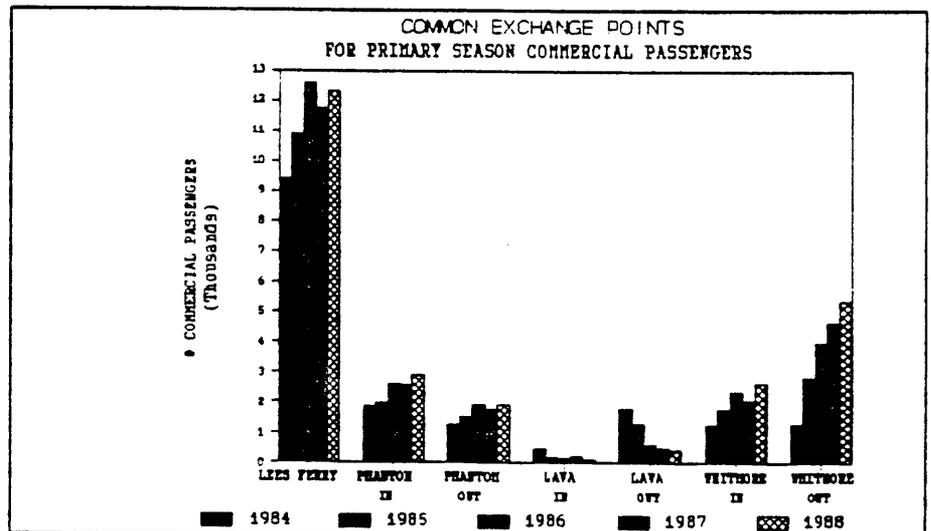


The average use per month for the commercial and noncommercial sectors is indicated in the graph to the left. The percentage is based on each sector's allotted annual use.

Commercial passenger trip lengths have declined since 1984. This is correlated with increased usage of passenger exchange points at the Whitmore Wash helicopter pad and Phantom Ranch.



The Hualapai tribe began allowing helicopter flights on tribal land in 1985 after the mule concession discontinued service on Whitmore trail. The Lava Falls helicopter pad was the only exchange point using helicopters prior to 1985. Since the Whitmore Wash helicopter pad has been in use, 43% of all commercial passengers utilized helicopter travel in connection with their river trip.



### C. LEGISLATIVE AND PLANNING INFLUENCES

Grand Canyon National Park was officially established as a "public park for the benefit and enjoyment of the people" on February 26, 1919. In 1975, the park was enlarged "in order to further protect and interpret the outstanding scenic, natural, and scientific values".

In all, approximately 20 pieces of legislation contributed to the establishment of Grand Canyon National Park and direct the protection of wildlife, objects of unusual scientific interest, geologic and paleontological features and objects, and other scientific and natural values.

Management of recreational boating on the Colorado River in Grand Canyon National Park is influenced directly by legislative mandates. The most significant is the National Park Service Act of 1916 (also known as the Organic Act) which established the mission of the agency:

"...The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations, hereinafter specified, by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired."

The act of Congress which established Grand Canyon National Park in 1919 included only a portion of the canyon and river corridor. This was modified by the Grand Canyon Enlargement Act of 1975. This act added Marble Canyon National Monument, Grand Canyon National Monument, and portions of Lake Mead National Recreation Area to Grand Canyon National Park. All of the Colorado River corridor within Grand Canyon, except adjacent Indian tribal lands on the Navajo, Havasupai, and Hualapai Reservations, is now within the park boundary.

The Grand Canyon National Park Master Plan also contains statements which directly influence management of the Colorado River, including:

"...preservation of the Grand Canyon natural environment is the fundamental requirement for its continued use and enjoyment as an unimpaired natural area. Park management therefore looks first to the preservation and management of the natural resources of the park. The management concept is the preservation of total environments, as contrasted with the protection of only a single feature or species."

Additional legislation and executive orders which influence river management in the park include:

The National Historic Preservation Act of 1966 as amended  
The National Environmental Policy Act of 1969 (NEPA)  
The Water Pollution Control Act Amendments of 1972  
The Endangered Species Act of 1973 as amended  
The Clean Air Act Amendments of 1977  
The American Indian Religious Freedom Act of 1978

The Archaeological Resources Protection Act of 1979  
The Hatch Amendment No. 1754 to the FY81 Department of the Interior  
Appropriations Bill  
Public Law 100-91 of 1987 (regarding aircraft management) Public Law 95-250  
of 1978  
Executive Order 11593  
Executive Order 11987

The amendment to the congressional act that established Redwood National Park in 1978 reinforced the intent of legislation passed on August 18, 1970 which reaffirmed the mandate that all areas of the NPS were to be regulated consistently with the Organic Act. This law directed the Secretary of the Interior to afford the highest standard of protection and care to the resources of the National Park system. It stated that no decisions could be made in derogation of park values and purposes except as Congress may have specifically provided.

The Wilderness Act of 1964 required all federal land management agencies to re-examine their resources for possible wilderness classification. In 1976, the National Park Service prepared a draft environmental statement (ES) and preliminary wilderness proposal which was reviewed by the public. A recommendation was forwarded to the Department of the Interior in 1980 which proposed 980,088 acres, or approximately 80% of the park, for immediate wilderness designation. Further, 131,814 acres, or approximately 11% of the park, were proposed as potential wilderness additions. Action on this recommendation is still pending.

Several additional regional and park management plans directly influence the management of the Colorado River environment. These include but are not limited to:

- The 1976 Master Plan for Grand Canyon National Park
- The Natural and Cultural Resources Management Plan
- The Backcountry Management Plan
- The Aircraft Management Plan
- The Water Resources Management Plan
- The Land Protection Plan
- The Supplement to the Regional Contingency Plan for the Colorado River  
(Addressing oil and hazardous substance spills)

Encompassing a total of 1,215,734.64 acres, the park is bounded on the north by national forest, public domain lands, and Glen Canyon National Recreation Area, on the east by the Navajo Indian Reservation, on the south by national forest and Hualapai and Havasupai Indian Reservation lands, and on the west by the upper reaches of Lake Mead National Recreation Area. The park is located within Coconino and Mohave Counties. These adjacent land management entities also affect the management of the Colorado River through Grand Canyon National Park.

#### D. PLAN REVIEW AND UPDATE

The Colorado River Management Plan will be in effect for a five to ten year period. A comprehensive plan review, directed by the Superintendent through the Division of Visitor and Resources Protection and the Division of Resources Management and Planning, will occur before the end of this period.

This comprehensive review process will incorporate public meetings and comments, data from monitoring/research projects, visitor use statistics, NPS policies, federal rules and regulations, and legislated mandates. The purpose of the review will be to fully examine evolving public concerns and develop far-reaching programs needed to protect natural and cultural resources and environmental processes, thereby enhancing the opportunity for park visitors to have a quality experience.

The Colorado River Management Plan will also be responsive, on an annual basis, to results of research, monitoring programs, and public and constituent group input. This annual review will primarily be concerned with the annual Noncommercial and Commercial Operating Requirements, which are dynamic in nature. Public input and research or monitoring program results may indicate that occasional changes in operational procedures may be necessary. These changes, after consideration by the park, will be initiated with the issuance of the Annual Operating Requirements prior to April 1st of each year. Changes that affect visitor safety or preservation of park resources may be initiated at the discretion of the Superintendent at any time.

Interested persons are encouraged to submit comments to the Superintendent for consideration at any time for use in the annual reviews.

## II. THE GOALS OF THE COLORADO RIVER MANAGEMENT PLAN

The basic goals of Grand Canyon National Park in the management of the Colorado River reflect those of the NPS as expressed in the National Park Service Act of 1916 and the Redwoods Act of 1978. These legislative mandates serve as the driving force behind management decisions in NPS areas across the nation. The goals of the Colorado River Management Plan are thus predicated on, and the result of, these mandates and management objectives. These goals are as follows:

- 1) To preserve the natural resources and environmental processes of the Colorado River corridor and the associated riparian and river environments.
- 2) To protect and preserve the historic and prehistoric cultural resources in the river corridor and associated environments subject to impact by visitor use or natural processes.
- 3) To provide Colorado River users the opportunity to participate in and appreciate a variety of the unique experiences offered by Grand Canyon National Park as a whole and by the riverine environment in particular.
- 4) To provide a quality Colorado River experience through Grand Canyon National Park:
  - a) by determining the impact of crowding and use levels on visitor experience (considering, trip size, number of contacts per day, visitor expectations, and time of year) through social science research;
  - b) by then establishing a human use capacity and a limitation on use based on the results of the above research and related management considerations; and
  - c) by managing visitor use to provide opportunities and settings for certain experiences and critical attributes as defined in the Limits of Acceptable Change guidelines found in this document (Appendix B).
- 5) To ameliorate social conflicts and activities which result in resource degradation involving backcountry and river users (especially in the upper Marble Canyon area).
- 6) To protect and preserve the river corridor environment within the National Park Service's ability to do so considering the unpredictable and therefore unmanageable effects of Glen Canyon Dam. This goal will be attained through interagency cooperative efforts in management of downstream resources.
- 7) To provide opportunities for people of most ages, abilities, and physical disabilities to participate in river trips.

### III. MANAGEMENT OBJECTIVES OF THE COLORADO RIVER MANAGEMENT PLAN

The management objectives of the Colorado River Management Plan acknowledge the natural, cultural, and experiential components which constitute the unique quality of a Grand Canyon river experience, including; solitude and natural quiet, hiking opportunities, the whitewater adventure, unique scenery and geologic features, wildlife and vegetative ecosystems in a natural condition, archaeological and historic features, and social and group interactions while on the river trip. These management objectives are governed by the preeminent NPS mandate of preserving the natural and cultural resources of the Colorado River within Grand Canyon National Park.

The following objectives (not in priority order) are designed to provide general guidance to park managers both conceptually and in the practical context of making decisions. Where applicable, certain management objectives are further defined and quantified in the Limits of Acceptable Change section (Appendix B) of this plan.

- 1) Research and Monitoring Program--Establish, design, and implement an integrated, long-term monitoring program to assess changes in the status of natural, cultural, and experiential resources.
  - a) This long-term monitoring program will require an integrated and standardized data base, statistical analyses, and management decision-making process.
  - b) This program will require definition of present resource status, and these data will serve as the baseline against which changes will be measured.
  - c) Results from the monitoring program will be reviewed each year to assist in evaluating the effectiveness of operational procedures.
- 2) Social Science Research--Initiate social science research to develop visitor profiles and user expectations for the Colorado River whitewater experience.
- 3) Glen Canyon Dam Operations--Advocate and support operational objectives for the Glen Canyon Dam which are most compatible with protection of the intrinsic resources of the Colorado River within Grand Canyon National Park. Furthermore, promote seasonal water releases which are consistent with the requirements of a safe, high quality, whitewater rafting experience. The attainment of NPS mandates and management objectives, relative to managing the Colorado River, is dependent on implementation of alternative management of Glen Canyon Dam; adequate development of which is in turn dependent on the study of operational alternatives determined by the Glen Canyon Environmental Studies (GCES) and the NEPA process.
- 4) Off-river Activities--Allow for visitation to attraction sites, for hiking side canyons, and for general off-river time versus on-river time.

- 5) Natural Experience--Provide the opportunity to experience solitude, quiet, and the unique and natural environment of the canyon.
- 6) Safety--Maximize river safety by determining and enforcing regulations regarding boat operations and equipment standards. These regulations must be adequate to minimize injuries and accidents due to equipment failure or craft design.
- 7) Fishing--Allow fishing as a recreational activity only if it does not adversely impact or jeopardize any threatened or endangered species inhabiting the river or dependent on river resources. Such species include humpback chub, and bald eagles.
- 8) Research--All scientific research will be in compliance with the research guidelines for the National Park Service and Grand Canyon National Park. To ensure compliance, researchers using the Colorado River will be required to make research available to the National Park Service in a timely manner.
- 9) Pre-trip Information--Provide NPS-approved trip information to confirmed clients of park concessioners which accurately describes trip size, trip length, and boat capacity. Concessioners will be required to provide this information to all passengers, thus aiding the planning process by comparing visitor trip expectations to their actual experiences.
- 10) Crowding and Congestion--If desired, parties will have the opportunity to avoid crowded areas and/or attraction sites, regardless of season, and find other places they do not have to share with any other group. Within existing user day allocations and seasonal distribution patterns, river users must expect to share high-use areas with at least one other group during the primary season. If deemed necessary and functionally effective, a computerized launch model may be used to reduce the frequency of trip contact to levels consistent with the park's general objectives of reducing crowding at attraction sites and of reducing competition for overnight camps.
- 11) Health, Sanitation, and Water Quality Guidelines--Implement and enforce all state and local public health and sanitation standards for all trips on the river. Maintain, to the extent possible, water quality in side streams and river to comply with state, county, and national health standards.
- 12) Commercial Guide Education--Continue to encourage concessioner support and guide participation in a yearly, park-sponsored Guide's Educational Seminar. This will enhance knowledge of park regulations and Annual Commercial Operating Requirements, as well as enhance their knowledge of the natural and cultural history of the park and the river corridor.
- 13) Spectrum of Opportunities--Maintain the opportunity for visitors to select commercial or noncommercial river trips offered on a variety of watercraft powered either by oars or motors.

IV. SUMMARY OF MANAGEMENT CHANGES SINCE IMPLEMENTATION OF THE  
1981 COLORADO RIVER MANAGEMENT PLAN (CRMP)

Following is a brief summary of policy, regulatory, and administrative changes that have been or will be instituted as part of the Colorado River Management Plan revision.

Subject/Change: Guide Certification

Implementation Date: 1988 Primary Commercial Season

Duration: Permanent

Policy Description: All commercial guides carrying passengers for hire on the Colorado River through Grand Canyon National Park will be required to pass a written exam based on the Annual Commercial Operating Requirements.

Subject/Change: Limit on Commercial Trip Size

Implementation Date: 1987 Primary Commercial Season

Duration: Temporary

Policy Description: The 1981 Colorado River Management Plan established an upper limit of 36 commercial passengers traveling and camping together on a commercial river trip. During the 1987 and 1988 primary commercial river seasons that limit was raised to 40 passengers on a temporary basis. Based upon evaluation of all input related to crowding and congestion problems in the river corridor during the Primary Season, the limit is restored to 36.

Subject/Change: Commercial Maximum Trip Speed

Implementation Date: 1989 Commercial Season

Duration: Permanent

Policy Description: Maximum trip speed allowed shall average no more than 40 miles per day and may not travel farther than 50 miles in any one day except in an emergency or when necessitated by water releases from Glen Canyon Dam which create unforeseen travel requirements.

Subject/Change: Commercial Deadhead Trips

Implementation Date: 1990 Commercial Season

Duration: Permanent

Policy Description: Commercial trips traveling downriver with empty boats for the purpose of picking up passengers at Phantom Ranch or Whitmore Wash will

required to expedite travel to those destinations. These boats will not be allowed to stop at attraction sites, and will be required to use smaller, less popular camps. On days that deadhead trips depart Lees Ferry, the number of passengers being picked up downriver will be counted against that day's commercial passenger launch limit.

Subject/Change: Commercial Secondary Season Use

Implementation Date: 1989 Commercial Secondary Season

Duration: Permanent

Policy Description: This plan awards all historical users their average allocation from October 1, 1981 through April 30, 1987. If a company failed to average over 300 user days, they were allotted a base allocation of 300 user days. All 20 companies have been given an equal share of the remaining user days, and the minimum user days allocated per company is 343.

Subject/Change: Administrative Charges for Noncommercial Users

Implementation Date: 1990 Noncommercial Season

Duration: Permanent

Policy Description: Applicants to the noncommercial waiting list will be required to pay \$25 in order to be placed on the list. All trip leaders will be required to pay \$50 upon return of their noncommercial river trip permit application to the River Permits Office. Both charges will be non-refundable and non-transferable. These charges are being established by authority of 36 CFR 71.10, Sec. 1-6, Special Recreation Permits and Special Recreation Permit Fees.

Subject/Change: Scheduling of Noncommercial Launch Dates

Implementation Date: 1990 Noncommercial Season

Duration: Permanent

Policy Description: Noncommercial launch dates will be scheduled two years in advance. Each year a sufficient number of waiting list applicants will be contacted in order to fill available launch dates for two years (Primary and Secondary Seasons).

Subject/Change: Noncommercial Supplemental Launches and Resultant Effects on Commercial Launch Calendar

Implementation Date: 1988 Noncommercial Primary Season

**Policy Description:** In order to more fully utilize the existing noncommercial allocation in the Primary Season, 38 additional noncommercial launches have been added. Beginning in the 1989 Noncommercial Primary Season, one supplemental launch will be scheduled per week. On the supplemental launch day, the commercial launch limit will be held to 134 passengers. During the Secondary Season, 12 additional launches will be scheduled.

**Subject/Change:** Noncommercial Continuing Interest and Participant Rules

**Implementation Date:** 1990 Noncommercial Season

**Duration:** Permanent

**Policy Description:** All applicants to the noncommercial waiting list will be allowed to miss one continuing interest deadline and may participate in one noncommercial river trip other than their own for the duration of the time they are on the list.

**Subject/Change:** Call-in System/Filling of Open Noncommercial Launch Dates

**Implementation Date:** 1990 Noncommercial Season

**Duration:** Permanent

**Policy Description:** Any noncommercial date in the upcoming season which is not filled by the initial launch system, or which opens due to cancellation, will be filled by the River Subdistrict Office. The office will contact applicants at the top of the list by phone and/or in writing. If a date is not filled by either of these methods, the date may be claimed by anyone on the waiting list under the Call-in System Guidelines, as defined in Appendix D of this document.

**Subject/Change:** Noncommercial Deferral Policy

**Implementation Date:** 1990 Noncommercial Season

**Duration:** Permanent

**Policy Description:** Noncommercial waiting list applicants will not have the option of deferring their launch date by one year.

**Subject/Change:** Noncommercial User Day Pool

**Implementation Date:** 1989 Noncommercial Primary Season

**Duration:** Permanent

Policy Description: Noncommercial user days which become available due to trips with fewer than the maximum allowed participants or river days will become available through an NPS administered pool. As sufficient days become available, additional noncommercial launches will be scheduled as supplemental launches throughout the Primary and Secondary Seasons.

Subject/Change: Lower Gorge Management

Implementation Date: January 1990

Duration: Temporary pending development of Colorado River Lower Gorge Management Plan.

Policy Description: Use in the lower gorge below Diamond Creek will be monitored and regulated to determine future management needs. Interim guidelines have been designed to regulate use coming upriver from Lake Mead during development of a comprehensive Colorado River Lower Gorge Management Plan. These Guidelines are contained in Appendix F of this document.

Subject/Change: River Trips Conducted for Research Purposes

Implementation Date: December 1989

Duration: Permanent

Policy Description: Research trips conducted on the Colorado River will be required to submit research proposals and justifications for each trip member's participation prior to launch. Following completion of each trip, a brief report of trip activities must be submitted to Grand Canyon National Park in a timely manner. Published research results must be submitted to the park as soon as they become available to the researcher.

## V. SUMMARY OF 1987/1988 COLORADO RIVER MANAGEMENT PLAN REVIEW

Included in this section is a brief summary of the review process and public involvement plan that has been implemented since the initiation of the revision of the Colorado River Management Plan.

### 1987

March - CRMP review process commences with notification of over 4000 individuals, including media, interest groups, congressional delegations, and cooperating agencies.

June through July - Planning Guides mailed to over 1000 interested individuals to participate in identification of major issues.

July - Scoping session with advisory group comprised of river managers, recreation and social researchers and NPS managers. Session designed to target primary issues and potential changes to 1981 plan.

September - Due to the magnitude of interest and volume of comments (115 letters up to that date), the decision to expand and extend the revision process was announced.

September - Meetings with Grand Canyon commercial river guides in Flagstaff and Marble Canyon, Arizona to discuss guide certification program, resource management programs, and boat capacities. Approximately 50 were in attendance. December 1988, was established as the target completion date.

October - First meeting with park's Concessioner Steering Committee at Marble Canyon, Arizona. Contact and discussion with elected representatives of Colorado River commercial outfitters, including representatives from small, large, old, new, motor, and oar companies.

October - River Rendezvous, Telluride, Colorado. Approximately 200 people contacted, comprised primarily of noncommercial boating interests.

October - Annual Colorado River Concessioner's Meeting, Grand Canyon National Park. Issues discussed with the park's twenty commercial outfitters and company representatives.

### 1988

January - The mailing list exceeded 1,000 names of individuals and organizations interested in being involved in the review process. One hundred fifty written comments had been received, and the targeting of issues of greatest concern was begun. Thirty additional noncommercial launches ("supplemental launches") were added to the 1988 calendar on a trial basis.

January - Guide Certification Program instituted as an amendment to the Annual Commercial Operating Requirements.

February - Western River Guides Association Meeting, Denver, Colorado.

March - CRMP Issue Workbook developed from public comment and input and mailed to those on mailing list who requested one (approximately 400).

April - First public meeting in Flagstaff, Arizona. Approximately 34 people took advantage of workshop and formal comment opportunities.

May - Public meetings in Denver, Colorado and Reno, Nevada with about 50 people participating.

June - Over 50 completed workbooks returned by review/comment deadline.

July - Meeting with Concessioners' Steering Committee to discuss Draft Preferred Alternatives.

August - Meeting with Constituent Advisory Committee to discuss Draft Preferred Alternatives.

August - Draft Preferred Alternatives mailed for public review.

October - Attended River Rendezvous in Telluride, Colorado. Approximately 30 people contacted.

November - Draft 1988 Colorado River Management Plan distributed to over 500 individuals and organizations on mailing list. Draft open for comment for 30 days, until December 9, 1988.

December - Comment period extended to January 20, 1989.

COLORADO RIVER MANAGEMENT PLAN

APPENDIX A

RESOURCE MONITORING PROGRAM

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# COLORADO RIVER MANAGEMENT PLAN

## APPENDIX A

### RESOURCE MONITORING PROGRAM

#### I. INTRODUCTION

To fulfill its congressional mandate to protect all resources, the National Park Service (NPS) must keep pace with dramatic changes in the dynamic system of the Colorado River. Effective, efficient management of the many resources in the Colorado River corridor must be based on consistent, long-term monitoring data which have been carefully collected, appropriately analyzed, and thoroughly considered. The dynamic nature of the river corridor and recent advances in technology require this monitoring program to be periodically evaluated, updated, and integrated using modern data management practices. This portion of the CRMP summarizes the on-going and proposed monitoring activity, on which the next revision of the CRMP will be based.

#### A. The Need for an Integrated Approach to Resource Management

The management objectives of the CRMP require identification and protection of specific river corridor resources. Effective and rigorous resource management must be based on an integrated, long-term monitoring and research program. Monitoring methods and management options will be subject to external review, and a standardized data management system will be used. In the future, several tasks will be accomplished: 1) resource assessment of the monitoring issues identified here will be initiated or continued; 2) baseline resource conditions will be assessed and relevant literature compiled for each major resource issue; 3) a standardized, coordinated, computerized data management system will be developed to store and analyze all river resource data and will be used to identify significant departures from baseline resource conditions; and 4) an integrated, long-term monitoring plan will be developed and externally reviewed to integrate baseline data, assess resource changes, and direct management decisions. The monitoring program presented here is also supplemented by the Limits of Acceptable Change (LAC) monitoring approach, as described in Appendix B.

The NPS will consult with a professional data-base manager to develop the data base system, and this data management system will be on line before January 1, 1990. Analyses, graphics and other statistical products will contribute substantially to interpretation of monitoring data and will be used in annual and summary monitoring reports.

External and in-house review of monitoring methodology and management options will improve the scientific integrity of management approaches and actions. Recognized experts in the fields of water quality, public health, wildlife and habitat management, archaeology, recreation sociology, and systems analysis will be contacted as needed to review the monitoring methodology for each monitoring issue, the long-term monitoring program, as well as to examine management options.

## B. Contents and Schedule of Reports

Resources requiring identification and protection include natural, cultural, and experiential river corridor resources. A separate monitoring statement has been developed for each major management issue and each statement will be reviewed by qualified scientific experts in that field. A baseline status report will be prepared for each resource issue by January 1, 1990. This baseline report will include a comprehensive literature survey and history of action on each resource, as well as any data pertaining to evaluation of resource quality.

Monitoring of river corridor resources will take place at regular intervals, with an annual NPS monitoring river trip in the fall/winter of each year. In some cases, pre-season versus post-season evaluations of visitor impacts may be necessary. The annual monitoring report will be written by February of each year, reviewed externally, and the findings made available to the public upon request. The annual monitoring report will serve to update managers on the status of resources, introduce any changes in the monitoring program, and identify new issues which require management attention.

A summary monitoring report will be prepared for any major revision of the CRMP, summarizing the information contained in the annual reports. These reports will be prepared by the Division of Resources Management and Planning.

In addition, within two years of implementation of the CRMP, a long-term monitoring and research plan will be designed to integrate management concerns and perspectives on all river corridor monitoring efforts, data compilation, and statistical analyses, and it will suggest appropriate methodologies for development of management alternatives. This long-term plan will be reviewed externally and within the NPS. This long-term plan will confer a broad scientific perspective on the CRMP monitoring program and will strengthen the integrity and defensibility of future management decisions made by the NPS in Grand Canyon National Park.

## C. Management Actions

The long-term monitoring and research plan will address the implementation of management decisions which are triggered when a change in resource status reaches unacceptable levels. The scientific community can assist the NPS regarding the need for and range of management options. Within the constraints of statistical decision-making, the standard value used for judging the significance of a deviation from a given baseline is  $p = 0.05$ , and a change of 0% to 5% (depending on the resource) from the baseline value is considered an unacceptable level of change. Increased variance will also be used to evaluate changing status of resources. These statistical indicators will be used to evaluate change in resource status away from baseline conditions throughout the monitoring program. The annual and summary monitoring reports will document trends (nonsignificant changes or changes of less than the pre-established percentage) to allow NPS managers to distinguish incremental changes above  $p < 0.05$  (e.g. the  $p < 0.10$  level), and these increments will serve as indicators of potential or developing problems.

When management action is merited through monitoring data and has been verified by on-site inspection, a range of management options will be considered by NPS resource management and administrative staff. Consequences of each management option will be evaluated as well. The management problem, management options, and consequences of each option will be summarized and evaluated by internal and external review and, where necessary, through the process mandated by the National Environmental Policy Act (NEPA). Where possible, management options will be developed to maintain resource availability to the public by considering alternatives to visitor access reduction; however, the goals of the CRMP are maintenance of resource quality, and degradation of resources may require reduction of public access to facilitate a resource recovery program.

When indicated, management action will be taken following completion of the review process. The success of management action will be evaluated through continued monitoring of the affected resource using the methodological protocol previously described.

## II. RESOURCE MONITORING ISSUES

### RESOURCE MONITORING ISSUE 1: LISTED, THREATENED, ENDEMIC, AND ALIEN SPECIES

The population status of listed, threatened, endemic, and alien species is of primary importance to the park. Information on these species will be compiled and updated in the annual and summary monitoring reports. In several cases, data can be gathered from on-going studies sponsored by other agencies, however, some species will require examination in the field by staff or other qualified researchers.

#### Listed Species

Humpback Chub and Peregrine Falcon: Populations of these endangered species are currently under study in the park. Literature and data on population dynamics, habitat requirements, and distribution in and near the park will be gathered from on-going studies and summarized in annual CRMP reports on the status of important listed, threatened, endemic, and alien species. Consultation with the U.S. Fish and Wildlife Service (USFWS) will be initiated immediately, when applicable, to comply with Section 7 of the Endangered Species Act of 1973.

Wintering Bald Eagle: The Southern Bald Eagle (Haliaeetus leucocephalus) is federally listed as a rare and endangered subspecies. Wintering bald eagles have been observed in Marble Canyon since 1984, and the population has increased dramatically since 1986. In March, 1987 more than 18 individual bald eagles were observed in a single observation at the mouth of Nankoweap Creek. The period of eagle occupation corresponds roughly with the trout spawning period. From observations made at Nankoweap Creek in January, 1988, wintering bald eagles are extremely sensitive to the presence of humans and fly from foraging areas when humans are within 0.3 miles.

More information is needed on the presence of wintering bald eagles in Grand Canyon National Park, and a research program is currently being developed by the NPS (see Addendum A). In addition, an informal consultation with the USFWS will be initiated to comply with Section 7 for bald eagle and other rare and endangered species in the park following the 1988/1989 winter observation period.

#### Threatened Species

The status of all threatened species will be documented in the annual CRMP monitoring report. For example, the current status of the Colorado River otter (Lutra canadensis sonora) in the park is unknown. A recent study by B. Spicer of the Arizona Game and Fish Department found no evidence of this species in the park; however, several observations have been recorded and scats have been located in the river corridor during the last decade. Ranger patrols and other river users will be informed of the need for data on this species. A literature survey and any recent information on this species will be included in the summary CRMP monitoring report.

Similar attention should be devoted to the small population of the Gila monster (Heloderma suspectum) which inhabits the lower Grand Canyon below Colorado River Mile 208, and to the populations of Traill's Flycatcher and Bell's Vireo.

#### Endemic Species

The Colorado River corridor in the Grand Canyon hosts several endemic plant and animal species, such as Flaveria macdougallii, and the Grand Canyon rattlesnake, (Crotalus viridis abyssus) which are not federally listed. The taxonomic status of the collared lizard (Crotaphytus spp.) in the Grand Canyon is also unknown and is worthy of further investigation. Research on these and other potential endemic species will be encouraged by the NPS. Data on these and other endemic species will be compiled and presented in the baseline, annual, and summary monitoring reports.

#### Alien Species

Numerous alien species occupy the river corridor and, for the most part, their population dynamics are unknown. Alien species of primary importance include salt cedar, camel-thorn, several Bromus grasses, Russian olive, Chinese elm, white and yellow sweet clover, alfalfa, and other plant species; river "shrimp" (Gammaris lacustris), rainbow and other trout, striped bass, carp, and other fish species; house sparrows, and other vertebrates. The park will determine the rate of population change for alien species. Such a determination will be based on data from on-going studies and periodic surveys of the flora and fauna in the river corridor. The population status of each major alien species will be detailed in the baseline, annual and summary monitoring reports. Management actions will be developed, reviewed, and presented in the CRMP summary report.

In addition to listed, threatened, endemic, and alien species, the NPS monitoring program will periodically evaluate the status of the river corridor habitat, including beach campsite availability and size; the distribution, cover and change in vegetation along the Colorado River and its tributaries; and changes in xeric sites. So too, the population status of indicator species will be pursued. For example, populations of the side-blotched lizard (Uta stansburiana), riparian obligate bird species, and/or small mammals may be used to evaluate ecosystem changes. These data will be compiled and presented in a baseline report and updated for the summary monitoring report.

#### RESOURCE MONITORING ISSUE 2: CAMP AND ATTRACTION SITE QUALITY

Trailing, refuse accumulation, and the destruction of vegetation and cultural resources is a perennial problem in the river corridor. Sites historically prone to visitor use impacts are listed in Table 1. These sites, as well as others which may sustain high levels of use in the future, require an active program of photo documentation, baseline data accumulation, and monitoring.

The site quality monitoring program will involve the following steps:

- 1) Baseline data will be compiled for each site. Existing information.

photographs, and maps will be compiled for each site to serve as the 1990 baseline, against which future change will be measured. These baseline data will include location, slope and aspect, parent rock type, sand color (in beach areas), amount and type of vegetational cover, flora and fauna of special importance (listed, threatened, endemic, or alien species), type of site (campsite, attraction site, or other), extent of impacts (trampling, trailing, rock movement and destruction, litter and waste accumulation), and a detailed map of each site. At each site a comparable low/no-impact site will be established to serve as a control against which future changes will be evaluated. If these baseline data are not currently available, data will be gathered and compiled by qualified personnel.

2) A use area map will be developed for each site, to be used to document present conditions and to identify critical locations for monitoring. For example, the camping area at a beach camp site should be mapped, and the impact area calculated for comparison through time. As another example, trail width and depth may be measured at 30 pre-designated sites along an attraction site trail and compared over time to evaluate trail area increases.

3) Impacted sites will be monitored through time during ranger patrol river trips. The map previously prepared for each site will be used to evaluate and/or measure changes in the field. Fire pits and fractured rocks will be counted, litter accumulation will be assessed through predetermined transects, and sand color in the heavily used areas will be determined using a set of grey cards. Data will be compiled following the patrol trip and entered into the pre-existing, computerized data base.

4) Management priorities will be established by ranking sites according to level of impact: Sites with the highest levels of impact will receive immediate management attention, as compared to sites with low impact levels. High impact sites will be monitored at yearly intervals, while low impact sites will be monitored at 2 to 3 year intervals. Patrol rangers will visit all high- and low-impact sites over the course of a year and report any pronounced changes in resource quality at any site. However, actual monitoring/assessment activity at low impact sites will take place at 2 to 3 year intervals. Improved protection and recovery of damaged attraction sites will be assured by establishing management priorities for each site and by providing sufficient time for an evaluation team to complete an adequate assessment of each site. Thus, all high-impact sites will be monitored each fall, but low-impact sites may only be evaluated every other year.

5) A report on the status of each site will be completed for the annual summary CRMP monitoring report. This report will document management actions taken, and recommendations for future management action based on the results obtained during the monitoring program.

6) If impacts are significant and/or exceed a pre-designated percentage (not to exceed 5%) of the 1990 baseline level, management action will be taken. This decision will be announced publicly through press releases, at constituent meetings and will be posted at Lees Ferry, Phantom Ranch, and Pearce Ferry. Depending on the severity, urgency, and magnitude of the problem, management action may consist of any of the following: a) voluntary

reduction in use; b) reclamation activity directed by NPS staff, and/or; c) administrative closure of specified camps, attraction sites, or beaches until recovery to the 1990 baseline state has occurred.

Reclamation activities of degraded areas may include litter reduction, trail work, and/or revegetation of selected sites by NPS staff and volunteers. Efforts currently underway have been successful and will be continued.

7) Continued monitoring will assess recovery rates of managed sites and will be used to evaluate the duration of management action. Completion of management action will be announced publicly.

8) The management of upper Marble Canyon (Mile 0 to Mile 13) entails special considerations due to conflicting use patterns and multiple jurisdictions. The use of the Colorado River shoreline in upper Marble Canyon by fishermen has increased sharply in recent years. Sanitation and litter accumulation are worsening, and fishermen have been using beach camps also required by river runners. With major river camps destroyed by debris flows at Miles 18 and 19, and with camps at 6 Mile Wash, Badger Creek, Soap Creek, Salt Water Wash, and 13 Mile Camp often preempted by fishermen, few camps remain in the critical first-day reach for noncommercial and commercial river parties. Conflicts between fishermen and the river running parties are expected to worsen in the near future.

Use levels, site degradation, and waste accumulation on these beaches will be documented on a monthly basis to at least Mile 8. Rigorous efforts will be undertaken with the Navajo Tribe concerning management of the affected reach, and the success of this management effort will be reported in the annual and summary CRMP monitoring reports.

TABLE 1: Camps and attraction sites in the Colorado River corridor in the Grand Canyon with moderate to high levels of estimated use-related impacts.

\* Type of Impacts: A = attraction site with trailing; C = campsite; D = departure site; F = fishing-related impacts (waste and trailing); H = hiking-related impacts; R = rapid scouting and trailing

\*\* Level of Impact: L = low, M = medium; H = high; estimated from current observations

"R" or "L" in Mile column indicates river right or river left

SITE	MILE	TYPE OF IMPACT*	ESTIMATED LEVEL OF IMPACT**
Lees Ferry Area	0.0R	A,C,D,F	M
Upper Marble Canyon	1.0-13.0L,R	H,F	M-H
4-Mile	4.0L	H,F	H
6-Mile	6.0R	C,F	M-H
Jackass Canyon	8.0L	H,F	H
Salt Water Wash	12.0L	H,F	M
19 1/2-Mile	19.5L	C	M-H
North Canyon	20.0R	C,A	M
24 1/2-Mile	24.5L	C	M-H
South Canyon	30.5R	C,A,F,H	M-H
Redwall Cavern	33.0L	A	M
Martha's Camp	38.4L	C	M-H
Buck Farm Canyon	41.0R	C,A	M
Royal Arches	41.5R	C,A	M
Anasazi Bridge	43.0R	A	H
President Harding Camp	43.9L	H,A	M-H
Triple Alcoves	46.5R	C,A	M
Saddle Canyon	47.0R	C,A	H
Nankoweap Area	52.0R	C,A	H
Kwagunt Canyon	56.0R	A	M
Little Colorado River	61.0L	A	H
Carbon Creek	64.5R	C,A	M
Chuar Canyon	65.3R	C,A	M
Palisades Delta	65.5L	A	M
Tanner Canyon	67.5L	A,H	H
Cardenas Creek	71.0L	C,A	M-H
Furnace Flats	71.2R	A	M
Unkar Delta	72.3R	C,A	M-H
Red Canyon	76.5L	C,R,H	M-H
Cremation Camp	87.5L	C	H
Phantom Ranch	88.0R	A,D,H,F	M-H
Pipe Creek	89.0L	D,H	M
Monument Creek	93.0L	C,H	H
Hermit Creek	94.0L	H	H
Crystal Creek	98.0R	C,R	H
North Bass Camp	108.0R	C,A	M-H

SITE	MILE	TYPE OF IMPACT*	ESTIMATED LEVEL OF IMPACT**
Shinumo Creek	108.5R	A,F	H
Garnet Canyon	115.0L	A,H	M-H
Upper Royal Arch Creek	116.5L	H	M
Elves Chasm	116.5L	A	M-H
Blacktail Canyon	120.0R	C,A	M-H
Forster Canyon	123.0L	C	M
Galloway Canyon	131.8L	C,A	M-H
Stone Creek	132.0R	C,A	M-H
Tapeats Creek	133.5R	C,A,F,H	M-H
Thunder River/Tapeats Cave	133.5R	C,H	M-H
Surprise Valley	136.0R	H	M
Christmas Tree Cave	135.4R	A	M
Deer Creek Area	135.8-136.3L&R	A,C,H	H
Poncho's Kitchen	138.0L	C,A	H
Kanab Creek	144.0R	A,H	L-M
Olo Canyon	145.0L	C?,A	L-M
Matkatamiba Canyon	148.0L	A	M-H
Slime Canyon	155.0R	A	L-M
Havasu Canyon	157.0L	A	H
National Canyon	166.5L	C,A	M-H
Mohawk/Stairway Cyns.	171.5L&R	C,A	M
Fern Glen Canyon	168.0R	C,A	M-H
Lava Falls	179.0L&R	R	H
Helicopter Pad	87.0L	D	H
Whitmore Wash Trail Area	187.5R	A,H,D	H
Granite Park	208.5L	C	H
Granite Park Springs	208.7L	A	M
220 Camp	220.0R	C	H
Diamond Creek	226.5L	D	H
Travertine Canyon	229.0L	A,C	H
Spencer Canyon	246.0L	A,C	M
Surprise Canyon	248.0R	A,C	M
Bat Towers	266.3R	A	M
Rampart Cave	274.5L	A	M-H
Pearce Ferry	279.5L	D	H

### RESOURCE MONITORING ISSUE 3: VISITOR EXPERIENCE IN THE RIVER CORRIDOR

The challenge and thrill of the Colorado River's many rapids have made river running in the Grand Canyon a much sought-after experience. Summer use is strongly dominated by commercial concession-operated trips. Spring, autumn, and winter use is predominantly enjoyed by noncommercial parties. To balance the many and different demands for river recreation, this plan recognizes the value of a "Recreational Opportunity Spectrum," in which various kinds and lengths of commercial and noncommercial river trips can take place, depending on the season and historical use patterns.

