PRIVATE AND COMMERCIAL TRIPS IN THE GRAND CANYON
Bo Shelby and Joyce M. Nielsen
Colorado River Research Program Final Report

Technical Report No. 4

Colorado River Research Program

REPORT SERIES
GRAND CANYON NATIONAL PARK

United States
Department of the Interior
National Park Service

COLORADO RIVER RESEARCH PROGRAM
Grand Canyon National Park
Grand Canyon, Arizona 86023

The Colorado River Research Program was initiated by the National Park Service in 1974 to secure scientific data to provide a factual basis for the development and the implementation of a plan for appropriate visitor-use of the Colorado River from Lee's Ferry to Grand Wash Cliffs and for the effective management of the natural and cultural resources within the Inner Canyons. The intensified research program consists of a series of interdisciplinary investigations that deal with the resources of the riparian and the aquatic zones and with the visitor-uses including river-running, camping, hiking, and sight-seeing of these resources, as well as the impact of use and upstream development upon canyon resources and visitor enjoyment.

Final reports that result from these studies will be reproduced in a series of Program Bulletins that will be supplemented by technical articles published as Program Contributions in scientific journals.

Merle E. Stitt, Superintendent
R. Roy Johnson, Program Director

Cover Drawing by J.G. Carswell, University of Virginia

PRIVATE AND COMMERCIAL TRIPS IN THE GRAND CANYON

Bo Shelby and Joyce M. Nielsen

Colorado River Research Program Final Report

Technical Report No. 4

Grand Canyon National Park
Colorado River Research Series
Contribution Number 33

PRIVATE AND COMMERCIAL TRIPS IN THE GRAND CANYON

RIVER CONTACT STUDY

FINAL REPORT

PART IV

Prepared by:

Bo Shelby
Joyce M. Nielsen

Human Ecology Research Services, Inc.
J. Eugene Haas, President

Submitted to:

Superintendent
Grand Canyon National Park
Grand Canyon, Arizona 86023

Contract #CX821040104

June 1976

Digitized by the Internet Archive
in 2012 with funding from
LYRASIS Members and Sloan Foundation

http://archive.org/details/privatecommercia00shel

PREFACE TO PART IV

The River Contact Study was contracted in April, 1974, to assess the sociological effects of different management alternatives on the nature and quality of the river experience in the Grand Canyon. Initially, the project was focused on the effects of motorized travel and different use levels. In the spring of 1975, concern over differences in private and commercial use prompted the Park Service to include this issue within the scope of the study.

The final report is organized into four major sections. The first is a description of the study design and implementation, including measurement techniques, sampling, and data collection. Parts II, III, and IV consider in turn the motor-oar, use levels, and private-commercial issues. The sections are bound separately to make them more easily available to those with specific interests.

ABSTRACT

The history of the private-commercial controversy is discussed and arguments on each side are summarized. Private and commercial users differ on a number of background variables, and trips differ on structural characteristics. The attitudes and perceptions of private users are different from those of commercial users as a whole, but are similar to those of commercial oar passengers. Implications for management are discussed.

ACKNOWLEDGEMENTS

Our ability to conduct the River Contact Study was based primarily on the cooperation of the people who run the Colorado River. Outfitters accommodated the project by allowing observers to accompany trips, boatmen were helpful on a day-to-day basis on the river, and passengers filled out questionnaires with only minor grumbling. Special thanks are due to Bob and Jessica Elliott of ARTA Southwest, who made possible the motor-oar combination trips. Private river runners were especially gracious in allowing observers to become a part of their trips.

Our observers turned in reliable trip reports under sometimes trying circumstances. Mary Strand, Mike Delaney, Susan Shoulders, and Randy Fout did the bulk of the data collecting, while Bill Fowkes, Dan Spray, David Schoen, Dick Skeene, Barb Farhar, David Lillie, Bev Shafer, Peter Marshall, Sig Krane, and Kim Rea rounded out the trip schedule, sometimes on short notice.

The staff of Grand Canyon National Park made many contributions to the project. Bob Yearout and his people in the Inner Canyon Office provided invaluable information from their files. Roy Johnson's commitment to the integrity of the project was crucial at several points, and he proved to be a resourceful research strategist as well as an able liason with the Park Service.

The members of our research advisory board, Drs. William Catton, John Krutilla, George Stankey, and Karl Taeuber, provided professional advice, suggestions, and criticism. Tom Heberlein at the University of Wisconsin contributed his expertise and enthusiasm on an informal basis. Thanks also go to Jeff Ingram, who provided assistance on historical aspects of the motor-oar controversy.

First rate support was provided by Charlotte Purvis and Susan Leavy, who without extensive complaining turned semi-legible scrawl into finished manuscripts. They created a competent and congenial office atmosphere on which the project relied heavily. Barbara Douglas provided editorial assistance, and we made extensive use of her ability to insure that written material actually conveyed what we meant to say.

Finally, some sociological issues seem to be of interest to almost everyone. When it was discovered that we were doing research in the Canyon, many people had ideas and opinions which they shared with us. Some of these thoughts were clever and insightful and others weren't, but they were fun to talk about and the project benefitted from our exposure to all of them.

TABLE OF CONTENTS

Preface to Part IV..... i

Abstract..... ii

Acknowledgements..... iii

List of Tables and Appendices..... vii

Findings, Conclusions, and Recommendations..... 1

Introduction..... 3

Background..... 5
The Nature of the Controversy..... 8
Summary of Arguments..... 9
Further Implications..... 11

Private and Commercial Trips in the Canyon..... 13
Background Characteristics of Private and Commercial Users..... 13
Demographic Characteristics..... 15
Outdoor Experience and Attitudes..... 15
Structural Differences Between Private and Commercial Trips..... 16
Differences in the River Experience..... 18
Perceptions Related to Travel Mode (Oar or Motor)..... 18
Opinions About Motors..... 18
Contacts With Other Parties..... 21
Perceptions of Use..... 21
Similarity of the Private and Commercial Oar Groups..... 21
Other Private-Commercial Differences..... 21

Implications for Management..... 25
Private-Commercial Differences..... 25
Background Characteristics..... 25
Structural Trip Characteristics..... 25
Attitudes and Perceptions..... 26

Resource Preservation 26

Demand Figures..... 27
The River Running Public..... 28

Footnotes..... 29

References..... 31

LIST OF TABLES AND APPENDICES

Table 1:	Private Permits Requested and Issued.....	6
Table 2:	Background Characteristics of Private and Commercial River Runners.....	14
Table 3:	Comparison of Characteristics of Private and Commercial Trips.....	17
Table 4:	Comparison of Characteristics of Private and Commercial Trips (With Separate Means for Commercial Motor and Oar Trips).....	19
Table 5:	Perceptions Related to Travel Mode.....	20
Table 6:	Other Private-Commercial Differences.....	22
Appendix 1:	Tables Not Presented in Text.....	A-I
Table A1:	Age Distributions For Private and Commercial Users	1
Table A2:	Sex Composition of Private and Commercial User Groups.....	2
Table A3:	Income Distribution For Private and Commercial Users.....	3
Table A4:	Present Residence of Private and Commercial Users.	4
Table A5:	Outdoor Club Membership of Private and Commercial Users.....	5
Table A6:	Time of First Wilderness Experience -- Private and Commercial Users.....	5
Table A7:	River Running Experience of Private and Commercial Users.....	6
Table A8:	Previous Trips Through Grand Canyon of Private and Commercial Users.....	6

