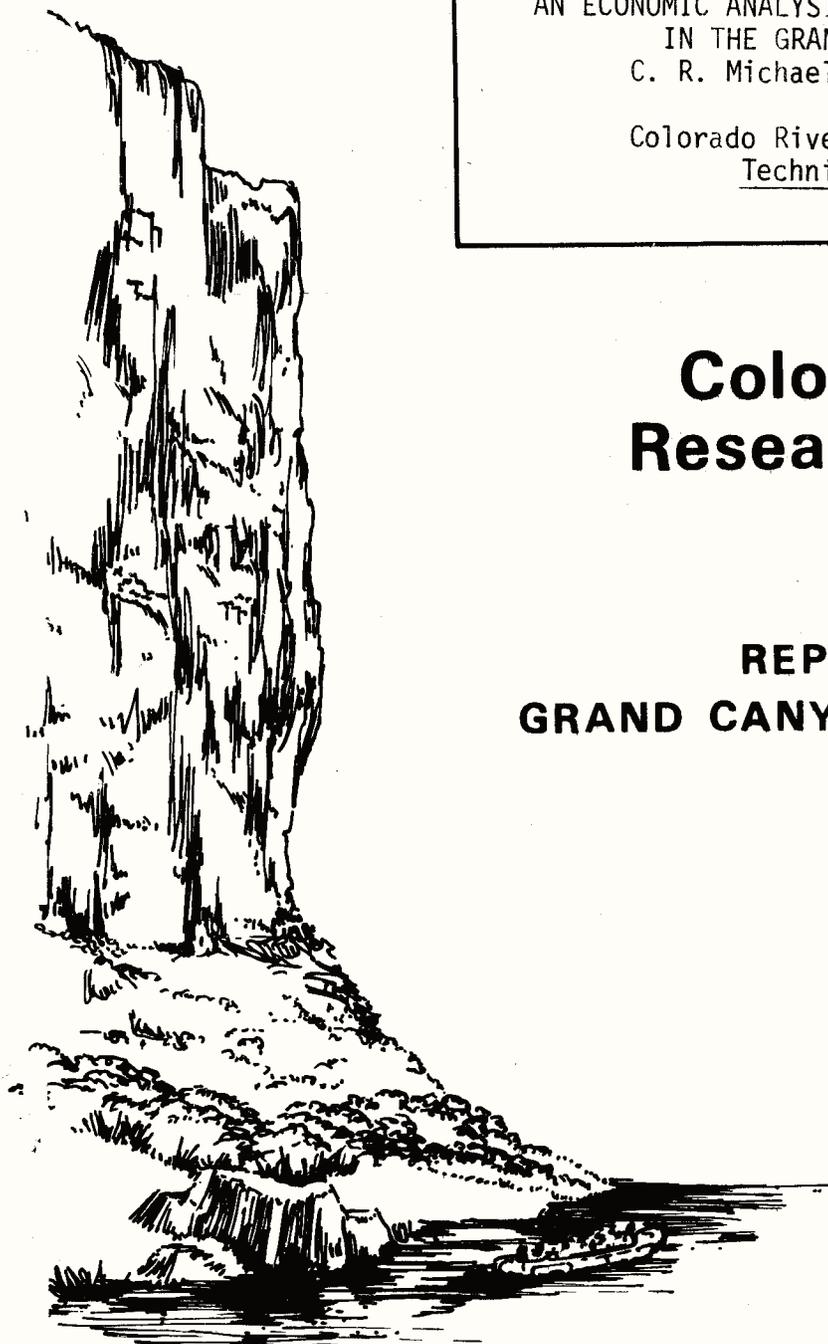


AN ECONOMIC ANALYSIS OF THE RIVER RUNNING INDUSTRY
IN THE GRAND CANYON NATIONAL PARK
C. R. Michael Parent and F. E. Robeson

Colorado River Research Program Report
Technical Report No. 16

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
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~~NATIONAL PARK SERVICE~~

~~REPORT~~

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Prepared under the auspices of
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for

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NOTICE:

Portions of this report that contain financial information about specific concessioners that is of a propriety nature are not included in the reproduction of this Technical Report.

1.0 ABSTRACT

A study of the float trip concessions and related issues in Grand Canyon National Park (GCNP) was conducted during the period between August 1st and December 15th, 1976. The study relied on a variety of secondary data but primarily upon financial reports filed by each concessioner with the National Park Service (NPS). Traditional techniques of financial ratio analysis, breakeven analysis and econometric research were applied to the study of the float trip industry.

Sixteen issues were specifically investigated and for many of these issues the researchers encountered unanticipated problems which required additional analysis. Data problems plagued the researchers throughout the study. There were three major data problems which are specifically addressed in the section the authors have prepared on recommendations. Basically, the three are:

1. Inconsistent and incomplete reporting of financial information by the float trip concessions.
2. The necessity of the researchers' reliance on existing secondary data sources for socio-economic information. The problem here is not so much the sociological study which was competently performed but the fact that demand in an economic sense is not sufficiently described by aggregate user data.

3. The administrative (OMB primary data collection guidelines) and budget constraints of the project precluded the collection of data appropriately scaled and correctly attributable to individual float trips.

Where data limitations have limited the scope or depth of the analysis, appropriate caveats have been noted in the complete text of the report.

The report is organized into separate sections. Each section address one of the sixteen issues and includes a statement on purpose, methodology, findings and discussion. Recommendations are included under a separate section with a brief discussion supporting each recommendation and their implication for management.

Some of the more interesting findings are presented in this abstract. However, it should be noted that the financial data upon which conclusions are based is not presented here as such data is of an extremely proprietary nature. Similarly, there are comments in the text of this report which are directly and inextricably tied to specific concessions. To the extent that these are related to financial and operational aspects of the firms, they are not included in this abstract but are dealt with in detail in the text.

In developing an economic profile for each firm numerous financial characteristics are detailed. Most firms are profitable. Some earn large profits and pay high officer salaries. However, the average industry profitability is not unreasonable considering the

size of the average firm. Small firms are more variable in their performance than large firms; however, the analysis of specific cost items did not reveal any measurable economies of scale. That is there is no justification for a theory that large firms provide any more or any less costly trips. There is some evidence to suggest that average economic performance could be improved slightly and certainly stabilized if firms with small allotments were combined.

In terms of rates charged, the float trip concessions offer the prospective passenger a wide range of choice. Average revenue per user day ranges between \$34.88 and \$78.64 with the mean equal to \$52.60. For the profitable trips the profit per user day ranges from \$3.01 to \$13.59 the average profit per user day is just under \$5.00. There are conditions of excess demand, particularly during peak season, and consumer surplus. The latter condition suggests that some firms are offering a price too low relative to demand for their services. Consumers are getting their monies worth and the mechanism for establishing rate parameters would probably be dysfunctional at this time and could easily result in less diversity and higher prices over time.

It is very difficult to measure trip quality as it is related to profit and loss. Generally, it appears that some average level of profit is related to trip quality and vice-versa; however there are a numerous other issues which confound the analysis. Poor earnings in non-GCNP business, even given a high profit on the GCNP portion of a business, could adversely affect trip quality.

One commonly held belief is that oar trips are less efficient, more costly and less profitable than motor trips. It was reported in the Congressional Record (Vol. 119, No. 115) that the price of an oar trip is twice that of a motor trip. Oar trips are slightly more efficient than motor trips. Average cost (to the concessioner) per user day for an oar trip averages \$1.50 less than the motor trip. Due to the wide variation in costs for both motor and oar trips this difference between motor and oar trips is not as meaningful as the difference among motor trips and among oar trips. Oar trips are slightly less costly per user day than motor trips. The average revenue per user day for oar trips is approximately \$2.00 less than for motor trips. Again this difference is not nearly as large as differences among trips. Oar trips are slightly less profitable than motor trips. Measured as percent of sales, motor trips earned 2.1% more than the pure oar trips and 1.5% more than the combination trips. Again this difference is smaller than the variability among trips, and since oar trips receive smaller allotments than motor trips, some of this difference may be attributable to allotments not type of trip.

Investment decisions by the river concessions vary substantially in amount and type. Most assets are depreciated fairly quickly with IRS regulations responsible for setting depreciation rules. Some firms borrow heavily while others use a depreciation reserve and self-finance purchases. Firms which are more capital intensive, that

is have higher fixed costs, are able, through tax savings due to depreciation, to generate cash flows two to three times greater than their profits. These data indicate that conversion to partial or all oar trips would not place a financial burden on existing concessioners particularly if a two to three year conversion period were allowed. All oar concessions may require concession contracts be issued for 4 to 5 years to accomodate different depreciation schedules and one or two year contracts be issued during the interim coversion period. Management expertise and commitment and the interpersonal skills of the guides seem more important to profitability and user satisfaction than investment decisions, size of allotment and type of trip.

Local impact due to the river trips is difficult to measure as it is so small and there is little detail to determine where purchases are made. Companies are based in a wide range of areas in three states, Utah, Nevada and Arizona. No one town receives the total impact of the concessions. Employment is seasonal and most employees do not live on the towns' economy. In fact it could be argued that eliminating all river trips would be a net economic benefit to local communities if 10% of the existing user days could be captured in local motels and restaurants.

Finally, a lottery system could not be made workable for the coming season. There are numerous administrative problems with the proposed system as presently constituted. Judging from a somewhat similar situation, the smaller concessioners would face

financial hardship. Advertising and promotion costs would increase rapidly causing firms to attempt to generate more primary and selective demand. Price would increase at an increasing rate and a far more significant number of potential users could be priced out of the market. The private user is not always motivated by "recreational expectations" on a legitimate "shared cost basis." Some are quasi-commercial operations and have admitted amortising equipment and receiving a "leader fee." The lottery system at this point could easily be more inequitable than the current allocation scheme if in fact the current scheme is that inequitable all things considered.

It is obvious that findings and conclusions reported in this abstract fall just short of recommendations. Again, all recommendations may be found in the section on recommendations. Other less obvious or less significant findings and conclusions are reported in the text. All concession specific findings are in sections 4.1 through 4.16.