To clarify the many conflicting viewpoints regarding use of the river corridor, visitor experience will be evaluated through a comprehensive sociological monitoring program during the period of baseline data compilation. This evaluation will be designed and implemented by qualified recreation sociologists. "Visitor experience" should be defined to permit management of use levels in the Grand Canyon. Visitor experience depends on individual preconceptions and expectations, not simply on visitor satisfaction. Present evidence suggests that visitor trip preferences and expectations have changed and will continue to evolve. Scientific investigations will be directed at determining which components of visitor experience are manageable and the optimal values of those experiential qualities. Some of the components of visitor experience include:

- a) the number of contacts with other parties
- b) trip size
- c) trip length
- d) boatman qualifications
  - 1) guiding skills
  - 2) interpretation skills
  - 3) safety skills
- e) crowding at attraction sites
- f) camping beach quality and size
- g) sanitation

Each component will be evaluated. The sociological monitoring program will also include a thorough documentation of the extensive recreation sociology research conducted in this and other systems. Methodology of this program may include: mailings to passengers and whitewater guides; on-river evaluation and interviews; and experimentation with different types of river trip experiences to determine the importance of key parameters. Results will be compiled into a baseline report within three years of implementation of the CRMP.

#### RESOURCE MONITORING ISSUE 4: WATER QUALITY IN THE COLORADO RIVER CORRIDOR

A comprehensive water resources management plan for Grand Canyon National Park was prepared in 1984. This plan addressed all relevant issues pertaining to maintenance of water quality and public health in the Colorado River corridor. Since the release of that plan, concerns have been expressed over radioactive wastes from tributaries, and at least one new water-borne disease organism appears to have entered the system. The recommendations made in the 1984 Water Resources Management Plan need to be implemented by the park. Effective management of water quality will require: 1) an updated literature review on the water quality in this system; 2) establishment of baseline criteria for river and tributary water chemistry, physical parameters, bacteria, and disease organisms; 3) a monitoring program for the mainstream and major tributaries; 4) development of an integrated data management system for data compilation and ease of analysis of resource status; 5) definition of management options for maintaining water quality in this system; 6) a plan for implementation of management actions; and 7) assessment of effectiveness of management actions.

Essential baseline information regarding water quality in the park will be provided through an integrated sampling program in the river corridor and tributaries. This program will include an assessment of water quality (including bacterial and other disease organism counts) in the Colorado River at three stations (Lees Ferry, Phantom Ranch, and Diamond Creek) for a period of three years at seasonal intervals. Thereafter, one river station (Diamond Creek) should be sampled regularly throughout the year. Major tributaries (the Paria River, the Little Colorado River, Bright Angel Creek, Kanab Creek, Tapeats Creek, and Havasu Creek) should be sampled at base flow and during flooding during the initial 3-year period and resampled at least every other year after that time. Parameters to be sampled are listed in Table 2. Collections should consist of 3 or more separate samples from the main current to provide an estimate of variance at each site, and sampling should conform to accepted standards of the United States Environmental Protection Agency and Arizona State Department of Health.

The Water Resources Division of the U.S. Geological Survey (USGS) in Tucson is presently developing a research plan for assessing water quality in the Colorado River drainage in the Grand Canyon. This research would emphasize the status of physical and chemical water characteristics, major ions, heavy metals, and bacteria and disease organisms in the mainstream and in selected tributaries. In the interest of conserving money and time, the NPS will request access to the USGS water quality data, should such a program be undertaken by the USGS. The project could provide the NPS with pertinent water quality data, and the NPS would assist in development of research criteria, such as sampling sites, sampling regime, replication, and sampling schedule.

TABLE 2: Physical, chemical, and bacteriological parameters for analysis of water quality in the Colorado River corridor in Grand Canyon National Park.

PHYSICAL PARAMETERS	TRACE ELEMENTS
Temperature	Aluminum
Flow	Arsenic
Turbidity	Boron
	Cadmium
	Copper
	Iron
	Lead
	Manganese
	Mercury
	Molybdenum
	Nickel
	Selenium
	Vanadium
	Zinc
MAJOR	RADIONUCLIDES
pH (field and lab)	Gross alpha
Alkalinity	Gross beta
Hardness	Combined Ra 226, 228
Specific conductance	Strontium 90
Total Dissolved Solids	
Chloride	
Sulfate	
Calcium	
Magnesium	
Potassium	
Sodium	
Bicarbonate	
Fluoride	
Silica	
Dissolved Oxygen	
NUTRIENTS	DISEASE ORGANISMS
Nitrate	Fecal coliform
Phosphate	Streptococcal and total coliform
	<u>Shigella sonnei</u>
	<u>Salmonella spp.</u>
	<u>Giardia lambla</u>
	Unidentified podophilic bacterium

## RESOURCE MONITORING ISSUE 5: CULTURAL RESOURCES

Archaeological resources in the Colorado River corridor have received a considerable amount of attention from NPS staff. Many major archaeological sites have been identified along the river, and a site-specific monitoring program has been initiated for some of these. Monitoring priorities have been established on a six-year monitoring cycle in which major sites are monitored annually, and some sites may require no monitoring. The six-year monitoring cycle is adequate for minor sites to allow staff to identify changing resource conditions; however, major sites will continue to be monitored annually. NPS archaeologists have found that visitor impacts and natural impacts to archaeological sites are often interrelated; for example, trailing may cause drainage channels to further expose archaeological deposits. The CRMP identifies the need for additional monitoring activity necessary to ensure that resource managers keep pace with changing conditions.

The same process will be followed for cultural resource monitoring as has been proposed for natural and experiential resources. A site-specific baseline inventory will be completed for each site, including consideration of control sites. The staff archaeologist presently maintains a list of all recorded sites, and the baseline inventory report has already been completed for most of those sites. Monitoring priorities will be established or modified when baseline information has been compiled or when additional information is obtained. Monitoring will be carried out on a six-year cycle, with an annual monitoring report prepared for all major and/or stabilized sites, and with less frequent monitoring of minor sites. A summary report will be prepared for the periodic revision of the CRMP.

Cultural resource data differ from those obtained from other resources by falling primarily into nominal and ordinal categories and, consequently, require the use of nonparametric statistical analyses for interpretation. Within the LAC management approach, no or very low levels of change are acceptable at most archaeological sites. These differences notwithstanding, management decisions will be made in the same fashion as for other park resources. If management action is warranted, options will include stabilization, data recovery, and/or closure to visitation. Several sites have already been stabilized in the river corridor, and closure has been required at several sites (the Anasazi Bridge, the Hopi Salt Mines and the Furnace Flats area).

### III. REFERENCES CITED

- Bennett, P.S. and M.R. Kunzmann. 1987. Organ Pipe Cactus National Monument Biosphere Reserve Sensitive Ecosystems program. National Park Service Cooperative Resource Studies Unit Special Report No. 7, Tucson. 82 pp.
- Grand Canyon National Park. 1984. Water Resources Management Plan. Grand Canyon. 161 pp.

#### IV. ADDENDUM A: BALD EAGLE RESEARCH PROGRAM

The NPS bald eagle research program must be timed to coincide with the wintering/foraging activity period of the eagles (November through March). Questions to be addressed in this plan include:

- a) What is the pertinent literature on bald eagle wintering behavior, habitat requirements, sensitivity to human disturbance, and changes in distribution patterns?
- b) What is the range and duration of wintering bald eagle presence in the Grand Canyon, including upper Lake Mead?
- c) What are wintering bald eagle habitat requirements and are those requirements limiting bald eagle presence in Grand Canyon: 1) Do wintering bald eagles specifically require spawning trout populations in tributaries (a period of observation during which the river is turbid is required here); 2) do dam releases or low-flow years restrict trout access to spawning tributaries or limit eagle foraging success; 3) what is the carrying capacity of this system?
- d) What levels of human presence interrupt bald eagle foraging and roosting behavior?

This research should involve frequent observations of eagle presence at Nankoweap, with several periods of long-term observation to gather foraging data and population dynamics. Special attention should be given to the arrival period in late November and the staging/departure period in February/March.

After these data are collected, a biological assessment will be prepared, in accordance with Section 7 protocol. Should the bald eagle presence continue and impacts indicate a need for mitigation, the NPS will examine management options for minimizing disturbance of the eagles by recreationists. These options and management decisions will be reviewed in consultation with the USFWS office in Phoenix, Arizona.

COLORADO RIVER MANAGEMENT PLAN

APPENDIX B

LIMITS OF ACCEPTABLE CHANGE

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## COLORADO RIVER MANAGEMENT PLAN

### APPENDIX B

#### LIMITS OF ACCEPTABLE CHANGE

##### INTRODUCTION

The "Limits of Acceptable Change" concept was developed by Stanke, et al. It has become an accepted planning scheme, used by the U.S. Forest Service, Bureau of Land Management, and National Park Service for recreational use management.

"Limits of Acceptable Change" identify those levels at which management action will be taken. Their foundation lies in management objectives which are either measurable or based upon some value of the resource or sociological condition.

If a management objective is to be stated, there should also be an evaluation of the alternative means of assuring attainment; otherwise, there is no commitment for accomplishment and no incentive for the public to accept either a lower level means or the limit of acceptable change. By evaluating all alternatives, some should become evidently more favorable and thus, more willingly adopted if necessary. The lowest level of management action and intervention will be the NPS posture in assuring that recreational use impacts are within the "Limits of Acceptable Change".

The accompanying matrix does the following: it states the management objective and the level of change or recreational influence at which management action will be taken; it identifies the various means available for assuring attainment of the stated objective, listed with a brief description of the consequence of each; it prescribes a monitoring program and its objectives, along with the desired form of results and the means which will be employed to evaluate them; and it specifies the relationship of the monitoring program to the "means of assuring attainment". It should be clear that the intent of the matrix is to provide the means of translating a management objective into a management action.

In the temporal "Recreational Opportunity Spectrum" (ROS), use levels and patterns of recent years were used as baseline. Contact levels for each of the periods specified in the ROS are taken from results of research completed in 1976, which are believed to adequately approximate current contact probabilities. Three experience opportunity periods are defined: high and moderate use-level periods within the Primary Season, and a low use-level period within the Secondary Season. The ROS is intended to serve several purposes: to specify objectives for managing visitor experience opportunities; to provide the visitor the opportunity to make clear choices as to the use period that will satisfy their preferences; and give the NPS clearer direction for monitoring and applying management action.

Opportunity classes were developed around current use patterns, with contact/crowding levels that should be in the range of present levels. The purpose is to establish foundations for management and focus for monitoring on the river. Future requirements of the plan will include new sociological research on visitor preferences and actual monitoring results of on river contact and crowding. Future decisions for refinement will be based on public input and sound scientific results.

The following criteria were considered in developing the management objectives: (1) each objective should clearly reflect a specific social, physical, natural, or administrative condition of the Colorado River corridor; (2) each objective should reflect a value which can be altered or influenced by changing management practices; and, (3) each objective should be sensitive to recreational use.

A. Topic	B. Management Objective:	C. Level of Change/Influence at which action is taken:	D. Means of Attainment of Objective:	E. Consequences of Such Action:	F. Monitoring Program:	G. Objectives of Monitoring Program:	H. Desired Form of Results:	I. Evaluation of Results:	J. Relationship of Monitoring to Item C:
1. Recreational Opportunity Spectrum:	1(a). Primary Season (high use period) 6/1-8/15/1. This use period will be managed for higher density use. Density will be managed below those thresholds at which private and commercial boatmen reduce number of attraction sites visited to less than 10 to 14 sites, due to crowding and contacts. During this period of year, demand on the commercial sector is historically greatest (June is peak use month of the year). The commercial customer in most cases brings the least defined set of preferences. High density use will likely have the least impact on this group. The private boater who uses this period assumes higher density-related impacts, assuming they bring expectations for greater solitude.	1(a). High Density Use Period: 1. Launch limits: 166 people/day; 1000 people/week. 11. 1 river contacts/day: 800	1(a). Voluntary Compliance with "no layovers" stipulations and suggested attraction site stop durations. 11. Establish ceiling on trip launches per week. 11.1. Equalize distribution of trip launches throughout the week. 11.2. Equalize distribution of trip launches throughout the week. 11.3. On-river freedoms preserved while some concessions lose preference launch dates. 11.4. On-river freedoms; greater manipulation of concession launch schedules. 11.5. Only two assigned camps but resultant rate of travel. 11.6. Highly restricted/regulate rates of travel. No camp selection. Likelihood of limiting social contacts. 11.7. Reduction of number of trips per week allowed.	1(a). Least restrictive/most freedom to public/concessionalists. Greatest likelihood of non-attainment of objective levels. 11. Leveling of use through period. 11.1. On-river freedoms preserved while some concessions lose preference launch dates. 11.4. On-river freedoms; greater manipulation of concession launch schedules. 11.5. Only two assigned camps but resultant rate of travel. 11.6. Highly restricted/regulate rates of travel. No camp selection. Likelihood of limiting social contacts. 11.7. Limitation on the number of visitors or trips granted access, to assure attainment.	1(a). 1. Sociological Research Program. Results desired by December 1990. 2. Contacts/crowding monitoring program; On-river and between parties; at destination sites; and, Campsites. Results desired prior to annual revision of Annual Operating Requirements.	1(a). 1. Monitor changes in experience/perceptions of use levels. Monitor success at matching visitor with appropriate use period. 2. Indicate whether contact levels on the river (within and between parties) at destination sites and at campsites, are within objective ranges for all use periods. Attractions sites include: South Can., Cavern., Saddle Can., Nankweap Ck., Little Col. River, Phantom Ranch, lower Bass Camp/Shinumo Ck., Elves Chasm, Upper Elves Chasm, Tapeats Ck./Thunder Riv., Deer Ck., Ojo Can., Matkat Can., Havasu Can., Silver Grocto, Blacktail Can., Fern Glen Can., National Can., and Nautiloid Can.	1(a). 1. Range/distribution of compatible experience preferences and perceptions of users during all use periods. 2. Value (with confidence) for contact levels on river (within and between parties); at destination sites, and at camp, including a mean value for 1 of destination sites used for that use period.	1(a). 1. Subjective evaluation as to whether conflicts (resulting from contact) commonly exist between groups and population subsets for a given use period. 2. Sample means within +/- 10% of the mean, 80% confidence level.	1(a). 1. Planning action support. 2. Value outside satisfactory limits will initiate use of the next level for that use period.

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1. Recreational Opportunity Spectrum (continued):	<p>1(b) - Primary Season 1990-91/92 and 8/15-9/30/91. These use periods will be managed for medium density use; levels at which neither commercial boaters make significant reduction in attraction sites visited. Optimum opportunity for up to 14 site visits over the trip.</p> <p>-During this period demand of the commercial sector on the whole is less, affording the opportunity for private boaters and commercial passengers who wish to avoid highest use levels to do so.</p>	<p>1(b) - Medium density use. 1. launch limits: 166 people/day, up to 700 people in a week.</p> <p>11. # river contacts/day: 800</p> <p>Probability of 4 or less contacts/day, with a daily mean of approx. 40 minutes or less within site of less than 65 people.</p> <p>111. # destination site contacts: 800 prob- that other groups will be encountered at 50% or less of the sites visited but Prob. at L.C., Elves Chasm, Deer Ck. increases to 65%, with as many as 70 people; at Havasu Ck. - 90% Prob. with 50-100 people.</p> <p>1v. campsites contacts: 10% of less probability of camping within sight or sound of other groups.</p>	<p>1(b) - Voluntary Compliance with "no layovers" stipulation and suggested attraction site stop durations.</p> <p>11. Establish ceiling on trip launches per week.</p> <p>111. Equalize distribution of trip launches throughout the week.</p>	<p>1(b) - Least restrictive/most freedom to public/concessional. Greatest likelihood of non-attainment of objective levels.</p> <p>11. Leveling of use through period.</p> <p>111. On-river freedoms preserved while some concessions lose preferred launch dates.</p> <p>1v. On-river freedoms; greater manipulation of concession launch schedules.</p>	<p>1(b) - Sociological Research Program. Results desired prior December 1990.</p> <p>2. Contacts/monitoring program: On-river (within and between parties); destination sites; and Campsites. Results desired prior to annual revision of Annual Operating Plans for commercial and private users (October 1 of each year).</p>	<p>1(b) - Monitor changes in experience; preferences; perceptions of use levels. Monitor success at matching visitor with appropriate use period.</p> <p>2. Indicate whether contact levels on the river (within and between parties); at destination sites and at campsites, are within objective ranges for all use periods.</p>	<p>1(b) - Range/distribution of compatible experience preferences and perceptions of users during all use periods.</p>	<p>1(b) - Subjective evaluation as to whether conflicts (resulting from contact) commonly exist between groups and population subsets for a given use period.</p> <p>2. Sample means within +/- 10% of the mean, 80% confidence level.</p>	<p>1(b) - Planning action support.</p> <p>2. Value outside satisfactory limits will initiate use of the next regulatory level for that use period.</p>

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1. <u>Temporal Opportunity Spectrum</u> (continued):	1(c). Secondary Season 10/1-4/30: Optimum opportunity for experience with low density use. Low prob. of either private or commercial boatmen reducing attraction site visits; opportunity for 16 or more site visits over the duration of the trip. -Secondary season visitors will likely have the most defined expectations with respect to crowding and general solitude. 10/1-12/15 is the quietest period with least prob. of conflicts due to the lack of motors and minimal on-river contacts with other groups.	1(c). Low Density Use 1. Launch limits: 12 Effs per week/2 trips/day; 332 people/week. 11. 4 river contacts/day; 80% probability of 2 or less contacts/day. 20% or less of the destination sites. Probability of meeting other groups at L.C., Deer Ck., Elves Chasm and Havasu Ck. remains high (60%) but at lesser densities (less than 40 people).	1(c). Voluntary Compliance with "no layers" stipulation and suggested attraction site stop durations. 11. Establish ceiling on trip launches per week. 111. Equalize distribution of trip launches throughout the week.	1(c). Least restrictive/most freedom to public/concessionalaire. Greatest likelihood of non-attainment of objective if leveling of use through period. 11. On-river freedoms preserved while some concessions lose preferred launch dates. 11. On-river freedoms; greater manipulation of concession launch schedules. 11. Only two assigned camps but resultant rate of travel effects.	1(c). Sociological Research Program. Results desired by December 1990. 2. Contacts/monitoring program: On-river (within and between parties); Destination sites; and Campsites. Results desired prior to annual revision of annual operating plans for commercial and private users (October 1 of each year).	1(c). Monitor changes in experience preferences; perceptions of use levels. Monitor success at matching visitor with appropriate use period. 2. Indicate whether contact levels on the river (within parties), at destination sites and at campsites, are within objective ranges for all use periods.	1(c). Range/distribution of compatible experience preferences and perceptions of users during all use periods. 2. Value (with confidence) for contact levels on river (within parties), at destination sites, and at camp, including a mean value for 1 of destination sites used for that use period.	1(c). Subjective evaluation as to whether conflicts (resulting from contact) commonly exist between groups and population subsets for a given use period. 2. Sample means within +/- 10% of the mean, 80% confidence level.	1(c). Planning action support. 2. Value outside satisfactory limits will initiate use of the next regulatory level for that use period.
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2. Influence of Recreational Use on the Natural Environment:	2. Identify and localize recreational impacts within plant communities.  ZONE DESCRIPTIONS: 3(a). New High Water Zone: This pine community's development is characterized by rapidly proliferating species, such as Tamarix, Salix, Pinus, and Baccharis, as well as slow colonizing species such as acacia and mesquite. Will invade the wetted perimeter, but under managed conditions may be replaced by native species, such as Salix (Stevens, 1988). Extent of Acacia and Prosopis in the NHRZ will depend on seedling establishment and survival (influenced by Glen Canyon Dam).	2. There should be no longterm modification of plant community development as a result of recreational use on areas outside campsites and trails.  Acceptable: Impacts that will recover in one growing season. 3(a). Acceptable impacts: Exclusion of vegetation on camping beaches allowed, due to the dynamic nature of the plant community and the recruitment/survival strategy of plant species. Wood collection in this zone only. Unacceptable impacts: VISITOR use-related encroachment area into vegetated area by more than 10% surface area above baseline. -Human waste deposition. -Fire related impacts to beach sands. -Food waste accumulation. -Rock scars.	2(a). Continue Regulations: Human waste carry-out requirements. Fire pan requirements and fire restrictions. Sanitation and food preparation requirements.  (ii). Education: Encourage use of core area of camping beaches.  (iii). Rehabilitation/re-vegetation of impacted sites, increasing cover of appropriate plant species.  (iv). Cyclic beach closure, to allow vegetation recovery and regrowth for resistance.	2(a). (i). Regulated visitor activities, but resource integrity retained.  (ii). Possibility of localized use, allowing perimeter growth/improvement.  (iii). Some altering of natural scene to protect plantings; plan for prescribed actions required.  (iv). Some vegetative recovery for stabilizing beaches, but increased impacts possible at other camping beaches.	2(a). Campsite area inventory and monitoring program; annual or cyclic assessment.	2(a). Baseline map for each site, including: location; slope and aspect; rock parent type; sand color in beach areas; amount and type of vegetational cover (recruitment and demography); flora and fauna of special importance (listed, endemic or exotic species); type of site (campsite, attraction site or other); and extent of impacts (trampling, trampling, rock movement and destruction, and litter and waste accumulation).	2(a). Measured change in site parameters, using reported measures and statistical analysis.	2(a). Rated into condition class (high, medium, low) based on relative impacts within the population of campsites. This management objective will be revised upon completion of baseline surveys to adopt an acceptable limit on numbers within highly impacted condition classes, by length of the river.	2(a). Regulatory, educational or rehabilitation/vegetation actions taken as indicated annually; closures only after evaluation of local camping opportunities and assessment of expected impacts.

<p>2. Influence of Recreational Use on the Natural Environment (continued):</p>	<p>2(b) - Old High Water Zone (OHMZ): The acacia and mesquite which comprise much of this vegetation zone have declined in growth (Anderson, 1986) and cover (Pucheranelli, 1987), although the community is rather stable. In numbers in mature age classes exceed those of seedlings, and saplings, although recruitment into older age classes probable for mesquite in deep fine grained substrates such as sand and siltly alluvium, and for acacia in Lajus and siltly alluvium.</p> <p>3(c) - Desert Zone: Glen Canyon Dam has had little or no influence on this zone. This ecological community is not resilient and human activities, especially trailing and fire, pose the greatest threats.</p>	<p>2(b) - Acceptable Vegetative Loss: Should occur only as a result of trail management and/or visitor use along one trail.</p> <p>Unacceptable: Site disturbance should not exceed 225 sq. ft. at any site; camping, fires and human waste deposition not allowed. No loss of trees due to human activity. Destruction of dead, standing vegetation. Recruitment of Acacia and Mesquite: No less than a 20% decline in mature age classes between high activity areas &amp; control sites.</p> <p>3(c) - Acceptable: Trailing will be allowed only in the form of one trail to an attraction site; impacts that will recover in one season. Unacceptable: Disturbance should not exceed 225 sq. ft. at any site. No long-term modification of natural plant succession; no fires, wood collecting or deposition of human wastes.</p>	<p>2(b) - (i) - Education - increased efforts to assure that the public concentrates activities in lower zones.</p> <p>(ii) - Rehabilitation and reduction to one trail to localize impacts. Trail definition to the extent that it will be used by the public, allowing some local erosional impacts but causing little or no change to vegetative patterns outside the trail tread.</p> <p>(iv) - Closure and revegetation, to encourage local native species; however, xeric conditions hinder such efforts.</p>	<p>2(b) - (i) - Least impact on the public with possibility of continued impacts on the possibly senescent OHMZ.</p> <p>(ii) - Impacts accepted but localized and limited.</p> <p>(iii) - Same as above but level of trail development may have negative impacts on the primitive character of the area; human impacts localized.</p> <p>(iv) - Loss of freedom to the public and alteration of visitation patterns; local conditions may improve but impacts may shift in unknown ways.</p>	<p>2(b) - (i) - Photodocumentation and monitoring of trailing and site disturbance.</p> <p>(ii) - Acacia and mesquite recruitment and age-class monitoring program (using methods and study areas established by Anderson and Ruffner, 1986)</p>	<p>2(b) - Document levels of impact; rehabilitation efforts and success of rehabilitation.</p> <p>(ii) - Determine whether human impacts have an influence above those exerted by flows induced by Glen Canyon Dam; determine whether a stable age class distribution exists to assure replacement of mesquite and acacia in the OHMZ.</p>	<p>2(b) - Photos with descriptive narratives documenting impacts and rehab efforts and success.</p> <p>(ii) - For control sites and human use areas, numbers of acacia and mesquite by age class; change in density of mature age classes/ 1000 sq. m on pre-established quadrats. Analysis through repeated measures and statistical design.</p>	<p>2(b) - +/- Change at rehab sites; prescribed mitigation for new impacts.</p> <p>(ii) - Hypothesis testing of management objectives: H<sub>0</sub>: Density of adult acacia and mesquite did not decrease significantly with human use; vs. H<sub>a</sub>: Density of adult acacia and mesquite decreased significantly with human use; chi-squared statistics for each site.</p>	<p>2(b) - Education, rehab and revegetation used annually as indicated by monitoring; increased trail definition used only in sensitive areas or in areas of repeated failure of above; closures used only as indicated by data and review of management objectives.</p>
<p>3(c) - Same as above.</p>	<p>3(c) - Same as above.</p>	<p>3(c) - Same as above.</p>	<p>3(c) - Same as above.</p>	<p>3(c) - Same as above, except (iv).</p>	<p>3(c) - Trailing and site disturbance photodocumentation and monitoring program, including xerophyte monitoring.</p>	<p>3(c) - Document impacts and evaluate the success of rehabilitation efforts. Establish a record of recurring social trailing and other impacts. Determine if xerophytic vegetation is stable.</p>	<p>3(c) - Black and white photos at established photopoints with statistical descriptions of impacts and exotic vegetation. Evaluate survivorship of rehab plants.</p>	<p>3(c) - Change at rehabilitated sites; prescribed mitigation for new impacts.</p>	<p>3(c) - Same as above.</p>

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3. Influence of Glen Canyon Dam on Natural Environment; Flow Regime:	Consistent with the 1962 agreement between the NPS and BOR, the position of the NPS with regard to BOR plans of operation and environmental review documents relating to Glen Canyon Dam operations will be to propose an integrated approach to management of all river resources so that one release scenario (that may include such provisions as seasonally fluctuating flow) is adopted that benefits all resources to the greatest extent possible. No one flow regime meets the needs for managing or minimizing impact on resources; this indicates the need for and value of research, as called for by the Sec. of the Interior in his extension of GCS. (The National Park Service will participate in GCS to affirm its mandates to manage and protect these resources since the primary responsibility for Glen Canyon Dam lies with the Bureau of Reclamation)	1) <u>Key Values:</u> (a) - <u>Sediment</u> deposited. Minimize the sediment loss in the riverine system. (b) - <u>Riparian</u> vegetation. Minimize disruption of riparian zone to afford fluvial sediments protection from scouring and manage conditions to allow replacement of riparian aliens w/ native species. Minimize disruption to the established High Water Zone allow colonization by native components of the tributaries and the Old High Water Zone in this unstable community. (c) - <u>Invertebrate populations:</u> Conditions that sustain stable populations of invertebrates. (d) - <u>Humpback Chub:</u> Seasonally fluctuating flows, as verified by research, that meet the needs of the various life history stages of the Humpback Chub. Determine conditions in backwater areas between aquatic and terrestrial life as result of flows. (e) - <u>Visitor Safety:</u> Flows that contribute to safety and experience.	3. Because the NPS does not manage operations of Glen Canyon Dam, it is necessary for the NPS to cooperate in support of GCS and research programs directed at development of an integrated approach to management of all Colorado River resources.	3. Consequences of continued Glen Canyon Dam operations without water release schedules adopted in an integrated approach to management of all river resources. (a). Loss of sediment in the system through erosion, mass wasting (Graf and Schmidt, 1987). (b). Significant disturbance to riparian ecosystem through periodic flooding (as such as 508 reduction of plants in NHWZ, Stevens and Marling, 1985). (c). Potentially reduced populations of invertebrates, which are an important part of food chain for aquatic and terrestrial organisms. (d). Potential lack of habitat needed to support various life stages of the humpback chub. (e). Potential of increased accidents under some release levels. (f). And other effects, known and unknown.	3. NPS will support GCS studies to research and monitor the effects of Glen Canyon Dam operations, specifically, GCS, Part II, and its study of socioeconomics and fisheries, including humpback chub. Other methods of notable worth: (a). Sediment and beach profiles monitoring, methods as in: Dolan, 1974; Ferrari, 1987; Schmidt and Graf, 1987. (b). Soil and vegetation monitoring methods, as in Stevens and Marling (1986), and Anderson and Ruffner (1986). (c). Invertebrate population stability, as in Stevens and Marling. (d). Fisheries, including Humpback Chub, as in Arizona Fish and Game, 1987.	3. Define the effects of Glen Canyon Dam and develop and refine a release schedule that meets the management objective.	3. Results that satisfy concerns expressed in the review by the National Academy of Science.	3. Evaluation that supports management action and decision making, relative to the management objective.	3. Refined range of flow, contribute to management of Colorado River values, and attaining the management objective.



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5. Influence of Man on Cultural Resources:	5. Maintain compliance with National Historic Preservation Act, to mitigate impacts and consider effects of NPS undertakings, including management actions.	5. Any actual or anticipated impacts to cultural resources will initiate management action, as mandated.	5. Step up Plan a. Monitoring and prescribed reestablishment, replotting of use, etc. b. Collection, excavation, or stabilization to prevent loss of resources.	5. Visitor freedom but continued susceptibility/degradation of the resource. b. Manipulation of resource by NPS; protection but lost value of site context. Visitor freedom at site while also obtaining some site data.	5. Photodocumentation of resource status; conducted annually or cyclically, as indicated by site trends. Site mapping and remapping, as needed.	5. Indicate evidence of change/loss of cultural resources.	5. Photos with description narratives on current condition/change/im-pacts. Site maps.	5. Site-specific prescribed action. Non-parametric statistical analysis of data.	5. Detected impacts initiate management action. Subsequent evaluation indicates which level management intervention.
			c. Closure of site following impacts due to public access; or, closure to prevent exacerbation of erosional processes.	c. Lost visitor freedom to site assure protection and preservation.					

A. Topic	B. Management Objective:	C. Level of Change/Influence at which action is taken:	D. Means of Assuring Attainment of Obj. Objective:	E. Consequences of Such Action:	F. Monitoring Program:	6. Trailing Development:	6. Localize the impacts of social trails to minimize the influence of humans on the natural scene, especially in the Old High Water and Desert Zones.	6. No more than one primary trail from a mooring location to a destination site, through the Old High Water and Desert Zone.	6. Confine human use to one defined, evident, primary trail; eliminate other social trails. b. Education effort and programs discussing human impacts and the person-hours required for rehab. c. Close the area and allow rehabilitation.	6. Defined visitor traffic in an area; localized and limited impacts. b. Understanding that will contribute to compliance, lesser amounts of trailing, and resource improvement. c. Loss of access to the public for many years.	6. Photodocumentation of impacts and before and after photos of sites where mitigation/rehab work was conducted.	6. Trailing Development:	6. Localize the impacts of social trails to minimize the influence of humans on the natural scene, especially in the Old High Water and Desert Zones.	6. No more than one primary trail from a mooring location to a destination site, through the Old High Water and Desert Zone.	6. Confine human use to one defined, evident, primary trail; eliminate other social trails. b. Education effort and programs discussing human impacts and the person-hours required for rehab. c. Close the area and allow rehabilitation.	6. Defined visitor traffic in an area; localized and limited impacts. b. Understanding that will contribute to compliance, lesser amounts of trailing, and resource improvement. c. Loss of access to the public for many years.	6. Photodocumentation of impacts and before and after photos of sites where mitigation/rehab work was conducted.	6. 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G. Objectives of Monitoring Program:	H. Desired Form of Results:	I. Evaluation of Results:	J. Relationship of Monitoring to Item C:																																																		
6. Provide documentation of impacts. Provide basis for evaluating the success of rehabilitation efforts. Establish record for recurring social trailing.	6. Black and white photos at established photopoints with descriptive narratives of impacts.	6. +/- change at rehabbed sites; prescribed mitigation for new impacts. Non-parametric statistical analysis of impacts.	6. Initiates action prescribed in C(a). Documentation required for C(b).																																																		

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7. Fisheries:	7(a). Humpback Chub: For conservation of the Humpback Chub, the NPS will cooperate in an interagency effort (with USFWS as lead agency) to protect the Chub and plan for its management, recognizing that the chub can be effected by far reaching activities within the watershed. Much is unknown about the requirements of the Chub, and impacts of other recreational activities are unknown. (b). Sport Fisheries: The status of trout as a resource will be defined to allow the NPS and A2 Fish and Game to cooperate in whatever management is deemed appropriate, including evaluation of concession-guided fishing trips and their impacts.	7(a)(1). Activities will be restricted in known Humpback Chub habitat. (11). All humpback Chub caught by sport fishermen must be released; educational efforts for the release program will be continued. (111). To assist management agencies, the educational effort will be expanded to encourage the public to call in tag numbers and colors and location for each tagged Humpback Chub caught. (1v). As a management agency, the NPS will support further studies of humpback chub.	7. (i). Fishing and activity restrictions at the confluence of the Little Colorado and Colorado Rivers (11). Regulatory means and patrol action. (a)(11). Current restrictions at confluence of Little Colorado seem to be working. Occasional Chub catches at other locations may not indicate a need for new closures, but they support the need for continued educational efforts for releases of the chub. (111). Request for information on caught tagged chub will provide information that may benefit in the future management of the species.	(iv). As a result, NPS will implement recommendations resulting from studies. (b). This may result in limits on fishermen, following consultation and research.	7. (a). Patrol function, conducted on a frequent basis. (b). Review of educational materials; likely when new data available or program initiated. (c). Coordination with Glen Canyon Environmental Studies.	7. (a). Detect violations of species protection closures. (b). Improved educational effort. (c). Ensure survival of Humpback Chub.	7. (a). Violations of area closures and species release laws. (b). N/A	7. (a). Data on incident occurrence for use by management agencies. (b). N/A	7. Closures and educational efforts evaluated and refined.