Table A9: Participation In Outdoor Activities of Private and Commercial Users..... 7

Table A10: Attitudes Toward Motor Noise..... 8

Table A11: Opinions Regarding Motors and Wilderness..... 8

Table A12: Preference For Running the River..... 9

Table A13: Preference For Meeting Other Trips..... 9

Table A14: Preferred Number of Encounters (On River)..... 10

Table A15: Perceived Crowding In the Canyon..... 11

Table A16: Perceived Impact of Use On the Canyon..... 12

Table A17: Attitude Toward Conveniences..... 13

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Finding: The private-commercial issue developed as a result of a marked increase in private demand with no increase in use allotment. Controversy centers around the 92% commercial, 8% private division of use. Attempts to resolve the allocation question through judicial and legislative means are in progress. Arguments for both sides are summarized. pp. 6-12

Finding: Private and commercial users differ on a number of background variables. The largest differences exist on outdoor experience variables, particularly experience running other rivers. pp. 13-16

Finding: Private and commercial trips differ on a number of structural characteristics (length, size, etc.). Commercial oar trips differ from commercial motor trips in the same ways that private trips do, but to a lesser degree. pp. 16-18

Finding: Private users differ from the commercial group as a whole in their attitudes and perceptions. However, they share many ideological positions with the commercial oar group. pp. 18-23

Conclusion: Altering the proportion of private and commercial use would affect the demographic composition of the river running population. p. 25

Conclusion: An increase in the proportion of private trips would have an effect similar to that of increasing the proportion of oar trips. p. 25

Conclusion: Private users may not have the same opportunity as commercial boatmen to develop the equipment and camp practices most appropriate for the Grand Canyon. P. 26

Recommendation: The Park Service should make an attempt to develop informational literature helpful to private users in minimizing their impact on the Canyon environment. An orientation talk or slide program at Lee's Ferry might be effective for dealing with specific problems (e.g., waste disposal). The approach should be informational rather than authoritarian. p. 26

Recommendation: In discussions of "demand" figures, comparable units need to be used. p. 27

Recommendation: If an accurate determination of private and commercial demand is desired, an individual permit system should be explored. p. 27

Recommendation: Three segments of the Grand Canyon user "public" need to be distinguished: 1) commercial outfitters, 2) commercial passengers, and 3) private river runners. Public involvement data on the private-commercial issue should be separated according to these three groups. p. 28

INTRODUCTION

There has been a dramatic increase in the running of white-water rivers in the past ten years. In order to preserve the quality of the river experience, many resource managers have instituted limits on use. These limits have produced controversy over the proportions of total use allocated to different user groups.

Much of this controversy has centered around use allocations to the "commercial" and "private" sectors.[1] Commercial trips are offered by outfitters who are in the business of running rivers. Passengers essentially buy a space on a trip, and the outfitter makes all the arrangements. A part of trip revenue is profit for the outfitter.

Private trips, by contrast, are organized by individuals whose interest in river running is primarily recreational. The idea is that participants share in running the trip. Private permits are granted on the assumption that the trip members are dividing costs, with no one realizing financial gain from the venture. River managers have made a substantial effort to clarify the definition of private trips and their distinction from commercial operations (see, for example, the guidelines drawn up by the Interagency Whitewater Committee, 1976).

BACKGROUND*

The specific issues explored here arose in relation to the Grand Canyon section of the Colorado River. The river flows through the Canyon for 280 miles from Lee's Ferry to the Grand Wash Cliffs and provides an incomparable outdoor whitewater experience. River trips through the Canyon begin at Lee's Ferry, Arizona. The first point at which passengers can debark is Phantom Ranch, 88 miles downstream, but most go on to either Diamond Creek (mile 225, the first point where boats can be taken out) or Pierce's Ferry (mile 280). Motorized trips float the river on large (30-40 foot) pontoon rafts, and take between five and eleven days to traverse the Canyon. Oar powered craft are generally smaller (15-25 feet) and take a longer time (12-22 days or more) to make the trip.

Complete commercial trips (from Lee's Ferry to at least Lava Falls) range in length from five to twenty-two days; costs range from $350 to $750 (1975 prices). It is difficult to compare prices among outfitters, since some include such things as shuttle transportation or motel accommodations while others do not. Partial trips (using Phantom Ranch as an interchange) are also available.

Private trip lengths range from twelve to twenty-two days or longer, and costs generally range from $100 to $350. As with commercial trips, it is difficult to compare cost figures since they often include different aspects of the trip (e.g., transportation). Trips also vary in the degree of luxury (e.g., food) which they provide.

At night, trips camp on natural beaches along the river. During the day, they travel on the river and make stops at "visitor attraction sites." These are places of scientific, historical, or aesthetic interest. They include side canyons, tributary streams, waterfalls, swimming holes, etc. The number and length of these stops varies from one trip to another.

---

*This section begins with a brief description of Grand Canyon river trips, which is repeated at the beginning of Parts II, III, and IV. It then discusses the development of the private-commercial controversy. Those not interested in this history should skip to the next section, "Private and Commercial Trips in the Canyon."

TABLE 1

PRIVATE PERMITS REQUESTED AND ISSUED[1]

Year	Number of Qualified Applications	Number of Permits Issued
1972	44	44
1973	71	46
1974	85	37
1975	165	39
1976	380[2]	34

[1]Source: Exhibit A, response to interogatories, suit against Park Service by Wilderness Public Rights Fund.

[2]An additional 49 requests were received which were rejected by the Park Service as duplicate applications.

Although first run in 1869 by the Powell Expedition, the Grand Canyon had seen less than 100 river runners by 1950, and by 1959 there were still less than 100 people making the trip each year. During the sixties and early seventies, however, use grew at an average rate of 59% a year. In 1965, only 547 people ran the river; by 1972, the number had grown to 16,428 (see Nash, 1973: 271 for further documentation).

The private-commercial controversy arose within the context of this rapid increase in use. In 1967, private and commercial use figures were recorded separately for the first time. Between 1967 and 1972, commercial use increased from 1,998 to 15,884 persons; private use increased from 101 to 548.

The effects of these use levels on either the Canyon itself or the river experience were unknown. But with the rapid increase in use and reports of deteriorating conditions, the Park Service decided to limit use until an appropriate level could be determined on the basis of research. The history of this decision-making process is discussed more thoroughly in Part II of this report, "Motors and Oars in the Grand Canyon."

A research program was initiated, and 1973 use for both the private and commercial sectors was limited to actual use in 1972. This amounted to 7,600 user-days for private trips, and 89,000 passenger-days for commercial trips. These limits were later extended through 1976, the year that research results were to be available.

The demand for private trips increased greatly in the next several years (see Table 1). Private runners had applied for permits for 47 trips in 1972, and all had been granted. With the number of permits granted remaining fairly constant (37-46), qualified applications increased to 71, 85, and 165 in 1973, 1974, and 1975, respectively. In 1976, requests were made for 380 permits, and only 34 were granted. Requests for an additional 49 permits were rejected by the Park Service as duplicate applications. With an average trip size of 15, this means that "legitimate" requests by about 5,190 private users were turned down. With an average trip length of 17.3 days, this amounts to approximately 89,787 user-days.

In the fall of 1973, it had become evident to Park personnel that the number of private permit applications for 1974 would greatly exceed the number allowed by the use limit. A "no-repeat" rule was developed which would give preference to applicants who had not made the trip the previous year. The inequality of imposing this rule only on private users was acknowledged by the Park Service, but it

was not applied to the commercial sector since it would have been "hard to monitor and, therefore, impractical."[2] Concessioners were encouraged to voluntarily apply the rule to their customers.