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3.0 INTRODUCTION

The float trip concessions in Grand Canyon National Park (GCNP), represent a multi-million dollar industry. This alone is reason enough for the study and analysis of commercial float trip companies operating under a concession contract issued by the National Park Service (NPS). Moreover, the Grand Canyon of the Colorado is a unique, fragile environment which must be managed by the NPS consistent with objectives of visitor use and preservation of the natural resource.

To accomplish these often conflicting objectives, the NPS has initiated and supported the Colorado Research Project. The final product of the varied research projects will be the GCNP river management plan. To this end the NPS has sought a detailed analysis of the river running business. Several of the objections to first efforts to develop a river management plan were directed towards the economies of limiting use, changing the structure of the industry, and the impact on motor trips resulting from an oars only policy. The concern was voiced by and on behalf of three groups: river trip passengers, concessioners, and communities where river river trip firms were headquartered. This study provides factual information where the prior arguments were basically emotional. However, some issues are still not amenable to conclusive, objective analysis; Still others are not given an in depth treatment due to budget and time constraints.

There are sixteen specific issues addressed by this study. Many other problems and issues surfaced during the research and receive treatment in the appropriate sections.

- 4.1 Economic Profile of Grand Canyon National Park River Concessioners.
- 4.2 Implication of Varying Use Levels on Companies.
- 4.3 What Values are Passengers Receiving in Comparison With Rates Charged? What Would Be Appropriate Rate Parameters for the National Park Service to Consider Using? Are Passengers Getting Their Monies Worth?
- 4.4 How Do Profit and Loss Figures Affect Trip Quality?
- 4.5 What Is the Return On Investment at Various Use Levels?
- 4.6 What Are the Implications of a Change From Motor to Oar Operation, or a Partial Oar Operation?
- 4.7 What is the Type of Clientele Now? Would a Change To All Oars Affect This?
- 4.8 What Are the Typical Capital Expenditures Both Current and Future?
- 4.9 What Are the Projected Equipment and Personnel Costs at Various Allotment Levels?
- 4.10 How Much and What Type of Advertising Is Used or Needed by Concessioners?
- 4.11 What Are the Economic Ramifications of Limiting Company Size, Size of Rafting Parties, Boat Limitations, etc.?

- 4.12 What Are the Rates Charged Passengers versus Value Received?
- 4.13 How Many Passenger Days Does a Company Need To Provide a Good Service?
- 4.14 What Is the Extent of Repeat Business? How Important Is This to a Company?
- 4.15 What Is the Effect of River Running on Local Economies?
- 4.16 What Would Be the Ramifications of a Lottery System to Allocate User Days?

The research plan closely paralleled an approach to industry analysis, the Industrial Organization Model. The Industrial Organization Model (IO) is a construct by economists to understand the relationships among firms which leads to a certain standard of performance for the total industry. The theory suggests that certain elements of market structure constrain conduct the result of which is some particular level of performance for the industry. The theoretical underpinning of the IO model assumes a competitive market absent government interference. While the government, the NPS in this case, has an active role in the market the IO model still provides an excellent framework from which to study the river running business.

Elements of market structure typically include:

1. Concentration--the number and size of firms in the market.
2. Entry Barriers--how and why firms enter the industry or are excluded from the industry?

3. Economies of Scale--are certain size firms more cost efficient than others and why?
4. Nature and Type of Product Differentiation--to what extent and how do firms seek to make their products different from one another?
5. Demand for the Product--a basic condition to which all firms in the industry must respond.
6. Industry Cost Structure--is a ratio of fixed to variable costs dictated by the nature of the industry?

Elements of conduct typically include:

1. Pricing--How are prices set? What is the diversity in the industry? And, what has been the pricing behavior of firms over time?
2. Promotion--How much and what type of advertising is found?
3. Output Decisions--How much of the product or service is produced? What is included and not included?
4. Location--Where does the firm do business?

The IO model assists the researcher in organizing the data collection process, the objective of which becomes the organization of data in response to the questions raised by each of the elements of structure and conduct. For this study the principal source of data was the financial statement filed by each concessioner. Other sources of data included published reports, NPS records on visitor use, published promotional literature, visitor use and concession

data from other NPS and Forest Service areas, the concessioners, river trip guides, former passengers, and NPS personnel. This research project was probably no different than most others. In some cases the data were perfectly sufficient for the analysis of the topic. In other cases the data were incomplete or non-existent. In fact, a strong recommendation outside the scope of the sixteen topics previously listed involves the methods of reporting data by the concessioners.

After the data were collected and organized, several analysis techniques were used. Among these techniques are: financial ratio analysis, breakeven analysis, cost-benefit analysis, and regression analysis. In addition data were tabulated, frequencies calculated, averages and ranges determined and subsequently data were categorized and compared against itself and data from other sources. Description of the various analysis techniques is presented in each section as each section is organized into four mutually exclusive, to the extent reasonable and possible, topics: purpose, methodology and techniques, data and findings, discussion and conclusions.

Finally, we would like to acknowledge the capable assistance of the NPS personnel at Grand Canyon. Their timely and professional response to our request for data and briefings on the evolution of the Grand Canyon River Management Plan proved to be an important contribution to our efforts. In particular we would like to commend Dr. Roy Johnson and by doing so, his staff as well, for the unbiased,

professional approach he has taken in support of a quality research environment in GCNP. We are sure his efforts are favorably reflected in all the projects sponsored by GCNP during his tenure there. And, lastly, we owe a large debt of gratitude to our typist, Denise Lindsay, for her efforts and seemingly endless hours in the face of what must have seemed at times a manuscript which was going to become her life's work.

4.1 Economic Profile of Grand Canyon National Park River Concessioners

4.1.1 Purpose--The focus in this section of the report is on the financial and economic characteristics of each river concessioner. Such economic and financial data serves as an input to analysis concerning necessary size, capital requirements, profit characteristics, and cost determinants of the concession operators. In addition, the financial and economic profile will provide an overview to GCNP management in terms of the operational viability of each concession. Financial and economic trends are certainly crucial in assuring that a quality service is delivered to concession clients.

4.1.2 Methodology and Techniques--The financial and economic profile of each concessioner is based on extensive analysis of (1) each concessioner's available financial statements, (2) additional secondary data such as advertising brochures or discussions with the concessioner, and (3) secondary data provided by GCNP. Data were collected from existing concessioner financial reports concerning financial performance (income statement figures) and financial structure (balance sheet). From this data several relevant financial statistics and economic profile characteristics were calculated and arranged in a consistent manner for each operator.

The twenty-five financial and economic profile statistics are explained below. This data then provides the background

for the concession specific profile in the next section. The method of determining the statistic or profile is described and then the interpretation of the data is noted. By offering a wide selection of financial analysis figures, it is possible to evaluate accurately the structure and relative viability of a specific concessioner.

1. Breakeven level - This figure is expressed in dollar terms. The figure is found by using the following formula:

$$BL = \frac{FC}{1 - \frac{VC}{S}}$$

where BL = Breakeven level

FC = fixed cost

VC = variable cost

S = Sales

The result indicates the level of sales to just meet fixed cost and variable cost. Concessioners with relatively high levels of fixed cost will require a relatively high sales level in order to meet total cost.

2. Variable Costs - Variable costs represent those costs directly related to the quantity of output. Thus, variable costs will increase if quantity of output increases or if the types of services provided is altered. The figure for variable costs is found

by using the following formula:

$$VC = \text{Gross Income} - \text{Net Profit before Tax} - \text{Fixed Cost}$$

The result is used to compute the Breakeven Level.

3. Fixed Cost - These costs are invariati regardless of output level. While fixed cost is a theoretically precise concept, no definite manner of calculating real fixed cost exists. Accordingly, fixed costs for river concessioners are estimated by the following formula:

$$\begin{aligned} \text{Fixed Costs} = & \text{Depreciation} + \text{Interest Expense} \\ & + \text{Taxes (other than income and FICA)} + \\ & .75 \text{ (officer's salaries)} \end{aligned}$$

Officer's salaries are treated with both variable and fixed components. The need to meet the officers' salaries is assumed because of relatively small and closely held nature of most companies.¹ We have decided to include 75 percent of officers' salaries as fixed costs. For many concessions, officers' salaries are indicated. When not provided, it was possible to impute the figures or use net profit in the case of a sole proprietorship. More consistency would be insured in the future if concessioners are required to keep records in a uniform manner and statements audited periodically.

¹For justification of this approach, see: Weston and Brigham, Managerial Finance, 4th ed. (New York: Holt, Rinehart, and Winston, Inc. 1972) p. 47.

4. Depreciation - The depreciation figure is included from the income statement so that the proportion of fixed asset cost can be compared to total fixed costs. Also, depreciation expenses indicate the relative capital intensity or at least the age of the capital stock for the concession.
5. Breakeven Level as a percent of sales - This figure indicates the margin from current sales to the breakeven level. The closer to 100 percent, the closer the firm is to just breaking even. If the figure is below 50 percent that implies that sales (revenues) could be cut in half and the concessioner would still meet total costs. If the figure is over 100 percent, the concessioner must increase sales in order to breakeven.
6. Allocation of passenger days - Figure supplied by GCNP indicating relative size of concessioners.
7. Passenger days used - The passenger days used show the activity of each concessioner during the calendar year. When compared to the allocation of passenger days, one can evaluate the success or aggressiveness of the concessioner in utilizing its allotment.
8. Number of Trips - This figure is available only for the 1975 season. It partially indicates the characteristics of the trips provided the concessioners.

9. Return on equity (ROE) - The formula is ROE =

$$\frac{\text{Net Profit after Tax}}{\text{Net Worth}}$$

This measures the return on stockholders' investment in the concession.

10. Return on Assets (ROA) The formula is ROA =

$$\frac{\text{Net Profit After Tax}}{\text{Total Assets}}$$

This measures the return on the total investment of the firm.