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8. Aircraft Use:	8. Offer, to the extent possible, a primitive river experience without intrusion from aircraft. Limit, to the extent possible, activities and amounts of aircraft use that would preclude the experiences and managed for under the Recreation Opportunity Spectrum.	8. (a) NPS Operations: Aircraft use below rim level limited to administrative and emergency uses only? Probability of contact at Phantom Ranch Station, where ranger contact available for seeking help. (b) Concession Takeouts: Concession takeouts outside the route described in Public Law 100-91 are unacceptable. Landings may not be made in the park, and any landings made on the Hualapai Reservation cannot be made without permission of the Hualapai Tribe. Probability of contact at highest at Whitmore Wash. (c) Concession Use of Shuttles: commercial river passenger and employees must observe flight ceilings and free zones, as per P.L. 100-91.	8. (a) Emergency Use; helicopter use may be necessary in life-or-death situations. (b) Administrative Use, alternatives to helicopter use may exist. (b) (1) Mitigate impacts by assuring regulations promulgated under Public Law 100-91 are adhered to. (1) Mitigate impacts by routinely maintaining (to Threshold Zone "Stock Standards") The Whitmore Wash trail to assure that options to helicopter takeouts exist (stock and hike takeouts for passengers). (c) Mitigate impacts by assuring regulations promulgated under P.L. 100-91 are adhered to by concessioners.	8. (a) N/A (b) Some impacts possible, but only to carry out the administrative and emergency missions of the NPS.	8. (a) N/A (b) Review process for programmed flights. (b) (1) Patrols and visitor sightings.	8. (a) N/A (b) To limit the use of administrative flights and find alternate means of achieving the same purpose. (b) (1) Detect violations of P.L. 100-91.	8. (a) N/A (b) Flight purpose. (b) (1) Issued "N" numbers, location of incident, date and time. (1) Trail conditions, erosion and washouts, etc.	8. (a) N/A (b) Committee approval of programmed flights. (b) (1) Report to FAA.	8. (a) N/A (b) Alternatives to helicopter flight may be chosen. (b) (1) FAA initiates action. (1) Work is conducted to assure that takeout options exist.
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References:

- Anderson, L.S., and G.S. Ruffner. 1987. Growth and demography of western honey mesquite and catclaw acacia in the old high water line riparian zone of the Colorado River in Grand Canyon. Glen Canyon Environmental Studies Technical Report. U.S. Bureau of Reclamation, Salt Lake City, UT.
- Brian, N.J., and J.R. Thomas. 1984. 1983 Colorado River Beach Campsite Inventory, Grand Canyon National Park, Arizona. Unpubl. report. Division of Resource Management and Planning, Grand Canyon, AZ
- Carothers, S.W., and S.W. Aitchison, eds. 1976. An ecological survey of the riparian zone of the Colorado River between Lee's Ferry and the Grand Wash Cliffs, AZ. Colorado River Res. Ser. Contrib. No. 38, Tech. Report No. 10. Grand Canyon National Park, AZ
- Ferrari, R. 1987. Sandy Beach area survey along the Colorado River in Grand Canyon National Park. Glen Canyon Environmental Studies Technical Report. U.S. Bureau of Reclamation, Salt Lake City, UT.
- Pucherelli, M.J. 1987. Evaluation of riparian vegetation trends in the Grand Canyon using multitemporal remote sensing techniques. Glen Canyon Environmental Studies Technical Report. U.S. Bureau of Reclamation, Salt Lake City, UT.
- Schmidt, J.C., and J.B. Graf. 1987. Aggradation and degradation of alluvial sand deposits, 1965 to 1986, Colorado River, Grand Canyon National Park, AZ. USGS Open-File report 87-555. Glen Canyon Environmental Studies Technical Report. U.S. Bureau of Reclamation, Salt Lake City, UT.
- Shelby, B. and J.M. Nielson, 1976. Use Levels and crowding in the Grand Canyon; Part III, river contract study. Colorado River Technical Report #3, Grand Canyon National Park. 51 pp.
- Stevens, L.E., and G.L. Waring. 1987. Effects of post-dam flooding on riparian substrates, vegetation, and invertebrate populations in the Colorado River corridor in Grand Canyon, AZ. Glen Canyon Environmental Studies Technical Report. U.S. Bureau of Reclamation, Salt Lake City, UT.
- Tunnicliff, B., and S. K. Brickler. 1981. Water Quality Monitoring in the Colorado River Corridor, Lees Ferry to Diamond Creek. Contracted study; Grand Canyon National Park, AZ.
- Underhill, A.H., R.E. Borkan and A.B. Xaba. 1986. "The Wilderness Simulation Model applied to Colorado River Boating in Grand Canyon National Park, USA". Environmental Management Vol.10, No. 3, pp.367-374.
- U.S.D.A., Forest Service. 1985. General Technical Report INT-176. The Limits of Acceptable Change (LAC) System for Wilderness Planning. Intermountain Forest and Range Experiment Station, Ogden, UT.
- U.S.D.A., Forest Service. FSM 4/87 R-6 SUPP 81, Title 2300 - Recreation, Wilderness and Related Resource Management. Wilderness Planning Supplement.
- U.S.D.A., Forest Service. 1982. Recreational Opportunity Spectrum User Guide.
- U.S.D.I., National Park Service. 1978. NPS Management Policies.
- U.S.D.I., National Park Service. 1985. Water Resources Management Plan - Grand Canyon National Park.



COLORADO RIVER MANAGEMENT PLAN

APPENDIX C

COMMERCIAL OPERATING REQUIREMENTS

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I. WATERCRAFT AND CAPACITIES

- A. Those types of watercraft listed below are acceptable. While most current designs have offered a reasonable degree of safety, additional improvements that afford increased safety and comfort of passengers and crew will be strongly recommended. Changes must be approved by the Superintendent.
- B. Capacities - Specific capacities have been set for each company and the particular boats it operates. All capacities are for total numbers of persons on any watercraft, crew included. The capacities are outlined below:

<u>Company</u>	<u>Boat</u>	<u>Capacity</u>
Adventures West, Inc.	S-Rig - 33 ft or 37 ft	17
	G-Rig	20
Arizona Raft Adventures Inc.	Maravia Santana 17 ft	6
	Snout - 22 ft	8
	Havasu - 17 ft	6
	Avon Spirit - 18 ft	6
	C-Craft - 32 ft	18
	Paddle boat (Santana)	7
	Paddle boat (Domar)	7
Arizona River Runners, Inc.	S-Rig - 33 ft or 37 ft	17
Canyoneers, Inc.	C-Craft - 37 ft	23
	C-Craft - 32 ft to 34 ft	20
	Maravia Santana - 22 ft	8
Canyon Explorations, Inc.	Havasu - 17 ft	6
	Riken Aztek - 18 ft	6
	Paddle Boat (Riken)	7
Colorado River & Trail Expeditions, Inc.	S-Rig - 33 ft	17
	Havasu - 17 ft	6
	Leyland - 17 ft	6
	Green River - 17 ft	6
Diamond River Adventures, Inc.	S-Rig - 33 ft or 37 ft	17
	Havasu - 17 ft	6
	Snout - 22 ft	8
Expeditions, Inc.	Tandem Oar Snout - 22 ft	9
	Rogue River - 18 ft	6
	Rogue River - 20 ft	8
	Paddle Boat (Rogue River) 16-18 ft	7

<u>Company</u>	<u>Boat</u>	<u>Capacity</u>
Georgie's Royal River Rats	G-Rig	28
	Green River Triple Rig	16
	10 man raft	5
	10 man triple-rigged raft	15
	S-Rig - 35 ft	17
Grand Canyon Dories	Dory	6
	Maravia Chubasco - 22 ft	8
	Avon Spirit - 18 ft	6
Grand Canyon Expeditions Company	S-Rig - 37 ft	17
Hatch River Expeditions, Inc.	S-Rig - 33 ft	17
Mark Sleight Expeditions, Inc.	S-Rig - 39 ft	18
	S-Rig - 33 ft or 37 ft	17
	Snout - 22 ft	8
	Rogue River - 18 ft	6
Moki Mac River Expeditions, Inc.	S-Rig - 33 ft	17
	Snout - 22 ft	8
	Rubber Crafters - 18 ft	7
OARS, Inc.	Domar Zambezi - 17 ft	6
	Caligari - 17 ft	6
Outdoors Unlimited	Maravia Chubasco - 22 ft	8
	Avon Spirit - 18 ft	6
Tour West, Inc.	S-Rig - 33 ft	17
	S-Rig - 37 ft	18
	Domar Zambezi - 17 ft	7
Western River Expeditions, Inc.	J-Rig - 37 ft	20
	J-Rig - 27 ft	10
	Rogue River - 18 ft	6
SOBEK'S White Water River Expeditions	Modified S-Rig - 37 ft	20
Wilderness River Adventures	S-Rig - 33 ft or 37 ft	17
	Havasu - 17 ft	6
	Snout - 22 ft	8

C. Registration - All watercraft operating on the Colorado River within Grand Canyon National Park will be registered in accordance with the Arizona Boating and Water Sports Law (AGF, Article 5, R12-4-501 through R12-4-505).

## II. EMERGENCY EQUIPMENT AND PROCEDURES

### A. Life Preservers

1. One U.S. Coast Guard approved personal flotation device (PFD) Type I or V for each passenger. Each passenger's PFD will have an identifying mark and will be fitted for that particular passenger and worn only by that passenger for the entire trip. One extra PFD for every 10 passengers or 1 extra PFD per passenger-carrying, oar-powered boat to be carried on the boat (excluding kayaks, canoes, and sportyaks) whichever number is greater. Life jackets must be worn at all times while on the river and kept properly fastened and adjusted to fit. Boatmen and crew may use U.S. Coast Guard approved Type I, III, or V PFDs. Each PFD will be inspected at Lees Ferry for serviceability in compliance with U.S. Coast Guard standards. Unserviceable jackets will not be used. Passengers on kayak support trips may wear Type III PFDs while kayaking.
2. Each boat 16 ft. or greater in length must carry and have available a U.S. Coast Guard approved Type IV throwable PFD.
3. Rafts and boats operating on Lake Mead at night must comply with U.S. Coast Guard running light requirements.
4. A rescue rope throw bag is recommended for each boat.

### B. First Aid

A major first aid kit, as suggested in the attached First Aid Supplement, shall be carried on each trip, with a smaller kit on each additional boat.

### C. Communications and Signaling

1. Emergency signaling equipment will include a signal mirror of the U.S. Air Force type, and a set of orange signal panels, 3 ft. by 10 ft.
2. Additional recommended equipment is a ground-to-air radio transceiver on frequency 122.75 east of Supai, 122.85 east of Whitmore Wash, 124.85 and 134.95 for contacting commercial airliners, and 121.5 EMERGENCY.

### D. Other Emergency Items

1. One extra set of oars must be carried on each oar-powered raft. Two extra paddles are acceptable for inflatable paddle craft. Kayaks and whitewater canoes must have a spare paddle which can be carried on the support boat or on individual boats.
2. One extra motor must be carried for each motorized raft used. Also to be carried are spare parts of the types most commonly found to break and need replacement under river-running con-

- ditions, i.e., propellers, water pumps, shafts, etc.
3. When inflatable rafts or pontoons are used, each river trip will carry an air pump.
  4. Every river trip will carry a boat patching and repair kit.
  5. All motorized craft are required to carry two B-I or one B-II fire extinguishers.
  6. A supply of ropes and canteens should be carried.
  7. Each trip will carry one or more accurate maps or guides of the Colorado River in Grand Canyon National Park.

E. Incident Reports

Any incidents resulting in evacuation from the canyon, personal injury requiring a physician's attention, or property damage over \$100 must be reported to Grand Canyon National Park. Incident forms should be given to a National Park Service ranger at the time of evacuation, to the ranger at Phantom Ranch or Lake Mead, or mailed to the River Subdistrict Office within 7 days of the end of the trip. Incident forms will be supplied by Grand Canyon National Park and carried on each trip (see Supplement H).

F. Helicopter Evacuation (See Supplement E for evacuation procedures)

In the event of an emergency requiring helicopter evacuation and rescue, arrangements will be made for the rescue only by Grand Canyon National Park personnel. The outfitter will be responsible for the cost of the rescue, but may in turn bill the rescued passenger(s) for such rescue costs.

Requests by someone not on the river trip (relative or friend, etc., for family death or other emergency) for helicopter evacuation of a trip passenger will be made through Grand Canyon National Park. The outfitter and/or the person requesting the evacuation is responsible for costs of such evacuations, as indicated above.

III. TRIP LEADER AND GUIDE REQUIREMENTS

A. Certification

The following qualification requirements must be met before guiding or leading a trip on the Colorado River through Grand Canyon National Park.

1. Guide - An individual who meets the following qualifications:
  - a. Must be age 18 or older.
  - b. Must have made at least 6 trips through Grand Canyon National Park on the Colorado River as a boat operator or as an apprentice under a qualified guide, at least 3 of

which must be in the type of craft to be operated with passengers on board. With the approval of the Superintendent, comparable experience on other rivers may be substituted for not more than 3 of the 6 trips. Any exceptions must be approved by the Superintendent on a case-by-case basis. The Superintendent in his sole discretion will determine what constitutes comparable experience.

- c. Must be able to navigate the river.
- d. Must be able to operate the emergency communications equipment carried by the outfitter and know the evacuation procedures.
- e. Must have knowledge of State, U.S. Coast Guard, and National Park Service regulations applicable to boats carrying passengers for hire.
- f. Must have a knowledge of Grand Canyon natural and human history, points of interest encountered, and the ability and willingness to impart this knowledge to passengers.
- g. Must have a working knowledge of the safety aspects and equipment repair procedures for each craft operated.
- h. Must possess a valid first aid certificate equivalent to the "American Red Cross Advanced First Aid and Personal Safety" or current Emergency Medical Technician credential. Current certification in CPR is required.
- i. Must possess a valid Commercial Operating Requirement Certification for guide status.
- j. Must have a working knowledge of all environmental protection equipment and sanitation procedures for river trips in Grand Canyon National Park.

2. Trip Leader - A person whose character, personality, and capabilities qualify him as a responsible leader shall be in charge of each river trip. In addition to meeting the guide qualifications specified above, the trip leader:

- a. Must have made at least 10 total trips through Grand Canyon National Park on the Colorado River as a guide, in addition to the 6 trips required to achieve guide status.
- b. Must be knowledgeable and capable of giving a suitable orientation talk to all passengers throughout the trip. This required orientation will cover life preservers, boating safety, swimming, hiking safety, drinking water, sanitation, and cultural and natural history of the Grand Canyon.
- c. Must hold a valid Commercial Operating Requirements Certification for trip leader status.

B. Resumes

All guides must file updated resume forms (available from the River Subdistrict Office or Lees Ferry) with the River Subdistrict, P.O. Box 129, Grand Canyon, Arizona 86023. Photocopies of current

advance first aid (or equivalent) and CPR credentials must also be submitted with resumes. Resumes will be accepted after sufficient river experience and required first aid training for guide status are completed. Resumes must be updated for trip leader status. Grand Canyon National Park river concessioners will be responsible for verification of resume information prior to hiring an individual as a guide.

C. Commercial Operating Requirements Certification

All guides and trip leaders must demonstrate satisfactory knowledge of the Commercial Operating Requirements by passing the Commercial Operating Requirements Certification examination. Only individuals with valid resumes and current CPR and first aid credentials will be permitted to take the examination. Passing score for guide status is 75 percent. Passing score for trip leader status is 85 percent. Those failing to achieve the required score may be granted a 30-day probationary period during which they may retake the examination. Upon successful completion of the examination, a Guide or Trip Leader Commercial Operating Requirements Certification card will be issued. This card must be available upon request of the Lees Ferry Ranger during the pre-launch checkout. A copy of the Commercial Operating Requirements, to be used as a study guide for the examination, is available at Lees Ferry and the River Subdistrict Office at the South Rim. The test can be administered at either location. The certification card will be valid for three (3) years from the date of issue.

Concessioners are responsible for hiring and operating with qualified guides and trip leaders. Any deficiencies will be documented in concessioner evaluations. Nothing shall prohibit a concessioner from establishing requirements more stringent than those established by the NPS.

IV. ENVIRONMENTAL PROTECTION AND SANITATION

A. Refuse

Cans, rubbish, and other refuse MAY NOT BE DISCARDED IN THE WATER OR ALONG THE SHORE OF THE RIVER, in side canyons, trails, escape routes, or any other portions of the canyon. All refuse material must be carried out. Deposits may not be made at Phantom Ranch, Diamond Creek, Pearce Ferry, or South Cove. Liquid garbage will be strained through a fine mesh screen into the river, and the solids then placed in garbage bags. The trip leader must ensure that all trip members properly dispose of refuse. Crushing food and beverage cans must be done in a way which leaves the beach free of liquids, food, and paper particles.

B. Soap

The use of soap is restricted to the mainstream of the Colorado River only. Use of soap in side streams or within 100 yards of the confluence of any side stream and the main river is prohibited.

C. Portable Toilets

Each boat party must carry a toilet system capable of containing and removing solid human waste from the canyon. The carry-out system described in Supplement B is the minimum allowable. Upon arrival at camp, these facilities will be set up in an area affording reasonable privacy. For groups larger than 26, 2 toilets will be provided (the day-use toilet may be considered a second facility provided it is available at a convenient on-shore location such as near the hand wash containers). The toilet will remain set up until the party breaks camp. Toilet paper must be deposited with human waste. A day-use toilet, as described in Supplement B, MUST be available when the portable toilet is not set up. Urination should occur in the wet sand below the high water line.

D. Fires

Gas stoves (propane, white gas, etc.) with sufficient fuel for cooking are required on all trips. Manufactured charcoal briquettes may be used for cooking. Wood fires may be used for warmth or aesthetics, but not for cooking. From May 1 through September 30, all wood for fires must be carried into the canyon from an outside source. From October 1 through April 30, driftwood from beaches may be used for warming and aesthetic fires. Gathering of wood from standing or fallen trees, dead or alive, is prohibited. This includes introduced species such as tamarisk. All fires (wood or charcoal) must be contained in a fire pan that is at least 432 square inches on the bottom and has a 3-inch-high lip around its edge. Charcoal briquettes may be contained in fire pans 12 inches by 12 inches by 3 inches which are approved during pre-launch checkout at Lees Ferry. All ash and charcoal residue must be carried out of the canyon. The kindling of open fires using gathered wood, charcoal, or similar fuels is prohibited at any time when away from beaches. Gas stoves are required for overnight trips away from the river when cooking is planned.

E. Public Health

Each trip will comply with the requirements found in the Commercial Sanitation and Food Preparation Supplement (Supplement A).

F. Multiple Trails

Multiple trailing and its consequent impact on vegetation and soils comprises a perennial problem at attraction sites and along back-country trails. Guides should stress to their passengers the need

to stay on established trails. All group hikes will be led by a guide familiar with the trail taken.

G. Campsite Impacts

Impacts above the sandy, postdam riparian zone at camping areas continue to be a problem. Desert and old pre-dam riparian plant communities are particularly susceptible to damage and erosion due to trampling. Guides should stress the necessity of conducting camp activities in the more resistant post-dam sandbar areas. Passengers should be instructed not to blaze new hiking routes or sleeping areas in the fragile desert zones.

V. RESTRICTED AREAS

Areas along the Colorado River closed to either camping or visitation by order of the Superintendent (36 CFR 1.5 a), or requiring special environmental regulations include:

- A. Colorado/Paria River confluence to Navajo Bridge - no camping.
- B. Anasazi Bridge - closed to all visitation.
- C. Red Wall Cavern - no camping and no fires.
- D. Nankoweap - special camping regulations (see Supplement F).
- E. Little Colorado River confluence - no camping from Mile 60.5 to Mile 65.0 on the southeast (left) side of the Colorado River.
- F. Hopi Salt Mine - no visitation from Mile 63.0 to Mile 64.5 on the east (left) side of the Colorado River.
- G. Mile 71.0 to Mile 71.3 - Furnace Flats archeological site, north (right) side, no visitation.
- H. Hance Mine - no visitation along the trail from Mile 77.0 (north, right, bank) to and including Hance Mine (closure due to asbestos hazard).
- I. During the primary season, it is recommended that camps in the entire corridor from Hance Rapid to Phantom Ranch be utilized only by trips with passenger exchanges.
- J. Phantom Ranch - Mile 87.0 to Mile 89.25
  - 1. Left bank - 87 Mile Camp (Cremation) is reserved for river trips requiring exchanges at Phantom Ranch. The capacity of the camp is 2 parties. No camping is permitted from the Black Bridge to 1/4 mile downstream from Pipe Creek (Garden Creek).

2. Right bank - no camping from Mile 87.0 to Mile 89.25 except in an emergency. Emergency camping in this area, including Roy's Beach, must be approved in advance by the Phantom Ranger. Wood fires are not allowed at any time in this area. Passengers leaving trips at Phantom Ranch and wishing to camp at either Bright Angel Campground or Indian Gardens must have an overnight permit (which requires advance reservations) for these areas. Permits may be obtained from the Backcountry Reservations Office by writing to Grand Canyon National Park, P.O. Box 129, Grand Canyon, Arizona 86023 (see Section XV).
- K. Bass Mine, Hakatai Canyon - no visitation to the area immediately surrounding the mine, talus slope, and camp (closure due to asbestos hazard).
- L. Elves Chasm - no camping within 1/4 mile of Royal Arch Creek's confluence with the Colorado River or within the chasm.
- M. Deer Creek Falls - no camping on the north (right) side of the Colorado River within 1/4 mile upstream or 1/2 mile downstream of its confluence with Deer Creek.
- N. Matkatamiba - day use only, no camping in the canyon.
- O. Havasu Creek - no camping within one hundred yards upstream and 1/2 mile downstream of Havasu Creek's confluence with the Colorado River. Overnight use is permissible only within the Havasupai Campground. No camping is allowed between Beaver Falls and the Colorado River. See Section XV for reservations at Havasu Campground.
- P. Hualapai Tribal Lands - the left or south side of the canyon above the historical high water line between Mile 165 and Mile 273 is Hualapai Tribal land. Any use of those lands for camping or hiking must be approved by the Hualapai Tribe in Peach Springs, Arizona.
- Q. Other areas as listed on the bulletin board at Lees Ferry.

VI. USER DAY POOL

The policy for temporary loan of user days is as follows:

- A. The user day pool will be administered by the park. All requests must go through the River Permits Office, (602) 638-7843.
- B. Companies may call or write after the 1st or the 15th of each month from May 1 through August 31 to request or donate user days. Requests do not carry over. Donated user days will be evenly distributed among those making requests on the first business day after the 1st and the 15th of the month.

- C. Companies donating user days earlier in the season will have a priority claim for up to the amount donated should they need user days later in the season.
- D. Allocations will not be permitted to be exceeded unless user days are obtained from the pool before the trip begins.
- E. If a company has not used 40 percent of its user day allocation with trips launching on or before June 30, and 60 percent of the allocation by July 31, use for the rest of the season must be substantiated by the 10th of the following month. Unsubstantiated user days will be donated automatically for distribution on the first business day after the 15th of July and August.
- F. User days in excess of 100 not donated to the pool prior to August 31 will be removed from the company's base allocation for the following primary season. This penalty may be appealed in writing by October 15 to the Superintendent providing documented evidence of cancellation of chartered trips.
- G. The first 500 user days donated to the pool will be held by the park for coverage of accidental bookkeeping errors of up to 50 user days per company. This does not increase any outfitter's allocation by 50 user days; it is only a means of covering small accounting errors. On the assumption that not all companies will make such errors, only 500 rather than 1,000 user days are being withheld.
- H. Any concessioner exceeding its adjusted allocation (i.e., base allocation plus any user days obtained from the pool) by more than the 50 user days allowed for accidental bookkeeping errors will be penalized for the entire amount exceeding the adjusted allocation, including the 50 user days allowed for accidental bookkeeping errors. These 50 user days are only provided for administrative errors and do not represent an increase in a company's user day allocation. The excess number of user days will be deducted from the company's current primary allocation for the next operating season, and access to the user day pool will be denied to that company for 1 year. This violation will also be identified in the Annual Review Program under the "Contract Compliance" portion for the particular concessioner involved.

## VII. LAUNCH LIMITATIONS

- A. The maximum number of commercial passengers per trip (travelling and/or camping together) will be 36. In areas of limited campsites, separate trips are encouraged to camp together when no other camps are available.
- B. The daily number of commercial passengers departing from Lees Ferry

shall not exceed 150. Passengers launching between Lees Ferry and River Mile 15 will be included in the total number of passengers launched at the Lees Ferry ramp. After a noncommercial supplemental launch date is established, the commercial passenger limit may not exceed 134.

The number of passengers to be picked up downriver for deadhead trips to Phantom Ranch or Whitmore Wash will be included in the 150 passenger limit on the day of the boat departure from Lees Ferry. Deadhead trips will be required to adhere to crew limitations as specified in the Annual Commercial Operating Requirements and will be required to expedite travel to the passenger pick up point. Motor trips must arrive at Phantom Ranch within 48 hours from leaving Lees Ferry, and oar-powered trips must arrive at Phantom Ranch on the fourth day. Motor trips deadheading to Whitmore Wash must arrive on their third day out from Lees Ferry. Exceptions to these deadhead trip lengths will be contingent upon adverse water conditions. Deadhead trips will not stop at attraction sites and will utilize small, lesser used camps.

All companies must schedule departures with the River Subdistrict prior to arrival at Lees Ferry. No company will be allowed more than 110 percent of its allocation on the calendar unless it has obtained user days from the pool in excess of 110 percent.

- C. Each boat carrying passengers for hire will have at least 1 qualified guide or trip leader on board. Motorized craft are allowed 2 assistants per boat in addition to the regular guide or trip leader.

Non-motorized trips will be allowed 2 assistants in addition to the regular compliment of guides necessary to directly operate the boats (i.e., one guide per boat). Exceptions will allow for 2 crew on tandem snouts, oar-powered triple rigs, etc.

"Trainees" may be counted as crew provided they are (1) working in the capacity of an assistant on a motor rig as specified above; or (2) operating a boat not carrying passengers for hire. Such craft may have 1 additional assistant for safety and/or training purposes in addition to those specified above.

Any participant other than those described above must be essential to accomplishing the specific purpose of a given trip in order to be considered crew. They must be approved in advance by the Superintendent, and such requests must be submitted in writing at least 2 weeks prior to the launch date.

#### VIII. TRIP LIMITATIONS

- A. Maximum trip speed allowed shall average no more than 40 miles per day and may not travel farther than 50 miles in any 1 day except in

an emergency or when necessitated by water releases from Glen Canyon Dam which creates unforeseen travel requirements. The maximum trip speed will be imposed from Lees Ferry to Diamond Creek.

- B. No vessel shall engage in primarily upstream motorized travel above Diamond Creek.
- C. No vessel shall be propelled by a motor rated in excess of 55 horsepower.
- D. Maximum allowable trip lengths to Diamond Creek are as follows:

Launch Date: 16 APR - 15 OCT ... 18 days  
16 OCT - 30 NOV ... 21 days  
01 DEC - 29 FEB ... 30 days  
01 MAR - 15 APR ... 21 days

IX. SECONDARY SEASON

- A. The commercial secondary season includes launches occurring October 1 through April 30. The user day allocation for this period is 9,344.
- B. One commercial trip is allowed to launch each day. A trip is defined as a group which travels and camps together. No splitting of trips is allowed after the launch. Deadhead boats (boats leaving Lees Ferry without passengers) will be counted as a launch.
- C. Each company receives a base allocation as outlined in Section X for the Secondary Season. Companies must report the number of user days planned for each Secondary Season trip on the schedule by May 1 of the year preceding the next season. User days on the schedule may not exceed the outfitters allocation unless user days are obtained from the Secondary Season user day pool.
- D. These user days may be accounted on the schedule for any number of trips.
- E. User days may be transferred to another trip scheduled by that company provided the River Permits Office is notified prior to launching.
- F. The Secondary Season user day pool will begin on May 1 and continue through March 31. Requests for user days will be taken each month. Requests do not carry over. A company's monthly request may not exceed 200 user days. User days will be distributed evenly among all requesting companies. If Secondary Season user days become available during the month of the request, outfitters will be notified on the first working day of the next month.
- G. Any concessioner exceeding its adjusted allocation (i.e., base

allocation plus any user days obtained from the pool) will be penalized for the entire amount exceeding the adjusted allocation. The excess number of user days will be deducted from the company's current allocation for the next secondary season, and access to the user day pool will be denied to that company for not less than 1 year. This violation will also be identified in the Annual Review Program under the "Contract Compliance" portion for the particular concessioner involved.

H. Secondary Season user day allocations may not be exceeded. There will not be an allowance for accidental bookkeeping errors due to the small size of the Secondary Season allocation.

X. CURRENT USER DAY BASE ALLOCATIONS PER COMPANY (non-adjusted)

User day allocations are administered solely by the National Park Service. These allocations may be adjusted by the National Park Service as a result of the assessment of penalties or sale of a company.

COMPANY	PRIMARY USER DAY ALLOCATION	SECONDARY USER DAY ALLOCATION
Adventures West, Inc.	7,113*	343
Arizona River Runners, Inc.	3,300	343
Arizona Raft Adventures, Inc.	9,782	586
Canyon Explorations, Inc.	3,720	343
Canyoneers, Inc.	4,060	343
Colorado River & Trail Expd., Inc.	2,500	348
Diamond River Adventures, Inc.	6,860	343
Expeditions, Inc.	2,325	635
Georgie's Royal River Rats	2,600	343
Grand Canyon Dories	4,225	1,353
Grand Canyon Expeditions Company	8,877	367
Hatch River Expeditions, Inc.	10,656	371
Moki Mac River Expeditions, Inc.	3,350	343
OARS, Inc.	2,800	1,090
Outdoors Unlimited	2,365	343
Mark Sleight Expeditions, Inc.	2,980	343
Tour West, Inc.	4,480	343
Western River Expeditions, Inc.	10,651	407
SOBEK'S White Water River Expd.	4,380	343
Wilderness River Adventures	9,132	414
Initial User Day Pool	0	0
Total Allocation	106,156	9,344

\* Based on the demonstrated ability of this company to fully use their total allocation in 1989.

## XI. TRAINING TRIPS

Trips may be conducted for the purpose of training new boatmen or familiarizing boatmen with new types of equipment, interpretive methods, and operational requirements. These trips must be requested by the outfitter at least 2 weeks prior to the trip, and must be approved by the Chief of Visitor and Resources Protection. Training trips will not be allowed during the peak season from Memorial Day to Labor Day. A work project such as campsite cleanup or trail maintenance may be assigned by the Chief of Visitor and Resources Protection at that time. The outfitter or a designated representative must accompany the trip. A list of participants and their positions with the company must accompany the request. These trips will be conducted for the benefit of company personnel only, not for relatives, friends, etc. Training trips will be inspected before departure at Lees Ferry and must meet the conditions set forth in the Commercial Operating Requirements. User days are not charged for these trips unless persons other than company employees accompany the trip.

## XII. SUBLETTING OF USER DAYS

User days may not be sublet to another company or to a noncommercial trip. Current policies are outlined below.

- A. All fees paid must go directly to the concessioner actually running the trip. A booking agent may be used, but they must not advertise, organize, and operate the trip. A person or organization may not collect fees for a trip, pay a concessioner a franchise fee, and then personally run the trip.
- B. It is not the intent of the National Park Service to prevent a river concessioner from making incidental passenger bookings for another concessioner on an occasional basis. However, strict adherence to procedural guidelines will be required to avoid contractual violations. These include:
  1. Passengers booked by one outfitter for another outfitter must be made aware that their trip will be outfitted by another company.
  2. Equipment and personnel exchanges cannot be a part of the procedure of transferring passengers from one company to another company; thereby eliminating potential for misuse of company-specific user day allocations.
  3. No concessioner may pay or receive payment from another concessioner for any "commission" or other fee for the exchange of passengers (however, this does not apply to the transfer of money equal to the actual published fares for the trip being reserved as described in Subsection XI.B. above).
  4. In the event a concessioner becomes unable to run a scheduled trip and wishes to transfer the entire trip to another concessioner, written details of circumstances necessitating the

exchange must be submitted for review, and prior approval of the trip exchange must be received from the National Park Service. No such exchange will occur until both concessioners receive approval from the NPS.

There should not be a need for concessioners to book one another's passengers unless such bookings are in response to last-minute cancellations, emergencies, etc. and will result in saving passengers' deposits and payments by transferring them to a trip with another concessioner.

- C. All trip participants must be covered by the contractually required insurance coverage of the concessioner. Separate insurance provided by charter groups, etc., is permissible but must be in addition to regular insurance provided by the river concessioner.
- D. If rented or borrowed boating equipment is used, it must not have any company names on the boats other than the river concessioner company name that is running the trip.
- E. All employees must be regular salaried or paid employees. Free-lance boatmen or boatmen for 1 or 2 trips may be used provided they are paid in the same fashion as all other boatmen for the trip. All boatmen must meet standards outlined in Section III above.
- F. In summary, it is clearly a sublet of user days where a person advertises, organizes, books, and operates a trip with his/her own equipment, personnel, and insurance, all of which is separate from that of the authorized river concessioner, and that concessioner is paid a fee for the use of its user days. The National Park Service reserves the right at all times, in its sole discretion and based on available information, to determine whether or not a trip is a sublet trip.

### XIII. OTHER CONDITIONS

- A. Diamond Creek Road: A fee is charged for each person, boat, and vehicle to traverse the Diamond Creek Road. Permits are required in advance. For current information, contact Ms. Donnita Selana, Hualapai River Running Department, P.O. Box 246, Peach Springs, Arizona 86434, (602) 769-2210 or 769-2219.
- B. Pets: No pets are permitted on a river trip. Requests to use guide dogs for visually or hearing impaired passengers must be cleared in advance through the Canyon District Ranger's Office.
- C. Commercial Operating Requirements must be carried on each trip.
- D. Pre-trip Checkout: All trips shall complete a pre-trip checkout with the ranger on duty prior to launching at Lees Ferry.

- E. Orientation Talks are required. See Supplement D.
- F. Passenger Manifest: The lead guide or trip leader must carry a passenger manifest list.

Trips may be delayed at Lees Ferry if conditions, as set forth above, are not met or until noted deficiencies are corrected. Approval of conditions prior to departure shall be solely determined by the Lees Ferry Ranger on duty.

#### XIV. LEES FERRY LAUNCHING PROCEDURES

Launching procedures must be carried out in such a manner as to ensure maximum efficiency in the rigging and launching of river trips.

- A. The launch ramp may not be used to perform maintenance projects on equipment.
- B. Rigging Procedures: Only river equipment and National Park Service vehicles may park on the ramp. The loading/unloading of passengers and river bags must take place off the ramp.
- C. Parking: Equipment vehicles must be moved to upper parking lots after equipment is loaded/unloaded.
- D. Meal Preparation is not permitted on the launch ramp.
- E. Overnight: A maximum of 2 people per company are allowed to stay with equipment overnight on the ramp. All other trip participants must sleep in the area designated by the ranger on duty at Lees Ferry.
- F. Prerigging: Boats that are rigged 24 hours or more prior to their launch date shall be moved off the ramp to make room for trips with more current launch dates.
- G. Morning Rigging: Because of ever increasing congestion at Lees Ferry launch ramp, rigging between the hours of 9:30 a.m. and 11:30 a.m. will be only for those trips leaving that day. In addition, no radios or tape players will be allowed to be played on the ramp during morning hours.
- H. Paria Beach Launch: Use of Paria Beach to launch trips will be permissible provided the Lees Ferry Ranger has given prior approval.

XV. BACKCOUNTRY OR OFF-RIVER CAMPING

Permits and/or reservations are necessary for off-river camping in all areas of Grand Canyon National Park.

To receive off-river camping permits, mail a reservation request to the Backcountry Reservations Office, P.O. Box 129, Grand Canyon, Arizona 86023, and include the number of people, date, and location of the hike. Requests must be received 2 weeks prior to the launch date. Off-river camping may not be used to reduce user day totals.

For camping reservations at Havasu Campground, contact the Havasupai Indian Tribe at (602) 448-2121. A fee is charged for each person entering or crossing the Havasupai Indian Reservation, payable at the time of entry (above Beaver Falls). An additional charge is made for each night of camping within the reservation.

Hualapai Tribal land extends from Mile 165 to Mile 273 on the south (left) side of the Colorado River. Any overnight use away from the river requires permission from the Hualapai Tribal Council.

## Supplement A

### COMMERCIAL SANITATION AND FOOD PREPARATION

Proper food handling and sanitation techniques are necessary to prevent the spread of communicable diseases among the members of your trip. Gastrointestinal illnesses are of primary concern. The usual source of gastrointestinal organisms is the human intestinal tract. Some organisms found in the nose or infected skin lesions can produce a powerful toxin, which cannot be destroyed by heat, causing severe gastrointestinal illness. In addition to human sources, meat and poultry products may be contaminated with disease organisms at the slaughterhouse or butcher shop. If these foods are inadequately cooked, the bacteria survive. Bacteria in food will result in the contamination of utensils, preparation surfaces, and the hands of handlers, which leads to contamination of other foods.

Following contamination of a food, it is usually necessary for reproduction of the bacteria to take place before an infective dose is developed. In order for a contaminating organism to grow or reproduce enough to develop an infective dose or a large amount of toxin, three factors are required - time, temperature, and a nutrient source.

It usually takes no more than 3 to 4 hours after food has been contaminated to produce enough bacterial growth to cause illness in a large number of people. Most of the organisms of concern will grow well between 77 degrees Fahrenheit and 114 degrees Fahrenheit. The contaminated food provides a nutrient source.

In order to prevent contamination of food during its preparation along the river, personal and environmental cleanliness are vitally important. No one with symptoms of a communicable disease, especially diarrhea, should be allowed to prepare food or handle utensils for others. Neither should anyone with infected wounds or boils be permitted to handle food. As disease-causing organisms often get into food by the hands of a person preparing food, scrupulous personal cleanliness is important. Washing the hands with soap and water is essential after going to the toilet, handling raw meat and poultry, putting fingers in the nose, or handling objects that may be contaminated.

All surfaces with which food comes into contact during preparation, including knives, utensils, cutting boards, and table tops, must be clean and sanitary. Tables and equipment used for preparing raw meats and poultry should not be used for prepared and other foods until they have been cleaned and sanitized thoroughly.

**FOOD PREPARATION** - The means by which foods become contaminated with disease organisms, and the subsequent processes through which these organisms pass in order to become dangerous to human health, dictate the procedures necessary to interrupt the chain of events leading to an outbreak of human illness. Briefly stated, these procedures are:

- A. After going to the toilet or handling raw meat or poultry, wash hands with soap and water before handling and preparing foods.