The no repeat rule was enforced on private river runners for the 1974 and 1975 seasons. However, this unequal enforcement was very unpopular and pressure from private users prompted an attempt by the Park Service to apply the rule to commercial operations in 1976. When the difficulty of this task (in terms of funds and personnel) became obvious, the no-repeat rule was dropped altogether.[3]

THE NATURE OF THE CONTROVERSY

The private and commercial use allotments have become increasingly controversial as demand for private trips has increased. The controversy has been quite complex and is continuing at the time of this writing. An attempt will be made to summarize the major issues. It should be understood that some aspects of the controversy may be unknown to us and, therefore, are not discussed here.

The concern of private users has been focused on the split of user-days (92% commercial, 8% private). They point out that commercial space can be had by those willing to pay commercial rates, while private permits are unavailable to many applicants. The need for regulation of total use is not contested; rather, controversy centers around the division of the "user-pie."[4]

The "Private Permit Action Committee," formed in 1974 through the Western River Guides' Association, addressed this issue. It was made up of private users, outfitters, and a Park Service manager. The committee's recommendation was that private and commercial use should be allocated according to "bonafide" demand. The problem of determining demand was left unresolved.[5]

Guidelines drawn up by the Interagency Whitewater Committee are a similar attempt to deal with the allocation issue. They point out that the proportion of private use varies considerably from one river to another, and that a "reasonable percentage" should be established to "protect the privilege for non-commercial trips."[6]

Two attempts to resolve the apportionment problem are currently under way. One began with a formal petition to the Park Service by the "Wilderness Public Rights Fund."[7] The petition quoted the "'Organic Park Service Act of 1916,' which states that 'no natural curiosities, wonders, or objects of interest shall be leased, rented, or granted to anyone on such terms as to interfere with free access

to them by the public.'" Also quoted was "a Congressional Act [of] 1965 [16 U.S.C. § 20], codifying policies for concession developments in the parks . . ., [which states] . . . that 'such developments shall be limited to those that are necessary and appropriate for public use and enjoyment.'"

The petition's primary contention, then, was that the granting of concession permits to commercial outfitters, to the exclusion of qualified private permit applications, is in violation of the enabling legislation for national parks. It further argues that priority should be given to "'non-commercial applicants' whenever applications . . . exceed the 'available supply of user-days. . . .' Commercial outfitters . . . should have to prove that their services are essential to the enjoyment of National Park System values . . .'"[8] The petition was denied.[9] The Wilderness Public Rights Fund then filed suit against the Department of the Interior, the Park Service, and Grand Canyon National Park on January 27, 1976. The suit makes essentially the same arguments made in the petition. Litigation is proceeding in federal district court (San Francisco) at the time of this writing.

A second attempt has been made to resolve the allocation issue through legislation. House Concurrent Resolution 331 [10] cites the same legislative mandates quoted in the WPRF petition. If enacted, it would instruct the Secretary of the Interior to "initiate a comprehensive revision of regulations governing the allocation of use between commercial and qualified non-commercial users . . . to insure a fair and equitable allocation of use . . .," both in the Grand Canyon and on other rivers administered by the Department of the Interior. Until equitable regulations can be written, allocations "should provide for the maximum use . . . by the qualified non-commercial users, . . . and for the remaining use by the commercial users." The resolution is currently in committee.

Summary of Arguments

The numerous arguments which have developed on both sides of the allocation issue can be briefly summarized as follows. In favor of commercial trips, four major points are made. First, it is asserted that commercial trips provide a service to the public, since "few people possess the equipment or skills necessary to raft these rivers on their own or have the necessary connections to participate in a trip sponsored by a nonprofit group."[11] Accordingly, outfitters are seen to "have provided the only river experience possible for the vast majority of Americans who travel on and use the [Colorado] river, but who cannot afford the luxury of their own trips."[12]

Second, it has been pointed out that outfitters in 1972 faced the same artifical "blockage of the growth curve" encountered by private boaters in later years.[13] The restriction of growth in the private sector is thus not discriminatory.

Third, the Park Service apparently feels some "degree of obligation to its float trip concessioners,"[14] "some of whom have spent many years in building a business."[15] It is unclear whether this means honoring concession contracts until they expire or renewing them afterwards.

Finally, it has been asserted by some that outfitters "have initiated programs for resource preservation . . . [and] . . . maintenance, sanitation, and [the] upgrading and improvement of facilities and equipment which have greatly contributed to increasing the capacity of the river resource and to the quality of river trips. . . . The private carrier who is not in the business of anticipating and meeting public needs on a regular basis does not have the incentive to make similar efforts."[16]

Arguments in favor of private trips first point to the dramatic increase in private demand since 1972, with no increase in allocation.[17] By contrast, commercial outfitters as a group had 2,806 unused passenger-days in 1973; 4,805 in 1974; and 5,239 in 1975.[18] With an average commercial trip length of 8.6 days, this means that an additional 609 persons could make the trip. Presumably, then, privates should be allocated more use. It should be pointed out that these "demand" figures are not directly comparable, since the Park Service has records of all private applications but not of all requests for commercial trips. In addition, the majority of the 21 outfitters come fairly close to using their entire allotment; three outfitters accounted for 4,378 of the unused passenger-days in 1975.

Second, the higher cost (which is "at least twice as great"[19]) of commercial trips is seen as discriminatory against the private "do-it-yourself guy."[20] The contention is that with greater numbers of people able to run on their own, outfitters may not be necessary to provide public access to rivers. Qualified groups should be allowed to run without having to pay for an outfitter's profit. This argument generally cites the legislative mandates quoted in the WPRF petition and suit and H.C.R. 331.

Third, other legal mandates are cited in an attempt to demonstrate two related points.[21] The first is that "public user's recreational interest in public lands is in no degree subordinate to commercial or exploitive interest." Managing some resources for wilderness or aesthetic values, then, is a legitimate aim, and

may be called for by certain legislation. The second point is that federally managed lands are seen as being held in trust for the "indefinite public." The "state as trustee for the public cannot by acquiescence abandon the trust property or enable a diversion of it to private ends different from the object for which the trust was created."[22] It appears that the point of these arguments is to identify the "indefinite public" with private allocations and "commercial or exploitive" interests with commercial use. It can then be argued that allowing commercial use of wilderness resources to the exclusion of any private use constitutes a breach of public trust.

Finally, some proponents of private use contend that "commercial advertising and outfitting of trips encourages use by persons who otherwise would not run rivers -- an artifical incentive to overuse."[23] People who "buy their spot on the river" are seen to do so "at the expense of others who perhaps have developed river skills throughout their life (sic)." In this view, the "most immediate and natural limit on access and use could be achieved by making self-responsibility and recreational motive (rather than profit) key priorities." It is helpful in understanding this argument to distinguish the profit motives of commercial outfitters from the recreational motives of their passengers.

Both the commercial and private interests, then, claim to represent "the public." It may be most useful to think in terms of three different segments of the public. Commercial outfitters from one segment, and represent their own profit interest (although there may be considerable variation in the "profit motiviation" of individual outfitters). Commercial passengers and private users form two additional segments; they share a recreational interest in running rivers. Commercial passengers presumably want to be "outfitted," while private boaters want to run their own trips. It is often assumed (by outfitters and the Park Service) that commercial outfitters represent the commercial passenger group. This might result in some confusion of outfitters' profit motives with passengers' recreational motives.