11. Profit as a percent of sales - This formula is:

$$\frac{\text{Net Profit After Tax}}{\text{Sales}}$$

The result is the profit contributed per dollar of sales. This is the most meaningful measure in this industry because of the wide variations in equity and net asset positions among concessions.

12. Average Revenue per Trip - This is found by dividing Gross Income by Trips. It indicates the funds contributed by each trip. It is available only for 1975.

13. Average Cost per Trip - The figures are found by dividing the number of trips into total costs. Total costs are equal to gross income minus profit before taxes. Trip cost data is available only for 1975. The difference between average revenue and average cost per trip is the profit provided on a per trip basis.

14. Average Revenue per Passenger Day - This is found by dividing gross income by passenger days used in a calendar year.
15. Average Cost per Passenger Day - The measure is found by dividing passenger days used into total costs. Again, total cost equals gross income minus profit before taxes. The difference between Average Revenue and Average Cost per passenger day is the profit or loss contributed on a passenger day basis.
16. Current Ratio - The current ratio is equal to:

$$\frac{\text{Current Assets}}{\text{Current Liabilities}}$$

This ratio measures the ability of the firm to meet its current obligations. A rough rule of thumb is a figure of 2. Too large a figure indicates an over "investment" in current assets. A very low number (e.g., .75) would show the possible inability to meet maturing debt obligations.

17. Debt-Equity - This figure equals $\frac{\text{Total debt}}{\text{Net Worth}}$
- It reflects the financing composition of the figure. A result of 1 would imply that 50 percent of the firms asset financing is provided by both debtors and owners. The higher the figure the greater the financial risk. This risk is associated with the need to meet fixed interest expenses.

18. Dividends - When dividends are compared with net profits and officers' salaries it provides a more complete statement of financing sources and income levels of the typically closely held concessioner.
19. Advertising - The dollar figure is estimated from information provided in the concessioner financial report.
20. Advertising as a Percent of Sales - This figure shows the relative importance of advertising to each concessioner.
21. Wages - This figure is provided on the concessioner financial report. It indicates partially whether most services are provided by the concessioner or are subcontracted when compared with other operators and a firm's income statement.
22. Net Worth - This measures the investment in firm made by the stockholders. It is the sum of contributed capital and accumulated retained earnings.
23. Fixed Assets Turnover - This ratio is found by dividing fixed assets into the Gross Income figure. It measures the turnover of plant and equipment by each concessioner. It is a relative measure of asset management by the operator.
24. Net Profit After Tax - This is the net profit for each concessioner.

25. Net Cash Flow - This is the sum of net profit after tax plus depreciation. It measures the cash generated by the firm. This follows because depreciation expense as a noncash expenditure shelters income for the operator who has a before tax profit.
26. Officers' Salaries - This provides a dollar estimate of payments to all corporate officers. Often this data coincides with net profit for a sole proprietorship. Also, for many operators, the officers receive a "wage" for float trips in addition to an officer's salary. The importance of such payments could be determined only by an audit.
27. Officer Salaries as a Percent of Sales - This provides a comparison of officers' salaries holding size constant.

4.1.3 Data and Findings--In this section an analysis of the financial and economic conditions of the twenty-one river concessioners operating in the Grand Canyon National Park are presented. The financial data available from concession records covers the period from 1972 through 1975. Some companies have incomplete or missing data and the analysis is so noted in this section. By evaluating the economic conditions of each of the concessioners, we should get a better understanding of the economic structure of river outfitters and their financial viability. Such an awareness of the financial conditions regarding concessioners is necessary in order to provide appropriate river management on the part of the National Park Service. Questions such as necessary size for concessioners in terms of allocations, pricing, revenue, and returns all become critical since the Park Service is mandated with not only over-seeing the natural resource of the river itself but also is charged with economic regulation of the individual concessioners operating under permit in the national parks. * * *

4.1.4 Discussion and Conclusions--The previous sections provide a detailed economic and financial profile of the 21 river concessions in GCNP. Most of the concessioners are financially viable. The ability to make detailed inter-company comparisons is hampered by two items. First, many concessioners have not provide complete data. Several

concessioners had missing years of data that make trend analysis difficult. Also many categories of data were not completed by the concessions. Second, concessioners don't keep records in a consistent manner. With inconsistent accounting methods comparisons of ratios or rates are made quite difficult. Clearly, a closer informant by Park Service management would insure the ability to monitor concessioner financial performance and trends. * * *

There are wide variations among concessions for profits, asset structure, working capital position, and financial structure. Such variations occur for large and small concession (as measured by passenger day allotments). The major difference among the large and small operations are the absolute magnitudes for the financial measures. Accordingly, both types might accomodate similar percentage changes in sales and still breakeven. But for a small concession such percentage changes may represent one trip or even less while much larger concessions could tolerate a loss of three or more trips. It is possible for such percentage shifts to occur more easily for the small operator. That is they are open to larger risks because of a smaller tolerance for changes in absolute terms.

4.2 WHAT ARE THE IMPLICATIONS OF VARYING USE LEVELS ON CONCESSIONERS?

4.2.1 Purpose--The focus in this section is on the impact of varying use levels on concessioners and the resulting economic performance. If size or utilization rates influence the chances for economic returns, the NPS should consider such factors when making passenger day allocations for each operator. Additionally, since multivariate techniques are used in the following analysis, it was possible to investigate many other influences on economic performance. Thus, we are able to identify key factors that are associated with operator's costs and performance.

4.2.2 Methodology and Techniques--In order to evaluate the impact of varying use levels on concessioners, several regression models were formulated and tested. While several alternative statistical techniques are available, we chose single equation regression models (1) because of their appropriateness and (2) limited resources necessary for more elaborate models.¹ The multiple regression approach allows the research to investigate the separate associations of several independent variables with an unidentified dependent variable.

Data for this portion of the study were collected from, (1) concessioner financial statements, (2) NPS documents, (3) concessioner advertising materials, and (4) discussion with GCNP

¹See R. Pindyck and D. Rubinfeld, Econometric Models and Economic Forecasts, (New York: McGraw Hill Book Company, 1976) Ch. 1.

Management. The data were collected for each concession over a four year period from 1972 to 1974. Because of data limitations instead of 84 observations (4 years X 21 concessions), the final number of usable observations was 64. Thus, the regression was based on a pooled, time-series and cross-sectional data base.²

The data utilized for the analysis is detailed below along with the abbreviations for these variables used throughout the remainder of this section. The data include the following variables (variables marked with an * were used as a dependent variable):

1. TC = Total concession costs in a calendar year.*
2. AC = Average cost per passenger day*
3. PROF = Profits before taxes*
4. PPS = Profits as a percent of sales*
5. AR = Average revenue per passenger day
6. PDA = Passenger day allotment granted by the Park Service
7. PD = Passenger days actually used by the concessioner
8. PDU = Passenger day utilization rate; PD divided by PDA
9. DE = Debt to Equity ratio (see section 4.2.2)
10. FA = Fixed Assets per concessioner (net of depreciation)
11. TA = Total Assets per concessioner
12. FCSUR = Surrogate for fixed cost using the ratio of FA to TA
13. T = Measures year to which data applies
14. OT = Measures whether an operator provides river trips on other rivers. The values of the dummy variable:
1 = other trip offered
0 = no other trips

²see Pindyck and Rubinfeld, pp. 202-210.

15. B = Measures whether the operator provides motor only trips. The values of this dummy variable:
 1 = oar or combination trips offered
 0 = motor only
16. Q = A subjective measure of quality provided by NPS personnel. The value for this dummy variable: 1 = high quality trip
 0 = not high quality
17. TRIP = number of trips offered by each concessioner (available only for 1975)
18. TRAN = Measures whether the concessioner offers transportation to the river and back to the departure point. This dummy variable is measure by: 1 = transportation included
 0 = transportation not included

The formulation and interpretation of the regression models using the above data are discussed in the next section.

4.2.3 Data and Findings--Four different models were formulated to measure varying use level impacts on concession permit holders. Two model formulations focus on costs, and two models are concerned with profitability measures.

First, the analysis of the cost studies are presented. We hypothesized that costs for a concessioner are a function of (1) size in terms of user day allocation, (2) year of operation, (3) type of trip, (4) whether trips on others rivers are offered, (5) financial structure of the firm, (6) asset structure of the firm, (7) number of trips provided, (8) whether transportation to departure

point is included, and (9) quality of concession trip. Costs were measured as average costs per passenger day and total costs.

The independent variables used in the analysis for the two cost studies are discussed below.

1. Use Level--This was measured in terms of passenger days used PD and alternatively, the utilization rate for the allotment, PDU. We wanted to see if larger utilizations would make the concessioner more cost effective or provide economies of scale.
2. Year of Operation--This was measured by the variable T. Costs increased over the time period involved because of the general upward trend in all input prices and substitute recreation.
3. Type of Trip Offered--This was measured by the dummy variable B. This variable will indicate any association between type of trip and costs.
4. Other Trips--Here the intent is to review whether a concessioner who has float trips on several rivers is more or less cost efficient.
5. Financial Structure--If the firm is highly levered with debt, the interest cost may force up the firm's costs. This is measured by DE.
6. Asset Structure of the Firm--This variable attempts to measure cost impact and efficiencies of firms that have high levels

of fixed assets. It is measured by FCSUR.

7. Number of Trips Offered--If the operator floats fewer trips with larger party size, this might provide certain cost savings. We attempted to measure this for the year 1975 the only year for which data were available. This is measured by the variable TRIP.
8. Transportation--Many operators provide transportation to the departure point from a designed location and return transportation at the conclusion of the river trip to the departure point. We wanted to see the impact this service had on average costs. This is measured by the variable TRANS.
9. Quality--We wanted to see if trips perceived to be high quality in nature had higher operating costs associated with the quality or had lower costs because of management effectiveness. The variable is measured by Q.