- B. Cooked, prepared foods, or foods served raw (e.g., vegetables) should come in contact only with clean and sanitized surfaces, equipment, and utensils. Equipment used for raw foods should be washed and sanitized before being used with cooked foods.
- C. Persons with communicable diseases, infected wounds on the hands and arms, or boils should not be allowed to prepare food.
- D. Stored perishable food should be kept at temperatures below 45 degrees Fahrenheit.
- E. Foods such as meat and poultry products should be well cooked (165 degrees Fahrenheit) to destroy disease organisms.
- F. After preparation and prior to serving, keep hot foods hot (above 140 degrees Fahrenheit) and cold foods cold (below 45 degrees Fahrenheit).
- G. Each trip is required to have in their possession one dial thermometer for each cooler and one stem thermometer for checking food temperatures during preparation, serving, and storage.
- H. Leftover perishable food should be discarded or refrigerated immediately in clean, protected, labeled containers.
- I. Leftover perishable food should be thoroughly reheated before use (to 165 degrees Fahrenheit).
- J. Tarps are recommended for use in camp to reduce the amount of food debris left on beaches. Tarps should be placed under food preparation and serving tables and under the dishwashing system.

DISHWASHING - The most effective means of sanitizing dishes and utensils on a river trip is the 3-bucket system. Place 3 buckets below the high water mark or in such a way as to leave the beach free of soap and food spillage. The system is as follows:

- A. Use 3 buckets large enough to immerse largest plates and utensils, 2 buckets of which are heated to near boiling. Allow dishwater to settle, and remove sediments before use if the river is muddy. The use of alum is recommended for settling.
- B. Add detergent to one heated bucket, leaving the other heated bucket clear for rinsing, and to the third bucket add chlorine at the rate of 3 to 4 ounces per 5 gallons for sanitizing. Set up sanitizing rinse 30 minutes prior to washing dishes to allow chlorine to work.
- C. Wash dishes and utensils in the first tub to remove grease and food particles. Water temperature should be 120 degrees Fahrenheit to 140 degrees Fahrenheit.

- D. Dip rinse in the second tub.
- E. Immerse articles in the third bucket for 60 seconds, double time if towel-dried. The effectiveness of chlorine for disinfection is directly related to time of exposure. Be sure to allow time for the chlorine to sanitize.
- F. Rack for air-drying or wipe dry with fresh paper towels.
- G. Store the articles in a clean, dry location, and they will be ready for the next meal.

WATER PURIFICATION - All water for river-user consumption or cooking must be disinfected. Research during 1981 on the Colorado River and its tributaries indicated that increased sediment from flooding or other causes may pose a high risk to river users. The following water disinfection steps should be followed:

- A. Use the main course of the Colorado River to collect water for disinfection, unless the river is quite cloudy from sediment.
- B. Use side streams as a water source when the main river is heavily laden with suspended sediment and the side stream is running clear. Avoid the following tributaries because of the inconsistent water quality: Paria River, Little Colorado River, Bright Angel Creek, Garden Creek, Hermit Creek, Elves Chasm, Tapeats Creek, Deer Creek, Havasu Creek, and Diamond Creek.
- C. To disinfect visually clear water, add 8 drops of liquid chlorine bleach per gallon, mix the water, and let it stand uncovered for at least 2 hours.
- D. Cloudy, sediment-laden water must be cleared before disinfection. Settle overnight or use flocculating procedures. Water that is cloudy after settling must receive 10 to 12 drops of liquid chlorine bleach per gallon and be allowed disinfection time of at least 2 hours.
- E. The effectiveness of chlorine bleach deteriorates rapidly when the individual containers are exposed to high temperatures. The effectiveness of liquid chlorine bleach that has been on the shelf for extended periods cannot be assured. Outfitters should rotate stock and assure that only the amounts of bleach that can be quickly used be purchased at one time.
- F. Use of an approved filter alone will remove bacteria and cysts; however, to assure removal of viruses, the use of a disinfectant and a filter is recommended. Some filters currently available on the market contain components having a disinfectant action during filtration. However, bear in mind that these may not provide a protective residual to guard against recontamination once the water is filtered.

- G. Portable filters (either gravity flow or piston pump) having a nominal pore size of 0.45 microns or less may also be used. Settled water will extend filter life. In addition to overnight settling, alum may be added at the rate of 1/4 teaspoon per 1 1/2 gallons. Decant the clarified portion, filter, and disinfect by adding 1 to 2 drops of fresh bleach per gallon. Water treated in this manner should be allowed as long a contact time as possible but no less than 1 hour.
- H. An alternative to filtration and chemical treatment is to boil river water for a minimum of 1 minute prior to use.

## Supplement B

### HUMAN WASTE CARRY-OUT METHOD

Grand Canyon National Park requires all river runners to carry out their solid human waste. The most common system is described below and is approved by the NPS. Other alternatives exist, but must be approved prior to launch.

- A. Ammo cans (20 mm rocket boxes), the big ones, commonly 18 inches by 14 inches by 8 inches.
- B. Toilet seat.
- C. Large, heavy-duty plastic garbage bags or equivalent.
- D. Deodorant chemical: Aqua Chem (blue goo), chlorine bleach, slaked lime, or Clorox II (dry bleach).
- E. Toilet paper, hand washing water dispenser, and soap. Avoid the use of bar soap. Use a system which allows flowing water to rinse off the soap. It is recommended that the rinse system not employ the use of beverage coolers due to possible contamination of the spigot.
- F. When feasible, place the toilet system near river's edge to discourage passengers from urinating above the wet soil of the river's edge.
- G. For groups greater than 26, 2 toilets are required. The day use toilet described below may be substituted for the second toilet provided it is readily available at an on-shore location such as near the hand-wash facility.

The system is set up as follows. One of the rocket boxes serves as the actual toilet. The rocket box is first lined with 1 of the heavy-duty large garbage bags; fold the excess bag around the edge of the can. Pour the deodorant chemical into the open bag and place the toilet seat on top of the can. The toilet is now ready for use. The hand-washing water dispenser and the hand soap should be placed close by. Used toilet paper, tampons, and sanitary napkins can be placed directly into the toilet. After each deposit, the toilet should be covered.

It takes only a few minutes to dismantle the toilet system and store the feces. Squeeze the excess air out of the bag and then tie it off. Place the bag containing the feces into yet another garbage bag and store subsequent bags in it. This is a security measure against leakage. The bag is then tied off as before and placed into a rocket box with the lid sealed. The container is stored until the next use.

The toilet seat, plastic bags, toilet paper, and deodorant are stored in another ammo can ready for the next camp's use. It is necessary to remove only 2 cans per night from the boat, 1 for the storage of the equipment, another for actual use as a toilet and the subsequent storage of the feces.

The amount of chemical used per day depends on the type used and the number of people on the trip. With liquid deodorant, a few ounces at the bottom of the bag is sufficient for 6 or 7 people. Bleach, requires more approximately double. If used, slaked lime and dry bleach should be sprinkled over feces after each use. The chemical reduces bacterial growth in the feces and the production of methane gas. We have found that it is easy to containerize about 50 uses in one ammo box. Thus, for an 8-day, 10-person trip, you would need only 2 ammo boxes for feces and 1 ammo box for equipment.

Collection containers are no longer available at Pearce Ferry. Do not dump human waste in any container at Pearce Ferry. Feces must be disposed of in a sanitary landfill or RV dump station. You should check in your area before leaving the river.

There will undoubtedly be many innovative improvements on the above system. The basic tenet is to safely containerize the feces and prevent it from generating methane gas in the absence of air in the ammo cans.

#### Day Use Toilet System

A day use toilet system is required to be readily available and accessible when the regular toilet is not set up. Store toilet paper, plastic bags, coffee can, hand soap, and a small container of toilet chemical in a small ammo can or similar container that passengers can obtain when needed. Instruct users to deposit human waste and toilet paper in plastic bag with a squirt of bleach or other disinfectant chemical. The full plastic bags can be stored in a 1-pound coffee can (sealed) until dumped. Guides can then empty the used bags directly into the waste storage cans. This system prevents the accumulation of human waste at beaches and attraction sites.

GLEN CANYON  
ENVIRONMENTAL STUDIES  
P. O. BOX 1811  
FLAGSTAFF, AZ 86002

Supplement C

SUGGESTED FIRST AID ITEMS

Items should be neatly stored in an easy to locate and identifiable waterproof container.

Highly recommended

First aid kit inventory list taped to the inside lid of the container and Red Cross First Aid Manual or equivalent.

<u>Instruments</u>	<u>Description</u>	<u>Uses</u>
Scissors (EMT type)	1 (medium size)	Cutting tape, dressings, clothes
Razor blade, single	2	For removing hair before taping
Tweezers	1	To remove wood splinters, etc.
Safety pins	10 (various sizes)	Mending and triangular bandage
Q-Tips (Cotton swabs)	1 package	Cleaning lacerations, eyes, etc.
Pencil/Note pad	1 each	Documenting injuries and items used in treatment

Relief of Discomfort

Pain reliever (aspirin or substitute)	36 tablets (5 grain)	1-2 every 4 hours for headaches, minor pain, and fever
Ibuprofen (Advil or generic brand)	200 mg tablets	Muscle strains, minor pain, or menstrual cramps
Antacid	18 tablets	For indigestion or heartburn
Antihistamine	18 tablets	1 every 4 hours for insect bites, colds, hives, or rashes
"Cookinaid" or similar electrolyte replacement drink	1 tub minimum	Relieve or prevent muscle cramps and symptoms of heat exhaustion
Oil of clove	1 small bottle	Relief of toothache
Balamine lotion or	1 bottle	Relief of itching from poison

Cortisone Cream		ivy, life preserver rash, or allergies
Solarcaine	1 bottle	Relief of sunburn pain
Zinc oxide/PABA or other sun block	1 bottle	Prevent sunburn
Benadryl Syrup	1 bottle	Minor allergic reactions
<u>Other</u>		
Antibacterial soap (Phisoderm, tincture of zepthesis, Hibiclens)	8 to 12 ounces	Antiseptic for wounds
Moleskin	1 package	For blisters
Betadine	1 bottle	For cleaning wounds
Band-aids	36 (1-inch)	For lacerations
Anti-bacterial ointment (Bacitracin, etc.)	2 tubes	For lacerations and wounds
Butterfly Band-aids (or know how to make)	18 (various sizes)	For closing lacerations
Carlisle (trauma dressing) or substitute (such as Kotex)	3 (4-inch)	For large bleeding wounds
Elastic bandage	2 (3-inch)	For sprains and securing rigid splints
Steri-pad gauze pads	18 (4 inch by 4 inch)	For large wounds
Steri-pad gauze pads	18 (2 inch by 2 inch)	For small wounds
Tape, waterproof adhesive	2 (2-inch rolls)	For sprains, securing dressing, etc.
Triangular bandage or Muslin pieces	4 (40-inch)	For securing rigid splints, slinging and securing extremities, and protecting dressing from contamination
Roller gauze	5 rolls (2 inch by 5 yds.)	For holding gauze pads in place, securing splints, and improvising slings

Rigid splint, arm board, Sam Splint	1	For in-line fracture, pressure bandage
Rigid splint, leg board, Sam Splint	1	For in-line fracture, pressure bandage
Thermometers: 1 oral, 1 rectal (a hypothermia thermometer is recommended)	2	Diagnosing fever or other exposure illnesses: heatstroke, hypothermia
Signal Mirror	1	Signaling aircraft in case of emergency
Dimes and quarters	Several	Making phone calls in case of emergency
<u>Optional</u>		
Mineral oil	Small bottle	Constipation
Syrup of Ipecac	Small bottle	Induce vomiting
Kaopectate	Small bottle	Diarrhea
Ophthalmic wash and/or Eye drops	Small bottle	Eye wash/irritation
Ear drops	Small bottle	Clogged/Infected ears
Water purification tablets	Small bottle	Purify water on side canyon hikes (use bleach for river water)
Eye pad	2	Injured eye
Tincture of Benzoin	2 small bottles	To hold tape in place and protect skin
Insect repellent	Large can or bottle	Flies, ants, mosquitoes

A Note About Hypothermia (Exposure):

Should someone fall in the river, it is extremely important to get them out of the water as quickly as possible. After 5 minutes of floating in 50-degree water, muscular strength and coordination rapidly diminish. Generally after 10 to 15 minutes, a person is totally unable to help themselves.

Supplement D

ORIENTATION TALKS

All companies recognize the importance of orientation talks. Orientation talks may be given on a bus while traveling to Lees Ferry, or at other times or locations, if approved in advance by the River Subdistrict Ranger. To ensure that each company covers the points stressed by the National Park Service, an outline and description of the items that must be covered is included here:

- A. Passengers should be informed that they will be traveling throughout their trip in Grand Canyon National Park, and all natural, historical, archeological, and wildlife components are not to be disturbed.
- B. On motor trips, boatmen will shut down the motor to interpret all natural features when safe to do so.
- C. Purified drinking water will be identified and accessible for those who desire it.
- D. Life jackets must be worn at all times while on the river and kept properly fastened and adjusted to fit. A demonstration of how to fasten and adjust the life preserver and what to do if a passenger finds themselves in the river should also be given.
- E. Chemical toilets or other means of containerization of human waste will be provided for passengers and must be used while they are in camp. Reasons for this rule must be clearly explained. Passengers should also be informed of the proper means of disposing of human waste while not in camp (day toilet system).
  - 1. Urinate in wet sand below high water line. Go "high and far" to urinate at off-river places such as Havasu to avoid the buildup of feces and urine. Passengers should be informed that the boats will occasionally be stopping above scenic stops for these needs, to prevent human waste buildup at such places as Deer Creek, Redwall Cavern, and the Little Colorado River.
  - 2. Passengers will be informed how to dispose of human feces and toilet paper while not in camp. Availability of a day use toilet system is required (see Supplement B).
- F. They will be advised to stay on trails at scenic stops, and that a boatman will lead the way to these areas.
- G. If fires are to be used during winter trips, passengers will be informed of the limitations on the use of driftwood only.
- H. Companies will be checked to ensure that this orientation talk is occurring prior to departure from Lees Ferry, and that it includes the above points.

Spot checks at Lake Mead will be made by the Meadview Ranger to ensure these points are stressed during the trip. Failure to do so will be documented and included in the concessioner evaluation.

## Supplement E

### HELICOPTER EVACUATIONS

- A. JUSTIFICATION - Helicopter evacuations are available for medical or other emergencies only.
- B. Request Procedures
1. Arrangements for helicopter evacuations will only be made by the NPS.
  2. Requests for evacuation can be made by (1) contacting the NPS directly (river patrols, Lees Ferry, Phantom Ranch) or, after using an escape route, by telephoning Grand Canyon Dispatch at (602) 638-2477; (2) contacting aircraft by ground-to-air radio; (3) mirror flash or other signaling device directed toward passing aircraft or rim overlook locations.
  3. When contacting aircraft by radio, be sure to provide accurate and concise information. Remember, your message may be relayed several times before it reaches the Park Service Dispatch. Provide information in the following order:
    - (a) Give your location. State that you are a river trip requesting helicopter evacuation at a given river mile in the Grand Canyon.
    - (b) Briefly state the problem (suspected spinal injury, severe head injury, hypothermia, etc.).
    - (c) If the injury is minor and stable, state that fact. This will allow EMS personnel to determine priorities in the event of simultaneous requests for medical responses. Ask the pilot to repeat the message so that you know he understands your situation.
  4. A mirror flash is often the most reliable method of contacting aircraft, so be sure you understand how to use the mirror as a signaling device. Remember that the mirror flash presents problems in that no patient assessment information is relayed and your location is not certain to be reported correctly.
- C. Landing Zone Selection and Preparation
1. Select a level area approximately 10 feet by 10 feet. Be sure it is clear of obstacles such as trees and large rocks for a diameter of 50 feet. Such areas are virtually non-existent in some stretches of river (i.e., below Crystal to Bass, Olo to Havasu, etc.). While the pilot and crew can conduct hover exits and one-skid landings, these attempts can be dangerous and will not be attempted except as a last resort in life-threatening situations. Unless such travel poses serious problems for the patient, transport by boat to a safe landing zone will generally provide a faster and safer evacuation.

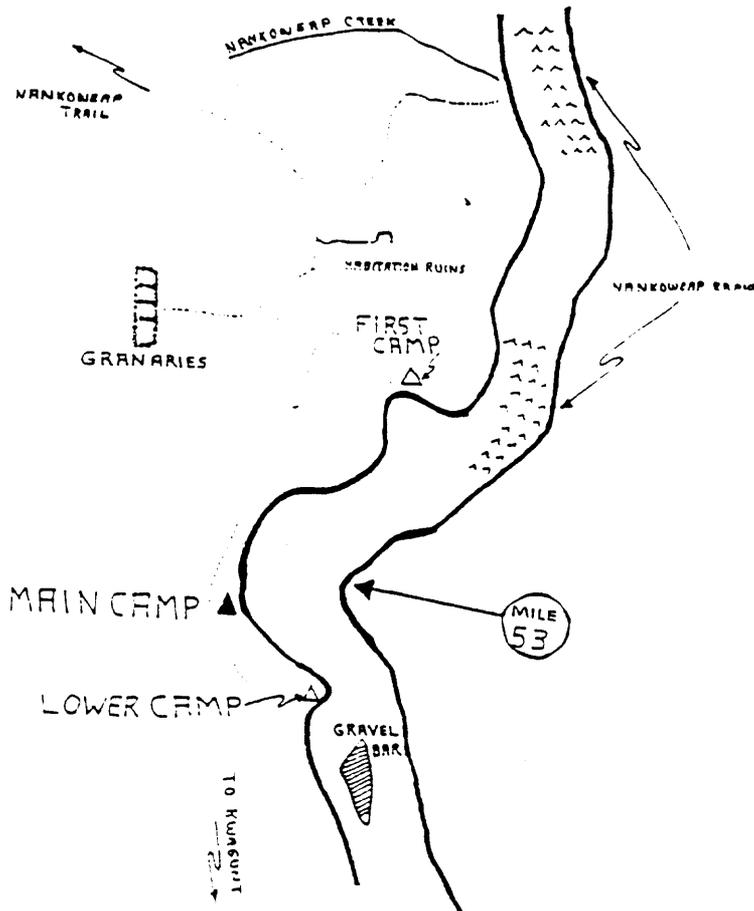
2. Set up an X with the orange signal panels. Do not locate the panels directly on the landing zone. Remove the panels once the pilot locates your position in the event he selects that site for landing. This will assist the pilot in determining your party from others in the vicinity.
3. Prepare your group and camp for the evacuation. It is extremely important that everyone be gathered together away from the landing zone and in full view of the pilot. Be certain that no loose items are in the landing zone since the downwash will lift and toss articles, possibly into the rotor or into your group. Secure loose equipment in the camp (sleeping bags, ground cloths, tables, life jackets, tents, etc.) in the event the pilot must pass over the area.
4. Wet down as much of the landing area as possible just prior to the helicopter's arrival. This helps the pilot's visibility, decreases the amount of sand blown into eyes, boats, and food, and reduces damage to the helicopter's surface and engine.
5. The pilot's awareness of wind direction is critical for safe landings. The helicopter must fly directly into the wind when landing and taking off. Do not locate your group in the flight path. You can assist the pilot by indicating wind direction. The easiest method is to simply toss a handful of sand directly upward. The pilot can then observe the direction of drift. Another method is to stand with your back into wind and extend both arms forward pointing into the direction the wind is blowing.
6. NEVER APPROACH THE HELICOPTER UNLESS DIRECTED TO DO SO BY THE PILOT OR CREW. Never approach from the rear of the helicopter. Keep your group together and in one location. When directed to do so, approach the helicopter in full view of the pilot. Walk in a crouched position to avoid being struck in the head by the helicopter rotor blades.

Supplement F

NANKOWEAP SPECIAL USE AREA

Because of impacts of multiple trailing, campsite competition, and congestion in the Nankoweap area, the following special camping regulations are in effect. Camping for river runners in the Nankoweap Delta area, Mile 52.0 to Mile 53.0, right bank, is restricted to the three river camps identified on the map as First Camp, Main Camp, and Lower Camp. The First Camp is located in a large cove behind a gravel bar, approximately 1/2 mile downstream of the confluence with Nankoweap Creek. The camp is visible on the right from the tail waves of Nankoweap Rapid. The Main Camp is also visible several hundred yards downstream. The Lower Camp is a small, boulder-covered sand bar forming a point of land 100 yards downstream and around a corner from Main Camp. Each camp has a capacity of 1 river party only. River parties wishing to hike must disembark at any one of the three camp locations or at the mouth of Nankoweap Creek (Hiker's Camp) only. This requirement is due to past problems of multiple trailing. Groups camping early or on layovers should expect other groups to pull in for hikes.

NANKOWEAP



Supplement G

TRAINING TRIP REQUEST

OUTFITTER: \_\_\_\_\_ DEPARTURE DATE: \_\_\_\_\_

NUMBER OF BOATS: \_\_\_\_\_ COMPLETION DATE: \_\_\_\_\_

LIST OF PARTICIPANTS: 8. \_\_\_\_\_

1. \_\_\_\_\_ 9. \_\_\_\_\_

2. \_\_\_\_\_ 10. \_\_\_\_\_

3. \_\_\_\_\_ 11. \_\_\_\_\_

4. \_\_\_\_\_ 12. \_\_\_\_\_

5. \_\_\_\_\_ 13. \_\_\_\_\_

6. \_\_\_\_\_ 14. \_\_\_\_\_

7. \_\_\_\_\_ 15. \_\_\_\_\_

OBJECTIVE OF TRIP: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
OUTFITTER'S SIGNATURE

\_\_\_\_\_  
OUTFITTER'S DESIGNATED TRIP LEADER

WORK PROJECT, ASSIGNED BY NPS, TO BE ACCOMPLISHED ON TRIP: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Chief of Visitor and Resource Protection  
Signature

\_\_\_\_\_  
Date

Supplement H

RIVER INCIDENT REPORT

THE RIVER SUBDISTRICT  
GRAND CANYON NATIONAL PARK  
P.O. BOX 129  
GRAND CANYON, ARIZONA 86023

Company: \_\_\_\_\_ Trip Leader: \_\_\_\_\_

Date: \_\_\_\_\_ Location of Incident: \_\_\_\_\_

NATURE OF INCIDENT \_\_\_\_\_

<u>INVOLVED PERSONS</u>	<u>ADDRESS</u>	<u>PHONE</u>	<u>SEX</u>	<u>AGE</u>	<u>DOB</u>
-------------------------	----------------	--------------	------------	------------	------------


OCCURRED: Ashore \_\_\_\_\_ Boat \_\_\_\_\_ In water \_\_\_\_\_ Other \_\_\_\_\_

WATER LEVEL: \_\_\_\_\_ cfs

DESCRIPTION: How did the incident occur? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

When did it happen (date and time)? \_\_\_\_\_

First Aid given: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Medications given (dose and time): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature

COLORADO RIVER MANAGEMENT PLAN

APPENDIX D

NONCOMMERCIAL OPERATING REQUIREMENTS

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A. NONCOMMERCIAL RIVER PERMIT SYSTEM GUIDELINES

I. Definition of a Noncommercial River Trip

- A. A noncommercial river trip must be participatory in nature. Trip preparation (including logistics, food purchase, equipment assembly, transportation, and vehicle shuttle) and conduct of the trip (including food preparation and sanitation) must be shared by members of the group. Collecting a set fee (monetary compensation), payable to an individual, group, or organization for conducting, leading, or guiding a noncommercial river trip is not allowed. The trip permittee should delegate responsibility (financial and otherwise) for various aspects of trip preparation and conduct.
- B. Trips may be ~~considered~~ noncommercial even though a member of the trip, within their normal scope of employment receives a salary from an educational institution or non-profit organization to participate in the trip. This salary may not come directly through fees contributed by members of the party. No person may be hired or paid to participate in a trip operating under the noncommercial permit system.

II. Noncommercial Waiting List Guidelines:

The intention of the noncommercial waiting list guidelines is to ensure an individual's interest and commitment to obtain a noncommercial river trip. Individuals who have added their name to the waiting list must continue their interest on the list, as described in Section II, B, below. This requirement must be met by the individual on the list and not by another individual or company representing that person.

A person may hold only 1 position on the list. Waiting list positions may not be continued if incomplete information is given. Only 1 request for new addition/continuing interest per envelope will be accepted. No company or individual may make a profit as a result of waiting list requirements.

- A. New Applicants:—New applicants to the waiting list will be charged a non-transferable and non-refundable \$25 waiting list application fee by authority of 36 CFR 71.10, Sec. 1-6, Special Recreation Permits and Special Recreation Permit Fees. Written requests postmarked between February 1 and February 29 requesting to be added to the waiting list and containing a money order or cashier's check for \$25 will be accepted. No cash or personal checks will be accepted. Information needed at the time of placement on the list is full legal name, address, daytime telephone number, the first 7 digits of the applicant's social security number, and signature of the applicant. Those on the waiting list when this policy is adopted and implemented will not be charged the application fee as long as they remain on the list.

- B. Continuing Interest: All persons on the waiting list are responsible for informing the River Subdistrict in writing each year between December 15 and January 31 that they wish to remain on the waiting list. Letters must be postmarked between December 15 and January 31 to be accepted; all others will be returned to sender. When continuing your interest on the waiting list, please list your full legal name, the last recorded address, any new address, daytime telephone number, the first 7 digits of your social security number, and your signature. Waiting list members will be allowed to miss one continuing interest filing period for their length of wait on the list. Waiting list members are responsible to notify the River Permits Office of any change of address.

It is highly recommended that letters confirming interest in remaining on the list and letters of new addition to the list be sent by Certified Mail, Return Receipt Requested to ensure the letter has been received by the River Subdistrict. We cannot take responsibility for letters not received due to Postal Service error. Notification of placement on the waiting list will be sent in March.

- C. Participation in Other Noncommercial Trips: There is no limit to the number of river trips a person may participate in during a year. However, those on the waiting list will be allowed to be a participant on only 1 noncommercial trip for their length of wait on the list. The second noncommercial trip they participate in will result in immediate removal from the waiting list. After the second river trip is completed, the person may follow procedures for the February filing period for new additions to the list. Trip leaders may not have a scheduled trip and be on the waiting list at the same time. Trip leaders may reapply to the waiting list during the February filing period following the completion of their trip.

### III. Scheduling of Noncommercial Permits:

#### A. Initially Scheduled Launch Dates.

1. Those at the top of the list will be contacted in October for their preferred launch dates for the next season and the following season. The number of people contacted will be determined by the following:
  - a) number of permits available for the upcoming season occurring from advanced cancellations
  - b) the number of permits estimated to be available as a result of the short-term cancellation rate at the time (40% for the upcoming season)
  - c) number of permits available for the following season (2 years in advance).

2. Those contacted must list a minimum of 15 launch dates. Supplemental information will be obtained to determine the possibilities of claiming cancellations with a minimum notice of 120 days, 90 days, 60 days, and 30 days specified with a preferred launch period of 2 consecutive weeks.
3. Launch dates will be assigned in waiting list priority order.
4. Those who listed 15 launch dates in the initial process and possibilities of accepting cancellations and did not receive a scheduled launch will be contacted the following year for preferred launches.
5. Deferrals (rescheduling to the next year) will not be allowed unless the permittee has a confirmed medical problem that will not allow them to participate in a river trip. Exceptions may be requested in writing addressed to the Chief of Visitor and Resource Protection.
6. Launch dates may only be rescheduled for the same year if notification of more than 60 days is given and only if a launch date is available.
7. Cancellation of a launch date more than 60 days prior to the scheduled launch date will not result in restriction from the waiting list. Those cancelling less than 60 days prior to the scheduled launch date, will be restricted from the waiting list for 1 year. Cancellations less than 30 days prior to launch will be restricted from the waiting list for 2 years.

B. Scheduling Cancelled or Unclaimed Launch Dates:

An attempt will be made to fill any cancelled launch date with those at the top of the list through information gathered as described in Section A, III, 2.

1. If the cancellation occurs more than 90 days prior to the launch date, written notification will be sent to all those expressing interest in that particular time period, and interested parties must then notify the River Permits Office in writing or by phone by a specified time not to be less than 5 days after notification.
2. If the cancellation occurs less than 90 and more than 30 days prior to the launch date, the River Permits Office will attempt to locate persons expressing interest in that particular time period by phone during a 2 working-day period from that cancellation.
3. The launch date will be given to the person with the lowest waiting list number who is willing to accept the launch date.

4. Call-in System

- a. Applicants with official verification from the River Permits Office of placement on the waiting list are eligible to utilize the Call-in System.
  - b. Dates not claimed by the process outlined above will be open to anyone on the waiting list, regardless of their position on the list, on a first-call-first-served basis.
  - c. The first working day in January is the first day that those on the list may call to check on unclaimed launch dates for the upcoming season. To allow for geographical differences, only telephone (no walk-in) requests will be accepted during the first week of January. After that time anyone on the waiting list may claim available dates in person or by telephone.
5. Those claiming a cancelled date will be deleted immediately from the waiting list. Rescheduling of launch dates is not allowed when accepting a cancelled date. Cancellation of a launch date more than 60 days prior to the scheduled launch date will not result in restriction from the waiting list. Those cancelling less than 60 days prior to the scheduled launch date, will be restricted from the waiting list for 1 year. Cancellations less than 30 days prior to launch will be restricted from the waiting list for 2 years. However, if a date is accepted with less than 30 days notice prior to launch, restriction from the waiting list will be for only 1 year if that date is cancelled at a later time.
6. No open dates with less than 10 work days of lead time will be considered available. This time is necessary for processing the permit.

C. Permit Application Fee

A non-refundable \$50 permit application fee is due 30 days prior to launch along with the permit application form.

IV. Allocation, Launch, and Trip Limits:

- A. The seasonal noncommercial user day allocation is defined as follows:

Primary Season: April 16 - October 15 43,920 user days  
Secondary Season: October 16 - April 15 10,530 user days

- B. During the primary season, 221 launches will be available and will be scheduled 1 per day with 2 launches occurring on one day per week April 16 through October 15. No more than 3 supplemental launches will occur in a week, with at least a day between the supplemental launches. The supplemental launches will be scheduled

on days that traditionally launch fewer, commercial trips and the commercial passenger launch limit will be held to 134 on these days. On launch dates with 2 noncommercial trips, a morning and afternoon departure will be imposed to let the Lees Ferry Ranger effectively carry out the required check-out procedures and orientation, as well as to mitigate downstream crowding.

- C. During the secondary season, 52 launches will be available. Five launches per week will be allowed, with trips launching on no more than 2 consecutive days.
- D. Maximum trip lengths allowed on the river between Lees Ferry and Diamond Creek (including layovers and off-river hiking days) are:

<u>Launch Date</u>	<u>Trip Length</u>
April 16 - October 15	18 Days
October 16 - November 30	21 Days
December 1 - February 29	30 Days
March 1 - April 15	21 Days

- E. A 3-month period has been set exclusively for oar-powered craft on the river. Motor-powered boats are prohibited from launching from September 16 through December 15. During the remainder of the year, both oar- and motor-powered boats may launch.
- F. Maximum size for a noncommercial river trip is 16 people, including the trip leader.

V. User Day Pool:

- A. User days resulting from trips already completed will be pooled beginning June 1. Supplemental launches will be added for the months of August, September, and October upon availability of the maximum number of user days for a primary season trip (18 days X 16 passengers = 288 user days).
- B. These launch dates will be filled by the process described in Section III,B. which discusses scheduling cancelled or unclaimed launch dates.

VI. Little Colorado River Trips (kayak or canoe only)

With an increased interest in kayaking the Little Colorado, the permit process has been outlined. A permit to traverse tribal lands must be obtained from the Navajo Tribe. Two options of traversing through Grand Canyon National Park are described below:

- A. Prior arrangements may be made to meet a commercial or noncommercial river trip. Notification must be given to the River Permits Office prior to launch. The rendezvous must take place at the confluence of the Little Colorado and Colorado Rivers and must be reported to the Lees Ferry Ranger at the time of the launch.

Recreational user days will be charged as appropriate. If any camping is planned prior to being picked up at the confluence, a backcountry permit is required from the Grand Canyon Backcountry Office.

- B. A noncommercial permit may be obtained by the scheduling process described in Section III. by anyone on the waiting list. Due to the unpredictable water flow of the Little Colorado, the launch date from the entry point must coincide with noncommercial Lees Ferry launches. This secured launch date would allow the party to launch from Lees Ferry should the water flows from the Little Colorado not be adequate. The secondary season scheduling regulations have increased the number of weekly and seasonal launches, allowing for flexibility to schedule impromptu launches.

Please note that at the discretion of the Superintendent, any serious violation of noncommercial river permit system guidelines may result in removal from, or not being permitted to be placed on, the waiting list for a period of no more than 3 years.

## B. NONCOMMERCIAL REGULATIONS

A noncommercial river trip permit, issued by the authority of the Superintendent, is required for all noncommercial travel on the Colorado River between Lees Ferry and Pearce Ferry. Failure to comply with terms of the permit may result in administrative actions resulting in your exclusion from any future trips.

### I. General Requirements

- A. Only the trip permittee may complete the application. The noncommercial permit is not transferrable, and the permittee must accompany the entire river trip.
- B. No trip shall carry more than 16 persons (including the trip permittee) in any 1 party. Persons traveling under 1 permit must travel and camp together and occupy only 1 beach.
- C. There is no limit to the number of river trips a person may participate in during a year. However, those on the waiting list will be allowed to be a participant on only 1 noncommercial trip for their length of wait on the list. The second trip they participate in will result in immediate removal from the waiting list. After the second river trip is completed, the person may follow procedures for the February filing period for new additions to the list.
- D. Failure to comply with any portion of the permit application procedure, or participation in advertising resulting in profit, will result in the cancellation of those permits. (See Noncommercial Use Affidavit on application form.) The trip permittee is solely responsible for the actions of his/her party.
- E. Noncommercial trips must be on a cost-sharing basis. (See Noncommercial Use Affidavit). Failure to comply will cause cancellation of the permit and may jeopardize any future applications.
- F. Substitution of participants may occur at Lees Ferry. Only the permittee must be present the entire trip.
- G. All trips must complete a trip checkout form with the Lees Ferry ranger prior to departing. All trip participants must have a valid, unaltered photo identification to present to the ranger at this time. All trip members will complete an orientation program at Lees Ferry prior to their trip departure.
- H. It is the permittee's responsibility to notify the River Permits Office of their inability to use their scheduled launch date (See Section II).

- I. Maximum trip lengths allowed between Lees Ferry and Diamond Creek are: April 16 - October 15: 18 days; October 16 - November 30: 21 days; December 1 - February 29: 30 days; and March 1 - April 15: 21 days.

This includes layover or off-river hiking days. The breakdown of season dates is as follows: PRIMARY LAUNCHES - April 16 through October 15, SECONDARY LAUNCHES - October 16 through April 15. Failure to meet these seasonal trip lengths will result in a citation and possible administrative decision that may affect future use of the Colorado River. All dates listed above refer to launch dates from Lees Ferry.

- J. All participants hiking into the canyon to meet a river trip, regardless of entry point, must contact the River Permits Office or the ranger on duty at Phantom Ranch prior to joining the trip. Identification must be available upon request. Any inner canyon camping while waiting for a river trip must be approved by the Backcountry Reservations Office through the reservation system.
- K. While conducting your trip, rangers may contact your party and request information such as a copy of your permit or passenger list. They may also request to check camping procedures to see that regulations are being followed.

## II. Cancellation Policies

- A. Cancellation more than 60 days prior to the scheduled launch date will not result in restriction from the waiting list. Parties may reschedule a trip if their original date was not claimed from a cancellation and only if a launch date is available.
- B. Anyone cancelling less than 60 days prior to the scheduled launch date will be restricted from the waiting list for 1 year.
- C. Anyone cancelling less than 30 days prior to the scheduled launch date will be restricted from the waiting list for 2 years.
- D. Deferrals (rescheduling to the next year) will not be allowed unless there is a confirmed medical problem with the permittee that will not allow them to participate in a river trip. Exceptions may be requested in writing addressed to the Chief of Visitor and Resource Protection.
- E. If a launch date is accepted less than 30 days prior to launch, restriction from the waiting list will be for only 1 year if that date is cancelled at a later time.

## I. Leader of Party and Boatman Experience

Experience in the Grand Canyon or 1 or more of the other comparable whitewater rivers is mandatory. The trip permittee or another member of

the party should be familiar with the Grand Canyon portion of the Colorado River. The trip permittee and boatmen must have a working knowledge of whitewater safety, general first aid, river equipment repair, and the techniques of whitewater navigation.

#### IV. Water Craft

##### A. Types

1. Inflatable Rafts and Dorries - All trip applications will be reviewed to determine if the numbers of rafts and/or dorries are adequate in size and number in order to meet all equipment requirements (see Sections V and VI) and boat capacities (Section IV,B).

2. Fiberglass or Plastic Whitewater Canoes and Kayaks - Kayaks and canoes must be in good condition, and the front deck should be reinforced with extra layers or a sturdy brace. All trips must have the capacity to carry the minimum equipment required (See Sections V and VI).

Open or canvas-decked canoes are acceptable provided paddlers have extensive high-volume river experience. Canoes should have sturdy reinforcements and adequate flotation.

On supported and unsupported kayak or canoe trips, 1 spare paddle and 1 extra life preserver is required for every 4 kayaks and/or canoes. If there are fewer than 4 kayaks or canoes, 1 spare paddle and 1 spare life preserver is required.

3. Motorized Water Craft - Motor-powered boats are prohibited from launching between September 16 and December 15. During the remainder of the year, both oar- and motor-powered boats may launch.