Further Implications

The political nature of the allocation question is demonstrated by the number of letters to and from legislators and government officials (see footnotes). But the issue has implications for people other than river runners. A letter from the Economic Development, Business, and Labor Committee of the Utah state legislature contends that the resolution of the controversy may "vitally

affect the future of tourism in this State and in surrounding states."[24] The letter goes on the state that "policies initiated [in the Grand Canyon] have invariably become precedents for management policies adopted in national parks located in Utah -- particularly those with whitewater boating resources." (The Park Service at Grand Canyon cautions that people should not "overestimate the weight Grand Canyon's private permit situation carries with other areas."[25]) An open letter from the Wilderness Public Rights Fund to dealers of boating equipment points out additional economic implications. "A few moments with your desk calculator will tell a dramatic story of the equipment purchasing potential [of private boaters] if, for example, these use allocation figures were equalized or reversed as between commercial and non-commercial parties."[26]

PRIVATE AND COMMERCIAL TRIPS IN THE CANYON

The overall aim of this study is to find out how different management alternatives affect the river experience. The general model by which this phenomenon is understood contains four elements:

management alternatives	→	character of the experience	→	perceived differences in character of experience	→	evaluation of the experience

With respect to the private-commercial issue, the general model can be further specified:

		background characteristics of river groups	↘			
private or commercial trips	↗			perceptions of the experience	→	private or commercial preference
	↘	length, size, etc. of trips	↗			

There are four major research questions suggested by this discussion. First, how do private and commercial river runners differ in terms of background characteristics? Second, what are the structural differences (in terms of length, size, etc.) between private and commercial trips? Third, do the two groups perceive the river experience differently? Finally, with which kind of trip would people rather run the river?

BACKGROUND CHARACTERISTICS OF PRIVATE AND COMMERCIAL USERS

A number of background variables are listed in Table 2. The first column gives the correlation of each variable with trip type (commercial or private). The second gives the correlation of each variable with propulsion (oar or motor). Since most private trips are oar powered and propulsion is significantly correlated with some background variables, all relationships were re-calculated controlling for propulsion type. These partial correlations are found in the third column. For variables with significant private-commercial differences, percentage distributions are given in Tables A1-A9 (in Appendix 1).

TABLE 2

BACKGROUND CHARACTERISTICS OF PRIVATE AND COMMERCIAL RIVER RUNNERS

Variable	correlation with trip type (commercial) private)[1]	correlation with propulsion (oar-motor)[2]	correlation with trip type controlling for propulsion
Demographic Characteristics			
Age	-.12*	.01	-.12*
Sex[3]	-.16*	.07	-.13*
Education	.00	-.10	-.07
Occupational Status	-.05	-.07	-.10
Income	-.17*	.13*	-.09
Marital Status	-.08	.05	-.05
Number of Children	-.04	.07	.02
Present Residence (rural-urban)	-.23*	.11*	-.17*
Past Residence	-.09	.03	-.07
Outdoor Experience and Attitudes			
Membership in Outdoor Club or Org.[4]	.26*	-.25*	.10
Time of first wilderness experience	.22*	-.13*	.15*
Experience on other Rivers	.57*	-.25*	.48*
Experience in Grand Canyon	.23*	-.11*	.17*
Participation in Outdoor Activities	.34*	-.21*	.22*
Artifactualism	-.08	.15*	.03

[1]coded 1 = commercial, 2 = private

[2]coded 1 = oar, 2 = motor

[3]coded 1 = male, 2 = female

[4]coded 1 = no, 2 = yes

* $p < .001$

Demographic Characteristics

The upper half of Table 2 gives information on demographic variables. It can be seen from the correlations in column one that significant private-commercial differences exist on several of these. People on private trips tend to be younger (r = -.12). The age distributions in Table A1 show that the private group has a greater proportion of persons aged 10-40, while the commercial group has a greater proportion in the 40-80 range. Private users are also more predominately male (r = -.16). As Table A2 shows, 77% of private users are male, while 52% of commercial travelers are men. People in the private group tend to have lower incomes (r = -.17). The income distributions in Table A3 show that a greater proportion of private users are in the 0 - $8,000 income bracket, while a higher proportion of commercial travelers make over $48,000. Finally, people on private trips are less likely to live in urban areas (r = -.23). As Table A4 shows, a greater proportion of private users live in rural areas and small towns, while commercial users tend to come from suburban areas and large cities.

Column three in Table 2 shows that the correlations of trip type (private-commercial) with age, sex, and present residence obtain despite statistical control for propulsion. The correlation with income is no longer significant after the control variable is introduced. Slightly lower average income is a characteristic which the private group shares with commercial oar travelers.

Outdoor Experience and Attitudes

The lower half of Table 2 lists variables relating to outdoor experience and attitudes. It can be seen from correlations in column one that people on private trips are more likely to belong to outdoor organizations (r = .26) and report that it has been a longer time since they had their first wilderness-type experience (r = .22; distributions are presented in Tables A5 and A6). As a group, privates have had more experience running other rivers (r = .57) and have been down the Grand Canyon a greater number of times (r = .23). Tables A8 and A9 give further information about these last two differences. Seventy percent of private users are running the Canyon for the first time, compared to 91% of commercial passengers. Over two-thirds (72%) of the private group have been on four or more other rivers, while about the same proportion (66%) of commercial users have been on no other river trips. Private users also report greater participation in other outdoor activities (hiking, backpacking, etc., r = .34). They are not significantly different from commercial users in their attitudes towards developments in wild areas (r = -.08).

The above relationships, controlling for propulsion, are shown in column three of Table 2. The correlation with club membership is no longer significant, indicating that this is a characteristic which privates share with commercial oar passengers. The correlations with time of first wilderness experience, experience on other rivers, experience in the Grand Canyon, and outdoor activities still obtain, although they are smaller.

In sum, private river runners as a group tend to be a bit younger and more predominately male. They report slightly lower incomes and are less likely to live in cities. Private users are more likely to belong to outdoor clubs, and they report having had their first wilderness experience earlier. They have had more experience running other rivers, and are more likely to have been down the Grand Canyon before. They also participate more frequently in other outdoor activites, such as camping and backpacking. The largest differences between the private and commercial groups exist on the outdoor experience variables, particularly experience running other rivers.

STRUCTURAL DIFFERENCES BETWEEN PRIVATE AND COMMERCIAL TRIPS

Structural characteristics of private and commercial trips are shown in Table 3. The group structure of private trips is different from that of commercial trips. The average commercial party size is about 29 people, while private groups average 17 people. Commercial trips are generally run on larger boats, so average number of boats is 2.5, while private groups have an average of 9.4 boats. With smaller groups and more boats, private groups have less people on each boat (an average of 2 as compared to about 13 for commercial groups).

Private groups also tend to spend a longer time in the Canyon. Trip length for private trips averages about 17 days, while commercial trips average 9 days. Private parties also stop at more attraction sites, averaging about 21 stops per trip as compared to 13 for commercial groups. The amount of time spent at each site is not significantly different for the two groups.

River contact variables (contacts per day, people per day, etc.) are also presented in Table 3. There are no significant differences between private and commercial trips on these variables. There is also no significant difference in the average number of adjustments for crowding made each day.