Thus, for the four year period the cost models were estimated in the following general form with 64 variables. For the average cost model we have:

$$AC = a + b_1 PD + b_2 PDU + b_3 FCSUR + b_4 T + b_5 OT + b_6 B + b_7 TRAN + b_8 DE + b_9 Q + e$$

For the Total Cost model we have:

$$TC = a + b_1 PD + b_2 PDU + b_3 FCSUR + b_4 T + b_5 + OT + b_6 B + b_7 TRAN + b_8 + DE + b_9 Q + e$$

where a = intercept values

b_1 = coefficient estimate of impact on cost

e = error term.

Many combinations of these independent variables were tested. The best results from this original model using least-squares to estimate the coefficients are shown in Table 4.2-1. The results for the AC functions were not too impressive. The columns labeled N, R^2 , D.W. and F represent sample size, coefficient of variation, Durbin Watson statistic and F statistic respectively. The independent variables "explain" less than 50 percent of the total variation. The Durbin Watson result verifies the presence of serial correlation, a problem that biases coefficient estimates. The coefficient estimates show that use levels associated with concessioners contribute to higher average costs. This implies that economies of size are not present. If such economies were present, we would find a negative value for PD. In equation 1 both DE and Q are not statistically different than zero. In all of our tests quality of trip (a very subjective measure) was not associated with cost. One of the most important cost related variables is TRAN. This demonstrates the importance of transportation provided by a concessioner in determining costs.

The results in terms of direction and relative importance of variables for TC are similar to AC. The R^2 is much higher with higher D.W. and F values. The higher D.W. places the measure for serial correlation in the inconclusive range. Thus, we can't reject the existence of serial correlation.

In order to clarify the impact of serial correlation on the regression, the equations were calculated using the Cochrane-Orcutt

Table 4.2-1

REGRESSION RESULTS FOR AC AND TC USING ORDINARY LEAST SQUARES
(t values are shown in parenthesis)

INDEPENDENT VARIABLES

Dependent Variable	Intercept	PD	DE	FCSUR	T	OT	B	TRAN	Q	N	R ²	D.W.	F
(1) AC	10.30	.00083* (2.09)	1.42 (1.12)	1.33* (1.77)	3.42** (2.86)	7.57* (2.35)	5.23* (1.88)	13.74** (3.88)	2.51 (.581)	64	.49	1.12	6.51*
(2) AC	11.61	.00097** (2.53)		1.22 (1.64)	3.67** (3.00)	7.42* (2.33)	5.44* (1.86)	14.36** (4.95)		64	.47	1.13	8.45*
(3) TC	-10,885.7	44.10** (27.44)	12046.3* (2.38)	3817.40 (1.27)	10348.8* (2.10)	24130.0* (1.87)	29337.6* (2.20)	50682.0** (3.57)	19567.5 (1.13)	64	.95	1.65	119.08*
(4) TC	-10,497.2	44.50** (28.50)	11835 (2.34)*		11537.2* (2.36)	20467.4 (1.60)	2205.2* (1.86)	60320** (5.09)		64	.94	1.55	156.6

* = significant at .05 level

** = significant at .01 level

Iterative Least Squares Method to correct for serial correlation.³ These results are provided in Table 4.2-2. The results for the Cochrane-Orcutt Method are somewhat altered from the earlier results. First, notice the columns labeled N and P. The N has changed from 64 to 63 because one observation is "lost" in the iterative technique. The column "f" indicates the final serial correlation adjustment factor.

The magnitudes and statistical significance of some variables have changed from Table 4.2-1 to Table 4.2-2. The variables PD, T, and TRAN are all significant at .01 level. The variable PD became relatively more important as an associated variable to both types of costs. Again economies of size are not present. The variable OT and B using the "CO" technique are not statistically significant. The variable Q was deleted from this analysis because of the weak association in the earlier regressions. All the Durbin Watson values suggest that the iterative process has removed the problem of positive serial correlation.

The major findings from these two tables are:

1. Economies of size are not present,
2. Time is associated with increasing costs (a measure of inflation)
3. Providing transportation sharply increases costs, and
4. Firms with higher levels of debt financing have higher costs.

³For an explanation see J. Murphy, Introductory Econometrics, (Homewood, Ill.: Richard D. Irwin, Inc., 1973) p. 315.

Table 4.2-2

REGRESSION RESULTS USING COCHRANE-ORCUTT ITERATIVE LEAST SQUARES
(t values are shown in parenthesis)

Dependent Variable	Intercept	PD	FCSUR	T	OT	B	TRAN	DE	N	R ²	P	D.W.	F
(1) AC	15.32	.0015** (2.68)	.691 (1.21)	4.07** (4.46)	6.01 (1.54)	2.16 (.594)	10.89** (3.18)		63	.42	.531	1.74	6.72*
(2) AC	14.60	.0013** (2.61)		4.23** (4.68)	6.08 (1.55)	1.55 (.422)	11.52** (3.27)	1.06 (.920)	63	.41	.537	1.74	6.54*
(3) TC	-93,013	45.33** (25.1)		1303.0** (2.81)	1805.8 (1.17)	21459 (1.48)	52244** (3.76)		63	.93	.265	1.93	144.06
(4) TC	-104,521	44.86** (26.22)		12836** (2.80)	19351 (1.35)	19049 (1.41)	58141** (4.41)	11702* (2.24)	63	.94	.206	1.91	134.9*

* = significant at .05 level

** = significant at .01 level

For the year 1975, data were available for the number of trips used by each concessioner. The cost equations were run with this trip data for the year 1975 only. The results are weaker because of the lack of degrees of freedom. However, the direction of the number of trips shows higher AC and (as expected) total costs. Thus, there don't appear to be any economies in terms of the number of trips.

Two models were hypothesized for the association between several independent variables and the performance dependent variables PROF and PPS. The models were:

$$\text{PROF} = a + b_1 \text{ PD} + b_2 \text{ FCSUR} + b_3 \text{ T} + b_4 \text{ OT} + b_5 \text{ B} + b_6 \text{ TRAN} + b_7 \text{ PDU} + e, \text{ and}$$

$$\text{PPS} = a + b_1 \text{ PD} + b_2 \text{ FCSUR} + b_3 \text{ T} + b_4 \text{ OT} + b_5 \text{ B} + b_6 \text{ TRAN} + b_7 \text{ PDU} + e$$

While several combinations of these above variables were evaluated, the results were not very significant. The final best results are shown in Table 4.2-3.

The resulting R^2 's are low and serial correlation is present in the PPS expression. Only two findings are weakly suggested from the analysis. First, higher passenger day allotments are associated with higher profits. This makes sense; The larger concessions will have higher absolute revenues and hence higher absolute levels of profits. The attempts to measure PPS were attempts to reduce this scale effect, but regression results were not statistically significant.

Table 4.2-3

REGRESSION RESULTS FOR PROF AND PPS USING ORDINARY LEAST SQUARES

Dependent Variable	Intercept	PD	FCSUR	T	OT	B	TRAN	R ²	D.W.	N	F
PROF	-9480	3.19** (3.76)	-963.8 (.584)	93657** (3.46)	-13,425 (1.90)	-2125.8 (.326)	3758.1 (.585)	.35	1.68	64	5.32*
PPS	.049	.27x10 ⁻⁶ (.067)	.005 (.663)	.031* (2.38)	-.042 (1.22)	-.028 (.911)	.016 (.542)	.12	1.51	64	1.25

* = significant at .05 level

** = significant at .01 level

The second consistent result again appeared in the PROF equation. The variable T was associated with higher absolute profits. This implies that increased profit amounts are associated with inflation.

Additional regression results were used in evaluating the impact of varying use level on concessioner economic performance. These results primarily show the directional relationships of the independent variables in various combinations with the dependent variables AC, TC, PROF, and PPS.

4.2.4 Discussion and Conclusions--The role of the regression model in this section was to investigate the impact of varying use levels (as measured by allotment) on performance while holding other variables constant. The most meaningful results were found in the cost functions. The results in profitability measures were less noteworthy.

From the cost analysis, we can make the following conclusions:

1. Economies of size as shown with different allotments for particular concessioners is not present,
2. Time, as a measure of inflation, is associated with increasing costs,
3. The provision of transportation is associated with higher costs of operation,
4. Debt financing is related with higher costs.

From the profit equation weaker results show that:

1. Allotments are associated with absolute levels of profits.
2. Allotments are not related statistically with rates of profits.
3. Time, as a measure of inflation, is related to levels of profits.

4.3 WHAT VALUES ARE THE PASSENGERS RECEIVING IN COMPARISON WITH RATES CHARGED? WHAT WOULD BE APPROPRIATE RATE PARAMETERS FOR THE NATIONAL PARK SERVICE TO CONSIDER USING? ARE PASSENGERS GETTING THEIR MONIES WORTH?

4.3.1 Purpose--The NPS is charged with the responsibility of determining the reasonableness of a concessioner's rates.

P.L. 89-249 states in part, "The reasonableness. . . shall be judged primarily by comparison with those current for facilities and services of comparable character under similar conditons with consideration for length of season, provision for peakloads. . . and other factors deemed significant by the Secretary." The Act further states that the Secretary's actions shall be ". . . consistent with a reasonable opportunity for the concessioner to realize a profit on his operation as whole commensurate with the capital invested and obligations assumed." Therefore, the National Park Service (NPS) must approach the problem of rates with concern for the welfare of the park visitor, the concessioner, and the preservation of park values for the enjoyment of future generations.

4.3.2 Methodology and Technique--Analysis of value, rates, and parameters required a search of several secondary data sources, calculation of financial ratios and average price per trip, and a review of the techniques of setting rate parameters. Another important piece of information concerns demand. No demand study has been performed for river running in general or the Grand Canyon river trips in particular. There are studies which have measured characteristics of rivers user

(Shelby and Nielsen, 1976) and NPS data are available which report numbers; however, these studies measure use not demand. These sources were reviewed, and it is possible to reach some conclusions regarding demand.