##### B. Capacities: Occupant capacities, including boatmen, for boat sizes (including gear) are listed below.

- |   |    |
|---|----|
| 1. Dorries: 16-18 feet in length:                 | 5  |
| 2. Inflatable rafts and pontoons:                 |    |
| a. less than 12 feet in length:                   | 2  |
| b. up to 14 feet in length:                       | 3  |
| c. up to 16 feet in length:                       | 4  |
| d. up to 17 feet in length:                       | 5  |
| e. up to 18 feet in length:                       | 6  |
| f. 22 foot snout:                                 | 8  |
| g. 22-27 feet in length:                          | 9  |
| h. 33 feet and over in length with outriggers:    | 16 |
| i. 33 feet and over in length without outriggers: | 12 |

C. Boat Registration

All watercraft operating in Grand Canyon National Park must be registered and must display numbers and decals in accordance with the Arizona Boating and Water Sports Law, (AGF, Article 5, R12-4-501 through R12-4-505). Arizona accepts home-state rules of registration for a 90-day period.

V. Emergency Equipment

A. Life Preservers and Regulations

Each participant MUST have a serviceable U.S. Coast Guard approved personal flotation device (PFD) Type I, II, III, or V. One extra PFD must be carried for every 10 persons, or one per boat, whichever number is greater. These must be maintained in good and serviceable condition in compliance with U.S. Coast Guard Standards AND MUST BE WORN AND FASTENED PROPERLY AT ALL TIMES WHILE ON THE RIVER. A throwable cushion (U.S. Coast Guard approved, Type IV) is required for each watercraft 16 feet in length and over.

B. First Aid

A major first aid kit is required and shall be carried on each trip. A smaller kit must be carried on each boat. (See Supplement C, Suggested First Aid Items.)

C. Communications and Signalling

1. Emergency signalling equipment must include a signal mirror of the U.S. Air Force type and two 3-foot by 10-foot panels of international orange that can be placed in an "X" so as to be visible from aircraft. In the event of an emergency, the symbol "X" marked or placed on the ground by any means will signify that help or emergency aid is necessary. Upon notification by observers, a helicopter will be dispatched by the National Park Service.
2. A ground-to-air radio transceiver is recommended (although not required) equipment. Tune to frequency 122.75 east of Supai, frequency 122.85 east of Whitmore Wash and west of Supai, frequency 121.95 west of Whitmore Wash, and frequency 121.5 for EMERGENCY. Frequencies 124.85 or 134.95 may be used to contact commercial airlines. Maps for radio frequencies are available upon request.

D. Other Emergency Items

One extra set of oars must be carried on each oar-powered boat or raft. Two extra paddles must be carried on rafts that are paddle-powered.

One extra motor must be carried on each motorized boat. Also, spare motor parts of the types most commonly found to break and need replacement under river-running conditions (such as propellers, shafts, water pumps, etc.) should be carried. All motorized craft are required to carry one B-II or two B-I fire extinguishers.

When inflatable rafts or pontoons are used, each river trip will carry at least 1 air pump.

Every trip will carry a boat patching and repair kit.

One or more of the following maps or guides or their equivalent should be carried on each boat: Grand Canyon River Guide by Buzz Belknap, "Pictorial Color Map of Grand Canyon" by Jack Currey, appropriate U.S.G.S. quadrangles, Brigham Young University Guidebooks to the Colorado River, Colorado River Guidebook by Troy L. Pewe, A River Runner's Guide to the History of Grand Canyon by Kim Crumbo, and A Guide to the Colorado River in Grand Canyon by Larry Stevens.

E. Incident Reports

Any incidents resulting in personal injury requiring a physician's attention, evacuation from the canyon, or property damage over \$100 must be reported to Grand Canyon National Park. River Incident Forms must be given to the NPS ranger at the time of evacuation or to the ranger at Phantom Ranch or Pearce Ferry, or they may be mailed to the River Subdistrict within 5 days of the end of your trip. Incident forms will be supplied by Grand Canyon National Park with the trip permit.

F. Helicopter Evacuation (See Supplement E for evacuation procedures.)

In the event of an emergency requiring helicopter evacuation, arrangements will be made for the rescue service by Grand Canyon National Park only. The permittee will be responsible for the cost of the helicopter evacuation if the passenger is unable to pay.

VI. Environmental Protection and Sanitation

A. Refuse

Cans, rubbish and other refuse MAY NOT BE DISCARDED IN THE WATER OR ALONG THE SHORE OF THE RIVER, in side canyons, trails, escape routes, or any other portions of the canyon. All refuse material must be carried out. Deposits cannot be made at Phantom Ranch or Diamond Creek. Liquid garbage will be strained directly into the river through a fine-mesh screen capable of holding small food particles; the solids will then be placed in garbage bags. Crushing food and beverage cans must be done on a tarp or below the high water line in a manner that will not leave food particles, liquids, or paper on the beach. The trip permittee is responsible to ensure that participants properly dispose of refuse.

B. The Use of Soap

The use of soap is restricted to the mainstream of the Colorado River only. Use of soap in side streams or within 100 yards of any side stream junction with the Colorado River is prohibited.

C. Portable Toilets

HUMAN WASTE CONTAINERS MUST CONSIST OF 20MM AMMO BOXES or a system approved by Grand Canyon National Park. It is the responsibility of each boat party to remove its solid human waste from the canyon. A human waste carry-out system will accompany all trips on the river. This system must be a minimum of that described in Supplement B or other previously inspected and NPS approved toilet system. These facilities will be set up in camp and remain until the party breaks camp. A small, accessible toilet is required for day use. Deposit toilet paper in a suitable container. DO NOT BURN TOILET PAPER. Urination should occur in the river or in the wet sand below the high water line.

D. Fires

Gas stoves (propane, white gas, etc.) with sufficient fuel for cooking are required on all trips. Charcoal briquettes may be used for cooking. Wood fires may be used only for warmth or aesthetics. From May 1 through September 30, all wood must be carried into the canyon from an outside source. From October 1 through April 30, driftwood from along beaches may be used for warming and aesthetic fires. Gathering of wood from any standing or on-site fallen trees, dead or alive, is prohibited. All wood fires must be contained in a fire pan measuring 432 square inches; the lip of the pan must be 3 inches high. Charcoal briquettes may be contained in fire pans 12 inches by 12 inches by 3 inches. All ash and residue will be carried out of the canyon. Trips launching from October 1 through April 30 must carry an approved fire pan. Wood or charcoal fires are not allowed outside of the river corridor beaches.

E. Multiple Trails

Multiple trailing and its consequent impact on vegetation and soils comprises a perennial problem at attraction sites and along backcountry trails. All river runners should stay on established trails and avoid short-cutting across fragile desert soils.

F. Campsite Impacts

Impacts above the sandy, post-dam riparian zone at camping areas continue to be a problem. Desert and old pre-dam riparian plant communities are particularly susceptible to damage and erosion due to trampling. River runners should set up camp in the more resistant, post-dam, sandbar areas. Do not blaze new hiking routes or sleeping areas in the fragile desert zone.

VII. Restricted Areas

Areas along the Colorado River closed to either camping (including no open fires) or Visitation include:

- A. Colorado/Paria River confluence to Navajo Bridge - no camping.
- B. Redwall Cavern - no camping and no fires.
- C. Anasazi Bridge - closed to all visitation.
- D. Nankoweap - special camping regulations (see Supplement F).
- E. Little Colorado River - no camping from Mile 60.5 to Mile 65 on ~~southeast (left) side of the Colorado River.~~
- F. Hopi Salt Mine - no visitation from Mile 63 to Mile 64.5 on the east (left) side of the Colorado River.
- G. Furnace Flats - Mile 71 to Mile 71.3 on north (right) side - no visitation.
- H. Hance Mine - no visitation along trail from Mile 77.0 (north bank) to and including Hance Mine (closure due to asbestos hazard).
- I. From Memorial Day to Labor Day, it is recommended that camps in the entire corridor between Hance and Phantom Ranch be utilized only by trips with passenger exchanges.
- J. Phantom Ranch (Mile 87 to Mile 89.25).
  - 1. Left bank: 87 Mile Camp (Cremation) is for river trips requiring exchanges at Phantom Ranch. The capacity of the camp is 2 parties. No camping is permitted from the Black Bridge to 1/4 mile downstream of Pipe Creek (Garden Creek). Trip leader must notify the Phantom Ranch ranger at time of exchange of passengers.

2. Right bank: No camping from Mile 87 to Mile 89.25 except in an emergency. Emergency camping in this area, including Roy's Beach, must be approved by the Phantom Ranch ranger. Wood fires will not be allowed at any time in this area. Passengers leaving trips at Phantom Ranch and wishing to camp at either Bright Angel Campground or Indian Gardens must have an overnight permit from the Backcountry Reservations Office (See Section X).
- K. Bass Mine, Hakatai Canyon - no visitation of area immediately surrounding the mine, talus slope, and camp (closure due to asbestos hazard).
- L. Elves Chasm - no camping within 1/4 mile of the confluence of Royal Arch Creek with the river or within the chasm.
- M. Deer Creek Falls - no camping on the north (right) side of the Colorado River within 1/4 mile upstream or 1/2 mile downstream of its confluence with Deer Creek.
- N. Matkatamiba - day use only, no camping in the canyon.
- O. Havasu Creek - no camping within 100 yards upstream of the confluence of Havasu Creek with the river or 1/2 mile downriver from the confluence. Overnight use is permissible only within the Havasupai Campground. No camping is allowed between Beaver Falls and the river. A fee is charged for entrance to the Havasupai Reservation. For reservations at Havasu Campground, telephone the Havasupai Indian Tribe at (602) 448-2121 or 448-2141.
- P. The left or south side of the canyon above the historical high water line between Mile 165 and Mile 273 is Hualapai Tribal lands. Any use of those lands for camping or hiking must be approved by the Hualapai Tribe in Peach Springs, Arizona.
- Q. Other areas as listed on the bulletin board at Lees Ferry.

#### VIII. Other Conditions

- A. A fee is charged for each person, boat, and vehicle to traverse the Diamond Creek Road. Permits are required in advance. For further information, contact Ms. Donnita Selana, Director, Hualapai River Running Department, P.O. Box 246, Peach Springs, Arizona 86434, (602) 769-2210 or 769-2219.
- B. Rafts/boats operating on Lake Mead at night must comply with U.S. Coast Guard running light requirements.
- C. No cats, dogs, or other pets are permitted on a raft trip.

- D. Trips may be delayed or cancelled at Lees Ferry if Noncommercial River Trip Regulations are not met. Approval of conditions prior to departure shall be solely determined by the park ranger on duty.
- E. An NPS river ranger may, on occasion, travel or camp with noncommercial parties in order to insure compliance with permit conditions.
- F. Natural or historical features such as rocks, old mining artifacts, fossils, flowers, or Indian artifacts may not be removed or disturbed (~~36 CFR 2.1~~).
- G. No vessel shall engage in primarily upstream travel above Diamond Creek or have a total horsepower of greater than 55.
- H. Lees Ferry Launch Ramp Procedures - (See Supplement D).

IX. Noncommercial Use Affidavit

(See page 45 of application form, Section C)

X. Backcountry or Off-river Camping

Permits are necessary for off-river camping in all areas of Grand Canyon National Park. All backcountry areas have group and/or party limits. A party is 8 or less people and a group is 16 or less people.

A backcountry permit is necessary for all off-river overnight use. Permits may be obtained from the Backcountry Reservations Office by requesting them in writing. Telephone requests are not accepted. The Backcountry Reservations Office accepts permit requests beginning October 1 for the following calendar year. All requests for overnight off-river camping should be sent to:

Backcountry Reservations Office  
National Park Service  
P.O. Box 129  
Grand Canyon, Arizona 86023

Be sure to read Part VII, Restricted Areas.

XI. Derigging

All trips derigging at the Pearce Ferry boat ramp may not block the ramp or restrict the access of any other visitor wishing to use the boat ramp. River parties may not derig within the area between the deep-water launch rig signs at the Pearce Ferry boat ramp.

XII. Advisory to River Trips

- A. Flash floods occur in side canyons of the Grand Canyon occasionally during the summer. The likelihood of flash floods increases during the afternoon. It is advisable to plan takeouts at Diamond Creek during the morning. Keep the possibility of flash floods in mind when camping at side canyons.
  
- B. Water releases from Glen Canyon Dam have varied widely during past years. In 1988, substantial daily fluctuations occurred. Flows have ranged from 3,000 cfs to 20,000 cfs with averages of 12,000 cfs between July and September. Flows in the remainder of 1988 generally ranged between 3,000 cfs and 18,000 cfs with averages of 10,000 cfs. In prior years (1984-1986), flows were higher but consistent. The high releases were due to higher than normal precipitation in Utah and Colorado accompanied with relatively little storage space available in Lake Powell. During these years, flows peaked in May or June from 45,000 cfs to 48,000 cfs. Although there are no minimum boat size restrictions, boats of at least 16 feet are recommended during these high releases.

Supplement A  
SANITATION AND FOOD PREPARATION

Proper food handling and sanitation techniques are necessary to prevent the spread of communicable diseases among the members of your trip. Gastrointestinal illnesses are of primary concern. The usual source of gastrointestinal organisms is the human intestinal tract. Some organisms found in the nose or in infected skin lesions can produce a powerful toxin which cannot be destroyed by heat, and which can cause severe gastrointestinal illness. In addition to human sources, meat and poultry may be contaminated. If these foods are inadequately cooked, the result will be the contamination of utensils, preparation surfaces, and the hands of handlers.

Following contamination of a food, it is usually necessary for the bacteria to reproduce before an infective dose is developed. Three factors are required for reproduction - time, temperature, and a nutrient source.

It usually takes no more than 3 to 4 hours after food has been contaminated to produce enough bacterial growth to cause illness in a large number of people. Most of the organisms of concern will grow well between 77°F and 114°F. The contaminated food provides a nutrient source.

In order to prevent contamination of food during its preparation along the river, personal and environmental cleanliness are vitally important. No one with symptoms of a communicable disease, especially diarrhea, should be allowed to prepare food or handle utensils for others. Neither should anyone with infected wounds or boils be permitted to handle food. As disease-causing organisms often get into food from hands of a person preparing food, scrupulous personal cleanliness is important. Washing the hands with soap and water is essential after going to the toilet, handling raw meat and poultry, putting fingers in the nose, or handling objects that may be contaminated.

All surfaces with which food comes into contact during preparation, including knives, utensils, cutting boards, and table tops, must be clean and sanitary. Tables and equipment used for preparing raw meats and poultry should not be used for preparing other foods until they have been cleaned and sanitized thoroughly.

The means by which foods become contaminated with disease organisms, and the subsequent processes through which these organisms pass in order to become dangerous to human health, dictate the procedures necessary to interrupt the chain of events leading to an outbreak of human illness. Briefly stated, these procedures are:

1. After handling or going to the toilet or handling raw meat or poultry, wash hands with soap and water before handling utensils and preparing foods.
2. Cooked, prepared foods, or foods served raw (e.g., vegetables) should come in contact only with clean and sanitized surfaces, equipment, and utensils. Equipment used for raw foods should be washed and sanitized

before being used with cooked foods.

3. Persons with communicable diseases, infected wounds on the hands and arms, or boils should not be allowed to prepare food.
4. Stored perishable food should be kept at temperatures below 45°F.
5. Foods such as meat and poultry products should be well cooked (165°F) to destroy disease organisms.
6. After preparation and prior to serving, keep hot foods hot (above 140°F) and cold foods cold (below 45°F).
7. Leftover perishable food should be discarded or refrigerated immediately in clean, protected, labeled containers.
8. Leftover perishable food should be thoroughly reheated before use (to 165 degrees F).
9. It is recommended that tarps be placed in the kitchen area and under the dishwashing set-up in order to reduce the amount of food particles left on beaches.

It is recommended to sanitize dishes and utensils using the 3-bucket system. Place 3 buckets of water below the high water mark to leave the beach free of soap and spilled food. The system is as follows:

1. Use 3 buckets large enough to immerse the largest plates and utensils. Heat 2 buckets of water to near boiling. If the river is muddy, allow dishwater to settle and remove sediment before use. The use of alum is recommended for settling.
2. Add detergent to 1 heated bucket of water, leaving the other heated bucket of water clear for rinsing. To the third bucket of water, add chlorine at the rate of 3 to 4 ounces per 5 gallons for sanitizing. Set up sanitizing rinse 30 minutes prior to washing dishes to allow chlorine to work.
3. Wash dishes and utensils in first bucket to remove grease and food particles. Water temperature should be 120°F to 140°F.
4. Dip rinse in second bucket.
5. Immerse articles in the third bucket for 60 seconds, double time if towel-dried. The effectiveness of chlorine for disinfection is directly related to time of exposure. Be sure to allow time for the chlorine to sanitize.
6. Place dishes on a rack for air-drying or wipe dry with fresh paper towels. Store the articles in a clean, dry location to be ready for the next meal.

## WATER PURIFICATION

All water consumed or used for cooking must be disinfected. Research during 1981 on the Colorado River and its tributaries indicated that increased sediment from flooding or other causes may pose a high risk to river users. The following water disinfection steps should be followed:

1. Use the main course of the Colorado River to collect water unless the river is quite cloudy from sediment.
2. Use side streams as a water source when the main river is laden with sediment and the side stream is running clear. Avoid the following tributaries because of poor water quality: Paria River, Little Colorado River, Bright Angel Creek, Garden Creek, Hermit Creek, Elves Chasm, Havasu Creek, and Diamond Creek.
3. To disinfect visually clear water, add 8 drops of liquid chlorine bleach per gallon; mix the water; and let it stand uncovered for at least 2 hours.
4. Cloudy, sediment-laden water must be cleared before disinfection. Settle overnight or use flocculating procedures. Water that is cloudy after settling must receive 10 to 12 drops of liquid chlorine bleach per gallon and let set for at least 2 hours before using.
5. The effectiveness of chlorine bleach deteriorates rapidly when exposed to high temperatures or stored for extended periods.
6.
  - A. Use of an approved filter alone will remove bacteria and cysts, however, to assure removal of viruses, the use of a disinfectant and a filter is recommended. Some filters currently available on the market contain components having a disinfectant action during filtration.
  - B. Portable filters (either gravity flow or piston pump) having a nominal pore size of 0.45 microns or less may also be used. Settled water will extend filter life. In addition to overnight settling, alum may be added at the rate of 1/4 teaspoon per 1 1/2 gallons. Decant the clarified portion, filter, and disinfect by adding 1 to 2 drops of fresh bleach per gallon. Water treated in this manner should be allowed as long a contact time as possible but no less than 1 hour in all cases.
7. An alternative to filtration and chemical treatment is to boil river water for a minimum of 1 minute prior to use.

## Supplement B

### HUMAN WASTE CARRY-OUT METHOD

Previously, over 5,000 burials of human waste took place within the river corridor each year. Due to the impact on soils and vegetation and the hazard to human health presented by the burial system, it is now required that all solid human waste be carried from the canyon.

The cheapest and, so far, most effective means of transporting solid waste is by the use of air-tight ammo boxes and plastic bags. The items necessary are:

1. Large ammo cans (rocket boxes, 20 mm, 18 inches by 14 inches by 8 inches). Plastic buckets are not acceptable.
2. Toilet seat.
3. Large, heavy-duty plastic garbage bags.
4. Deodorant chemical: Aqua Chem (blue goo), chlorine bleach, slaked lime, or Clorox II (dry bleach).
5. Toilet paper, hand-washing water dispenser, and soap. Bar soap is not recommended. Use a system which allows flowing water to rinse soap off hands. It is recommended that the rinse system not employ the use of beverage coolers due to possible contamination of the spigot.
6. When feasible, place toilet system near river's edge and encourage ~~urination in the river.~~

The system is set next to the river if possible. One of the rocket boxes serves as the actual toilet container. The rocket box is first lined with 1 of the heavy-duty, large garbage bags (fold the excess bag around the edge of the can). Pour some of the deodorant chemical into the open bag and place the toilet seat on top of the can. The toilet is now ready for use. The hand-washing water dispenser and the hand soap can be placed close by. Used toilet paper, tampons, and sanitary napkins should be placed directly into the toilet. After each deposit, the toilet should then be covered with a large heavy-duty garbage bag or by the lid to discourage flies. When camp is to be broken, it takes only a few minutes to dismantle the toilet system and store the feces. Squeeze the excess air out of the bag and then tie it off. At this point, place the bag containing the feces into another garbage bag, and store subsequent bags in it. This is a security measure against leakage. This is then tied off as before. The storage bag is then placed into the rocket box, the lid is sealed, and the container ready for storage until the next use. The toilet seat, plastic bags, toilet paper, and deodorant are then stored in another ammo can ready for the next camp's use. It is necessary to remove only 2 cans per night from the boat - 1 for the storage of the equipment, another for actual use as a toilet and the subsequent storage of the fecal products.

The amount of chemical used per day depends on the type used and the number of people on the trip. With liquid deodorant, a few ounces at the bottom of the bag is sufficient for six or seven people. If you are using bleach, more is required, approximately double. If used, slaked lime and dry bleach should be sprinkled over feces after each use. The chemical reduces bacterial growth in the feces and the production of methane gas. The number of ammo cans needed is dependent on the number of people and the length of the trip. It is easy to contain about 50 uses in 1 ammo box. Thus, for an 8-day, 10-person trip, a minimum of 2 ammo boxes for feces, and 1 ammo box for equipment would be required. Please indicate on the application the number of ammo cans you intend to bring.

The above is the basic system. The basic tenant is to safely contain feces and prevent the generation of methane gas.

If you take out at Pearce Ferry, do not dump human waste in any container at Pearce Ferry. Feces must be disposed of in a sanitary landfill or RV dump station. You should check in your area before leaving the river. You will have carried the material with you down hundreds of miles of river; be sure to take it to a proper deposit location.

#### Day Use Toilet System

The ~~availability~~ of a day use toilet system is required during the times when the regular toilet is not set up. Store toilet paper, plastic bags, coffee can, hand soap, and a small container of toilet chemical in a small ammo can or similar container that passengers can obtain when needed. Instruct users to deposit human waste and toilet paper in a plastic bag with a squirt of bleach or other disinfectant chemical. To reduce the odor and increase the tidiness of the ammo can, the full plastic bags can be stored in a 1-pound coffee can (sealed) until dumped. Empty the used bags directly into the waste storage cans in the evening. This system prevents the accumulation of human waste at beaches and attraction sites

Supplement C

SUGGESTED FIRST AID ITEMS

Items should be neatly stored in an easy to locate and identifiable waterproof container.

Highly recommended

First aid kit inventory list taped to the inside lid of the container and Red Cross First Aid Manual or equivalent.

	<u>Description</u>	<u>Uses</u>
<u>Instruments</u>		
Scissors (EMT type)	1 (medium size)	Cutting tape, dressings, clothes
Razor blade, single	2	For removing hair before taping
Tweezers	1	To remove wood splinters, etc.
Safety pins	10 (various sizes)	Mending and triangular bandage
Q-Tips (Cotton swabs)	1 package	Cleaning lacerations, eyes, etc.
Pencil/Note pad	1 each	Documenting injuries and items used in treatment
<u>Relief of Discomfort</u>		
Pain reliever (aspirin or substitute)	36 tablets (5 grain)	1-2 every 4 hours for headaches, minor pain, and fever
Ibuprofen (Advil or generic brand)	200 mg tablets	Muscle strains, minor pain, or menstrual cramps
Antacid	18 tablets	For indigestion or heartburn
Antihistamine	18 tablets	1 every 4 hours for insect bites, colds, hives, or rashes
"Gookinaid" or similar electrolyte replacement drink	1 tub minimum	Relieve or prevent muscle cramps and symptoms of heat exhaustion
Oil of clove	1 small bottle	Relief of toothache
Calamine lotion or	1 bottle	Relief of itching from poison

Cortisone Cream		ivy, life preserver rash, or allergies
Solarcaine	1 bottle	Relief of sunburn pain
Zinc oxide/PABA or other sun block	1 bottle	Prevent sunburn
Benadryl Syrup	1 bottle	Minor allergic reactions
<u>Other</u>		
Antibacterial soap (Phisoderm, tincture of zepthesis, Hibiclens)	8 to 12 ounces	Antiseptic for wounds
Moleskin	1 package	For blisters
Betadine	1 bottle	For cleaning wounds
Band-aids	36 (1-inch)	For lacerations
Anti-bacterial ointment (Bacitracin, etc.)	2 tubes	For lacerations and wounds
Butterfly Band-aids (or know how to make)	18 (various sizes)	For closing lacerations
Carlisle (trauma dressing) or substitute (such as Kotex)	3 (4-inch)	For large bleeding wounds
Elastic bandage	2 (3-inch)	For sprains and securing rigid splints
Steri-pad gauze pads	18 (4 inch by 4 inch)	For large wounds
Steri-pad gauze pads	18 (2 inch by 2 inch)	For small wounds
Tape, waterproof adhesive	2 (2-inch rolls)	For sprains, securing dressing, etc.
Triangular bandage or Muslin pieces	4 (40-inch)	For securing rigid splints, slinging and securing extremities, and protecting dressing from contamination
Roller gauze	5 rolls (2 inch by 5 yds.)	For holding gauze pads in place, securing splints, and improvising slings

Rigid splint, arm board, Sam Splint	1	For in-line fracture, pressure bandage
Rigid splint, leg board, Sam Splint	1	For in-line fracture, pressure bandage
Thermometers: 1 oral, 1 rectal (a hypothermia thermometer is recommended)	2	Diagnosing fever or other exposure illnesses: heatstroke, hypothermia
Signal Mirror	1	Signaling aircraft in case of emergency
Dimes and quarters	Several	Making phone calls in case of emergency
<u>Optional</u>		
Mineral oil	Small bottle	Constipation
Syrup of Ipecac	Small bottle	Induce vomiting
Kaopectate	Small bottle	Diarrhea
Ophthalmic wash and/or Eye drops	Small bottle	Eye wash/irritation
Ear drops	Small bottle	Clogged/Infected ears
Water purification tablets	Small bottle	Purify water on side canyon hikes (use bleach for river water)
Eye pad	2	Injured eye
Tincture of Benzoin	2 small bottles	To hold tape in place and protect skin
Insect repellent	Large can or bottle	Flies, ants, mosquitoes

A Note About Hypothermia (Exposure):

Should someone fall in the river, it is extremely important to get them out of the water as quickly as possible. After 5 minutes of floating in 50-degree water, muscular strength and coordination rapidly diminish. Generally after 10 to 15 minutes, a person is totally unable to help themselves.

Supplement D

LEES FERRY INFORMATION SHEET

The procedures and regulations for using the campground and other facilities at Lees Ferry are listed below.

LAUNCH RAMP PROCEDURES

- (1) The trip leader will check-in with the ranger on duty prior to rigging for launch. Arrangements for attending the river passenger orientation program may be made with the ranger at this time. If launching on a day when 2 noncommercial trips are scheduled, you will be assigned at Lees Ferry to either a morning or afternoon check-in and orientation.
- (2) Trucks and cars may be parked on the ramp only long enough to unload gear. The vehicles must then be moved. Vehicles should be left in the 14-day parking area. There is NO OVERNIGHT PARKING on the launch ramp.
- (3) Bathing, washing dishes, and sleeping in the launch ramp rest rooms are prohibited. This includes the water spigots near the rest rooms.
- (4) Preparation and cooking of meals or setting up tables on the ramp is prohibited.
- (5) Due to the congestion and high level of activity on the launch ramp in the morning, the use of radios and tape players is prohibited.
- (6) A maximum of 2 trip members may sleep on the ramp with their gear. Everyone else must use the campground provided for noncommercial river parties.
- (7) There is no camping at or near the historic buildings.
- (8) Upon return to Lees Ferry after a trip, camping is allowed only in the Lees Ferry Campground. No overnight camping is allowed in any parking lot. The "Private River Runner's Camp" is for use only by noncommercial trips prior to launch and may not be used by river runners returning to Lees Ferry after their trip.

## CAMPING PROCEDURES

A three-site camping area has been designated near the launch ramp for noncommercial use. The camping area is located 100 yards west of the launch ramp. A sign ("Private River Runners Camp") designates this area. The Lees Ferry Campground, which is 1.5 miles from the launch ramp, may also be used; however, this is a fee area. The regulations for the camping area for noncommercial river runners are:

- (1) The trip leader will check-in with the ranger on duty prior to setting up camp during working hours.
- (2) Camping procedures must comply with the Noncommercial River Trip Regulations. Stoves, fire pans, dish washing systems, and human waste system will be set up, depending on the need.
- (3) Human waste will be carried downriver.
- (4) Charcoal ash will be carried downriver. Gathering of firewood is prohibited.
- (5) Trash will be bagged and deposited in the containers near the launch ramp.
- (6) A maximum of 16 river trip participants per site is allowed.
- (7) Quiet hours are from 10 p.m. to 6 a.m. No loud noise will be tolerated.
- (8) There is a 2 day limit in the camping area. If you arrive earlier, you will have to use the Lees Ferry Campground.
- (9) Groups arriving at Lees Ferry late at night must use the Lees Ferry Campground fee area. The following day, they may check in with the ranger on duty for the use of the "Private River Runners Campground" or rigging area.

Thank you for your cooperation with other river runners at Lees Ferry.

## Supplement E

### HELICOPTER EVACUATIONS

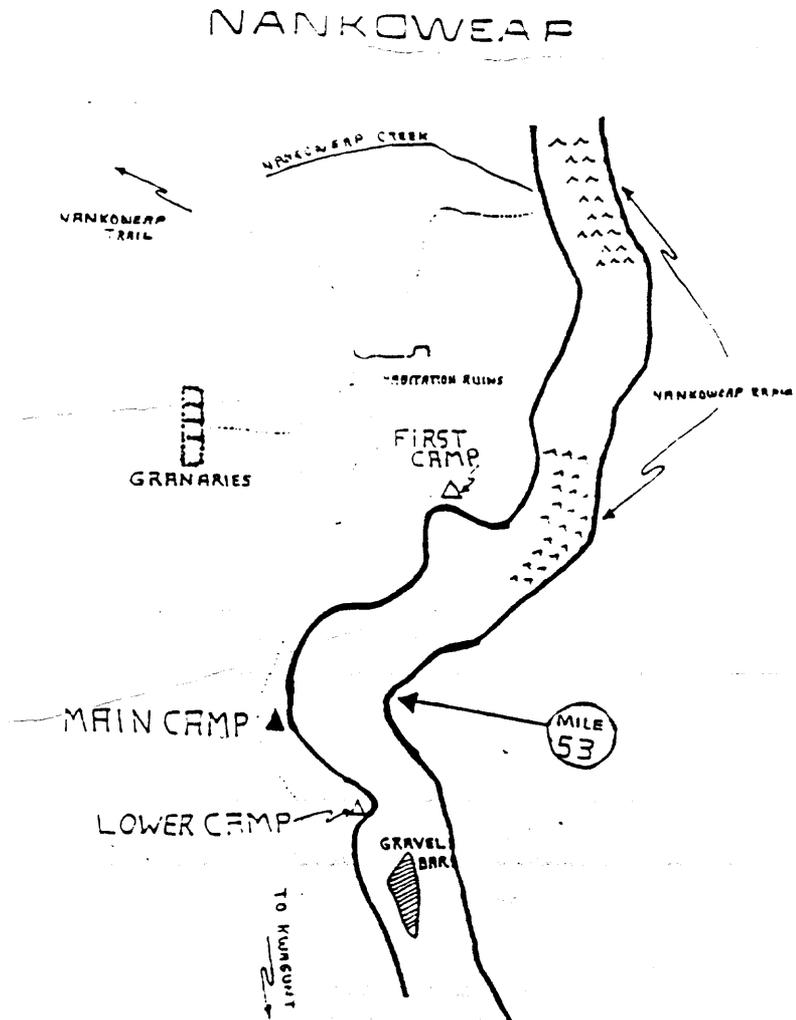
- A. JUSTIFICATION - Helicopter evacuations are available for medical or other emergencies only.
- B. Request Procedures
1. Arrangements for helicopter evacuations will only be made by the NPS.
  2. Requests for evacuation can be made by, (1) contacting the NPS directly (river patrols, Lees Ferry, Phantom Ranch) or, after using an escape route, by telephoning Grand Canyon Dispatch at (602) 638-2477, (2) contacting aircraft by ground-to-air radio, (3) mirror flash or other signaling device directed toward passing aircraft or ~~rim overlooks.~~
  3. When contacting aircraft by radio, be sure to provide accurate and concise information. Remember, your message may be relayed several times before it reaches the Park Service Dispatch. Provide information in the following order:
    - (a) Give your location. State that you are a river trip requesting helicopter evacuation at a given river mile in the Grand Canyon.
    - (b) Briefly state the problem (suspected spinal injury, severe head injury, hypothermia, etc.).
    - (c) If the injury is minor and stable, state that fact. This will allow EMS personnel to determine priorities in the event of simultaneous requests for medical responses. Ask the pilot to repeat the message so that you know they understand your situation.
  4. A mirror flash is often the most reliable method of contacting aircraft, so be sure you understand how to use the mirror as a signaling device. Remember that the mirror flash presents problems in that no patient assessment information is relayed and your location is not certain to be reported correctly.
- C. Landing Zone Selection and Preparation
1. Select a level area approximately 10 feet by 10 feet. Be sure that it is clear of obstacles such as trees and large rocks for a diameter of 50 feet. Such areas are virtually non-existent in some stretches of river (i.e., below Crystal to Bass, Olo to Havasu, etc.). While the pilot and crew can conduct hover exits and one-skid landings, these attempts are dangerous and will not be attempted except as a last resort in life-threatening situations. Unless such travel poses serious problems for the patient, transport by boat to a safe landing zone will generally provide a faster and safer evacuation.

2. Set up an X with the orange signal panels. Do not locate the panels directly on the landing zone. Remove the panels once the pilot locates your position in the event he selects that site for landing. This will assist the pilot in determining your party from others in the vicinity.
3. Prepare your group and camp for the evacuation. It is extremely important that everyone be gathered together away from the landing zone and in full view of the pilot. Be certain that no loose items are in the landing zone since the downwash will lift and toss articles, possibly into the rotor or your group. Secure loose equipment in the camp (sleeping bags, ground cloths, tables, lifejackets, tents, etc.) in the event the pilot must pass over the area.
4. Wet down as much of the landing area as possible just prior to the helicopter's arrival. This helps the pilot's visibility, decreases the amount of sand blown into eyes, boats, and food, and reduces damage to the helicopter's surface and engine.
5. The pilot's awareness of wind direction is critical for safe landings. The helicopter must fly directly into the wind when landing and taking off. Do not locate your group in the flight path. You can assist the pilot by indicating wind direction. The easiest method is to simply toss a handful of sand directly upward. The pilot can then observe the direction of drift. Another method is to stand with your back against the wind and extend both arms forward pointing the direction the wind is blowing.
6. NEVER APPROACH THE HELICOPTER UNLESS DIRECTED TO DO SO BY THE PILOT OR CREW. Never approach from the rear of the helicopter. Keep your group together and in one location. When directed to do so, approach the helicopter in full view of the pilot. Walk in a crouched position to avoid being struck by the helicopter rotor blades.

Supplement F

NANKOWEAP SPECIAL USE AREA

Due to the impacts of multiple trailing, campsite competition, and congestion in the Nankoweap area, the following special camping regulations are in effect. Camping for river runners in the Nankoweap Delta area, Mile 52.0 to Mile 53.0, right bank, is restricted to the three river camps identified on the map as First Camp, Main Camp, and Lower Camp. The First Camp is located in a large cove behind a gravel bar, approximately 1/2 mile downstream of the confluence with Nankoweap Creek. The camp is visible on the right from the tail waves of Nankoweap Rapid. The Main Camp is also visible several hundred yards downstream. The Lower Camp is a small, boulder-covered sand bar forming a point of land 100 yards downstream and around a corner from Main Camp. Each camp has a capacity of 1 river party only. River parties wishing to hike must disembark at any 1 of the 3 camp locations or at the mouth of Nankoweap Creek (Hiker's Camp) only. This requirement is due to past problems of multiple trailing. Groups camping early or on lavovers should expect other groups to pull in for hikes.



Supplement G

RIVER INCIDENT REPORT

THE RIVER SUBDISTRICT  
GRAND CANYON NATIONAL PARK  
P.O. BOX 129  
GRAND CANYON, ARIZONA 86023

Launch Date: \_\_\_\_\_ Trip Leader: \_\_\_\_\_

Date: \_\_\_\_\_ Location of Incident: \_\_\_\_\_

NATURE OF INCIDENT \_\_\_\_\_

<u>INVOLVED PERSONS</u>	<u>ADDRESS</u>	<u>PHONE</u>	<u>SEX</u>	<u>AGE</u>	<u>DOB</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

OCCURRED: Ashore \_\_\_\_\_ Boat \_\_\_\_\_ In water \_\_\_\_\_ Other \_\_\_\_\_

WATER LEVEL: \_\_\_\_\_ cfs

DESCRIPTION: How did the incident occur? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

When did it happen (date and time)? \_\_\_\_\_

First Aid given: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Medications given (dose and time): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE  
GRAND CANYON NATIONAL PARK  
P.O. Box 129  
Grand Canyon, Arizona 86023  
(602) 638-7843

C. NONCOMMERCIAL RIVER TRIP PERMIT APPLICATION

INSTRUCTIONS

- I. Enclosed are the following:
  - A. Copy of trip regulations
  - B. Permit application form which includes the listing of adverse actions and penalties with respect to violations of permit requirements.
- II. Please read the entire packet prior to completing the application or signing any part of it. Your signature is required on pages D-33 and 44.
- III. You have been assigned a launch date for a river trip in Grand Canyon National Park as indicated on page D-3. Complete the application and return it to Grand Canyon National Park no less than 30 days prior to the launch date, enclosing a non-refundable \$50 application fee. Only money orders or cashier's checks will be accepted. Upon receipt, your application will be reviewed and approved or disapproved. If disapproved, you will be contacted by telephone as soon as possible to correct the situation. This permit is subject to final approval by the park ranger on duty at Lees Ferry.
- IV. Cancellation Policies
  - A. Anyone cancelling more than 60 days prior to the scheduled launch date will not be restricted from the waiting list and may reschedule the trip if their original date was not claimed from a cancellation and only if a launch date is available.
  - B. Anyone cancelling less than 60 days prior to the scheduled launch date will be restricted from the waiting list for 1 year.
  - C. Anyone cancelling less than 30 days prior to the scheduled launch date will be restricted from the waiting list for 2 years.
  - D. Deferrals (rescheduling to the next year) will not be allowed unless the permittee has a confirmed medical problem that will not allow them to participate in a river trip. Exceptions may be requested in writing addressed to the Chief of Visitor Protection.
  - E. If a launch date is accepted less than 30 days notice prior to launch, restriction from the waiting list will be for only 1 year if that date is cancelled at a later time.