TABLE 3

COMPARISON OF CHARACTERISTICS
OF PRIVATE AND COMMERCIAL TRIPS

Variable	Mean (average) value commercial	private	t value
Group structure			
number in party	28.8	17.3[1]	2.3*
number of boats	2.5	9.4	5.5**
number of people per boat	13.3	2.0	14.1**
Time spent in the Canyon			
length of trip (days)	8.6	17.3	6.2**
total number of attraction sites visited	12.9	21.3	4.1**
average length of stops at sites (hours)	2.2	3.9	1.6 NS
Contacts with other trips			
number of river contacts per day	3.5	2.8	.9 NS
number of people seen per day (on river)	74	61	.7 NS
number of boats seen per day (on river)	8.9	6.3	1.4 NS
minutes (per day) in sight of other parties	38.7	41.1	.2 NS
Number of adjustments per day for crowding	.40	.26	.7 NS

*$p < .05$

**$p < .01$

[1]This figure is inflated, since one private trip was composed of two groups which traveled as one (of 35 persons). Average private trip size is nearer to 15, and might, according to Park Service recrods, be as low as 12.

These same variables are listed in Table 4, with separate mean values for commercial motor and oar trips. It can be seen that commercial oar trips are more similar to private trips than are commercial motor trips (which makes sense, since most private trips are oar-powered). Commercial oar trips have smaller party sizes, more boats, and fewer people per boat than commercial motor trips. They also spend more time in the Canyon and stop at more attraction sites. Private trips differ from commercial motor trips in these same ways, but more so.

To summarize, private trips have less people, more boats, and less people per boat than the average commercial trip. They spend a longer time in the Canyon, and visit a greater number of attraction sites. Commercial oar trips differ from commercial motor trips in these same ways, but to a lesser degree.

DIFFERENCES IN THE RIVER EXPERIENCE

Perceptions Related to Travel Mode (Oar or Motor)

The structural differences discussed above were found to be related to the opinions, preferences, and perceptions of commercial motor and oar passengers (see Part II, "Motors and Oars in the Grand Canyon," pp. 29-34, for further information). Similar differences exist between the private and commercial groups. These variables are listed in Table 5. Column one gives correlations with trip type (commercial or private), while column two gives correlations with propulsion (oar or motor). Partial correlations with trip type, controlling for propulsion, are given in column three. Percentage distributions are shown in Tables A10 - A16 (in Appendix 1).

Opinions about motors. Respondents were asked whether they were bothered by outboard motor noise. Private river runners were more likely to say "yes" ($r = .42$, see Table 5). Along the same line, they were more likely to agree that "The Canyon would be more of a wilderness if motor travel were banned" ($r = .37$). Private users also preferred to run the river with an oar trip rather than a motor trip ($r = .45$).

TABLE 4

COMPARISON OF CHARACTERISTICS OF
PRIVATE AND COMMERCIAL TRIPS

(With Separate Means for Commercial Motor and Oar Trips)

Variable	Mean (average) values Commercial		Private
	motor	oar	(oar)
Group Structure			
Number in party	29.8	24.1	17.3[1]
Number in boats	2.0	5.1	9.4
Number of people per boat	15.2	4.8	2.0
Time spent in the Canyon			
Length of trip (days)	7.3	14.4	17.3
Total number of attraction sites visited	12.1	17.0	21.3
Average length of stops at sites (hours)	1.3	6.0	3.9
Contacts with other Trips			
Number of river contacts per day	3.8	2.2	2.8
Number of people seen per day (on river)	80.9	44.3	61
Number of boats seen per day (on river)	9.7	5.4	6.3
Minutes (per day) in sight of other parties	41.0	28.3	41.1
Number of adjustments per day for crowding	.43	.23	.26

[1]This figure is inflated, since one private trip was composed of two groups which traveled as one (of 35 persons). Average private trip size is nearer to 15, and might, according to Park Service records, be as low as 12.

TABLE 5

PERCEPTIONS RELATED TO TRAVEL MODE

Variable	correlation trip type (commercial-private)[1]	correlation with propulsion (oar-motor)[2]	correlation with trip type controlling for propulsion
Opinions about			
motor noise	.42*	-.61*	.04
Canyon more wilderness if motor travel banned	.37*	-.44*	.10
prefer to run river with oar trip	.45*	.63*	.05
Contact with other parties			
prefer to meet oar trips	.39*	-.53	.04
preferred number of contacts	-.18*	.21*	-.04
Perceptions of use			
Canyon perceived as crowded	.22*	-.23*	.07
Canyon perceived as affected by use	.30*	-.35*	.08

[1] coded 1=commercial, 2=private

[2] coded 1 = oar, 2=motor

* $p<.001$

Contacts with other parties. Private runners differed from commercials in their preferences for meeting other parties. They were more likely to prefer encounters with oar (rather than motor) trips (r = .39). They also preferred fewer river contacts each day (r = -.18).

Perceptions of use. We have found that, on the average, a person on a private trip will have fewer people in his party and on his boat, and that he will be in the Canyon a longer time. He will find the presence of both motors and other people more bothersome. Are these structural factors and specific perceptions important for users' more general perceptions of the Canyon? To the extent that these things affect their Grand Canyon experience, those on private trips should perceive the Canyon as more crowded and more affected by the presence of man, since in their experience people are less a "part of the scene."

This appears to be the case. Private river runners were more likely to say they had met too many people during their trip (r = .22). They also perceived the Canyon as more affected by the presence of man (r = .30). Percentage distributions for these variables are presented in Tables A15 and A16.

Similarity of the private and commercial oar groups. Private users differ from the commercial population in the ways described above. However, the majority of the commercial groups are motor travelers. The third column in Table 5 shows the correlations of the above variables with trip type controlling for propulsion. All partials are non-significant. This information, combined with the propulsion correlations in column two, indicates that these opinions, preferences, and perceptions are shared by the private and commercial oar groups.

Other Private-Commercial Differences

Several other private-commercial differences deserve brief mention. Correlations for these variables are presented in Table 6. Private users were found to prefer fewer contacts, but they were also more willing to "pay a price" for this preference. They reported a greater willingness to run the river in the off season (April or October) in order to achieve their preferred contact level (r = .23), and were more willing to hike further at attraction sites in order to avoid contact with other parties (r = .22).

TABLE 6

OTHER PRIVATE-COMMERCIAL DIFFERENCES

Variable	correlation trip type (commercial-private)[1]	correlation with propulsion (oar-motor)[2]	correlation with trip type controlling for propulsion
Willingness to "pay" for encounter preference			
take trip in off-season	.23*	-.16*	.14*
hike further at sites	.22*	-.21*	.08
Would prefer more conveniences	-.20*	.13*	-.12*
Knowledge of the Canyon			
Names of places and features	.41*	-.36*	.22*
Carried guide book	.17*	-.03	.17*
Number of books and articles read	.14*	-.09	.09

[1] coded 1=commercial, 2=private

[2] coded 1=oar, 2=motor

* $P<.001$

River travelers were asked whether they would have preferred to have better camping facilities and more of the "conveniences of home." Only a small minority (about 10%) indicated that such facilities would have improved their trip, but private users were less likely to do so ($r = -.20$; percentages are given in Table A17).

Finally, people were asked to list the names of the rapids, attraction sites, and geologic features that they remembered. Private users listed a significantly larger number of these ($r = .41$), indicating greater knowledge of the Canyon. They were also slightly more likely to report carrying and consulting a guide book ($r = .17$), and they had read more books or articles about the Canyon ($r = .14$).