Rates in other national parks and vacation areas provided one source of comparison data. Unfortunately, there are few if any conditions which exactly parallel the Grand Canyon situation. There are several other, one day and longer, river trips under NPS and United States Forest Service (USFS) jurisdiction. Unfortunately, absolute costs differ so dramatically that most comparisons are meaningless. A cost per day or per contact hour basis could be developed. But, these comparisons may not be too meaningful when one considers the different market and technical problems faced by firms operating in different locations. Nevertheless, different comparisons were made on a trip basis, daily basis, and a total cost of vacation approach.

In determining appropriate rate parameters, the greater issue is perhaps "how to do so" rather than "what should they be." And, since specifying rate parameters must by its very nature take the form of a recommendation, specific discussion of rate parameters will be delayed until the section including all recommendations so as not to confuse findings and conclusions with recommendations. Therefore, the approach to setting rate parameters receives the principal attention in this section.

4.1.3 Data and Findings--Concessioners offer a wide range of trips by type, duration and price. Based on advertised prices for the 1975 season, float trips were available for a range of prices from \$125 per person to \$650 per person. On trips of the same duration there was little difference between the average cost of an oar trip vs. the average cost of a motor trip. For example, the range of prices available for an eight day oar trip was \$345-\$395 while the range for the motor trips was \$345-\$440. As there were more motor than oar trips, one would expect the range of prices to be larger.

On the basis of average cost per person per day, it follows that there is also a wide range of available options as to the price of the trip. These calculations were made by dividing a firm's user days into the revenues earned. This was done rather than dividing the trip duration into advertised price as it was felt the results would be more accurate. The problem exists because most firms offer some sort of family, group or seasonal discount; therefore, advertised price may only be a list price subject to discount. (Note: this is similar to the problems that government and industry encounter when trying to use price indexes.) The average revenue per user day may still slightly overstate the true average daily cost per user day depending upon the concession. Many concessions included interest income, rentals, gain on disposal of equipment and non-refunded deposits in total revenues.

On the minus side, user days undoubtedly include some complimentary trips, and as paid user days are overstated the average cost per user days would be understated. The range of average revenues per user day were from \$34.88 to \$78.64. The mean average revenue per user day was \$52.60. As a means of comparison, the average cost per user day ranged from \$33.71 to \$70.73. The mean average cost per user day was \$47.69.

Other float trips under NPS and USFS jurisdiction priced their services at approximately \$50 per user day.

Pack trips in the Teton-Yellowstone area charged customers \$35-\$60 per day depending upon the size of the party and the duration of the trip. (Smaller parties and shorter trips paid the higher price.)

Outfitters providing big game hunts on Forest Service lands charge their clients \$100 per day.

Ski tour packages are marketed at prices ranging from \$26 to \$80 per day depending upon what is included. Considering equipment, lift tickets and meals the more comparable prices would be those at the higher end of the range.

When one considers the cost of getting to one of the remote areas, trip price may not be as important as the total cost. Considering air fare, ground transportation, pre and post trip meals and

lodging, it would cost an individual approximately \$550 round trip to Grand Canyon from Washington, D.C.

In terms of visitor attitudes towards their float trip experience, it is unquestionable that they perceive the float trip to be well worth the price and the effort. Data contained in the Shelby and Nielsen study of 1976 show that 90% of those surveyed view the trip as a wilderness experience. Again from the same study, 85% of those surveyed rated their trip as excellent or perfect, and 32% of those surveyed would have been willing to spend \$100 more if a higher price would have reduced the contact on the river with other groups. Of those who had floated the Canyon with whom we were able to speak, albeit a non-probability sample, all indicated that they would like to take the trip again. Most wanted to extend their stay in the Canyon on subsequent trips. Many were so enthusiastic about their experience that they wished to float other white water rivers. Again, while these responses are not the result of a random sampling process, given our exposure to scientifically designed studies (Shelby and Nielsen) and the opinions of NPS personnel, the responses seem accurate.

At the current prices (based on the latest data available at this writing, the 1975 season) eight concessioners exceeded their allotment of user days. In the 1974 season only 4 did; in the 1973 season, 6 did; in 1972, 5 did. In 1975 four concessioners exceeded their allotment by more than 100 user days.

This equals the three season total for 1972-1974. The most popular floating dates, the month of June are reserved quickly. Some individuals are not able to make float trip reservations which coincide with their vacation schedules. Hence, they must delay their trip until future years. Seventeen of the concessions either came within one trip of reaching their allotment or exceeded their allotment of user days. (A trip is defined as 15 individuals for 8 days or about the average.)

From 1972 through 1975 the mean average revenue per user day has increased from \$39.25 to \$52.60, or it has increased at a rate of 10.25% per year. From 1974 to 1975, however, the increase was 3.32%. The mean average cost per user day increased at an annual rate of 8.58% from 1972 through 1975. Increasing from \$37.25 to \$47.69. There was no increase in the mean average cost per user day from 1974 to 1975.

4.3.4 Discussion and Conclusions--Float trip consumers are receiving fair value for the rates changed. First, consider other float trips. The price charged for the trip through the Grand Canyon is not too different than that charged to float other rivers. However, one should note two possible reasons. Many of these same companies are providing those float trips used for comparison, and some are under NPS and USFS jurisdiction. Hence, there could be reasons other than comparable service for the similar per day charges.

Second, when the average daily rate of Grand Canyon National Park float trip concessioners is compared with that charged by other recreation oriented activities at destination recreation/resort areas, it compares very favorably. In fact the average per day rate for the float trips in GCNP is generally less than that of other activities elsewhere. The lowest priced float trip could be considered a bargain when compared against a simple stay in a motel or lodge. However, the fact that the average rates are less for the float trips still does not conclusively prove that passengers are getting their monies worth. It simply shows that relative to other activities which may or may not be viewed as the same by the potential float trip passenger, the rates are less.

The best evidence that the passengers are getting their monies worth comes indirectly from the customers themselves. It appears that there is an adequate assortment of different priced trips from which to choose. To the extent that price is related to trip duration and the extras or amenities offered, this means that a variety of individual expectations are being met. It is interesting to note that the lowest priced trip, as measured by average revenue per user day, sold only just over half of its allotment while the highest price trip used nearly 96% of its allotment. That is float trip passengers are able to choose from among several different products and

prices, and since "values" are individually and personally evaluated, there is a greater likelihood that they are being met than dictated when there is such diversity.

Another positive piece of evidence that the float trip customer is getting his or her monies worth is the apparent existence of a consumer surplus. Basically, consumer surplus means that some consumers would be willing to pay more for the float trip than they are charged. Evidence of this fact is demonstrated in the report by Shelby and Nielsen that 32% of the respondents surveyed were willing to pay \$100 more for a trip which made fewer contacts with other trips. That demand for higher priced trips appears greater than that for lower priced trips (again, average revenue per user day is equated with price), is further indication that there may be consumer surplus.

There may also be a problem of excess demand. Certainly, in some segments of the industry this is the case. One concessioner, for example, has exceeded its allotment in three of the last four years. More firms exceeded their allotment in 1975 than in the three previous years for which data were available. Some firms reported turning away many would be floaters for the more popular times in June, July, and August. Even those firms which did not use all their allotment did operate at near capacity or slightly over capacity during the peak months of the season. When more people seek to purchase a product than there are products available, one can reasonably conclude that consumers are

getting their monies worth. In fact, the price is probably too low. When prices are too low, the resource may be exploited, used too quickly, over used, and/or ruined if some alternative rationing means is not employed such as the current ceiling on use effected by the allotment to each concessioner and private users. This assumes that the ceilings on use are appropriately determined. However, the problem of choosing among those who desire a float trip is still a problem.

Having reviewed the data from secondary sources, the financial analyses of each concessioner and the NPS use data, one can reasonably conclude that there are several demand curves, one for each segment of the market. As such, it is reasonable to conclude that the interests of the consumer, the values each receives from the float trip experience, are best provided for by a flexible system which encourages and allows consumers to choose among a variety of differently priced alternatives.

Certainly, a float trip is not an inexpensive experience. Many must consider the expenditure in terms of what other products, services or savings they are willing to forgo. However, as a vacation experience, a float trip down the Colorado may be less expensive than a comparable amount of time spent driving on a highway and spending nights in a hotel. If one views the price of a float trip in terms of what an average family could afford to pay, then two important qualifications must be considered.

First, the average family probably does not seek the float trip or even the National Park experience. Second, the total cost of the trip including round trip travel and in route lodging expenses plus the price of the river trip is the true cost to the potential visitor. For a majority of those who would like to take a float trip but can't afford it, the reason may be the geographic location of the Grand Canyon not the price of the trip. A data base on demographic and attitudinal characteristics of float trip passengers and other park visitors over time would enable the NPS to determine if there are any major differences between the two groups of users caused by float trip price. Moreover, such a study would be of value in determining the effectiveness and equity of prices charged by a range of concession operations not just float trips.

Before, proceeding with a brief discussion concerning the issue of rate parameters, we should again review the purpose for the NPS interest in price and the role of price in a market system. Price allocates resources. As price increases, it is a signal to provide more of a resource. When providing more of a resource is impossible or disallowed (as is the case in GCNP for environmental reasons) the price must be allowed additional increases to encourage substitutes to be developed and sought. A reasonable price is one which does not exploit the consumer, the producer or the resource. Under the present system, consumers (commercial float trip passengers) continue to buy the

service, and they are pleased with it; Producers continue to supply the service, and their rewards are sizeable enough to encourage their continued operation; And, the NPS can meet its obligations to their legislative mandate and future generations through an allotment ceiling which effectively limits over use of the resource. However, when output (the number of user days) is limited, the possibility of excess profits for industry participants is increased. This is particularly true of industries characterized by large economies of scale. Left unchecked the industry evolves into a monopoly encouraged by the increasing economies of size. However, the firm is in a position of maximising profits by restricting output and increasing price. For this reason, industries characterized by constantly decreasing average-total-cost curves are generally regulated by commissions to encourage continued and expanded output at moderate prices vis-a-vis costs.