NOTICE OF ADVERSE ACTIONS OR PENALTIES

You, as trip permittee for a noncommercial river trip conducted within Grand Canyon National Park, have the responsibility for ensuring this trip and all participants comply with the terms and conditions of the permit.

In the event that any violations of the terms and conditions of the permit do occur, you may be subject to the following adverse consequences and/or penalties. You, as trip permittee, and/or any member of your party may incur these penalties:

- A. You or any member of your party may be required to appear personally before the U.S. Magistrate at Grand Canyon National Park regarding any violation.
- B. You or any member of your party may be fined not more than \$500 per person per incident.
- C. At the discretion of the U.S. Magistrate, you or any member of your party may be sentenced to a period of incarceration not to exceed 6 months, subsequent to a serious violation of the permit terms and conditions.
- D. At the discretion of the Superintendent of Grand Canyon National Park, you or any member of your party may be prohibited from participation in any future commercial or noncommercial river trips in Grand Canyon National Park for a period of no more than 3 years subsequent to any violations of the permit terms and conditions.
- E. At the discretion of the Superintendent, your approved river trip permit may be revoked and your trip terminated at any point within Grand Canyon National Park subsequent to any violations of the permit terms and conditions. Should this occur, you, any, or all members of your party along with any or all of your party's equipment, may be removed from Grand Canyon by helicopter, boat, or other means. This action may result in any or all of your equipment being impounded until transportation costs are paid. Transportation costs could be \$5,000 or more.

Your signature below indicates that you have read and understand these penalties and adverse actions which may result subsequent to any violations of the terms and conditions of the permit.

Your signature further indicates that you accept full responsibility for any reasonable and customary expenses and/or impound fees incurred by the National Park Service during the removal of any or all of your party from Grand Canyon subsequent to violations of the permit terms and conditions.

Permittee's Signature \_\_\_\_\_

Date \_\_\_\_\_

Approved by \_\_\_\_\_  
Date \_\_\_\_\_

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE  
GRAND CANYON NATIONAL PARK  
P.O. Box 129  
Grand Canyon, Arizona 86023  
(602) 638-7843

THIS MUST BE RETURNED NO LESS THAN 30 DAYS PRIOR TO LAUNCH DATE.

NONCOMMERCIAL RIVER TRIP APPLICATION

Launch date \_\_\_\_\_ Takeout date \_\_\_\_\_

Initially Scheduled \_\_\_\_\_ Cancellation \_\_\_\_\_ Year Placed on Waiting List \_\_\_\_\_

Permittee \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Daytime telephone no. ( \_\_\_\_\_ )  
area code \_\_\_\_\_

Qualifying Boatman Experience

The permittee or one other qualified boatman who will be present on the entire trip must have participated in a previous Grand Canyon river trip as a boatman in command of a boat or participated as a boatman in command of a boat on a river of similar difficulty.

A list of rivers of similar difficulty appears below; this list is not all-inclusive.

Cataract Canyon, UT  
Westwater Canyon, UT  
Green River, UT  
Yampa River, CO  
Main Salmon, ID

Lodore Canyon, CO  
Rogue River, OR  
Selway River, ID  
Tuolumne River, CA  
Middle Fork Salmon, ID

In the space provided on the following page, the permittee must show evidence of qualifying experience for himself/herself or one other trip participant. The selection of all other boatmen/kayakers will be the responsibility of the permittee. He/she should be guided by a thorough understanding of the technical skill required to navigate the major rapids found in Grand Canyon National Park. Questions may be directed to the River Subdistrict at (602) 638-7843.

Qualifying Boatman

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Daytime telephone no. ( \_\_\_\_\_ )  
area code

<u>River</u>	<u>Type of Experience</u>	<u>Type of Craft</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Further Comments:

Participant List

PLEASE PRINT LEGIBLY

All participants must have a valid form of picture identification. Identification such as a driver's license, State ID, bank cards that have the owner's picture, and notarized affidavits are acceptable. Documents such as credit cards, altered birth certificates, etc., are not acceptable.

FAILURE TO PRESENT A VALID ID TO THE LEES FERRY RANGER WILL RESULT IN A PARTICIPANT BEING REMOVED FROM YOUR PERMIT.

	<u>Participant's Name</u>	<u>Address</u>	<u>Phone #</u>	<u>First 7 Digits of Social Security #</u>
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				

Please note anyone hiking into/out of the trip.

Note: Any last-minute changes in your passenger list are acceptable and may be made by the ranger on duty at Lees Ferry at the time of your launch.

Maximum trip lengths allowed from Lees Ferry to Diamond Creek are:

April 16 - October 15: 18 days      December 1 - February 29: 30 days  
October 16 - November 30: 21 days      March 1 - April 15: 21 days

PROPOSED ITINERARY

List dates and miles of progress as accurately as possible. A permit from the Backcountry Reservations Office must be obtained for all off-river camping use. Please include all nights of the trip.

Day #	Camp Name (Mile #)	Date	Day #	Camp Name (Mile #)	Date
1.	_____	_____	16.	_____	_____
2.	_____	_____	17.	_____	_____
3.	_____	_____	18.	_____	_____
4.	_____	_____	19.	_____	_____
5.	_____	_____	20.	_____	_____
6.	_____	_____	21.	_____	_____
7.	_____	_____	22.	_____	_____
8.	_____	_____	23.	_____	_____
9.	_____	_____	24.	_____	_____
10.	_____	_____	25.	_____	_____
11.	_____	_____	26.	_____	_____
12.	_____	_____	27.	_____	_____
13.	_____	_____	28.	_____	_____
14.	_____	_____	29.	_____	_____
15.	_____	_____	30.	_____	_____

Location of takeout: \_\_\_\_\_ Date: \_\_\_\_\_

ON-RIVER EQUIPMENT AND PROCEDURES

A. Watercraft

Note: Motor-powered boats are prohibited from launching between September 16 and December 15. During the remainder of the year, both oar-and motor-powered boats may launch.

Boat #1      Kayak \_\_\_\_\_      Raft \_\_\_\_\_      Other \_\_\_\_\_

Boat Manufacturer and Model \_\_\_\_\_      Dimensions \_\_\_\_\_

Type of frame and method of propulsion \_\_\_\_\_

Registration Numbers \_\_\_\_\_      Name of Boat Owner \_\_\_\_\_  
(See Part IV,C. of Permit Regulations.)

Boat #2      Kayak \_\_\_\_\_      Raft \_\_\_\_\_      Other \_\_\_\_\_

Boat Manufacturer and Model \_\_\_\_\_      Dimensions \_\_\_\_\_

Type of frame and method of propulsion \_\_\_\_\_

Registration Numbers \_\_\_\_\_      Name of Boat Owner \_\_\_\_\_  
(See Part IV,C. of Permit Regulations.)

Boat #3      Kayak \_\_\_\_\_      Raft \_\_\_\_\_      Other \_\_\_\_\_

Boat Manufacturer and Model \_\_\_\_\_      Dimensions \_\_\_\_\_

Type of frame and method of propulsion \_\_\_\_\_

Registration Numbers \_\_\_\_\_      Name of Boat Owner \_\_\_\_\_  
(See Part IV,C. of Permit Regulations.)

Boat #4 Kayak \_\_\_\_\_ Raft \_\_\_\_\_ Other \_\_\_\_\_

Boat Manufacturer and Model \_\_\_\_\_ Dimensions \_\_\_\_\_

Type of frame and method of propulsion \_\_\_\_\_

Registration Numbers \_\_\_\_\_ Name of Boat Owner \_\_\_\_\_  
(See Part IV,C. of Permit Regulations.)

Boat #5 Kayak \_\_\_\_\_ Raft \_\_\_\_\_ Other \_\_\_\_\_

Boat Manufacturer and Model \_\_\_\_\_ Dimensions \_\_\_\_\_

Type of frame and method of propulsion \_\_\_\_\_

Registration Numbers \_\_\_\_\_ Name of Boat Owner \_\_\_\_\_  
(See Part IV,C. of Permit Regulation.)

If more boats are to be used, use a separate sheet using the above format for each additional boat.

B. Life Preservers: (Only USCG approved Type I, II, III, or V are acceptable.) In addition to each participant's life preserver, 1 spare life preserver is required per boat or 1 spare per 10 persons, whichever is greater. Boats 16' or greater in length are required to carry 1 Type IV per boat.

Type I - - - - - Number of Each \_\_\_\_\_

Type II - - - - - Number of Each \_\_\_\_\_

Type III - - - - - Number of Each \_\_\_\_\_

Type IV - - - - - Number of Each \_\_\_\_\_

Type V - - - - - Number of Each \_\_\_\_\_

C. First Aid and Emergency Equipment

Number of first aid kits \_\_\_\_\_

How do you propose to handle a serious injury? Remoteness and isolation should be given heavy consideration.

D. Emergency Communications Equipment:

Type of Radio (optional) \_\_\_\_\_ Frequencies \_\_\_\_\_

Type of signal mirrors (required) \_\_\_\_\_ Number \_\_\_\_\_

Type, dimensions, and color of signal panels (required) \_\_\_\_\_

\_\_\_\_\_ Number \_\_\_\_\_

Other \_\_\_\_\_

\_\_\_\_\_

Passing trips, either commercial or noncommercial, should not be considered a reliable source of assistance in an emergency.

E. Describe spare items, repair kits, and spare means of propulsion for watercraft. Adequacy will be important on your trip.

ENVIRONMENTAL PROTECTION AND SANITATION

A. Describe how refuse, garbage, and dishwater will be disposed of and/or handled while on the trip. A straining screen is required. No trash may be dumped at Diamond Creek. There is a trash receptacle available at Pearce Ferry.

B. Describe your toilet facilities and methods of disposal; indicate number and capacity of containers you will carry. (Allow 50 uses per 20mm ammo can.) A small, accessible day-use toilet is required. No human waste may be dumped at Diamond Creek or Pearce Ferry.

- C. If you are planning to have a fire, provisions for containing it, hauling out charcoal and ash, and your fuel source must be described (See Part VI,D of the Permit Regulations).

Between May 1 and September 30, all fuel for fires must be brought in from outside Grand Canyon National Park. Between October 1 and April 30, DRIFTWOOD ONLY along beaches may be gathered and burned. Do not collect dead and down wood, and do not cut any tree or other vegetation. Fires may not be used for cooking. All trips launching between October 1 and April 30 must carry an approved firepan.

OTHER INFORMATION

- A. In the event that your party is in need of emergency assistance (medical evacuation, search and rescue, or emergency message), please describe in detail any information that would be helpful in locating your party from an aircraft. This includes colors of boats, rigging, tarps, frames, or any unusual equipment.
- B. Please give any additional information which you feel would be helpful in evaluating your application.
- C. Please plan to attend a required, hour-long orientation program at Lees Ferry before launching. You may contact the duty ranger to make arrangements.

ITEMIZED EXPENSES

	Cost
Food - - - - -	\$ _____
Travel - - - - -	\$ _____
Rental Equipment - - - - -	\$ _____
(From _____)	
Car/Air Shuttles - - - - -	\$ _____
(From _____)	
Tows - - - - -	\$ _____
Vehicle Storage - - - - -	\$ _____
Other _____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

Total Cost to be Shared \$ \_\_\_\_\_

Number of Participants \_\_\_\_\_

Cost per Person \$ \_\_\_\_\_

NONCOMMERCIAL USE AFFIDAVIT

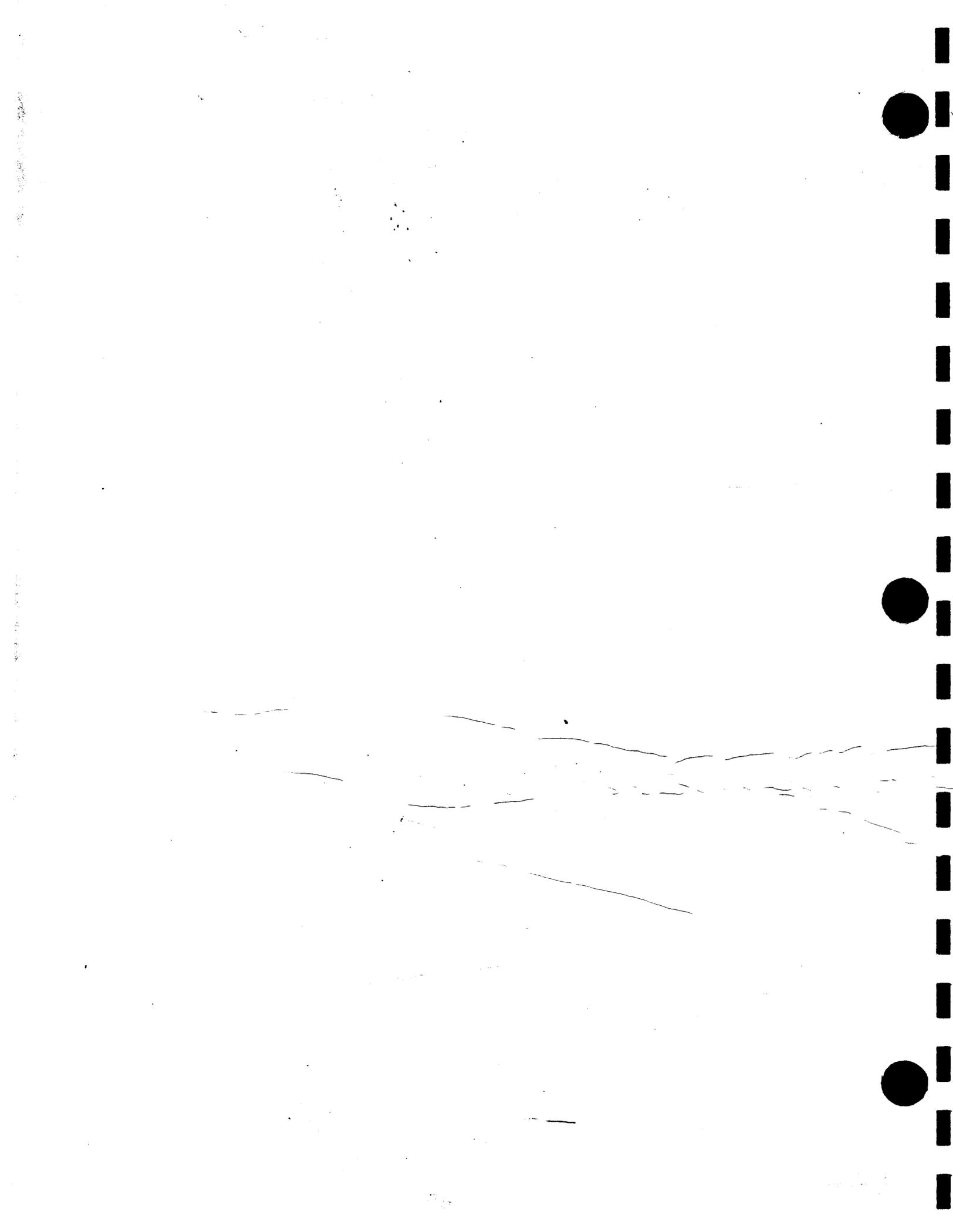
Your signature in this section indicates that you have considered the permit terms and conditions and that your trip is organized in the spirit, as well as the intent, of these conditions (pursuant to Title 36, Code of Federal Regulations). Failure to abide by these conditions will jeopardize future applications, and will result in permit cancellation.

1. A noncommercial river trip must be participatory in nature. Trip preparation (including logistics, food purchase, equipment assembly, transportation, and vehicle shuttle) and conduct of the trip (including food preparation and sanitation) must be shared by members of the group. Collecting a set fee (monetary compensation), payable to a trip participant, individual, group, or organization, for conducting, leading, or guiding a noncommercial river trip is not allowed. Trips may be considered noncommercial even though a member of the trip receives a salary, under their normal scope of employment, from an educational institution or non-profit organization, but not directly through fees contributed by members of the party. The trip permittee should delegate responsibility (financial and otherwise) for various aspects of trip preparation and conduct.
2. The purpose of the trip must be for its recreational values. The trip will not be conducted for the purpose of monetary gain (either as a direct or indirect result of the trip); acquisition of new equipment to the advantage of an individual, group, or organization; or for the purpose of amortizing equipment.
3. Media, direct mail, or other advertising is not permissible.
4. Estimated overall trip cost: \$ \_\_\_\_\_ (based on \_\_\_\_\_ trip members).
5. A complete itinerary including off-river days and a listing of qualifying boatmen, experience, equipment, and other information insuring compliance with the Noncommercial Regulations must be provided to the River Subdistrict no less than 30 days prior to trip launch.
6. The noncommercial river permit is not transferable. The permittee must accompany the entire river trip.

I have given complete and accurate descriptions and answers to all questions. I agree to comply with all park rules and regulations as stated in the regulations of this application, and appropriate parts of the Code of Federal Regulations, AND ASSUME FULL RESPONSIBILITY FOR THE CONDUCT OF MY ENTIRE PARTY OBEDIENCE TO THESE RULES AND REGULATIONS. I understand that falsification of these rules will make my permit application invalid. I also acknowledge that I have read and agree with all terms in the above Noncommercial Use Affidavit.

I understand that it is unlawful to knowingly and willfully falsify or conceal by a trick, scheme, or by any false, fictitious, or fraudulent statements or representations or make use of any false writings or documents knowing the same to contain any false, fictitious, or fraudulent statement or entry. Violators shall be subject to a fine of not more than \$10,000 or imprisonment for not more than 5 years or both. (18 U.S.C. 1001 (1970)).

Applicant's Signature \_\_\_\_\_ Date \_\_\_\_\_



COLORADO RIVER MANAGEMENT PLAN

APPENDIX E

GUIDELINES FOR CONDUCTING RESEARCH ON THE COLORADO RIVER

WITHIN GRAND CANYON NATIONAL PARK

	Page Number
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II. Research River Trip Permit Application	E-4
A. Research River Trip Application, Part A	E-5
B. Application Supplement, Part B	E-10

COLORADO RIVER MANAGEMENT PLAN

APPENDIX E

GUIDELINES FOR CONDUCTING RESEARCH ON THE COLORADO RIVER

WITHIN GRAND CANYON NATIONAL PARK

Introduction

The Colorado River corridor through Grand Canyon National Park offers the scientific community unique opportunities for study and research projects, and the National Park Service (NPS) fully supports these activities. River trips offer the researcher access to canyon resources not readily available by other methods of transportation. No limit has been placed on the number or size of research trips; however, former permit procedures allowed for misuse of these special river use opportunities. It is the intent of Grand Canyon National Park to more closely monitor and evaluate the impact of research river trips upon the natural and social environment of the river corridor. It is also the responsibility of the NPS to assure all research endeavors are conducted as scientific ventures sincerely managed to accomplish the stated objectives of the research permit.

Research trips are to be conducted specifically for the purpose of legitimate research and not for the recreational values offered by the setting of the Colorado River through Grand Canyon National Park. All research along the Colorado River through Grand Canyon National Park will continue to be subject to approval by the Superintendent through the Division of Resources Management and Planning prior to launching. Trip proposals must be submitted in writing to the Superintendent's Office no later than December 1 of the year prior to the research trip. However, if unforeseen special circumstances or natural events occur which do not conform to the above time requirements, research trips may be approved on an individual basis by the Superintendent. These special trips must still complete the required Research Trip Application. Trip proposals must include an explanation as to why a river trip is necessary to accomplish the research, and the number of trip participants must be justified as to their role in the context of the stated research trip goals.

Upon approval of the research proposal by the NPS, the researcher must submit an application to the River Permits Office. This application is similar to the noncommercial trip application and requires a justification statement explaining why each trip member's participation is essential to accomplishing the purpose of the trip. The completed application must be received in the River Permits Office no later than 45 days prior to the launch date.

Approved researchers will have three options to outfit their trip: 1) to utilize privately-owned or rented equipment, much like a noncommercial river trip; 2) to contract with an approved commercial concessioner; or 3) to use another approved outfitter. Personnel and equipment must meet the qualifications and standards identified in the Colorado River Management Plan. Research trips, at the discretion of the Superintendent, may be required to secure an adequate insurance bond in order to secure permit approval.

Within 30 days of trip completion, a brief report of trip activities must be submitted to the Superintendent. This informal report should contain a brief summary of trip activities, wildlife and resource observations, campsite locations, and significant trip incidents. Similarly, if the research results in a technical report or professional paper, this information must be submitted to the park no later than 90 days following publication or receipt by the researcher.

In order to monitor current research utilizing the Colorado River, the following Colorado River Research Application has been designed to help park managers accurately evaluate requests for research trips.

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE  
GRAND CANYON NATIONAL PARK  
P.O. Box 129  
Grand Canyon, Arizona 86023  
(602) 638-7843

RESEARCH RIVER TRIP PERMIT APPLICATION

INSTRUCTIONS

- I. Enclosed are the following:
  - Part A. This section applies to all research river trips. Please read carefully and sign pages E-8 and E-9. Trips utilizing an approved Grand Canyon commercial outfitter must complete only Part A.
  - Part B. All non-outfitted trips and those using commercially contracted outfitters other than approved Grand Canyon commercial outfitters must complete this entire section, Part B., in addition to Part A.
- II. Please read the entire packet prior to completing the application or signing any part of it.
- III. Please complete the application and return it to Grand Canyon National Park no less than 45 days prior to the proposed launch date; we will process your research trip application upon receipt. If your application is not approved, you will be contacted by telephone as soon as possible. This permit is subject to final approval by the park ranger on duty at Lees Ferry.
- IV. Cancellation of a scheduled research trip - It is the permittee's responsibility to notify the River Subdistrict Office of their inability to use the scheduled launch date. If appropriate, a new launch date will be assigned.
- V. Please attach a copy of your approved research proposal, research permit, and collecting permit (if applicable) to your completed application. Your request to launch will not be approved without this information.
- VI. All research river trips must be conducted in compliance with all safety, environmental, and health standards as outlined in the Annual Noncommercial Operating Requirements enclosed with this application.
- VII. All research trip participants must attend a one-hour river orientation program prior to launching. Contact the ranger on duty to make arrangements.



PARTICIPANT LIST

Please list each trip participant by their specific function, name (if known at time), and statement as to why the participant's role is essential to the purpose of the research trip. Please include participant telephone numbers.

	<u>Function</u>	<u>Justification</u>	<u>Name</u>	<u>Telephone</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____
11.	_____	_____	_____	_____
12.	_____	_____	_____	_____
13.	_____	_____	_____	_____
14.	_____	_____	_____	_____
15.	_____	_____	_____	_____
16.	_____	_____	_____	_____

Please attach additional sheets if necessary. Substitutions to this list must be made prior to launching at Lees Ferry with notification made to the River Permits Office.

River Research Trip Permits will be mailed to the research permit holder.

It is recommended that research trips be of a duration in which research is completed in the shortest possible time. Please give adequate consideration to propulsion type (motor or oars) in terms of travel and work to be accomplished. Research trips scheduled during the primary season (May 1 through November 30) are excluded from stopping at "attraction sites" not specifically identified as research targets. It is required that research trips select lightly camps not heavily used by noncommercial or commercial operators and that they discuss proposed campsites with other river trips traveling on similar schedules.

Maximum trip lengths allowed from Lees Ferry to Diamond Creek are:  
 April 16 - October 15            18 days            December 1 - February 29            30 days  
 October 16 - November 30        21 days            March 1 - April 15                    21 days

PROPOSED ITINERARY

List dates and miles of progress as accurately as possible. A permit will be necessary for all off-river camping use. Please identify sites where research work will take place. Please include all nights of the trip.

<u>Day #</u>	<u>Camp Name (Mile #)</u>	<u>Date</u>	<u>Day #</u>	<u>Camp Name (Mile #)</u>	<u>Date</u>
1.	_____	_____	16.	_____	_____
2.	_____	_____	17.	_____	_____
3.	_____	_____	18.	_____	_____
4.	_____	_____	19.	_____	_____
5.	_____	_____	20.	_____	_____
6.	_____	_____	21.	_____	_____
7.	_____	_____	22.	_____	_____
8.	_____	_____	23.	_____	_____
9.	_____	_____	24.	_____	_____
10.	_____	_____	25.	_____	_____
11.	_____	_____	26.	_____	_____
12.	_____	_____	27.	_____	_____
	_____	_____	28.	_____	_____
	_____	_____	29.	_____	_____
	_____	_____	30.	_____	_____

Location of takeout: \_\_\_\_\_ Date: \_\_\_\_\_

NOTICE OF ADVERSE ACTIONS OR PENALTIES

You, as trip permittee for a research river trip conducted within Grand Canyon National Park, have the responsibility for ensuring that this trip and all participants comply with the terms and conditions of the Colorado River Management Plan.

In the event that any violations of the terms and conditions of these permits do occur, you may be subject to the following adverse consequences and/or penalties. You, as trip permittee, and/or any member of your party may incur these penalties:

- A. Violation of the conditions of the Research Permit may result in a fine not more than \$500 per person per incident. At the discretion of the U.S. Magistrate, you or any member of your party may be sentenced to a period of incarceration not to exceed 6 months subsequent to a serious violation of the permit terms and conditions.
- B. At the discretion of the Superintendent of Grand Canyon National Park, you or any member of your party may be prohibited from participation in any future research, commercial, or noncommercial river trips in Grand Canyon National Park for a period of no more than 3 years subsequent to any violations of the permit terms and conditions.
- C. At the discretion of the Superintendent, your approved research river trip permit may be revoked and your trip terminated at any point within Grand Canyon National Park subsequent to any violations of the permit terms and conditions. Should this occur, you or members of your party along with any or all of your party's equipment, may be removed from Grand Canyon by helicopter, boat, or other means. This action may result in any or all of your equipment being impounded until transportation costs are paid. Transportation costs could be \$5,000 or more.

Your signature below indicates that you have read and understand these penalties and adverse actions which may result subsequent to any violations of the terms and conditions of the permit.

Your signature further indicates that you accept full responsibility for any reasonable and customary expenses and/or impound fees incurred by the National Park Service during the removal of any or all of your party from Grand Canyon subsequent to violations of the permit terms and conditions.

Permittee's Signature \_\_\_\_\_ Date \_\_\_\_\_

RESEARCH USE AFFIDAVIT

Your signature on this page indicates that you have considered the permit conditions and that your trip is organized in the spirit, as well as the intent, of these conditions (pursuant to Title 36, Code of Federal Regulations). Failure to abide by these conditions may jeopardize future applications and may result in permit cancellation.

1. A research river trip must be participatory in nature. Collecting a set fee (monetary compensation), payable to an individual, group, or organization, for conducting, leading, or guiding a research river trip is not allowed. The trip permittee is responsible (financial and otherwise) for all aspects of trip preparation and conduct. If not completely funded by the permit holder, trip costs are to be shared equally by all research trip participants.
2. The purpose of the trip must be for research purposes only. The trip will not be conducted for the purpose of monetary gain (either as a direct or indirect result of the trip); acquisition of new equipment to the advantage of an individual, group, or organization; or for the purpose of amortizing equipment.
3. Media, direct mail, or other advertising is not permissible. Recruitment of student researchers will be allowed; however, class or course fees are prohibited from being used to cover research trip expenses. Only the sharing of actual trip cost is allowed.
4. Estimated overall trip cost: \$ \_\_\_\_\_ (based on \_\_\_\_\_ trip members).  
Estimated participant cost \$ \_\_\_\_\_.
5. A complete itinerary including off-river days and a listing of qualifying boatmen, experience, equipment, and other information insuring compliance with the Part A criteria must be provided to the River Subdistrict no less than 45 days prior to trip launch.
6. The river research permit is not transferable without prior approval from the River Permits Office. The permittee must accompany the entire trip.
7. River research trips will abide by all applicable guidelines established for noncommercial users.

I have given complete and accurate descriptions and answers to all questions. I agree to comply with all park rules and regulations as stated in this application, and appropriate parts of the Code of Federal Regulations, AND ASSUME FULL RESPONSIBILITY FOR THE CONDUCT OF MY ENTIRE PARTY IN ABIDING BY THESE RULES AND REGULATIONS. I understand that falsification of names will make my permit application invalid. I also acknowledge that I have read and agree with all terms in the above River Research Use Affidavit.

I understand that it is unlawful to knowingly and willfully falsify or conceal by a trick, scheme, or by any false, fictitious, or fraudulent statements or representations or make use of any false writings or documents knowing the same contain any false, fictitious, or fraudulent statement or entry. Violators will be subject to a fine of not more than \$10,000 or imprisonment for not more than 5 years or both. (18 U.S.C. 1001 (1970)).

Applicant's Signature \_\_\_\_\_ Date \_\_\_\_\_





Boat #4 Kayak \_\_\_\_\_ Raft \_\_\_\_\_ Other \_\_\_\_\_

Boat Manufacturer and Model \_\_\_\_\_ Dimensions \_\_\_\_\_

Type of frame and method of propulsion \_\_\_\_\_

Registration Numbers \_\_\_\_\_ Name of Boat Owner \_\_\_\_\_  
(See part IV,C.)

Boat #5 Kayak \_\_\_\_\_ Raft \_\_\_\_\_ Other \_\_\_\_\_

Boat Manufacturer and Model \_\_\_\_\_ Dimensions \_\_\_\_\_

Type of frame and method of propulsion \_\_\_\_\_

Registration Numbers \_\_\_\_\_ Name of Boat Owner \_\_\_\_\_  
(See part IV,C.)

If more boats are to be used, use a separate sheet using the above format for each additional boat.

B. Life Preservers: (Only USCG approved Type I, II, III, or V are acceptable.)  
In addition to each participant's life preserver, 1 spare life preserver is required per boat or 1 spare per 10 persons, whichever is greater.

Type I - - - - - Number of Each \_\_\_\_\_  
Type II - - - - - Number of Each \_\_\_\_\_  
Type III - - - - - Number of Each \_\_\_\_\_  
Type IV (1/boat 16' & over) - - - - - Number of Each \_\_\_\_\_  
/ Type V - - - - - Number of Each \_\_\_\_\_

C. First Aid and Emergency Equipment

Number of first aid kits \_\_\_\_\_

How do you propose to handle a serious injury? Remoteness and isolation should be given heavy consideration.

D. Emergency Communications Equipment:

Type of Radio (optional) \_\_\_\_\_ Frequencies \_\_\_\_\_

Type of signal mirrors (required) \_\_\_\_\_ Number \_\_\_\_\_

Type and color of signal panels (required) \_\_\_\_\_

\_\_\_\_\_ Number \_\_\_\_\_

Other \_\_\_\_\_

Do not rely passing trips, either commercial or noncommercial, for help in an emergency situation.

E. Describe spare items, repair kits, and spare means of propulsion for watercraft.

ENVIRONMENTAL PROTECTION AND SANITATION

A. Describe how refuse, garbage, and dishwater will be disposed of and/or handled while on the trip. A straining screen is required. No trash may be dumped at Diamond Creek. There is a trash receptacle available at Pearce Ferry.

Describe your toilet facilities and methods of disposal; indicate number and capacity of containers you will carry (Allow 50 uses per 20mm ammo can). A small, accessible day-use toilet is required. No human waste may be dumped at Diamond Creek or Pearce Ferry (See Part IV,C. of Noncommercial Regulations and Supplement B).

- C. If you are planning to have a fire, provisions for containing it, hauling out charcoal and ash, and your fuel source must be described. (See Noncommercial Regulations, Part VI, D.)

Between May 1 and September 30, all fuel for fires must be brought in from outside Grand Canyon National Park. Between October 1 and April 30, DRIFTWOOD along beaches may be gathered and burned. Do not collect dead and down wood, and do not cut any tree or other vegetation. Fires may not be used for cooking. All trips launching between October 1 and April 30 must carry an approved firepan.

OTHER INFORMATION

- A. In the event that your party is in need of emergency assistance (medical evacuation, search and rescue, or emergency message), please describe in detail any information that would be helpful in locating your party from an aircraft. This includes colors of boats, rigging, tarps, frames, or any unusual equipment.
- B. Please give any ~~additional~~ information which you feel would be helpful in evaluating your application.



COLORADO RIVER MANAGEMENT PLAN

APPENDIX F

LOWER GRANITE GORGE INTERIM MANAGEMENT GUIDELINES

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COLORADO RIVER MANAGEMENT PLAN

APPENDIX F

LOWER GRANITE GORGE INTERIM MANAGEMENT GUIDELINES

I. INTRODUCTION

This document is the Lower Granite Gorge Interim Guidelines (LGGIG) of the Colorado River within Grand Canyon National Park (GCNP). It is to cover the same time period and become an appendix of the all inclusive Colorado River Management Plan (CRMP). Additionally, the LGGIG will be included in future CRMP review processes.

The lower gorge is defined as that portion of the Colorado River corridor from Diamond Creek (River Mile 225) to Grand Canyon's western park boundary (River Mile 277). Currently the management of the Colorado River from Lees Ferry (River Mile 0) to the western park boundary is outlined in the 1981 Colorado River Management Plan.

For the purposes of the LGGIG, Grand Canyon National Park recognizes the park boundary as defined by the Grand Canyon Enlargement Act of 1975. A portion of the park boundary is located at the pre-dam highwater mark on the south side of the river and is adjacent to the Hualapai Indian Reservation.

The LGGIG recommends that an inventory of natural and cultural resources be completed. Additionally, the LGGIG recommends, over the next three years, a comprehensive public review process be completed to assist park managers in writing a final document. A research and monitoring program will be instituted to collect baseline data against which visitor impacts and resource use patterns will be evaluated in the future. The LGGIG will be responsive to observations and data collected during these studies, which will be reviewed annually prior to development of a permanent Lower Gorge Management Plan. Lands outside the lower gorge river corridor are identified and managed according to the 1988 Backcountry Management Plan.

It is understood that the guidelines will be subject to extensive review and modification due to the dynamic nature of the area. A resource inventory, research, and monitoring program will facilitate the identification of resource problems and management concerns.

II. HISTORY

The Boulder Canyon Project Act of 1928 authorized the construction of Hoover Dam on the Colorado River. This project, completed in 1936, created Lake Mead, the waters of which extend into the western portion of Grand Canyon National Monument. The free-flowing river up to

Separation Canyon (River Mile 239.5) was buried beneath placid lake waters. Lake Mead National Recreation Area (LMNRA) was created at the same time. The expansion of Grand Canyon National Park, following the Enlargement Act of 1975, included Grand Canyon National Monument, and portions of Lake Mead National Recreation Area, the Kaibab National Forest, and Bureau of Land Management lands.

### III. ACCESS

The waters of Lake Mead extend into the lower gorge to Separation Canyon (River Mile 239.5, elevation 1221 feet). Launch ramps with access by all-weather roads are located at the eastern end of Lake Mead. These provide easy access for power boats to the lower gorge area. The Colorado River and the Diamond Creek Road on the Hualapai Indian Reservation provide down-river access to the lower gorge.

### IV. CURRENT MANAGEMENT ISSUES

There are an increasing number of impacts on the natural and cultural resources and the opportunities for solitude in the lower gorge area. This area includes portions of the park to the south of the Colorado River at the Grand Wash Cliffs and the areas along the north side of the Colorado River below the rim of the Sanup and Shivwits plateaus. Fluctuations of both lake and river levels affect recreational activity, beach composition, and other resources. The current list of impacts include:

#### A. Power Boat Recreation

The increasing number of hard-hulled craft, houseboats, and small cruisers arriving from the western reaches of Lake Mead has caused congestion near the limited number of attraction sites accessible by water (e.g., Columbine Falls). Currently, most visitation is day use. As more people become familiar with the area, the impacts caused by camping, off-river hiking, and associated problems (human waste, trash, fire pits, multiple trailing, etc.) will increase.

The logistical problems that once hindered power-boat use are now being resolved. The road to South Cove (approximately River Mile 290) from Dolan Springs is being paved. LMNRA is allowing expansion of houseboat rentals to include an outlet at Temple Bar. Boat gas is now available for sale at Meadview.

B. Local population and development

The most obvious year-round impact comes from the activities of the retirement community of Meadview. The local developer is very active, and more lots are being sold. This will increase the number of people who have the time to fully explore the entire area. It will be necessary to include this community in the planning process. Their cooperation and acceptance of this planning effort are vital to its long-term success.

Plans to complete a "pump back storage" dam near Meadview may increase the population of the area dramatically during construction. This may result in increased impacts as members of the construction population seek to utilize the area for recreational activities.