IMPLICATIONS FOR MANAGEMENT

PRIVATE-COMMERCIAL DIFFERENCES

Data presented here indicate that there are a number of differences between private and commercial users and their respective modes of running the river. These differences can be classified into three categories: background characteristics, structural trip characteristics, and attitudes and perceptions regarding the river experience. The implications of these differences are discussed below.

Background Characteristics

The private and commercial groups differ on demographic characteristics, so alterations in the percentage of use alloted to each group would affect the demographic composition of the river running population. If, for example, the percentage of private use were increased, one would expect that more people who are young, male, of slightly lower income, and from less urbanized areas would be running the river. If total use remained constant, an increase in private use would, of course, mean a decrease in commercial use, and consequently a decrease in the number of persons with "commercial" characteristics (e.g., older persons, women, etc.). The magnitude of these shifts would probably not be large, since correlations of trip type with demographic variables are fairly low. For example, a change to 50% private, 50% commercial would be expected to change the average age of river runners from 32.4 to 30.3. Private users also have more outdoor and river running experience, so an increase in private use would probably cause an increase in the number of river runners with such experience.

Structural Trip Characteristics

Structural characteristics of private trips differ from commercial trips in general. An increase in private use would mean an increase in small trips, with each one having more small boats. These trips could be expected to spend a longer time in the Canyon and visit a greater number of attraction sites. The implications of these differences are essentially the same as the implications of an increase in oar travel, since private trips are similar to commercial oar trips. These are discussed in the "Imlications for Management" section of Part II, "Motors and Oars in the Grand Canyon."

Attitudes and Perceptions

The attitudes and perceptions of the private group are different from those of the commercial group as a whole. In general, however, private users' ideological positions are shared by the commercial oar group. The greatest differences exist between these two groups taken together and commercial motor passengers. In terms of ideological views, then, it makes more sense to think in terms of "motor-oar" than "private-commercial."

RESOURCE PRESERVATION

It is contended by some that private users are less successful in their efforts at resource preservation and maintenance (see, for example, footnote 16). While no data that we know of exist to prove this point, it is true that private users are not (by definition) in the business of running rivers. As a result, they may not have the same opportunity as commercial boatmen to develop the equipment and camp practices most appropriate for the Grand Canyon.

There is, however, no reason to believe that private users are not committed to preserving the quality of the Grand Canyon experience. This means that an opportunity exists to help them learn about unique aspects of the Grand Canyon environment and specialized techniques for minimizing impacts. The Park Service has made a substantial effort to convey such information to commercial boatmen, and requires an orientation talk in which boatmen have an opportunity to educate passengers. In the same spirit, it might make sense to provide private users with references to the books available on river running practices and with additional material on specific problems in the Grand Canyon. An orientation talk or slide program at Lee's Ferry might assure that information on specific problems (e.g., waste disposal) reached all private runners.

The idea here is not to subject river runners to one more requirement. Rather, the aim would be to give people who don't run the river often an opportunity to learn about the Canyon's unique character and the ways of minimizing human impact upon it. Most of the intended audience appears to be highly motivated to learn, especially if the approach was informational rather than authoritarian.

DEMAND FIGURES

Much of the discussion of private and commercial allotments centers around the "demand" concept. If demand for each kind of trip were known, the "user-pie" could be divided accordingly. However, discussions always seem to end in frustration over the inability to determine demand. Two points should be kept in mind.

First, if demand figures are to be compared, they have to be in the same units. The commercial "surpluses" discussed earlier were originally presented in terms of passenger-days, while private "demand" was presented as permits denied. Comparable units are needed, whether they are user-days or person-trips. Number of private permits can be converted to number of person-trips by multiplying by average trip size (15). Private person-trips can be converted to user-days by multiplying by the average length of trips (17.3). Conversely, commercial passenger-days can be converted to person-trips by dividing by average trip length (8.6). While such conversions only yield approximations based on averages, they at least give units which can be compared. This solves the proverbial problem of comparing apples with oranges.

The second important point is that existing private and commercial demand figures, while perhaps better than no figures, are not directly comparable even when common units have been derived. The Park Service has records of all private trip requests, but has no such records for commercial requests. There appears to be no way of assuring zero duplication in private applications, and outfitters' records of refusals (if they kept them) would be inflated if individuals contacted several "full" outfitters before finding a space (that is, the individual would be counted several times as being "refused").

Suggestions for determining demand include a permit system whereby all individuals wanting to run the river would apply directly to the managing agency. The application would specify whether the individual wanted to go on a private or commercial trip, and the percentage of applications in each group would give an indication of demand. Selections would then be made on a chance basis, with the percentage selected in the private and commercial groups proportional to the percentage of applications from each sector. People wishing to go in groups would apply as a group, and their probability of selection would be adjusted accordingly. While opportunities for abuse would exist, this is the most reasonable system we have heard about for accurately determining demand. If such a determination is desirable, the possibilities of the system should be investigated.

THE RIVER RUNNING PUBLIC

It is important in understanding the private-commercial issue to identify the different segments of the public represented by the different user groups. Because of the way permits are handled, the division has traditionally been made between the private and commercial groups. However, the distinction between commercial outfitters and their passengers is lost in such a division.

Much discussion of the private-commercial issue centers around "motives." The "profit motive" label is frequently applied to the commercial sector as a whole, when it more appropriately applies only to the outfitters themselves (even though, as was mentioned ealier, there may be considerable variation in the "profit motivation" of individual outfitters). Commercial passengers and private users are more similar in their recreational motivation, while outfitters are presumably motivated by business or profit interests. The point is that three segments of the Grand Canyon users "public" need to be distinguished: 1) commercial outfitters, 2) commercial passengers, and 3) private river runners. The "recreational public" is composed of the later two groups; one presumably wants the services of an outfitter, the other does not.

Any public involvement data collected on the private-commercial issue should be separated according to these three groups. This means that information on group membership will have to be collected on the same forms as other data. See, Heberlein, 1975, pp. 4-7, for a more detailed discussion of disaggregation and the public involvement process.

FOOTNOTES

1. Many different terms have been used to label private and commercial trips. The words private and commercial are used here because they are the ones used by the managing agencies.

2. Joe Brown, Associate Director, Park System Management, memo to Regional Director, Western Region, May 23, 1974.

3. National Park Service, "Controversial 'No Repeat' Provision Dropped -- Application Deadline Extended for Private River Permits at Grand Canyon National Park," News Release #25, October 20, 1975.

4. Mike O'Brien, in Spray, newsletter of the Colorado White Water Association, March, 1974.

5. Recommendations of the Private Permit Action Committee, November, 1974, mimeo.

6. Interagency Whitewater Committee, "Interagency Whitewater Management Guidelines, 1976 Edition," April, 1976, mimeo.

7. Wilderness Public Rights Fund, "Additional background for attached news release: 'Petition Seeks to Resolve National Park Use Dilemma,'" undated mimeo.

8. Wilderness Public Rights Fund, "Petition Seeks to Resolve National Parks Dilemma," 1975 mimeo.

9. Joe Brown, Acting Associate Director, National Park Service, letter to Mr. David Dominick, Attorney at Law, May 22, 1975.