There are notable conditions upon which differences exist between the typical regulatory case and the situation on the Colorado River in GCNP. First, we have not found that there are substantial economies of scale among float trip concessions. To the contrary, there appears to be none, and we have concluded that management expertise influences absolute profitability more than size. Second, the evidence currently available suggests that demand is strong at the prices charged. Additionally, there is a wide range of available trips and prices

unlike the single producer case, eg. a public utility. Third, the restriction of output and limits on entry are imposed by the NPS not the result of conduct by the float trip companies. For several of the firms, price hasn't risen sufficiently to clear the market; hence, a first come first served rationing mechanism has evolved. Again, this is not characteristic of the regulated industry where the commission must set prices.

If the NPS were to establish rate parameters then some method would have to be contrived which evaluated industry characteristics for the purpose of recommending appropriate rate structures. The standard approach is to determine the required revenue based upon a firm's cost-of-service and rate base. The formula is as follows:

$$RR = CoS = O.E. + D + T + (I - A. D.) R$$

where RR = required revenue

CoS = cost of service

O. E. = operating expenses

D = current depreciation

T = taxes

I = investment

A. D. = accumulated depreciation

R = interest rate

There are two principal administrative problems with rate base (or cost based) models. First, considerable in depth audit

work must be performed to determine the relevance and authenticity of the expenses included in the operating expenses category. With only one firm in an industry (eg. a public utility regulated by a commission), several man years are committed each year to maintain a close watch on costs. The problem would be compounded in the GCNP setting with numerous concessions to consider. Given the current tight budgets for the NPS and the very poor reporting and record keeping performance of the float trip concessions, it is doubtful that such a system of providing the necessary information concerning rate parameters would provide benefits worth the costs. Second, the rate base, that part of the formula which specifies the undepreciated value of plant and equipment, $I - A \cdot D$, must be multiplied by an appropriate interest factor, R . To determine an appropriate R requires the financial analysis of firms with similar asset structures and risk characteristics coupled with an economic analysis of various capital markets. Again for a single firm industry, the problem is not nearly as complex as it would be for a multiple firm industry. The NPS would need more complete information from each concessioner concerning its source and application of funds for each asset. Consistent standards for equipment and its depreciation would have to be developed. Current interest rates charged for various sources of working capital; long term debt, short term debt, common and preferred stock; would have to be determined and

monitored. And, a weighted average cost of capital calculated and applied to each concessioner.

We believe the result of establishing rate parameters at this time would encourage firms to meet as an industry and submit for approval prospective rates within parameter guidelines. However, the result of rate parameters and the subsequent process would substantially reduce the existing trip and price diversity. To the extent that our analysis is correct concerning several diverse market segments, the result of rate parameters at this time would substantially reduce the values passengers receive for the price they pay for the trip.

In the future if prices dove-tail, that is average revenue per day and total cost per day are almost equal among all concessioners, then one of two options will be appropriate for the NPS. If consumer expectations have changed and have become more homogeneous, the NPS could effectively establish rate parameters to guide pricing decisions of concessioners without diminishing the value received by passengers and perhaps even increasing value received. However, if consumer expectations remain heterogeneous, and prices become the same, the NPS will be faced with choice of encouraging less diversity and lower value with a rate parameter system or encouraging more diversity among concessioners by aggressively promoting competition among concessions by focusing on types of service rather than prices.

In summary, we have addressed the issue of price vis-a-vis value using the most relevant and available secondary sources of data. Primary data collection was not a significant part of this analysis due to OMB questionnaire and data collection restrictions and the budget constraints of this project. The current condition was analyzed consistent with P.L. 89-249 and traditional economic theory. We have found and concluded that there is a wide diversity of trips, multiple market segments, reasonable price increases over time, a sizeable range in available prices, prices favorably comparable to those found in other recreation markets, excess demand and consumer surplus. All this leads us to believe that consumers are indeed receiving their monies worth. Setting rate parameters is a costly procedure requiring expertise and information not currently available to the NPS. The establishment of rate parameters given the current structure and conduct of the float trip industry in GCNP is not considered to be worth the cost and could lessen the values received by float trip passengers.

4.4 HOW DO PROFIT/LOSS FIGURES EFFECT TRIP QUALITY?

4.4.1 Purpose--The NPS is constantly reminded by the excellence and beauty of the natural surrounding that the concession operations must match the beauty of the environment or at least not detract from the natural setting. A physical structure may be located in an area with low visual impact or improved by appropriate design or landscaping. But, the Grand Canyon float trips provide a more difficult problem. There are no permanent physical structures, and as the data indicate the capital costs are not as significant as the labor and service costs. Hence, trip quality is not measured as easily as the visual impact or maintenance quality of a concessioner's building. Nevertheless, policies of the NPS may affect the profit or loss position of a concessioner which in turn may affect the quality of a given float trip. Additionally, the concessioner's ability to earn a reasonable profit is mandated by P.L. 89-249. Presumably, the policy protects the concessioner but also encourages an appropriate investment in equipment and facilities to provide a quality service. Hence, answering the question, "are profits related to quality of service," is an important task prior to establishing a regulatory policy.

4.4.2 Techniques and Methodology--The analysis of trip quality and profits presented a frustrating experience. The approach was to

rank firms by profitability and then compare information from secondary and published sources to determine whether there is a significant relationship between trip quality and the level of profits. Both absolute profits and profit percentage were to be evaluated using regression and correlation techniques.

Unfortunately, the data collected by Shelby and Nielsen suffered from two major problems and no substitute data were available. The Shelby and Nielsen data tabulated responses on a variety of perceptions, demographics and attitudes. But, in all the data collected by Shelby and Nielsen, none is keyed to specific concessions. Also, none of their data collection techniques measured "quality." In fact a reading of their complete four part report and summary leaves the reader with the impression that they and nearly everyone else assume that a commercial or private float trip is a valuable rewarding high quality experience.

The other major problem is essentially the difference between sociological and demand oriented or marketing research studies. The standard sociological study tabulates aggregate data usually on a nominal scale amenable to treatment by tabulation and frequencies. The demand oriented study attempts to use interval level scales so that a higher order of measure may be applied. The focus of the demand oriented study is what causes the difference in consumption habits among consumers and in particular how price is related to the measured differences.

Since OMB requirements limit the number of respondents one can survey on like items and since primary data collection was specifically excluded from the research project., the researchers had to rely on observation and unsought opinion as to the "best quality" float trips. It was hoped that nonparametric techniques could be used to test the hypothesis that the ranking of trips by "quality" is not related to the ranking of trips by amount of profit or profit percentage.

Finally, a study of visitor satisfaction and trip quality on the Snake River was reviewed. While it would not be appropriate to infer that the relationships would hold in the GCNP without further data collection and subsequent verification, the Warder and Jubenville study; "Perceptions and Management Preferences of Users as a Result of the Commercial Floating Experience on the Snake River Within Grand Teton National Park, 1975;" does provide a measure of "quality" while addressing visitor satisfaction.

4.4.3 Findings and Data--Eighteen of the twenty-one concessioners earned a profit in 1975. In absolute terms the profits ranged from \$5,220 to \$132,391. (The \$132,391 figure was in 1974. The highest 1975 figure was \$56,624.) As a percent of sale profit ranged from 4.6% to 24.7%. Another way of measuring profit is as a ratio to user days, i.e. profit per user day. Concessions were ranked on each of

the above profit measures and on allocation. There is some similarity between rank on allocation and rank on net profit after tax. However, only four firms were ranked on profits at the same level as they were on allocation. Ten firms ranked higher on profits than their rank on allotment, and seven firms ranked lower on profits than their rank on allotment. * * *

It is indeed unfortunate that data were not collected concerning user satisfaction and scaled and keyed to specific float trip concessions. Such data would have allowed a reasonable test of the hypothesis that there is no relationship between profit level and user satisfaction.

Instead we were forced to rely on informally collected and volunteered data on individual's perceptions of what constituted high and low quality trips. Most respondents were familiar with commercial float trips: park service personnel in GCNP and GTNP, float trip guides, other researchers and a couple of former passengers. Unfortunately, it was not a probability sample nor was there any substantial difference in the opinions. Everyone indicated a bias in favor of the oar trips. This was not surprising

given the Shelby-Nielsen data. Grand Canyon Dorries was most often mentioned as a quality trip. Most individuals indicated that Grand Canyon Expeditions offered a high quality trip. ARTA was also considered to offer a high quality trip. Less often mentioned than the above was the fact that Georgie's Royal River Rats provided a unique trip. Some individuals offered elaboration in support of their opinions. Grand Canyon Expeditions makes an unusual effort to provide a river experience which is informative; perhaps passengers form a more lasting impression due to an increased awareness and appreciation for the Canyon than would otherwise be the case if sheer excitement is stressed. ARTA provides a wide variety of trips as is evidenced by duration, price, boat type, party size and off river activities. Georgie is a mystery. Several indicated they would like to take her trip because they thought that it would be an "unusual experience."

Because the sample size was so small, non-probability based and little difference of opinion was noted (some trips were considered average; none was called poor quality), one can find very little evidence to suggest that trip quality is related to profit levels. However, those firms considered high quality were all profitable but then only a small percentage of the industry is unprofitable. * * *

The Warder and Jubenville study (1975) may provide some insight concerning visitor satisfaction and the general assumption that float trips are generally high quality and that to suggest otherwise given the Canyon environment is a form of heresy. Using a 9 point semantic differential scale they measured visitor satisfaction. 37.7% of the 509 surveyed rated the trip a 9, the highest level of satisfaction. 80.7% rated the trip either 7, 8, or 9. In other words, satisfaction ran high. Only four percent rated the trip below "moderately satisfied." The authors also sought to measure the underlying causes of visitor satisfaction. 26.9 percent rated the scenery as the most significant aspect; 26.3 percent viewing wildlife; and 15.9 percent the narration by the guide. Negative reactions to the river trip centered around crowding at embarkation and debarkation points, seeing other boats on the river, trip too short, too few "animals," too many insects and other passengers. However, only 50% of the respondents listed anything as least enjoyable. Of all the "favorable" variables only relaxation and listening to the guide had significant "t" statistics when included in a regression equation with visitor satisfaction. Listening to the guide determined the largest amount of variance.