C. Whitmore Wash

Although Whitmore Wash (River Mile 187.5) is east of the lower gorge management area, the activities taking place there have considerable influence. The construction of a modern lodge (the Bar Ten Ranch), approximately 8 miles north of the North Rim, and the use of helicopters have increased the number of passenger transfers. In 1987, 44.6% of all commercial river passengers either joined or finished a river trip at the Whitmore Wash helicopter pad. Whitewater river outfitters have developed a market for 2 and 3 day trips from Whitmore Wash through the lower gorge to Lake Mead. This, combined with trips conducted by the Hualapai Tribal River Trips and Tours Company below Diamond Creek and the full-length canyon trips normally offered, has increased the demand for overnight campsites below Diamond Creek.

Because user days are not assessed to the park's commercial outfitters below Diamond Creek, the desire to market 3 day trips through the lower gorge has increased. Controlling this use may mean extending the user day assessment point to the park's western boundary.

D. Livestock

Feral burros are a threat and can enter GCNP from Lake Mead where a large population still exists. The burro fence, erected approximately 1 mile west of the park boundary, is breached regularly by flash floods at Pearce Wash and in several other places where burros can get through.

Cattle are found in many of the side canyons that provide access to the Sanup and Shivwits plateaus. Burnt Springs Canyon exhibits the most obvious impact. GCNP is fencing the heads of these canyons, which should eliminate most of the problem. GCNP lands south of the Colorado River and those on top of the Grand Wash Cliffs are grazed by cattle on a regular basis. Fencing this area

would exclude the cattle; however, there is fear that without wildlife panels this action may hinder the movements of desert bighorn sheep. In addition, the lack of regular grazing may increase the potential of fire danger, through the increase of annual grasses, in the Joshua tree forest areas.

E. Hualapai Indian Reservation

Although there is disagreement between GCNP and the Hualapai Tribe over the legal location of GCNP's southern boundary, a sound working relationship exists between the two entities.

The Hualapai Tribe has encouraged several commercial ventures which may impact the GCNP lands along their mutual boundaries. They are as follows:

1. Whitmore Wash Helicopter Shuttle: The Hualapai Tribe has authorized a landing pad on the south side of the river at River Mile 187.5. This landing area is utilized for the shuttle of passengers coming on and off river trips to the Bar Ten Ranch. Helicopter traffic is heavy at certain times on particular days of the week. Safety and solitude are major concerns.
2. "Grand Canyon West": This development is located at Guano Point (River Mile 266.2). An airstrip has been constructed approximately 3 miles south of the old tramway towers. Currently, 30 to 60 persons per day are flown in from Las Vegas and given a meal and tour of the rim. Future development plans propose a helicopter landing pad located at lake level, and a "canoe ride" concession; both to be located in a cove at River Mile 267.
3. Desert Bighorn Sheep Hunting: The Hualapai Tribe allows a limited number of desert bighorn sheep to be taken per year. This is a "guide required" hunt, and access to the hunting area is usually by boat from Pearce Ferry.
4. Helicopter Tours: The Hualapai Tribal Government has authorized several helicopter landing permits which allow tour companies to land with passengers near the river or in remote locations to provide a specialty meal. A per-person charge is paid to the Tribal Government.
5. Hualapai River Trips: The Hualapai Tribal River Trips and Tours Company runs 1 and 2 day river trips from Diamond Creek to Pearce Ferry. In 1987, approximately 200 people participated in these trips. Approximately 80 percent of these were on the 1 day tours.

V. MANAGEMENT OBJECTIVES

A. Management objectives of the LGGIG are primarily the same as those of the Colorado River Management Plan.

B. Due to the different types of access and use, additional objectives specific to the area are necessary. The foundation of these objectives will be the establishment of two distinguishable use zones. Thus, the Colorado River in the lower gorge will be divided into lake and whitewater river use zones. These zones will be established to reflect boater safety concerns associated with the fluctuation of river and lake levels and strong river currents. Separation Canyon (River Mile 239.5) will be the established boundary between the lake and whitewater river use zones.

1. Whitewater River Use Zone

The river corridor from Diamond Creek to Separation Canyon will be restricted to river running, backpacking, and power boats using equipment designed for whitewater travel, i.e. zodiacs.

2. Lake Use Zone

The lake use area is that portion of the lower gorge below Separation Canyon (River Mile 239.5) where the lake meets the free-flowing river current.

C. Specific objectives include:

1. Manage visitor use and recreation in such a manner that allows a quality recreational experience consistent with preservation of the area's natural and cultural resources.
2. Define and maintain overall use limits that will ensure a quality experience for both day use and overnight trips.
3. Provide opportunities for all user groups (off-lake, river runners, and backpackers) to have access to the lower granite gorge experience they wish.
4. Maintain a zero population of feral animals, i.e. burros and cattle.
5. Prevent and/or eliminate cultural and natural resource vandalism.
6. Develop a resource inventory and monitoring program.
7. Develop cooperative agreements with adjoining land management agencies and tribal governments, which will further overall management objectives within the lower gorge.

8. Expand visitor information services on LMNRA lands at Meadview and in the lower gorge utilizing watercraft, (i.e. houseboats, platform boats, etc.) Develop educational programs for the local population centers (Meadview, Dolan Springs, Kingman, Las Vegas). This would include developing maps and brochures for the lower gorge area and adjacent lands.

#### VI. RESTRICTIONS ON USE

Dramatic increases in lower gorge use due to development in and around Lake Mead and the Hualapai Indian Reservation may necessitate immediate action to restrict use to protect park resources and to preserve the quality of the visitor experience.

- A. Travel by hard-hulled power boats is prohibited above Separation Canyon.
- B. Except in emergencies, upstream travel above Diamond Creek is prohibited.
- C. Due to shallow-water hazards, houseboats, sailboats, and other large craft are restricted to the lake area below the Bat Cave (River Mile 266).
- D. Areas in the lower gorge closed to camping or visitation are:
  1. Bat Cave (River Mile 266) - Entry to the cave is prohibited.
  2. Columbine Falls (River Mile 274.3) - Camping within 300 yards of the falls is prohibited.
  3. Rampart Cave (River Mile 274.5) - Entry to the cave is prohibited.

#### VII. COMMERCIAL USE

All groups and organizations using the lower gorge area for commercial purposes must obtain written authorization from the Grand Canyon National Park Office of Concessions Management prior to use. Commercial river trips must comply with the provisions of the CRMP. Groups must obtain permission to use the Diamond Creek Road and pay all fees required by the Hualapai Tribe.

#### VIII. NONCOMMERCIAL USE

All noncommercial groups launching from Diamond Creek must obtain a permit from the Grand Canyon National Park River Subdistrict Office. All river trips must comply with the provisions of the CRMP outlined in the Noncommercial Regulations. Noncommercial groups must obtain permission to use the Diamond Creek Road and pay all fees required to the Hualapai Indian Tribe.

IX. RECREATIONAL UPRIVER USE

Recreational boaters in the lower gorge area will be required to comply with all requirements established in the CRMP regarding safety and resource and environmental protection.

X. RESOURCE AND ENVIRONMENTAL PROTECTION

A. Human Waste/Refuse Disposal

The aesthetic and environmental health problems related to human waste are a major concern associated with river and backcountry use. Protection of environmental quality requires that all human waste be removed from the lower gorge area. All lower gorge boaters must follow the operating procedures for human waste disposal as outlined in the CRMP.

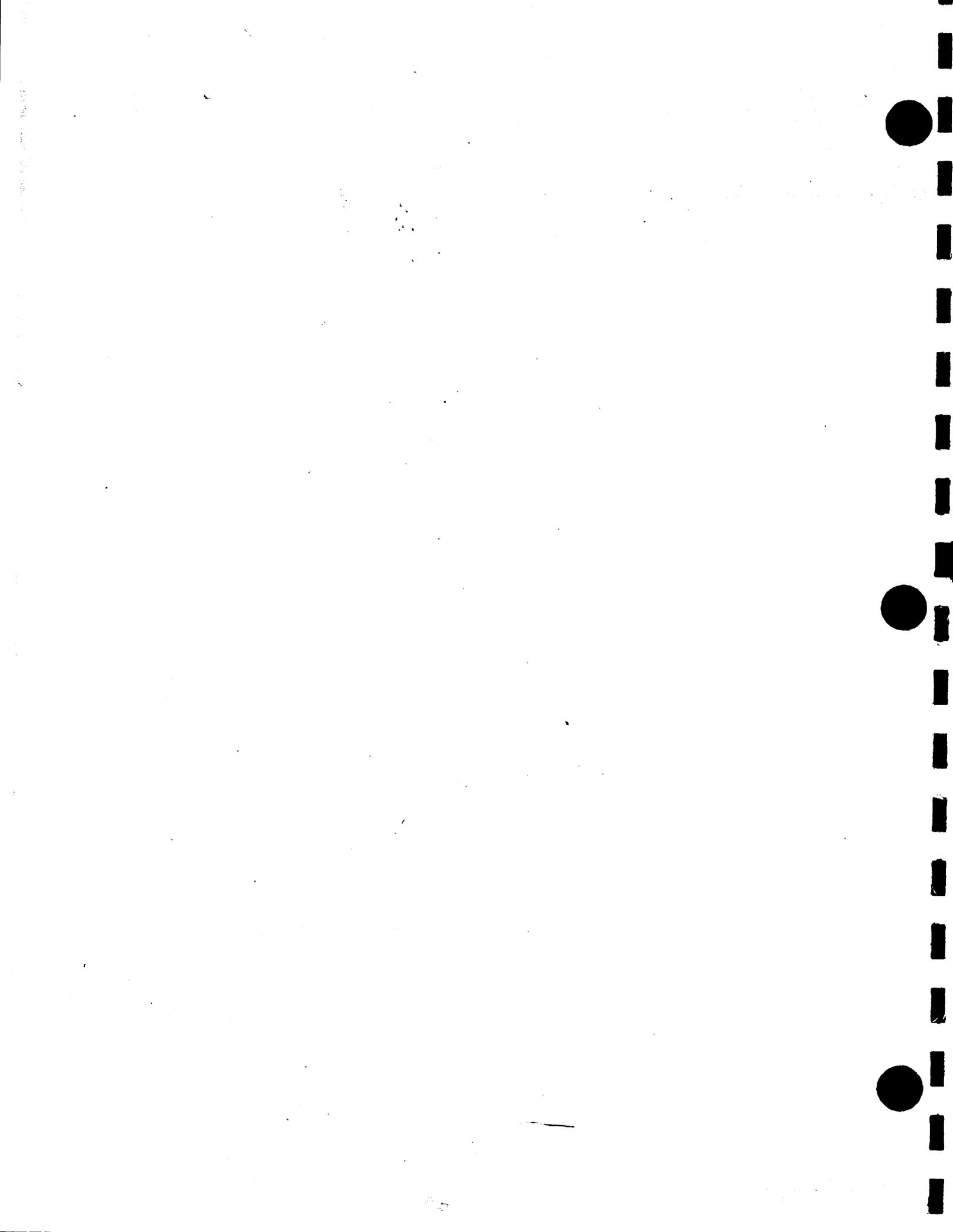
B. Refuse disposal ,

In order to maintain a healthy and quality experience, all trash and litter must be carried out of the lower gorge area.

C. All other regulations which must be adhered to regarding resource protection, environmental protection and sanitation are addressed in the Colorado River and Backcountry Management Plans.

XI. EMERGENCY MEDICAL SERVICES

Emergencies requiring evacuation or rescue will be coordinated by Grand Canyon National Park personnel. Responsibility for the cost of such evacuation will be paid by the outfitter and/or the person requesting evacuation.



COLORADO RIVER MANAGEMENT PLAN

APPENDIX G

ENVIRONMENTAL ASSESSMENT

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GLEN CANYON  
ENVIRONMENTAL STUDIES  
P. O. BOX 1811  
FLAGSTAFF, AZ 86002

COLORADO RIVER MANAGEMENT PLAN

APPENDIX G

ENVIRONMENTAL ASSESSMENT

I. Purpose and Need:

"A river management plan will be developed for each unit of the National Park System having significant river use or the potential for such use.

"In order to enhance visitor enjoyment and safety, and to preserve environmental quality, the National Park Service will regulate the use of rivers, as necessary, within units of the National Park System.

"Using scientific research and other applicable data, the service will establish the level of boating and related use that each river system can sustain without causing unacceptable changes in the ecosystem or degradation of the environment or the park experience.

"Persons or private companies may be authorized to provide river boating experiences for park visitors; such authorization will be limited to the number necessary to provide adequate visitor services in conformity with established visitor use capacities. Where public demand exceeds an established river use ceiling, use may be rationed."

Chapter VII, NPS Management Policies, 1978.

In 1979, the Colorado River Management Plan (CRMP) and Environmental Impact Statement (EIS) were completed and approved through the National Environmental Policy Act of 1969 (NEPA) process with full public review and disclosure. Due to the controversial nature of the plan and its provisions, and due to congressional actions that prevented implementation of the approved preferred alternative, a revised CRMP was issued in 1981. This plan assumed that the 1979 EIS was still valid and combined provisions of several of the alternatives evaluated in the 1979 EIS. As a result, no formal environmental review was associated with the 1981 CRMP.

The 1981 CRMP defined 2 use periods (summer and winter use seasons), 2 user sectors (commercial and noncommercial), and user day ceilings by use period and sector. Operating guidelines and research and monitoring provisions were outlined in the plan.

In response to provisions of the 1981 plan calling for periodic modification and updating, a review of the issues addressed and provisions outlined by the CRMP was begun in 1987. If management actions proposed in any revision are significant, the 1981 plan calls for a complete public review of any revisions (NPS, 1981).

## II. Affected Environment

### A. Natural Resources

#### 1. Vegetation

a. Pre-dam: before the construction of Glen Canyon Dam, three distinct zones of vegetation paralleled the river from Lees Ferry to the Grand Wash Cliffs. The zone closest to the river, and subject to annual flooding, was composed of many ephemeral herbaceous species adapted to periodic disturbance, and mesophytic woody plants such as seep willow and desert broom (Baccharis), and the true willows (Salix) that attempted to become established before the next scouring flood. Above the ephemeral zone was a belt of vegetation whose lower boundaries were delineated by the high-water line of major floods which would periodically scour away all vegetation growing below the zone. Typical plant species of this high-water-line zone were Apache plume (Fallugia paradoxa), redbud (Cercis occidentalis), honey mesquite (Prosopis juliflora) and acacia (Acacia greggii). On the talus slopes above this zone lived desert species that were not influenced by the river environment below; e.g., brittle brush (Encelia farinosa); various cacti, creosote bush (Larrea tridentata), and Mormon tea (Ephedra trifurca).

b. Post-dam: the construction of Glen Canyon Dam has caused a significant reduction of the high flood waters and sediment deposition which maintained the pre-dam riparian ecosystem and sediment regime of aggradation and degradation along the river course. Diurnal fluctuating flows, flood level flows in 1983-85 and resumption of highly fluctuating flows from 1986 to present have caused identifiable vegetation and substrate impacts. Such impacts could be considered deleterious, due to the fact that sediment is a near-nonrenewable resource.

Due to the regulated flows, vegetation changes have occurred along a resultant moisture gradient. Though not highly defined, 4 vegetative communities can be described along this moisture gradient: a New Riparian Zone, characterized by rapid proliferation species, such as Tamarix, Salix, Pluchea and Baccharis, which helps protect alluvial deposits from scouring (Tamarisk will invade the water's edge and under managed conditions will be replaced by native species, such as Salix); New High Water Zone, an unstable community of short lived invasion species, such as Alhagi, Salsola, Descuraina, and Bromus, which will compete with species of the Old High Water Zone that now have the opportunity to migrate to the New High Water Zone when water is available to allow Acacia and Prosopis seedling establishment and survival; Old High Water Zone, which is now characterized by

reduction in extent and growth of mesquite and acacia, though the community will remain relatively stable; and, the Desert Zone, a community that the Glen Canyon Dam has had little influence upon, which is a resistant though not resilient community susceptible to the influence of recreational use.

2. Wildlife

a. Fishes: of the 8 native fish species formerly found in the Colorado River below Glen Canyon Dam, only 3 species remain common: speckled dace, bluehead sucker, and flannelmouth sucker. Two others, the endangered humpback chub and the razorback sucker, are rare in occurrence. Humpback chub is presently classified an endangered species under the Endangered Species Act of 1973. Razorback sucker apparently does not reproduce in Grand Canyon and soon may be extirpated from this reach of the Colorado River; a report of sighting was made from Bright Angel Creek in April 1987. However, an extensive survey conducted about two weeks later by Arizona Game and Fish failed to verify this observation. Therefore, the observations are considered anecdotal and the presence of the fish at this site highly problematic. Three species are already extirpated from the Grand Canyon: Colorado squawfish, bonetail chub and roundtail chub.

The native fish depended on backwaters and seasonally fluctuating flows and water temperatures. The requirements of various life history stages are not totally understood, but the cold, stabilized temperatures and flows have limited the breeding of humpback chub to warm sidestreams.

With temperatures around 50 degrees F., the river below Glen Canyon Dam allows year-round growth and provides suitable temperatures for natural reproduction of rainbow trout, which is not native to the Colorado River through Grand Canyon.

b. Reptiles: ten lizard species are found in the river corridor. Total lizard population densities are approximately 10 times higher in shoreline habitats than in adjacent nonriparian habitats; reproduction is significantly higher in shoreline areas than in adjacent non-shore and nonriparian habitats. Reptiles include: desert spiny lizard (Sceloporus magister), western whiptail (Cnemidophorus tigris), tree lizard (Urosaurus ornatus wrightii), western rattlesnake (Crotalus viridis) and a (possibly new) subspecies of Rana pipiens.

c. Birds: nearly 30 species of birds are known to nest in the river corridor, 11 of which are referred to as "obligate riparian birds" due to their complete dependence on well-developed riparian vegetation in which to breed. Ninety percent of the nests of the obligate riparian birds are believed to be located within the New High Water Zone.

Bell's vireo, common yellowthroat, and yellow-breasted chat are the species most affected by river flows because they nest low to the ground and close to the water; direct nest losses from inundation are common.

Willow flycatcher is a specie of special concern in the river corridor due to its rare status within the region; it has been greatly reduced in numbers in the Southwest as riparian habitat has disappeared.

Peregrine falcon, a federally listed endangered species, is found in the canyon and depends on riparian bird-life for its preybase.

Rare along the Colorado River prior to the construction of Glen Canyon Dam, wintering bald eagles (Haliaeetus leucocephalus) have since increased in the Grand Canyon. A wintering population has occupied the mouth of Nankoweap Creek since the early 1980s, sustained by a food resource of easily accessible, spawning trout.

d. Insects: three major insect communities are present in the riparian zone: aquatic insects, which depend on the water for part of their life cycle; fossorial, or ground-dwelling insects; and phytophagous, or plant-feeding insects. Insects are important in the Grand Canyon ecosystem as food resources, decomposers, predators, and pollinators. For these reasons, changes in insect communities may have subtle but profound long-term effects on the entire riparian and aquatic ecosystems.

3. Physical environment: flow regulation, as a result of Glen Canyon Dam, began in 1963. From that time until the filling of Lake Powell in 1980, releases stayed between 1,000 cfs and 31,500 cfs. Higher releases were rare. Although the dam produced fluctuating flows, it also eliminated the very large spring and summer floods which had annually scoured Grand Canyon. The elimination of annual flooding allowed a more diverse and extensive riparian vegetative and wildlife community to colonize the old high water zone.

Pre-Glen Canyon Dam, the Colorado River carried a large suspended sediment load through Grand Canyon National Park. Suspended sediment at the U.S.G.S. gaging station at Lees Ferry between 1928 and 1959 commonly exceeded 10,000 parts per million (ppm); post-dam samples are typically less than 200 ppm.

When Lake Powell filled in 1980, a 17-year period with virtually no releases over 31,500 cfs came to an end. The capacity of the reservoir to store unusually high spring runoff was severely reduced, leading to the current situation

in which "flood" releases (over 31,500 cfs) are more likely. Concerns were raised over the effect of these flood releases on sediment deposits and vegetation, aquatic and terrestrial wildlife, and the quality and safety of river recreation in the river corridor.

Flows since the filling of Lake Powell have varied considerably and have included flood flows, flows of less than 5,000 cfs, nearly steady flows, and daily, highly fluctuating flows.

B. Cultural Resources

Archeological resources, both historic and prehistoric, constitute a primary research and interpretive value along the Colorado River. Since the first trip down the Colorado River by John Wesley Powell in 1869, archaeological sites have been reported along the river. While the first professional survey did not consider the river corridor to contain many ruins (Taylor, 1958), subsequent surveys have recorded many sites. At the present time, over 150 archaeological sites have been recorded adjacent to the Colorado River from Lees Ferry to the Grand Wash Cliffs and Lake Mead. Sites are located not only along the river corridor, but in the tributary canyons comprising the river system. Sites are both prehistoric and historic, dating from the Archaic period of time nearly 4,000 years ago to the historic mining attempts of the early 1900s. Types of sites commonly found and visited along the river represent the remains of pueblo villages, rockshelter and cave sites, rock art sites, cliff granaries, and historic mining camps. Many of these sites are undergoing rapid and irreversible impacts, some due to natural erosive forces, but others due to the considerable impact from visitor activities. Often, natural impacts are exacerbated by visitor impacts. Sometimes, these forces are interrelated, each generating increased impacts on the other.

Significance of the sites along the river has been evaluated in the past as part of the entire prehistoric and historic record. All sites within Grand Canyon have been nominated for inclusion in the National Register of Historic Places. As of this writing, the sites are considered eligible by the Arizona Advisory Council but not yet listed by the National Register. Complete documentation and listing of the archaeological resources of Grand Canyon on the National Register is expected in the near future.

C. Recreational Resources and Existing Visitor Use

The Colorado River through the Grand Canyon is the longest stretch of river (277 miles long) for recreational use entirely within a national park. It is surrounded by more than 1 million acres of

land with little human development. Some of the world's most difficult and exciting whitewater occurs here. The Colorado River's isolation in the mile-deep gorge of the Grand Canyon gives it primitive recreational qualities while enhancing off-river hiking, climbing, sightseeing, and solitude.

Prior to the early 1960s, there was little need to be concerned with resource impacts along the river; few visitors entered the canyon or ran the river. From 1960 to 1972, the number of boaters annually running the river grew from 205 persons to 16,432. The rapid growth of whitewater boating in Grand Canyon was paralleled by a dramatic increase nationwide. In 1972, increasing problems with management of fire, human waste and trash along the river, damage to fragile soils and vegetation, trailing, and destruction of prehistoric sites prompted the NPS to regulate river use more closely.

As an interim measure, the commercial use allotment for 1972 was set at 105,000 user days (one user day equals one passenger on the river for any portion of one day); this was readjusted to 89,000 in 1973 and maintained at that level until 1979. Noncommercial use was 7,600 user days in 1972 and this level was maintained until 1979. In 1979, with the development of the Colorado River Management Plan, use levels were to have been expanded, launch schedules implemented, and motors phased out in favor of oar-powered river trips. Due to the controversial nature of this plan and congressional action that limited the agency's ability to implement the approved, preferred alternative, a revised plan was released in 1981 that established new use ceilings: total commercial and noncommercial use levels of 150,076 user days (106,156 user days commercial allotment; 43,920 user days noncommercial allotment) for the summer season and 19,874 user days (9,344 user days commercial allotment; 10,530 user days noncommercial allotment) for the winter season. These numbers reflected historic use levels, increases for the growing demand for the private, noncommercial allotment, and an across-the-board increase for each concessioner. Use ceilings have been maintained at that level since 1981. Although the allotments have never been totally utilized, the commercial utilization has reached near-100% levels in recent years due to the use of a user day pool; noncommercial average group size and trip length are below limits, resulting in less than total utilization of allocation.

Since the gates of Glen Canyon Dam closed, fluctuating flows have been common; stranding moored boats, reducing camping beach sediments, and resulting in perceivably unnatural changes in water level. Under low-flow conditions, passage in some parts of the corridor becomes more difficult and, in some cases, constitutes a high risk. After Lake Powell filled, flood releases above 30,000 cfs were experienced during 1983-86; this resulted in sustained flows above levels that could be considered safe.

Another recreational use of the corridor is fishing; some humpback chub waters are closed and any caught must be released. Although the waters of the Colorado River are now a sustaining trout fishery, salmonids are alien species, and NPS Management Policies preclude their management as a primary resource.

### III. Alternative Actions

- A. Alternative A: No Action, Continue Action under 1981 Plan Guidelines.
- B. Alternative B: Initiate Management under the Revised Plan.

#### Summary of Management Actions Proposed by the Revised Plan Which Represent Changes From the 1981 Plan:

##### 1. Guide Certification

Alternative A: No Action-1981 Plan  
No test was required for guide certification.

Alternative B: 1989 Plan  
All commercial guides carrying passengers for hire on the Colorado River through Grand Canyon National Park would be required to pass a written exam based on the Annual Commercial Operating Requirements.

##### 2. Commercial Deadhead Trips

Alternative A: No Action-1981 Plan  
Commercial deadhead launches are not counted against the commercial passenger launch limit for any launch day, contributing to increased congestion and crowding downriver of Phantom Ranch; this causes a situation where there are more trips below Phantom Ranch than would normally have resulted under daily 166-person launch limits.

Commercial deadhead trips are not required to expedite travel to Phantom Ranch and they are allowed to stop at attraction sites and use any campsites, except for closed ones.

##### Alternative B: 1989 Plan

Commercial trips traveling downriver with empty boats for the purpose of picking up passengers at Phantom Ranch or Whitmore Wash will be required to expedite travel to those destinations. These boats will not be allowed to stop at attraction sites, and will be required to use smaller, less popular camps. On days that deadhead trips depart Lees Ferry, the number of passengers being picked up downriver will be counted against that day's commercial passenger launch limit.

3. Commercial Secondary Season Use:

Alternative A: No Action-1981 Plan

Winter season user day utilization by the commercial sector was on a first-come, first-served basis.

Alternative B: 1989 Plan

This plan awards all historical users their average allocation from October 1, 1981 through April 30, 1987. If a company failed to average over 300 user days, they were allotted a base allocation of 300 user days. All 20 companies have been given an equal share of the remaining user days.

4. Administrative Charges for Noncommercial Users

Alternative A: No Action-1981 Plan

There were no administrative charges for noncommercial users.

Alternative B: 1989 Plan

Applicants to the noncommercial waiting list will be required to pay a non-refundable \$25 charge in order to be placed on the list. All trip leaders will be required to pay \$50 upon confirmation of a launch date and the subsequent return of their noncommercial river trip application. Both charges will be non-refundable.

5. Scheduling of Noncommercial Launch Dates

Alternative A: No Action-1981 Plan

Noncommercial launches are scheduled in December, for the year beginning April 16 (ending April 15 the following year).

Alternative B: 1989 Plan

Noncommercial launch dates will be scheduled 2 years in advance. Each year a sufficient number of waiting list applicants will be contacted in order to fill available launch dates, for both primary and secondary seasons, for 2 years (under the proposed revision, the summer is designated the primary season and winter the secondary season).

6. Noncommercial Supplemental Launches and Resultant Effects on Commercial Launch Calendar

Alternative A: No Action-1981 Plan

Noncommercial sector is limited to 1 launch per day during the summer season.

Alternative B: 1989 Plan

Effects on Commercial Launch Calendar: In order to more fully utilize the noncommercial allocation in the primary season, 38 additional noncommercial launches have been added.

7. Noncommercial Continuing Interest and Participant Rules

Alternative A: No Action-1981 Plan

Applicants missing 1 continuing interest deadline are removed from the waiting list; participation on another noncommercial trip while on the waiting list results in removal from the list.

Alternative B: 1989 Plan

All applicants to the noncommercial waiting list will be allowed to miss 1 continuing interest deadline and may participate in 1 noncommercial river trip other than their own for the duration of the time they are on the list.

8. Call-in System/Filling of Open Noncommercial Launch Dates

Alternative A: No Action-1981 Plan

Call-in system is used for allowing individuals on the waiting list to claim unused launch dates.

Alternative B: 1989 Plan

Any noncommercial date in the upcoming season which is not filled by the initial scheduling/preferred launch sheet system, or becomes open due to cancellations, will initially be filled by the River Subdistrict Office contacting applicants at the top of the list by phone and/or in writing. If a date is not filled by this method, the date may be claimed by anyone on the waiting list under the Call-in System Guidelines.

9. Noncommercial Deferral Policy:

Alternative A: No Action-1981 Plan

Noncommercial waiting list applicants allowed to defer their launch date for one year.

Alternative B: 1989 Plan

Noncommercial waiting list applicants will no longer have the option of deferring their launch date by 1 year.

10. Noncommercial User Day Pool:

Alternative A: No Action-1981 Plan

No user day pool for noncommercial sector; allocation controlled by the number of trips launched from Lees Ferry on a daily (summer) or weekly (winter) basis.

Alternative B: 1989 Plan

Noncommercial user days which become available due to trips with fewer than the maximum allowed participants or trip length will become available through an NPS-administered pool. As sufficient days become available, additional noncommercial launches will be scheduled as supplemental launches throughout the primary (summer) season.

11. Lower Gorge Management:

Alternative A: No Action-1981 Plan

Visitor use limits, through user day allocations and use restrictions, are not imposed for the area below Diamond Creek.

Alternative B: 1989 Plan

Use in the lower gorge below Diamond Creek will be monitored and regulated to determine future management needs. Interim Guidelines are designed to regulate primary upriver use during development of a comprehensive Colorado River Lower Gorge Management Plan.

12. River Trips Conducted for Research Purposes:

Alternative A: No Action-1981 Plan

Research trips were allowed, but means of administering research permits/launches were not outlined.

Alternative B: 1989 Plan

Research conducted on the Colorado River and using rafts as the mode of transportation will be required to submit research proposals prior to trip launch, as well as justifications for each trip member's participation. Following completion of each trip, a brief report of trip activities, as well as research findings and results will be required to be submitted to Grand Canyon National Park in a timely manner.

13. Management Objectives and Limits of Acceptable Change:

Alternative A: No Action-1981 Plan

Two undefined management objectives were stated: (1) protection of the riparian environment from unacceptable change caused by river running activities; and, (2) provision of an opportunity to enjoy a high quality, rewarding river running experience. Allowable levels of influence/change were not specified.

Alternative B: 1989 Plan

Allowable levels of influence/change have been identified for recreational usage of the Colorado River corridor. Management objectives are included, specific to the following: temporal "recreation opportunity spectrum" (identifying three experience opportunities, based on probability and level of contacts while on the river, at attraction sites and at campsites); maximum group size; influence of recreational use on the natural environment; management of water quality; influence of recreational use on cultural resources; trailing development; fisheries; aircraft use; and baseline data gathering. The rationale for NPS posture on Glen Canyon Environmental Studies and dam operations is also articulated. Alternative means of assuring attainment of each management objective are identified. Specific monitoring programs are designed to support each of the objectives.

IV. Impacts and Mitigations:

A. Alternative A: No Action, Continue Management Under 1981 Plan Guidelines.

No change from the present condition of the resources. Continued adverse impacts due to overcrowding at attraction sites and multiple trailing through sites.

Under implementation of the 1981 plan, the following provisions and impacts resulted:

1. User Day Ceilings: The user day ceilings for the two sectors were established, but specific management objectives relative to sociological experience were not specified. The lack of seasonal objectives resulted in the public not being able to make clear decisions as to the period of year to visit the corridor in order to experience desired preferences.

2. Trailing and Other Visitor Impacts: The plan outlined general objectives for managing impacts of man. A level of trailing mitigation resulted: human waste carry-out provisions were implemented resulting in apparent positive impacts through reduction in human waste deposition; and, required practices related to campfire and food preparation and sanitation resulted in apparent positive impacts through the reduction in impacts to beach sediments. Improvements were noticeable at camping beaches and in previously multiple-trailed areas through Old High Water and Desert Zones; however, these changes have not been quantified and officially documented. The plan outlined monitoring and research goals which led to some elimination of informational deficiencies.

3. Commercial and Noncommercial Operating Requirements: The plan outlined operating requirements for both sectors that resulted in better understanding of NPS operating requirements.

B. Alternative B: Initiate Management Under the Revised Plan.

With implementation of the revised plan, the following impacts would occur beyond that of the 1981 plan:

1. Guide Certification:

a. Resource impacts: having increased quality control on guide certification would result in indirect beneficial impacts due to the increased amount of environmental and visitor safety awareness. Benefits would depend on the intensity of the certification program; for example, putting a strong emphasis on archaeological site and endangered species protection, and minimum impact camping.

b. Socioeconomic: no direct impact except to individuals. If they fail certification test, someone else would take their job. No regional impacts realized.

2. Commercial Deadhead Trips:

- a. Resource Impacts: no impacts realized.
- b. Socioeconomic Impacts: no economic impacts realized.

Compared to levels experienced under the 1981 plan, sociological impacts, such as competition for the better campsites and contacts at popular attraction sites, should decrease below Phantom Ranch, as some 2,500 user days previously not included within the Lees Ferry launch limits will be tabulated at time of launch.

3. Commercial Secondary Season Use:

- a. Resource Impacts: no impacts expected.
- b. Socioeconomic Impacts: economic impacts may be realized by

those companies that had previously used the greatest number of secondary season user days. Use will be distributed among river companies and will assure that the commercial allocation is not depleted by our companies during the non-motors season; motor use may increase during the motors-allowed portion of the secondary season.

4. Administrative Charges for Noncommercial Users:

- a. Resource impacts: no impacts realized.
- b. Socioeconomic impacts: monetary impacts upon some

individuals may result in unwillingness to apply for and obtain a permit. This provision will also result in a decrease in numbers on the waiting list because the frequency of multiple applications by an individual or family will decrease.

5. Scheduling of Noncommercial Launch Dates:

- a. Resource Impacts: no impacts realized.
- b. Socioeconomic Impacts: sociological impacts, undetermined at

this time.

6. Noncommercial Supplemental Launches and Resultant Effects on Commercial Launch Calendar:

a. Resource Impacts: conceivable increase in resource impacts, especially in camping areas. The proposal increases the probability and frequency of groups doubling up on camping beaches; thus, contributing to some impacts to periphery vegetation and sediments. An increase in use frequency for all camping beaches is assured, with unknown and unquantified known impacts to vegetation, beach sediments and cultural resources.

b. Socioeconomic Impacts: observations and monitoring of supplemental launches and their effects during the 1988 summer season did not appear to reveal a significant crowding problem, at that time. As a possible means of minimizing crowding and congestion, supplemental launches will be scheduled on days of the week traditionally not fully utilized by commercial companies; additional crowding at campsites and attraction sites may still occur. Beginning in the 1989 noncommercial primary season, 1 supplemental launch will be scheduled per week. On the supplemental launch day, the commercial launch limit will be held to 134 passengers. During the secondary season, 12 additional launches will be scheduled.

7. Noncommercial Continuing Interest and Participant Rules:
  - a. Resource Impacts: no impacts realized.
  - b. Socioeconomic Impacts: no negative impact; delayed effect of being taken off the waiting list as a result of failure to return continuing interest cards or for taking another trip as a passenger.
  
8. Call-in System/Filling of Open Noncommercial Launch Dates:
  - a. Resource Impacts: no impacts realized.
  - b. Socioeconomic Impacts: no economic impacts realized; sociological impacts should be positive, due to greater access to allocation.
  
9. Noncommercial Deferral Policy:
  - a. Resource Impacts: no impacts realized.
  - b. Socioeconomic Impacts: no economic impacts realized; sociological impacts due to the possibility of lost river trip opportunities for those who cannot schedule a river trip when their name comes up on the waiting list.
  
10. Noncommercial User Day Pool:
  - a. Resource Impacts: no impacts expected, beyond those identified under 4. Noncommercial Supplemental Launches.
  - b. Socioeconomic Impacts: no impacts expected.
  
11. Lower Gorge Management:
  - a. Resource Impacts: proposal will potentially result in greater understanding of resource conditions, allowing the development of management actions to be undertaken to assure their preservation.
  - b. Socioeconomic Impacts: economic impacts will likely be a result of any changes necessary upon completion of a Lower Gorge Management Plan; all commercial activities originating from Lake Mead will conflict with down-river use and will be prohibited above Separation Canyon.
  
12. River Trips Conducted for Research Purposes:
  - a. Resource Impacts: no impacts expected; however, some information of value in managing river corridor resources may be lost as a result of researchers' failure to meet permit requirements.
  - b. Socioeconomic Impacts: no impacts realized.
  
13. Management Objectives and Limits of Acceptable Change:
  - a. Resource Impacts: providing management objectives and acceptable limits of change enable park staff to readily focus on, measure, and mitigate impacts to natural and cultural resources.
  - b. Socioeconomic Impacts: because use levels are not being changed, only defined, no significant economic impacts are expected. No economic impacts under most means of attainment for the temporal "recreational opportunity spectrum"; reductions in use levels will be undertaken only following separate environmental assessment. The temporal "recreational opportunity spectrum" will allow recreational users of the Colorado River corridor to make clear choices as to the type of experience in which they wish to participate, given the use-period ceilings, and be reasonably assured that their expectations will be met. The contact levels identified provide clear objectives for direction of sociological monitoring program.

14. Cumulative Impacts Beyond those of the 1981 CRMP: the major changes in the proposed revision of the CRMP constitute operational refinements and do not appear to establish actions and incremental impacts adversely affecting natural and cultural resources beyond those levels resulting under the 1981 plan.