10. United States 94th Congress, House Concurrent Resolution 331, July 8, 1975.

11. Russel E. Dickenson, Acting Director, National Park Service, letter to Representative Lloyd Meeds, July 9, 1975.

12. Ronald H. Walker, Director, National Park Service, letter to Senator Floyd Haskell, June 26, 1974.

13. Curtis Bohlen, Acting Assistant Secretary of the Interior, letter to Representative Sidney R. Yates, July 3, 1975.

14. Ibid.

15. Op. Cit., see footnote 12.

16. Senator Edward T. Beck, Chairman, Economic Development, Business, and Labor Committee, Utah State Legislature, letter to Merle E. Stilt, Superintendent, Grand Canyon National Park, July 22, 1975.

17. Op. Cit., see footnote 10, and Wilderness Public Rights Fund, "What Do You Say, John Muir? Would You Have Wanted to Pay a Commercial Guide in Order to Walk the High Sierra?," undated mimeo.

18. Wilderness Public Rights Fund suit against Park Service, "Response to Interrogatories," undated mimeo.

19. Op. Cit., see footnote 10.

20. Op. Cit., see footnote 7.

21. Gary O. Grimm and Richard A. Wyman, Attorney at Law, Coordinators, Public Wild Rivers Environmental Project, "Public Rights to Rivers," November, 1974, mimeo.

22. State v. Cleveland and Pittsburgh Railroad, 94 Ohio St. 61, 113 NE 677, 682 (1916), cited in op. cit., see footnote 20.

23. Op. Cit., see footnote 20.

24. Op. Cit., see footnote 16.

25. Grand Canyon National Park, Grand National Park, Grand Canyon, Arizona, "Private River Permits -- Colorado River, Grand Canyon National Park," August, 1975, mimeo.

26. Wilderness Public Rights Fund, open letter to "Suppliers, Manufacturers, and Sellers of Camping and Boating Equipment," undated mimeo.

REFERENCES

Beck, Senator Edward T., Chairman, Economic Development, Business,
1975 and Labor Committe, Utah State Legislature, Letter to Merle E. Stilt, Superintendent, Grand Canyon National Park, July 22.

Bohlen, Curtis, Acting Assistant Secretary of the Interior,
1975 Letter to Representative Sidney R. Yates, July 3.

Brown, Joe, Associate Director, Park System Management,
1974 Memo to Regional Director, Western Region, May 23.

Brown, Joe, Acting Associate Director, National Park Service,
1975 Letter to Mr. David Dominick, Attorney at Law, May 22.

Dickenson, Russel E., Acting Director, National Park Service,
1975 Letter to Representative Lloyd Meeds, July 9.

Grimm, Gary O. and Richard A. Wyman, Attorney at Law, Coordinators,
1974 Public Wild Rivers Environmental Project, "Public Rights to Rivers," November, mimeo.

Grand Canyon National Park
1975 "Private River Permits--Colorado River, Grand Canyon National Park," August, mimeo.

Heberlein, Thomas A.
1975 "Principles of Public Involvement for National Park Service Planners and Managers." Report to National Park Service, June.

Interagency Whitewater Committee
1976 "Interagency Whitewater Management Guidelines, 1976 Edition," April, mimeo.

Nash, Roderick
1973 Wilderness and the American Mind. New Haven: Yale University Press.

National Park Service
1975 "Controversial 'No Repeat' Provision Dropped -- Application Deadline Extended for Private River Permits at Grand Canyon National Park," News Release #25, October 20.

O'Brien, Mike in Spray
1974 Newsletter of the Colorado White Water Association, March.

Private Permit Action Committee
1974 Recommendations of, November, mimeo.

United States 94th Congress
1975 House Concurrent Resolution 331, July 8.

Walker, Ronald H., Director, National Park Service
1974 Letter to Senator Floyd Haskell, June 26.

Wilderness Public Rights Fund
n.d. "Additional Background For Attached News Release: 'Petition Seeks to Resolve National Park Use Dilemma,'" undated mimeo.

Wilderness Public Rights Fund
n.d. Open letter to "Suppliers, Manufacturers, and Sellers of Camping and Boating Equipment," undated mimeo.

Wilderness Public Rights Fund
1975 "Petition Seeks to Resolve National Parks Dilemma," mimeo.

Wilderness Public Rights Fund
n.d. Suit against Park Service, "Response to Interrogatories," undated mimeo.

Wilderness Public Rights Fund
n.d. "What Do You Say, John Muir? Would You Have Wanted to Pay a Commercial Guide in Order to Walk the High Sierras?," undated mimeo.

APPENDIX 1*

TABLES NOT PRESENTED IN TEXT

*"Combined" or "overall" percentages in Tables A1-A17 are weighted to account for the over-sampling of private trips (see Part I, "Design and Method of the Sociological Research in the Grand Canyon," for further details). As a result, frequencies (N's) in the other columns will not necessarily sum to the frequencies in the "combined" column.

TABLE A1

AGE DISTRIBUTIONS FOR PRIVATE AND COMMERCIAL USERS

AGE	USER GROUP private	commercial	combined
0-9	0 (0)	1 (6)	1 (7)
10-19	24 (28)	17 (147)	18 (177)
20-29	36 (42)	30 (253)	30 (297)
30-39	28 (33)	21 (178)	21 (209)
40-49	8 (9)	16 (132)	15 (150)
50-59	4 (5)	12 (101)	12 (113)
60-69	0 (0)	3 (26)	3 (28)
70-79		1 (4)	0 (4)
TOTALS	100 (117)	100 (847)	100 (985)
	mean=27.8	mean=32.8	mean=32.5

Chi square=20.9, $p < .01$

Number of missing observations (unweighted)=45

TABLE A2

SEX COMPOSITION OF PRIVATE AND COMMERCIAL USER GROUPS

		USER GROUP		
		private	commercial	combined
SEX	male	77 (90)	52 (440)	53 (527)
	female	23 (27)	48 (409)	47 (460)
	TOTAL	100 (117)	100 (849)	100 (987)

Chi Square = 25.2, $p<.001$

Number of missing observations (unweighted) = 43

TABLE A3

INCOME DISTRIBUTIONS FOR
PRIVATE AND COMMERCIAL USERS

INCOME IN THOUSANDS	USER GROUP: private	commercial	combined
0- 4	22 (22)	4 (28)	5 (42)
4- 8	11 (11)	5 (35)	5 (44)
8-12	12 (12)	11 (81)	11 (94)
12-16	6 (6)	12 (85)	12 (96)
16-20	11 (11)	9 (61)	9 (71)
20-24	4 (4)	7 (51)	7 (56)
24-28	4 (4)	8 (60)	8 (68)
28-32	5 (5)	6 (46)	6 (53)
32-26	5 (5)	5 (34)	5 (38)
26-40	4 (4)	3 (22)	3 (26)
40-44	4 (4)	3 (24)	3 (28)
44-48	1 (1)	3 (19)	3 (21)
More than 48	10 (10)	23 (168)	23 (191)
TOTALS	100 (99)	100 (714)	100 (829)
	mean=5.3	mean=7.4	mean=7.3

Chi square=68.7, $p<.001$

Number of missing observations (unweighted)=196

TABLE A4

PRESENT RESIDENCE OF
PRIVATE AND COMMERCIAL USERS

		USER GROUP		
		private	commercial	combined
RESIDENCE	rural	14 (16)	7 (60)	8 (72)
	small town	33 (39)	9 (76)	11 (104)
	small city	21 (24)	19 (160)	19 (187)
	suburban area	18 (21)	32 (268)	32 (306)
	large city	15 (17)	32 (267)	31 (298)
	TOTALS	100 (117)	100 (831)	100 (967)