4.4.4 Discussion and Conclusions--Secondary data sources are insufficient for structuring any conclusive test of the hypothesis that trip quality is related to profitability. However, after many hours of trying to measure profitability and trip quality, we feel

confident, if only slightly so, in reaching some conclusions from available data.

First, it would be difficult to prove a cause and effect relationship between profitability and trip quality. The relationship is probably recursive. That is while trip quality is influencing profitability, profitability is influencing trip quality. Given the very low levels of advertising (see section 4.10), the trip must be sought out. These conditions usually mean that word of mouth is an important form of promotion. Trip quality, therefore, is an important prerequisite to generating selective (firm oriented) demand. It therefore affects marginal revenue which is an important component of price. Price times quantity demanded generates revenues which in turn help provide services, etc. which influences trip quality.

Second, people are extremely satisfied with their river trip which could be interpreted to mean that trip quality is high. It would be interesting to measure dissonance. This is after the purchase of a river trip to what extent do passengers wish they had spent their money elsewhere, and how do people seek to justify their purchase of the float trip? This could provide further evidence of the relationship between trip quality and operating characteristics of the firm.

Third, what constitutes trip quality is a personal decision made by float trip passengers not some generally applied and easily measured criteria imposed on the industry. While it is intuitively

obvious, albeit difficult to measure, after some acceptable level of profits are reached trip quality is more a function of management commitment and the training and personality of the guides. Just as we found that there were no economies of scale and concluded that management expertise influenced profitability more than company size management expertise and other factors are probably more important than profits in determining trip quality.

Fourth, we wish to emphasize that in reporting opinions of others concerning the best quality float trips, we are not suggesting that the report has any experimental validity. If the results agree with the readers perceptions then perhaps the readers opinions were among those reported. However, if a reader's favorite trip was not mentioned perhaps it would have been if the sample had been statistically designed and managed. We do believe that in a general way trip quality is related to concessions with a average profit level and higher.

Fifth, rather than a conclusion we feel one important prediction involves the influence of trips run by GCNP concessioners on other rivers and other business activities of GCNP concessioners. If other float trip markets are only marginally profitable or investment in activities other than floating decline in value, we would expect concessioners to use their protected market position in GCNP to generate

profits with which to offset losses elsewhere. While we generally believe profits and trip quality are generally associated with each other, very high levels of profits may be indicative of cost cutting, not replacing investment, low wages and slightly inflated prices in an effort to offset other losses. * * *

The NPS may want to monitor outside business activities of concessioners as these activities could affect trip quality.

4.5 CONCESSIONER PERFORMANCE AT VARIOUS USE LEVELS

4.5.1 Purpose--In this section the economic performance of GCNP river concessioners is analyzed in terms of passenger day allotments. If performance is associated with allotments, then allotment awards must be carefully controlled because of their impact on long run viability. Likewise if allotment is not associated with performance then the allotment figures become less critical.

4.5.2 Method and Techniques--Data were collected from concessioner financial statements and the summary tables developed in Section 4.1. The performance variables selected for analysis are (1) average return on equity, (2) average return on assets, and (3) average profit as a percent of sales. Return on equity measures the return earned for each dollar of stockholder investment. The return on asset (or alternatively return on investment) measures profitability per dollar of asset investment. The statistic shows the relative return on all assets. Finally, profit as a percent of sales indicates the percent of profit found (on the average) for every dollar of revenue generated. This last measure is most easily compared among concessioners. The earlier measures are inconsistent among some operations because of (1) various accounting levels of fixed assets (due to age difference), (2) sharply changing equity positions resulting from low relative net worth levels of many concessioners, (3) the difficulty of measuring equity in sole proprietorship, and (4) implicate profit paid as

officers' salaries to avoid double taxation. Also, please note that only these firms earning positive profits are included in the analysis.

The use levels were divided into three categories (1) concessioners with over 6,700 passenger day allotment, (2) concessioners with between 2,200 and 3,780 passenger day allocation, and (3) concessioners with less than 2,000 passenger day allotment. The groups include 6, 7, and 8 concessioners respectively. Also, average profitability figures are shown for all concessioners operating in GCNP.

4.5.3 Data and Findings--The data are presented in the following four tables:

Table 4.5-1 Average Profitability of Grand Canyon Concessioners 1972-1975.

Table 4.5-2 Profitability Measures for Concessioners with Less than a 2,000 Passenger Day Allocation 1972-1975.

Table 4.5-3 Profitability Measures for Concessioners with 2,200 to 3,780 Passenger Day Allocations 1972-1975.

Table 4.5-4 Profitability Measures for Concessioners with Over 6,700 Passenger Day Allocations 1972-1975.

In addition each table includes a list of concessioners included in the categories. The number of financial reports and those with operating losses are noted for each year. Minus figures were not included.

Three important findings can be identified from reviewing these four tables. First, the source of aggregate variation (in terms of mean values) from year to year for all concessions appears to vary among the subclassifications. For example in 1972 average return on equity for the middle grouping was 79.9%, for the large operators it was 21.0% the overall value was 51.0%. In this instance the medium and smaller operations determined the higher mean value. In 1975 the average return on equity was 51.8% for the large concessioners and 20.9% for the medium operators. The overall mean was 28.1 as shown in Table 4.5-1. The higher source for the mean had changed. Such changes can be attributed to substantial variations among the subcategories for each of the various years. Such shifts should encourage close monitoring for any subcategory in a year that is significantly different from the industry means as an approach for reviewing financial stability and management performance.

Second, the trend on most profitability measures for all the groupings has been downward over the four year period. It is not true for the largest concessioners that recovered from poor operating performance levels in 1972 through 1975. However, in certain measures of profitability this trend is not consistent or dramatic. The real interpretation is the lack of firms in the aggregate to dramatically improve their profit position.

The third result centers on profitability among various allocations groupings. With respect to the percentage measures,

Table 4.5-1

AVERAGE PROFITABILITY OF GRAND CANYON CONCESSIONERS
1972-1975

	<u>1975</u>	<u>1974</u>	<u>1973</u>	<u>1972</u>
No. of Finan. Reports	15	20	19	16
No. with Positive Profits	12	16	18	9
Avg. Return on Equity	28.1	26.0	* 62.5	51.0
Std. Dev.	13.1	22.1	114.5	43.0
Avg. Return on Assets	19.2	20.1	17.9	22.5
Std. Dev.	12.2	15.0	14.3	15.6
Avg. Profit As A % of Sales	10.3	10.0	9.0	11.7
Std. Dev.	4.6	7.2	7.8	8.8
			* 29.6	
			12.1	
			Without Out-Lier	

Source: Concessioner Financial Statement

Table 4.5-2

PROFITABILITY MEASURES FOR CONCESSIONERS WITH LESS THAN A
2,000 PASSENGER DAY ALLOCATION 1972-1975*

	<u>1975</u>	<u>1974</u>	<u>1973</u>	<u>1972</u>
No. Finan. Reports	5	7	6	6
No. Reporting Loss	1	3	1	2
1. Avg. Return on Equity	34.8	38.4	37.8	64.1
Std. Dev.	18.1	26.4	25.2	66.0
2. Avg. Return on Assets	24.2	21.2	21.3	24.1
Std. Dev.	17.6	20.7	13.4	19.9
3. Avg Profit As A % of Sales	12.1	14.9	13.7	16.4
Std. Dev.	8.5	10.8	10.9	10.3

*Includes

1. Moki Mac
2. Georgie River Rats
3. Colorado River Ex.
4. Harris
5. Wonderland
6. O.A.R.S.
7. Outdoors
8. Grand Canyon Youth

Source: Concessioner Financial Statements

Table 4.5-3

PROFITABILITY MEASURES FOR CONCESSIONERS WITH 2,200 TO
3,780 PASSENGER DAY ALLOCATIONS 1972-1975*

	<u>1975</u>	<u>1974</u>	<u>1973</u>	<u>1972</u>
No. Finan. Reports	5	6	6	5
No. Reporting Loss	0	0	0	3
1. Avg. Return on Equity Std. Dev.	20.9 13.3	22.4 20.4	29.0 17.3	79.9 30.3
2. Avg. return on Assets Std. Dev.	13.9 9.2	18.4 16.2	24.0 21.6	35.6 2.3
3. Avg. Profit As A % of Sales Std. Dev.	9.0 2.8	6.5 3.9	7.3 5.8	13.5 1.8

*Includes

1. White Water
2. Tour West
3. Canyoneers
4. Grand Canyon Dories
5. Arizona River Runners
6. Fort Lee
7. Wilderness World

Source: Concessioner Financial Statements

Table 4.5-4

PROFITABILITY MEASURES FOR CONCESSIONERS WITH OVER
6,700 PASSENGER DAY ALLOCATION 1972-1975*

	<u>1975</u>	<u>1974</u>	<u>1973</u>	<u>1972</u>
No. of Finan. Reports	5	5	6	6
No. Reporting Loss	1	0	0	3
1. Avg. Return on Equity Std. Dev.	51.8 50.4	38.8 23.3	21.9 6.8	21. 5.
2. Avg. Return on Assets Std. Dev.	20.1 8.9	21.3 11.2	11.6 1.1	11. 2.
3. Avg. Profit As A % of Sales Std. Dev.	9.3 1.4	11.4 6.3	6.1 3.7	4. 2.

*Includes

1. Western River
2. Sanderson
3. Hatch
4. ARTA
5. Grand Canyon Expeditions
6. Cross Tours

Source: Concessioner Financial Statement

the groups don't deviate significantly (for most years) from the industry average. There is an important difference if we consider the standard deviations on each table. From the standard deviation to mean values we obtain the statistic called the coefficient of variation (v). That is $v = s/\text{mean value}$. The smaller the coefficient of variation, the smaller the distribution of values and generally the lower the risk of realizing the mean values.¹

When comparing the coefficient of variation, the values are smaller the larger the allocation category. Thus, there appears to be more risk in achieving the average return values the smaller the allotment categories. When compared with (1) the industry average, and (2) larger allotments, the smaller firms exhibit less relative stability of earning power than larger concessions. This probably follows from the result that small absolute changes for small concessioners (perhaps part of one trip) can dramatically affect real performance. Larger firms with more trip flexibility and more offerings can minimize this risk of doing business. Certainly, such business risk is central in evaluating the risk category of a firm. In this instance, the smaller firms are riskier when measured by these three profit measures.