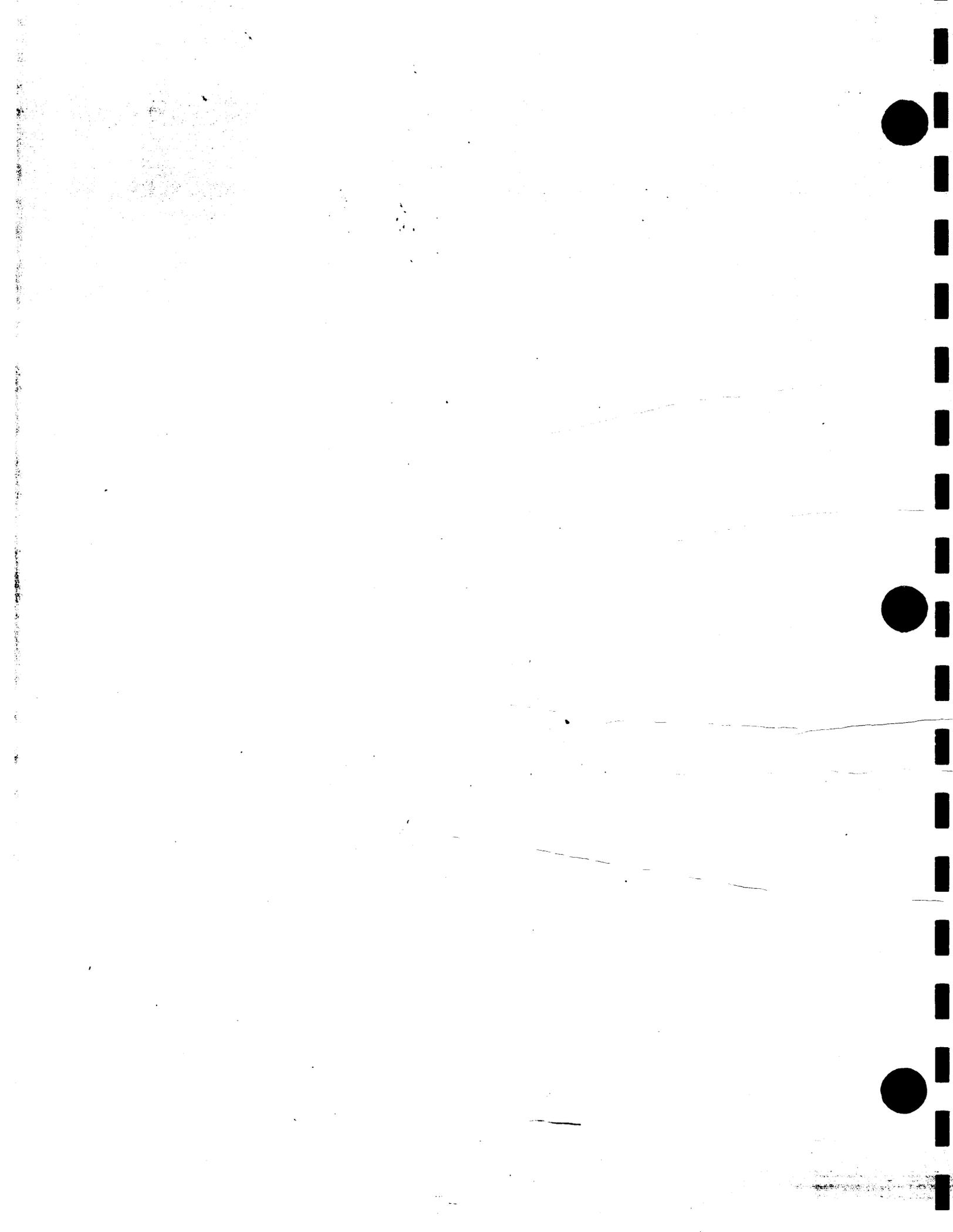
Management objectives have been more clearly defined and limits of acceptable change adopted. These do not constitute a change in management of the Colorado River corridor, but instead serve to define: specific management objectives; the levels of impact/change to the natural and sociological condition that are acceptable; the means of assuring attainment of objectives; and, the monitoring to support decisions and management actions. Any negative socioeconomic impacts will be a result of limits applied in order to protect natural and cultural resources; those limits applied to manage sociological experiences will have mostly positive impacts through improved visitor experiences.

V. Agencies and Individuals Consulted:

Frank Baucom, U.S.F.W.S, Phoenix, AZ  
Dennis Kubly, Arizona Game and Fish, Phoenix, AZ  
Larry Stevens, Northern Arizona University, Flagstaff, AZ  
James Huddlestun, NPS, Western Regional Office, San Francisco, CA  
Steve Hodapp, NPS, Washington (formerly of Grand Canyon National Park)

VI. References:

- Anderson, L.S., and G.A. Ruffner. 1987. Growth and demography of western honey mesquite and catclaw acacia in the old high water line riparian zone of the Colorado River in Grand Canyon. Glen Canyon Environmental Studies Technical Report. U.S. Bureau of Reclamation, Salt Lake City, UT.
- Brown, B.T., R. Mesta, and L.E. Stevens. 1988. Monitoring the Ecology and Natural History of Wintering Bald Eagles at Nankoweap Creek, Grand Canyon. Unpublished technical report.
- National Academy of Science. 1987. River and Dam Management; a Review of the Bureau of Reclamation's Glen Canyon Environmental Studies, National Academy Press.
- Stevens, L.E., and G.L. Waring. 1987. Effects of post-dam flooding on riparian substrates, vegetation and invertebrate populations in the Colorado River corridor in Grand Canyon, AZ. Glen Canyon Environmental Studies Technical Report. U.S. Bureau of Reclamation, Salt Lake City, UT.
- Schmidt, J.C., and J.B. Graf. 1988. Aggradation and Degradation of Alluvial Sand Deposits, 1965 to 1986, Colorado River, Grand Canyon National Park. Glen Canyon Environmental Studies Technical Report. U.S. Bureau of Reclamation. Salt Lake City, UT.
- U.S.D.I., National Park Service. 1979. Final Environmental Statement, Proposed Colorado River Management Plan.
- U.S.D.I., National Park Service. 1981. Colorado River Management Plan.
- U.S.D.I., National Park Service, 1978. Management Policies.
- U.S.D.I., 1988. Glen Canyon Environmental Studies Final Report.



COLORADO RIVER MANAGEMENT PLAN

**APPENDIX H**

FINDING OF NO SIGNIFICANT IMPACT  
AND SUMMARY OF PUBLIC COMMENT

	Page Number
I. Finding of No Significant Impact	H-2
II. Impact / Mitigation Matrix	H-4
III. Summary of Public Comment	H-6

FINDING OF NO SIGNIFICANT IMPACT  
FOR  
1989 REVISION - COLORADO RIVER MANAGEMENT PLAN  
GRAND CANYON NATIONAL PARK, ARIZONA  
JULY, 1989

NATURE OF THE PROPOSAL AND ALTERNATIVES CONSIDERED:

In 1987, Grand Canyon National Park began review of the Colorado River Management Plan (CRMP), through a public process that resulted in development of a draft (revised) plan and environmental assessment. The environmental assessment evaluated only two alternatives: continued management under the 1981 plan; and, the initiation of management under the revised plan (the preferred alternative).

In evaluating the proposal, the environmental assessment considered the effects of changes proposed by the revised plan, comparing its impacts to those of the 1981 plan. The 1981 plan assumed that the 1979 CRMP Environmental Impact Statement was still valid and combined provisions of several of the alternatives evaluated in the 1979 EIS; thus, the environmental assessment for the revised (1989) plan tiered off the 1979 EIS. In assessing cumulative impacts, the environmental assessment for the current proposal concludes that the revised plan consists of operational refinements and does not appear to establish actions and incremental impacts adversely affecting natural and cultural resources beyond those levels resulting under the 1981 plan.

SUMMARY OF PUBLIC REVIEW:

In March of 1987, CRMP review was initiated with the mailing of 4000 notifications to individuals, media, interest groups, congressional delegations and cooperating agencies; over 1000 planning guides were requested by those interested in contributing to the identification of major issues. In July of 1987, the park began revision of the Colorado River Management Plan with a workshop to discuss Colorado River management issues with researchers, concessioners and public constituents. In March 1988, an issue workbook was mailed to approximately 400 individuals, agencies and institutions for their review and input (over 50 were returned); public meetings were held in Flagstaff, AZ, Denver, CO, and Reno, NV, during April and May (with approximately eighty-four individuals attending). Following evaluation of comments, Draft Preferred Alternatives were developed and presented in meetings held in mid-July with the Grand Canyon Concessioner's Steering Committee and the Constituent Advisory Committee (made up of natural and social science researchers, noncommercial user groups, commercial river guides and environmental organizations). In August, the Preferred Alternatives were mailed out, with comments received from the public for a 30 day period. On November 10, 1988, a Draft Colorado River Management Plan/Environmental Assessment was distributed to over 500 individuals, agencies and institutions; the 30-day review period was announced in the Federal Register in November, 1988. On December 20, 1988, the public review period was extended an additional thirty days, for those needing additional time to formulate comments. One hundred and thirty written responses were received during the entire public review period, twenty four of which were received during the extension period. A summary of public comments was prepared. Both a draft of this FINDING and the summary of public comments were made available for a 30-day public review period, as announced in the Federal Register, dated July 24, 1989, on page 30800. Twelve copies of the FINDING were requested and distributed; no comments were received.

SUMMARY OF MITIGATION MEASURES:

The plan provides for improved management and monitoring through its adoptance of limits of acceptable change and a defined research and monitoring program; seasonal contact/crowding levels are specified, and acceptable influence of recreational use on natural and cultural resources, trailing development and water quality are defined.

The National Park Service conducted an informal section 7 consultation with the US Fish and Wildlife Service. The primary impacts on listed species, in particular: the humpback chub, bald eagle and peregrine falcon are, more likely than not, due to the direct result of the operations of Glen Canyon Dam. Any changes in visitor use due to the implementation of the Revised CRMP would be minor and incremental to existing impacts. To the best of our knowledge, past river use by visitors has had no discernible impact on these species. This is not to say, categorically, that impacts do not exist.

The CRMP is a dynamic document. The intent of the National Park Service is to revise the CRMP, especially with respect to the aforementioned species, as soon as the current research associated with

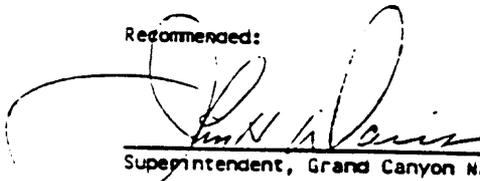
the Bureau of Reclamation Endangered Species Recovery Plan, is completed and the environmental impact statement for Glen Canyon Dam (preparation of which was decreed by Secretary of the Interior Lujan on July 27, 1989) yields selection of an approved operational alternative. In the interim, the monitoring guidelines associated with the CRMP will be used to assess condition and trend of these endangered resources.

The aforementioned environmental impact statement and associated studies may reveal additional resource information that may be used to guide future revisions.

A Colorado River Management Constituent Panel will be established to assist park management in recognizing the needs of the various constituent groups. The panel will be made up of a representatives from each of the following: private users, concessioners, commercial guides, fishermen, the research community, the Bureau of Reclamation and the National Park Service. Although primary responsibility for managing the river remains with the National Park Service, the role of the Panel will be to present the needs and views of the respective interest, to serve as the first level of review for annual monitoring results and to evaluate needs to initiate management actions, as outlined by the plan. The group will meet before and after annual reviews of annual operating plans.

Based on the analysis of the environmental assessment and alternatives, the public comment and the ability of the mitigation measures to reduce or eliminate impacts, the National Park Service is implementing the proposal, Alternative B, and has determined that this action does not constitute a major federal action significantly affecting the human environment. Therefore, an environmental impact statement will not be prepared.

Recommended:

  
\_\_\_\_\_  
Superintendent, Grand Canyon National Park

9/5/89  
Date

Approved:

  
\_\_\_\_\_  
~~ACTING~~ Regional Director, Western Region

9/14/89  
Date

IMPACT / MITIGATION MATRIX

PARK: Grand Canyon National Park  
PROJECT: 1989 Colorado River Management Plan Revision

IMPACT

PRESCRIBED MITIGATION AND  
RESPONSIBILITY

1. Counting of Commercial deadhead trips, traveling downriver with empty boats to Phantom Ranch, against the launch limit for the day of launch is intended to reduce congestion and crowding downriver, as resulted under the 1981 plan where deadheads could launch along with a full schedule of 166 persons launching. Though unlikely, this action could actually result in increased crowding, or it may be possible that additional crowding could be mitigated through an alternative launch scenario.

2. Supplemental launches intended to provide private users equitable access to the user-day allocation may result in sociological impacts to the groups that double-launch together; these groups may compete for campsites or spend periods of time in sight of each other that are unacceptable to one or both of the groups.

3. Defined management objectives, in the form of Limits of Acceptable Change are included in the plan.

1. Monitoring will be necessary to determine if the action accomplishes its desired objective, of reducing contacts and crowding downstream of Phantom Ranch. The objective of the monitoring will be to assess the launch days of those groups with which the deadhead trips make contacts, following its taking on passengers at Phantom Ranch. Other monitoring programs should indicate normal contact/crowding levels in the absence of deadheading trips. Comparison of the two may indicate need to refine the deadhead scheduling procedure. Responsibility: Resources Management.

2. Monitoring will be necessary to assess whether sociological impacts will occur for those groups double launching together. Assessing such impact will require sociological science methodology, which must be undertaken through sociologists; this work cannot be undertaken earlier than FY-90. Funding has been requested. Possible mitigations, if indicated by monitoring, may include: allowing double launches, but with groups with different itineraries only; double launches on high launch days, so that downstream contacts are with faster boats that launched on low density launch dates; and reduction of launches from both the commercial and noncommercial sectors. Responsibility: Resources Management.

3. Monitoring programs necessary to support these management objectives are specified in the matrices outlining the Limits of Acceptable Change. If impacts/influence/change occurs, as indicated by monitoring, above those levels specified as acceptable, the prescribed means of assuring accomplishment will be implemented; some actions may best be accomplished following an action specific environmental assessment, in order to assure adequate public involvement in

- implementation/selection of best means of accomplishment. Responsibility: Resource Management and Visitor Protection Divisions.
4. Administrative charges and recreation fees for Noncommercial Users.
  5. Scheduling of noncommercial launch dates, two years in advance. Impacts are not anticipated, but if any occur, these should become evident following implementation.
  6. Noncommercial deferral policy - waiting list applicants will no longer have the option of deferring their launch date by one year.
  7. Noncommercial user day pool - where user days, became available due to fewer than maximum allowable participants on trips, these may become available through supplemental launches. This may result in social and physical impacts, due to increased use of the user day allocation, over that of the 1981 plan.
  8. Visitor use levels in the Lower Gorge section of the Colorado River are not presently managed by the comprehensive provisions of the Colorado River Management Plan, resulting in possible conflicts between user groups.
  9. Research trips will be more closely administered to prevent conflicts with visitors during high density use periods. The resulting impact may be one of which there is a preclusion of some research, due to scheduling mandates and windows; thus, the park may not realize benefit from research and inventory data.
  10. The diversity of the public served by the Colorado River Management Plan has an equally diverse amount of needs and potential for conflict. A mechanism is needed for getting their input into the annual review of operating requirements.
4. Fees will be charged as a Special Recreation Permit Fee, until such time that enabling legislative authority allows for collection of fees for use in river management purposes. Responsibility: Visitor Protection Div.
  5. This provision will be evaluated during the annual review of the noncommercial operating criteria, 1990 and 1991. Responsibility: Visitor Protection Div.
  6. The public response to this procedural change will be assessed at annual review of the noncommercial operating criteria, in 1990 and 1991. Responsibility: Visitor Protection Div.
  7. Same as #2 above.
  8. A Lower Gorge Management Plan will be prepared, the initial preparation stages of which will take place in FY89, with completion targeted for FY91. Responsibility: Resource Management Division, with support from Visitor Protection Division.
  9. At the annual review of the CRMP's operating criteria, the research administration criteria will be reviewed to assure that its intended purpose was attained and that unnecessary impacts on researchers did not result. Responsibility: Resource Management Division.
  10. A Colorado River Management Constituency Panel will be established, made up of one representative from each of the following: private users, concessioners, commercial guides, fishermen, the research community, Bureau of Reclamation, and National Park Service. Although primary responsibility for managing the river remains with the National Park Service, the role of the Board will be to present the needs and views of the respective interest, to serve as the first level of review for annual monitoring results and to evaluate needs to initiate management actions, as outlined by the plan. The group will meet before and after annual reviews of annual operating plans.

Summary of Public Comment  
November 10, 1988 to January 20, 1989

November 1988 Draft Colorado River Management Plan  
Grand Canyon National Park

The public review period for the Draft Colorado River Management Plan was initially November 10, 1988 to December 9, 1988. On December 20, 1988 the review period was extended to January 20, 1989. During the initial and extended review periods 131 letters were received, containing over 600 comments. People commented on all aspects of the plan and its appendices, and addressed editing, overall content, the planning process, and the environmental review process, as well as specific issues and changes from the previous plan.

For evaluation of comments, letters were grouped into four categories: outfitters; professional river guides; researchers, organizations, and individuals having close involvement with the park; and the general public. All four groups commented on a wide range of issues, but certain issues were more important to some groups than others.

The General Public (55 letters, 222 comments) commented on all aspects of the plan, with many comments on several of the proposed changes to management policies that affect non-commercial users: administrative charges, continuing interest and participant rules, and the deferral policy. Many also commented on the allocation between commercial and non-commercial sectors.

Outfitters (30 letters, 98 comments) had a primary interest in the allocation of user days for commercial secondary season use.

Professional River Guides (24 letters, 143 comments) commented on a wide range of issues, and were particularly concerned with the issue of overcrowding in the river corridor.

Researchers and Organizations (22 letters, 177 comments) addressed many issues, in particular overall plan content and internal consistency, resources monitoring, the environmental review process, and proposed new guidelines for research trips in the Colorado River corridor.

In the following summary, comments have been grouped according to the table of contents of the plan. General comments on the plan as a whole are presented first.

## I. General Comments and Responses

### a. Comments on editing: 16 comments

Many suggestions were made to improve plan editing: the addition of a map, graphics, and a list of preparers were proposed.

**Response:** The final plan will have consecutive page numbering, graphics, and a map. Many small editorial inconsistencies will be corrected. A table of contents will be included at the front of each section.

### b. Overall plan content: 25 comments

Commenters recognized the tremendous amount of work involved in a plan of this complexity, and acknowledged the NPS effort. Some commenters were complimentary of the coherence, thoroughness and manageability of the plan, however, many of the comments were generally critical of it; some argued that there is no clear plan, that there is no integration between its different parts, that some proposed actions lack justification, and the plan does a poor job of addressing some resource protection mandates.

**Response:** A list of other regional and park management plans having direct influence on the management of the Colorado River environment was added to the preface.

### c. Planning process: 34 comments

12 people stated that the review period of 30 days was too short, especially for comment on a plan of this magnitude and complexity; some felt this was the first opportunity for people to comment on a decision document.

7 people commented there were no ground rules presented for integrating public input into the plan, or timetable for review and revision to a final plan.

3 people stated that the 10 year review process for this plan is too long, and others said it was unclear how the annual review fit in to this process.

**Response:** The comment period for the November 1988 Draft CRMP was extended to January 20, 1989, for a total review period of 60 days.

The annual review process was clarified within the plan.

The ten year review period was changed to "a five to ten year period".

### d. Important issues not addressed or inadequately dealt with in plan

#### 1. Crowding: 27 comments

Many commented to the effect that crowding on the river is a significant issue which has been recognized in the management objectives, but is not adequately dealt with in the plan; some feel that management changes that promote fuller use of user day allotment are in direct conflict with management objectives.

13 people specifically mentioned that the "user day" system leads to crowding by encouraging shorter trips, partial trips, and full utilization of the user day allotment; several people stated that a "launch limit" or a reduction in use limits would be effective ways to deal with crowding.

2 people opposed the idea of scheduling camps to deal with crowding.

**Response:** Defined contact/crowding management objectives are specified in the Limits of Acceptable Change, as are alternative means of assuring attainment.

#### 2. Glen Canyon Environmental Studies (GCES)/Bureau of Reclamation (BOR) Operation: 16 comments

6 people believed that the GCES project had not been adequately discussed in the plan, and felt that the results of this multiagency study would be helpful in the development

of sound Colorado River management policies, and an in depth monitoring program.

10 people encouraged the NPS to take a stronger stance on BOR operational procedures for Glen Canyon Dam, and to make commitments to attempt to reduce deleterious effects.

**Response:** References to the NPS responsibility relative to its relationship to BOR and review of Glen Canyon Dam operations were strengthened. Some monitoring programs outlined in the Limits of Acceptable Change appendix adopt GCES study methodologies.

### 3. Commercial/noncommercial allocation: 17 comments

Most of these commenters expressed disappointment that the issue of "equity of allocation/access between commercial and noncommercial users" was not addressed in the plan.

One person supported retaining 115,500 user days in the commercial sector.

**Response:** A total of 38 supplemental launches per primary season were added to the schedule as a means of improving noncommercial access to the noncommercial allocation; the NPS chose this alternative over attempting a reallocation by providing a method which allows for an increase in utilization of the noncommercial allocation.

### 4. Fishing trips: 4 comments

3 people supported the park's decision not to allow commercial fishing trips in the canyon.

1 person stated that the park should develop a policy to allow these trips.

**Response:** Public response generated in public meetings prior to the draft CRMP indicated a general lack of support for development of a specialized user group.

### 5. Wilderness: 4 comments

4 people said that the wilderness issue needs to be addressed in the plan.

**Response:** Wilderness proposals for Grand Canyon National Park have been made as part of the public land's inventory.

### 6. Resource issues: 7 comments

Comments included assessments that the plan was a rafting plan and did not adequately address management of the resource, or address other uses of the river corridor such as use of beaches by backpackers and fishermen.

5 people considered fishermen's camps in Marble Canyon to be a major problem with significant impacts on the environment.

**Response:** The scope of this plan has been identified in the introduction to the final plan.

### 7. Other: 9 comments

Included comments that the plan should also address: helicopter use at Whitmore Wash, motorized use of the river, and emergency operations for situations involving hazardous materials.

**Response:** The influence of Public Law 100-91, and its provision of a helicopter corridor for takeouts at Whitmore, is discussed in the Limits of Acceptable Change appendix; the Whitmore Wash Trail will be maintained for possible mule and hiker takeouts. The motors issue was not evaluated.

Hazardous materials contingencies will be covered in a park hazardous wastes plan.

### e. Miscellaneous: 14 comments

Support for "ride-along" program was expressed.

**Response:** The ride-along program has been adopted as a part of the annual concessions evaluation program.

A clarification of kayak regulations for the Little Colorado was requested.

**Response:** The regulations were clarified.

Better ramp facilities were requested.

**Response:** Ramp facilities are adequate for current operations.

An increase in NPS staff was requested during the primary season.

**Response:** Staff size is a function of annual congressional appropriations.

Comment was made that law enforcement last year placed too much emphasis on minor incidents in overall evaluations.

**Response:** Law enforcement actions were consistent with previous years enforcement standard operating procedure.

## II. Comments on Management Goals and Objectives: 15 comments

Most comments supported the goals and objectives, but some commenters felt that some stated goals were contradictory to the management changes. One commentor felt that the rationale for new goals and objectives should be addressed in the text and the EA.

**Response:** Park planners provided specific goals and objectives which were lacking in the 1981 plan.

## III. Comments on Summary of Changes to Management Policies

### **a. Guide Certification: 20 comments**

Nearly half the commenters supported guide certification; the remainder inquired either as to how certification would be renewed from year to year, or whether or not the NPS has the legal authority to require such certification.

**Response:** The NPS has legal authority to require certification and has adopted the guide certification program as a method to ensure safety and resource protection; certification is valid for a 3-year period.

### **b. Limit on Commercial Trip Size: 8 comments**

2 commenters would like to see the commercial trip size limit increased to 40.

5 commenters supported the commercial trip size of 36; some said it should be reduced even further, and that guides and assistants should be included in the 36 person limit.

1 comment questioned the difference in group size limit between commercial and private trips.

**Response:** The 40 person limit was a temporary limit, put in place for 1987-88 only; the 36 person trip limit was reinstated, based on considerations for resource protection and quality of visitor experience.

### **c. Administrative Charges for Noncommercial Users: 43 comments**

27 people opposed the new fees; some questioned the NPS authority or justification for collecting fees and others argued that fees will not shorten the waiting list.

9 people voiced partial support for fees, but suggested alternative fee schedules.

6 people supported fees, some asking how the money would be used.

1 person felt that if fees were imposed, all users, commercial and noncommercial should be charged, with the money to be used directly to fund research, monitoring, and rehabilitation in the river corridor.

**Response:** Fee schedules were changed to \$25 to get on the waiting list and \$50 launch fee. Authority to charge fees cited--36 CFR 71.10. Sec. 1-6, Special Recreation Permits and Special Recreation Permit Fees, to be used directly for river management purposes. Commercial companies are required to pay a franchise fee (approximately 2-1/4% of gross annual revenues).

**d. Scheduling of Noncommercial Launch Dates: 12 comments**

6 people opposed 2 year advanced scheduling.

2 people supported 2 year advanced scheduling.

Other commenters suggested that people should be given the option of one or two year advance scheduling, and that this policy should be instituted on an experimental basis only.

**Response:** 2-year scheduling was adopted to eliminate a trip deferral rate of nearly 50%; the noncommercial operating requirements will be reviewed on a yearly basis and this can be changed should it prove not to be successful.

**e. Noncommercial Double Launches and Resultant Effects on Commercial Launch Calendars: 38 comments**

15 support double launches as a means of improving access to the noncommercial user day allocation.

7 commenters felt that double launches should be a temporary policy until impacts are monitored and evaluated, since the effects of double launches may be in conflict with the management objectives of the plan.

4 people stated that double launches will increase crowding; one alternative proposed was to increase the group size limit for noncommercial trips in order to allow more private boaters on the river without compromising the goals and objectives of the CRMP.

10 people opposed double launches; some felt that double launches could be tolerated in the secondary use season.

2 commenters opposed the reduction of the commercial limit from 150 to 134 on noncommercial double launch days.

**Response:** Double launches will help assure noncommercial access to their allocation and their impacts will be monitored and addressed in the LAC process. Should there be a determination that there are unacceptable contacts and crowding, then reduction of trips could occur for both sectors, as identified in the LAC.

**f. Noncommercial Continuing Interest and Participant Rules: 32 comments.**

17 supported the flexibility of the continuing interest requirement of "one missed deadline"; some commenters asked that the continuing interest requirement be eliminated altogether, and some wished to be able to apply for permits year round.

3 people support retention of the annual continuing interest rule as implemented prior to the revision.

12 support the change to allow people on the waiting list to participate in one other noncommercial trip, some commenting that permit holders should be allowed unlimited opportunity to participate in other private trips.

**Response:** Relaxed continuing interest rules further increases noncommercial access to the Colorado River; the flexibility of the continuing-interest and the trip participant rule were adopted in response to comments received in the 2-year review period.

g. Call-in System/Filling of Open Noncommercial Launch Dates: 18 comments.

4 people support the new system.

11 people support the old call in system.

3 people wanted clarification on the new system: how many people will the NPS contact?; what will be the time frame for this procedure?

**Response:** The call-in system continues to exist. Cancellations will be utilized to fill trips with applicants from the top of the list--then, upon failure to fill, provided to call-ins.

h. Commercial Deadhead Trips: 15 comments

14 people support the NPS position; one person noted that downstream passengers should be counted against the launch limit for a day several in advance of the day the deadhead leaves; another noted that passengers picked up below Lees Ferry should not be counted as if launched at Lees Ferry.

1 commenter felt that deadheads were good opportunities to train new guides, teach them evacuation routes, etc., without being rushed.

**Response:** Deadhead trips will be required to expedite travel and will be required to utilize campsites not suitable for large groups.

i. River Trips Conducted for Research Purposes: 37 comments.

4 people support new guidelines for research trips; one felt that trip participants should be counted in user day limits for the river.

6 comments opposed the new restrictions, said they were not discussed in any public meetings, and feel that the new rules discourage rather than promote research.

27 comments opposed individual provisions of the new restrictions.

10 comments stated that the requirement for a one year advance research proposal does not allow for event based research which requires short response, quick planning, and flexibility.

10 comments opposed the bond requirement, stating that it will unfairly eliminate independent researchers with small budgets; some wanted further definition of the "adequate bond" requirement.

3 stated that exact trip participant lists are rarely available until immediately prior to the trip.

4 felt that the 30 day journal requirement is "arbitrary", and inquired as to how it will be used.

**Response:** The trip report requirement for research trips was clarified. Published results must be submitted to the park within 30 days of the time they become available to the researcher.

The "insurance bond" requirement may be waived, at the Superintendent's discretion. Research trip proposals not submitted by the December 1 deadline may be approved on an individual basis by the Superintendent. These trips may be approved in response to unforeseen special circumstances or natural events.

The trip application with a listing of each trip member does not need to include names of individual participants, but must include the function of each person who will participate in the trip.

j. Commercial Secondary Season Use: 47 comments

4 people favor retaining old winter use allocation policies.

2 people support the new guidelines.

7 commercial operators support equal allocation of winter use, with equal access to the user day pool.

7 commercial operators support winter allocation based on historic use.

7 felt that the formula used for winter use allocation is based on years not necessarily representative of winter use, and that companies should be notified in advance that certain years will be used to determine historic use allocations.

Other comments suggested eliminating the user day pool in the winter; allowing transfer of unused summer allocation to winter; increasing winter use; and allowing "motor only" companies to run oar trips in the winter so that they would have equal access to the pool.

**Response:** The plan has been changed to the following: "This plan awards all historical users their average allocation from October 1, 1981 through April 30, 1987. If a company failed to average over 300 user days, they were allotted a base allocation of 300 user days. All 20 companies have been given an equal share of the remaining user days." This change allows more equal access to the secondary season user day allotment than in the draft plan.

**k. Noncommercial User Day Pool: 16 comments**

11 support a noncommercial user day pool.

3 oppose a noncommercial user day pool, with the comment that this will increase crowding.

2 suggest combining the commercial and noncommercial user day pools.

**Response:** The Plan includes a noncommercial user day pool, paralleling that of the commercial sector, which will help improve access.

**l. Lower Gorge Management: comments under Appendix F.**

**m. Noncommercial Deferral Policy: 26 comments.**

All comments opposed the elimination of the deferral policy, citing extenuating circumstances such as illness or legitimate scheduling problems as justification for its continued use.

**Response:** Deferrals will not be allowed unless the permittee has a confirmed medical problem that will not allow them to participate in a river trip. Exceptions may be requested in writing addressed to the Chief of Visitor and Resource Protection. Deferrals are the chief obstruction causing unwarranted delays in gaining access to the river.

#### **IV. Appendix A: Resource Monitoring Program: 44 comments**

The monitoring program was viewed by many commenters as an important part of the plan. 11 general comments on the monitoring program voiced concerns over such matters as responsibility for the program, frequency of monitoring, review of results, ambitiousness of the program, integration of Glen Canyon Environmental Studies results and actual accomplishment.

Other comments addressed refinement of proposed programs, or the addition of new programs, for topics such as: water quality, endangered species, radionuclides, geologic hazards, and fishermen and hiker trash in Marble Canyon.

**Response:** Monitoring programs are an integral part of the CRMP.

#### **V. Appendix B: Levels of Acceptable Change (LAC): 48 comments**

**General Comments:**

17 fully support the LAC's; some propose including in the body of the plan.

4 support the LAC or its concept but were concerned either about the level of public involvement used in

its development or the current scientific body of knowledge used in its development.

2 people were concerned with implementation of the program, such as funding, management or review of monitoring results.

4 people questioned the choice of some chosen baselines and limits of change.

Other comments addressed individual elements of the LAC topics and management spectrum.

Several comments were made on format and editing, including several comments as to the difficulty of reading.

**Response:** Editorial changes have been made to make format easier to read. The language has been changed to clarify the meaning in some sections. A stronger, cooperative stance has been taken in regards to Glen Canyon Dam operations.

**VI. Appendix C: Commercial Operating Requirements: 21 comments**

3 comments oppose the 50 mile/day limit as an "unnecessary restriction" that reduces the flexibility needed to eliminate overcrowding.

2 people think that guides and training trips should be included in user day counts.

Many minor comments on the details of operational requirements.

**Response:** Minor internal changes to operating requirements.

**VII. Appendix D: Noncommercial Operating Guidelines: 11+ comments**

3 people stated the park should provide a clearer definition of "noncommercial".

Many small comments were made on the details of the operating requirements.

1 person requested that winter trips longer than 21 days be allowed by special request.

**Response:** Definition of commercial clarified. Thirty day winter trips continue to be available with launches December 1 through February 29. Minor internal changes to operating requirements.

**VIII. Appendix E: Research Trip Guidelines: comments above, under "Summary of Changes to Management Policies", "i. River Trips Conducted for Research Purposes".**

**Response:** See III. i., above: "River trips conducted for research purposes".

**IX. Appendix F: Lower Gorge Interim Management Guidelines: 12 comments**

4 commenters supported the idea of a Lower Gorge Management Plan; some thought it needed more attention and supported it being given a separate planning effort.

Other comments addressed various details of the proposed interim guidelines.

**Response:** A Lower Gorge Management Plan will be prepared; scoping is scheduled to begin in late 1989 or early 1990.

**X. Appendix G: Environmental Assessment (EA): 20+ comments**

10 commenters questioned the completeness of the environmental compliance document prepared for this plan; some felt an environmental impact statement should have been considered, while other comments included a feeling that the EA could have more adequately addressed major changes in the objectives of the CRMP.

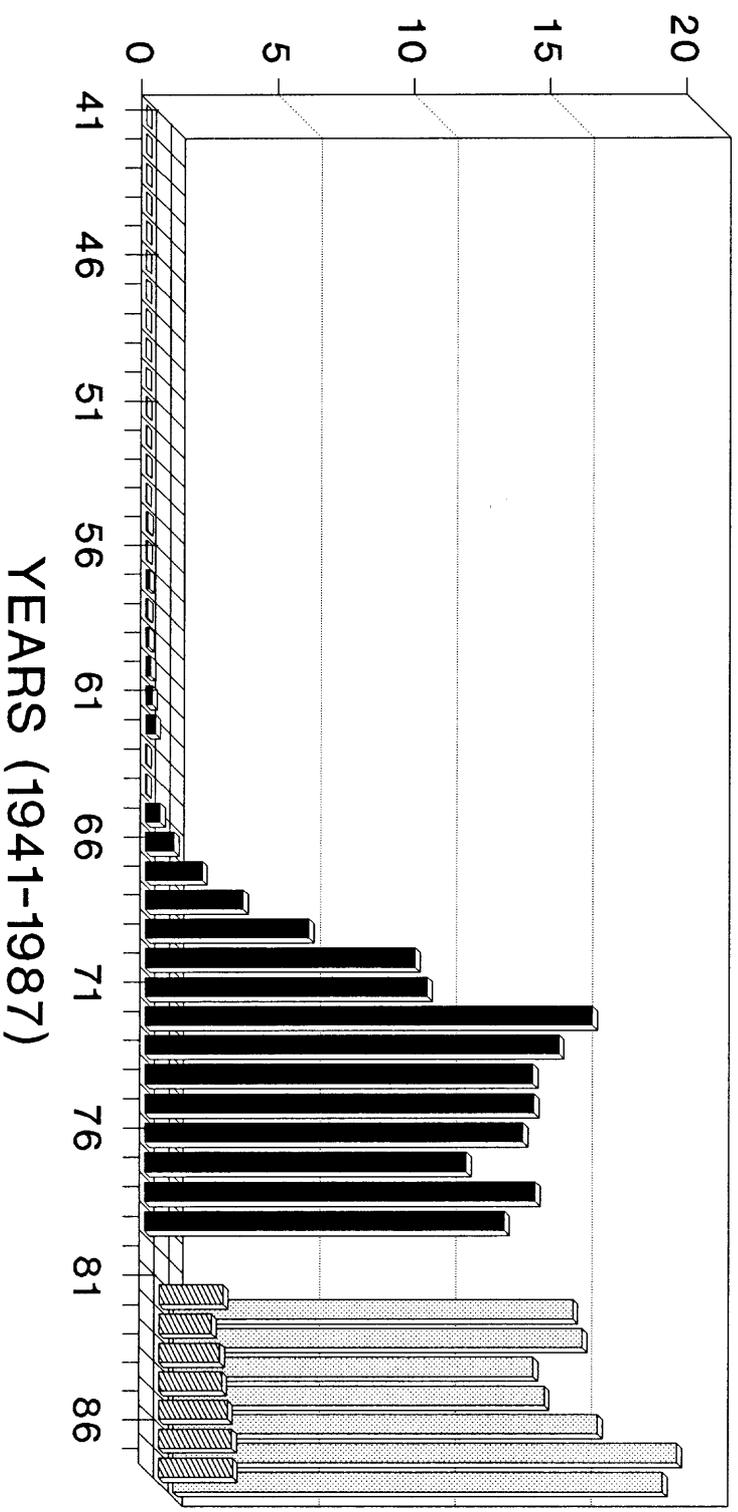
There were many small editorial comments on the EA.

Several people brought up impacts they felt should be addressed in the EA: aircraft, air pollution, loss of beach sediment, geologic hazards, and Glen Canyon Dam peaking power.

**Response:** The environmental assessment prepared for the revision of the Colorado River Management Plan tiered off the environmental impact statement prepared in 1979, which generally assessed the impacts of the same issues present in 1989. As such, the environmental assessment was used to evaluate the impacts of changes in the 1989 plan over that of the 1981 plan; though indeed impacts, many of the issues raised were believed to be the result of other management or of other legislated authority.

# TRAVEL ON THE COLORADO RIVER THROUGH THE GRAND CANYON

Number of People (Thousands)



■ People  
▨ Private  
▤ Commercial

no data for 1980

# GLEN CANYON DAM RELEASES

September 6, 1989