Chi Square=72.4, $p<.001$

Number of missing observations (unweighted)=61

TABLE A5

OUTDOOR CLUB MEMBERSHIP OF
PRIVATE AND COMMERCIAL USERS

		USER GROUP		
		private	commercial	combined
CLUB MEMBERSHIP	no	43 (51)	78 (648)	76 (738)
	yes	57 (67)	22 (186)	24 (233)
	TOTALS	100 (118)	100 (834)	100 (971)

Chi Square=61.2, p<.001
Number of missing observations (unweighted)=57

TABLE A6

TIME OF FIRST WILDERNESS EXPERIENCE --
PRIVATE AND COMMERCIAL USERS

		USER GROUP		
		private	commercial	combined
TIME OF FIRST WILDERNESS EXPERIENCE	This is first	2 (2)	31 (263)	30 (289)
	One year ago	9 (10)	5 (45)	6 (54)
	2-3 years ago	8 (9)	9 (78)	9 (90)
	4-5 years ago	6 (7)	11 (90)	11 (103)
	6 or more years ago	76 (89)	43 (361)	45 (438)
	TOTALS	100 (117)	100 (837)	100 (974)

Chi square=60.6, p<.001
Number of missing observations (unweighted)=55

TABLE A7

RIVER RUNNING EXPERIENCE OF
PRIVATE AND COMMERCIAL USERS

NUMBER OF PREVIOUS WHITEWATER TRIPS	USER GROUP: private	commercial	combined
0	3 (4)	66 (569)	62 (622)
1	9 (11)	17 (146)	17 (165)
2 or 3	15 (18)	9 (75)	9 (91)
4 or more	72 (84)	8 (67)	12 (117)
TOTALS	100 (117)	100 (857)	100 (995)

Chi Square=349.7, p<.001
Number of missing observations (unweighted)=35

TABLE A8

PREVIOUS TRIPS THROUGH GRAND CANYON
OF PRIVATE AND COMMERCIAL USERS

NUMBER OF PREVIOUS GRAND CANYON TRIPS	USER GROUP: private	commercial	combined
0	70 (82)	91 (781)	90 (894)
1	15 (18)	6 (54)	7 (68)
2	8 (9)	2 (16)	2 (22)
3 or more	7 (8)	1 (9)	1 (14)
TOTALS	100 (117)	100 (860)	100 (998)

Chi Square=50.1, p<.001
Number of missing observations (unweighted)=32

TABLE A9

PARTICIPATION IN OUTDOOR ACTIVITES OF PRIVATE AND COMMERCIAL USERS

PARTICIPATION IN CAMPING, HIKING, ETC.	USER GROUP: private	commercial	combined
never or seldom	6 (7)	42 (367)	40 (404)
occasionally or frequently	94 (112)	58 (515)	61 (619)
TOTAL	100 (119)	100 (882)	100 (1023)

Chi Square=55.7, $p<.001$
Number of missing observations (unweighted)=8

TABLE A10

ATTITUDES TOWARD MOTOR NOISE

		USER GROUP			
		Private	Commercial Oar	Motor	Combined
MOTOR NOISE BOTHERSOME	no	9 (11)	7 (8)	82 (581)	69 (664)
	yes	90 (106)	94 (115)	18 (127)	31 (304)
	TOTALS	100 (117)	100 (123)	100 (746)	100 (968)

Chi Square=430.6, p<.001
Number of missing observations (unweighted)=61

TABLE A11

OPINIONS REGARDING MOTORS AND WILDERNESS

		USER GROUP			
		Private	Commercial Oar	Motor	Combined
CANYON MORE OF A WILDERNESS IF MOTOR TRAVEL BANNED	disagree	9 (11)	20 (25)	65 (476)	56 (561)
	agree	91 (108)	80 (103)	35 (259)	44 (442)
	TOTALS	100 (119)	100 (128)	100 (735)	100 (1003)

Chi Square=315.2, p<.001
Number of missing observations (unweighted)=27

TABLE A12

PREFERENCE FOR RUNNING THE RIVER

		USER GROUP			
		Private	Commercial Oar	Commercial Motor	Commercial Combined
PREFERENCE	oar	98 (115)	98 (124)	15 (103)	30 (290)
	motor	0 (0)	1 (1)	61 (426)	50 (478)
	makes no difference	2 (2)	2 (2)	25 (173)	20 (197)
	TOTALS	100 (117)	100 (127)	100 (702)	100 (965)

Chi Square=544, p<.001
Number of missing observations (unweighted)=63

TABLE A13

PREFERENCE FOR MEETING OTHER TRIPS

		USER GROUP			
		Private	Commercial Oar	Commercial Motor	Commercial Combined
PREFERENCE	oar	92 (108)	92 (114)	18 (130)	32 (308)
	motor	8 (9)	7 (8)	73 (511)	8 (74)
	makes no difference	1 (1)	2 (2)	9 (64)	60 (584)
	TOTALS	100 (118)	100 (124)	100 (705)	100 (966)

TABLE A14

PREFERRED NUMBER OF ENCOUNTERS (ON RIVER)

		USER GROUP			
			Commercial		
		Private	Oar	Motor	Combined
PREFERENCE (parties per day)	none	53 (60)	52 (65)	30 (199)	34 (314)
	1 or 2	38 (43)	28 (35)	32 (212)	32 (292)
	3 or more	10 (11)	20 (25)	39 (259)	34 (319)
	TOTALS	100 (114)	100 (125)	100 (670)	100 (925)

TABLE A15

PERCEIVED CROWDING IN THE CANYON

	Percent Agreeing with Statement			
	Overall	Commercial		Private
		Motor	Oar	
General				
I don't think we met too many people during our trip down the river.	69	71	63	62 NS
Our trip would have been better if we had met fewer people along the way.	41	38	60	49 *
I would have enjoyed the trip more if there hadn't been so many boats going by.	26	21	48	56 *
On the River				
I would have enjoyed the trip more if we had seen less people while floating on the river.	31	27	52	51 *
It bothered me to meet so many people while floating on the river.	23	19	41	38 *
At Attraction Sites				
The places we stopped (like Redwall Cavern were often too crowded.	26	25	24	50 *
Too often we had to share a place like Deer Creek Falls with other groups.	26	24	28	48 *
I would have enjoyed the trip more if we had seen less people at side stops.	35	32	48	54 *
At Camp Sites				
Too often we had to camp near other parties.	7	6	9	11 NS

*Percentages for the three groups are significantly different; $p<.001$.

TABLE A16

PERCEIVED IMPACT OF USE ON THE CANYON

	Percent Agreeing with Statement			
	Overall	Commercial		Private
		Motor	Oar	
The Canyon seems relatively unaffected by the presence of man.	78	82	65	46*
The Grand Canyon environment is not being damaged by overuse.	75	80	53	43*
(Degree to which each of these environmental damage conditions exists in the Canyon.)				
Excessive littter	11	8	21	24*
Trampling of natural vegetation	18	14	31	38*
Over-use of campsites	19	15	37	31*
Over-use of visitor attraction sites (like Deer Creek Falls)	27	22	44	48*

*Percentages for the three groups are significantly different; $p<.001$.

TABLE A17

ATTITUDE TOWARD CONVENIENCES

	Percent Agreeing with Statement			
	Overall	Commercial Motor	Commercial Oar	Private
I would have preferred to have more of the "conveniences of home."	9	11	5	3*
I would have enjoyed the trip more if we had better camping facilities.	12	14	5	2*

*Percentages for the three groups are significantly different; $p<.001$.