4.5.4 Discussion and Conclusion--The major conclusion reached in this analysis is that smaller concessions are relatively more risky than large concessions. The fact that size of operation is largely influenced by the government award of allotments should be considered

¹see J. Weston and E. Brigham, Managerial Finance 5th edition (Hinsdale, Ill.: The Dryden Press, 1975) p. 316.

closely by GCNP in (1) reviewing concession performance and (2) determining policies towards future concession permit awards. GCNP could equalize the impact of risk caused by arbitrary allotments made by GCNP. This would also reduce the absolute level of profits made by large allotment concessioners if there were a gradual transfer to smaller concessioners. Profit as a percentage of sales would not be affected in a major way for either large or small concessioners as consequence of such a charge.

4.6 PERFORMANCE LEVELS BY FIRM TYPE

4.6.1 Purpose--The NPS management is currently considering the impact of "permitting" more oar trips on the Colorado River. Economic viability of concessioners operating on an oar only basis is of central concern to the GCNP. Thus, in this section we review the performance of oar, motor and combination type concessioners over the past four year period. We must caution that these performance results were measured for a given allotment to oar only concessioners. Drastic changes in allotment among types of trips might affect significantly the results.

4.6.2 Methodology and Techniques--The source of data included concessioner financial statements and GCNP records. The performance measures calculated include (1) average return on equity, (2) average return on assets, and (3) average profit as a percent of sales. The interpretation and calculation of these measures are detailed in section 4.5.2. From these data, tables were compiled for (1) oar only, and (2) oar and combination concessioners.

4.6.3 Data-Findings--The data are presented in the following two tables:

Table 4.6-1 Profitability of Oar and Combination Concessioners
in Grand Canyon 1972-1975.

Table 4.6-2 Profitability of Oar Only Concessioners in Grand Canyon 1972-1975.

Each table also includes a reporting of the number of financial returns and number of firms reporting a loss. These tables are also compared with overall industry results shown on Table 4.5-1, Average Profitability of Grand Canyon Concessions 1972-1975.

A comparison of oar and combination trips with the industry averages shows little variation. Oar and combination trips appear to have fewer operators in relative terms suffering an operating loss. Also, the coefficient of variation for the oar and combination trips is similar to that of the entire industry. The only discernible trend is that in 1975 and 1974 the oar and combination trips had averages slightly below the industry average. This variation, however, was not substantial.

Oar only concessioners, includes only two operations: Grand Canyon Dories and O.A.R.S. Both operators are relatively small operations. These two firms when averaged have results that are below industry averages. However, neither firms have reported an operating loss. Since only two firms are involved in the table no standard deviations are calculated. Hence, the coefficient of variation is not available. The only clear result from the analysis is the existing oar operations have returns slightly below the industry average.

4.6.4 Discussion and Conclusions--The results of the oar only analysis is that it includes only two concessions who have smaller allotments. Thus, it is difficult to say whether the lower results are a function of the type of trip or their relative size. The initial results clearly suggest that the type of trip may be associated with profitability. A definitive answer is likely to require some type of case study approach.

4.7 WHAT IS THE TYPE OF CLIENTELE NOW? WOULD A CHANGE TO ALL OARS AFFECT THIS?

4.7.1 Purpose--The NPS is motivated by an interest to maintain reasonable access to areas of natural beauty and scientific interest. The key issue it seems is what constitutes reasonable access given the equally important objectives of protecting and preserving the natural environment. As the river trips gradually became popular, the issue of reasonable access was resolved, more or less, by custom. A kind of "squatter's rights" accrued to that group which is characterized by socio-economic and attitudinal parameters consistent with those passengers who made the trip popular. Now the popularity of river trips threatens to damage the environment of the Canyon. One suggestion has been to eliminate motors and allow only oar powered trips in GCNP. The issue, therefore, is the tradeoff between environmental protection and public access. The issue is a problem because both sides of the tradeoff are difficult to measure. The purpose here is to determine whether or not there will be a substantial change in the access to the Grand Canyon River trips if an all oar policy is adopted.

4.7.2 Methodology and Techniques--Three sources of data were required for this analysis. First, we sought to determine the effect of an all oar policy elsewhere. Our best data and the best source of sociological comparative data was reported for the

Snake River in GTNP. Data from the Warder and Jubenville (1975) and the Parent and Robeson (1976) studies were evaluated and similarities and dissimilarities between the GTNP and GCNP situations examined.

Second, the Nielsen and Shelby study in the Grand Canyon was our source of data concerning demographic characteristics of Colorado River users. It is, of course, important to determine the significance of the difference between oar and motor trip passengers to the extent that any difference exists. We then compared the user profiles developed by the two sociological studies.

Third, we have stratified the river trip industry into three groups: motor trips, oar and combination trips, and oar trips. An analysis of the performance of each of these over time could reveal trends in the utilization rates of each concession type. This would provide reason for drawing conclusions concerning the trip type, clientele and how alternative policies might affect the river user and concessioner.

4.7.3 Data and Findings--The float trip industry in GTNP has one major similarity to the industry in GCNP. The total number of user days on the 25 mile section of Snake River in GTNP attracts approximately 80,000 user days during the season...a number similar to the number of user days in GCNP. However, there are some

important differences. Each user day in GTNP represents a person as the trips are less than one day in duration. All the trips in GTNP are oar only trips.

The Warder and Jubenville study reports many of the same attitudes and perceptions measured by Nielsen and Shelby. Passengers on the Snake used words such as wilderness, solitude, scenic, and relaxing to define their river experience. While adjectives weren't used to evaluate the experience, 80% of the respondents ranked their experience at the high end of the scale. Demographic characteristics of float trip passengers were also collected as control variables. Incomes were above average, a mean over \$20,000 per year. Most had completed some college education. 27% had credit beyond a B.A. degree. Many were professional people. The trip attracted family groups. The average age of the float trip passengers was in the low 30's. Most passengers came from the Southwest, 18%. And, lived in population centers between 25,000 and 1 million people, 30%.

The Nielsen and Shelby study found very little demographic difference between the oar trip user and the motor trip passenger. In fact on this basis they concluded that a shift to an all oars policy would not eliminate any significant portion of the population currently being served by the motor trips. On the basis of attitudes the Nielsen and Shelby study found some differences between the oar and motor trip passengers. The oar trip passengers'

sensitivity to crowding and motor noise was greater than that of the motor trip passenger. Consequently, it is not surprising that their preference for uncrowded conditions and quiet was also found to be higher. One question still remains. When were these attitudes formed?

We also examined the financial reports of GCNP concessioners to evaluate the change in user days over time for the various concessioners by trip type. The oar trip concessioners show a dramatic increase in the percentage of allocation used. The oar type trip use all their user days allotted and then some. This wasn't always the case. In three years Wilderness World has increased from 721 user days to 2,668 user days. In fact the increase in oar trip user days is similar to the increase in request for non-commercial river running permits.

4.7.4 Discussion and Conclusions--An interesting comparison exists between the findings in GTNP and GCNP between user profiles. We might expect differences between the two user profiles given the single day duration GTNP trips, the complete use of oar power, a different geographical location, the substantially different absolute cost of the trip, differences in policies affecting the allocation of commercial and non-commercial float trips, the difference in water characteristics, and the close availability of substitutes. But, the visitor profiles for age, income, education, occupation and hometown are nearly

identical. The similarity of attitudes between the two groups indicate that they view the river trip with similar expectations. There may be slightly closer attitude match between the oar trip passengers. This indicates that the attitudes may be shaped by the trip characteristics not a difference between groups before the trip. That is, "motors cause noise. There's a motor on our raft. Hence, excessive noise is that above the noise of a motor." Contrast this to those on the oar trips. Since there is no motor noise, motor noise becomes offensive when it is heard. The passengers in GTNP were never exposed to motor noise from boats; however, within a mile of the launch landing sites road noises can be heard. The GTNP passengers felt the highway noise was excessive.

The issue of change in clientele is partially answered by the sociological data collected in GTNP and GCNP. Shelby and Nielson report a sizeable percentage of motor trip passengers would like to take their next trip by oar and would also like to spend more time in the Canyon. All the passengers on the Snake (rode) rowed in oar trips. They did not differ in user characteristics from those on motor trips in GCNP. This means that the NPS visitor is being determined before a float trip is considered. Policies which affect river trips may not affect the general population at all given the impact already caused by the costs of getting to and the interests in the national park system. Since

both oar and motor passengers are apparently drawn from the same population, it does not appear that a shift in policy to oars only would affect clientele.

However, this assumes a static situation, that is no change in preference among visitors. There may be a change occurring. Shelby and Nielsen report that the attitudes of those taking an oar trip match those individuals who are taking a non-commercial trip. A shift in population attitudes may be causing the rapid growth of the oar concessions. This observation leads to some interesting speculation. Perhaps fewer non-commercial permits would have to be denied if there were more and a larger variety of oar trips. Perhaps the increase in non-commercial applications most of which are for oar powered trips, reflect a changing attitude among the population, and the motor trips are able to continue in the face of such changing preference because of a protected market position. Again the above isn't a conclusion; It's speculation. However, the trends and data seem to support it.

4.8 WHAT ARE THE TYPICAL CAPITAL EXPENDITURES BOTH CURRENT AND FUTURE?

4.8.1 Purpose--It is logical to assume that capital expenditures are a significant cause of various prices charged by concessioners. If capital expenditures are affected by NPS policies there may be an impact on prices and profitability for concessioners. Therefore, in this section we seek to identify the different measures of capital expenditures and reach some defensible conclusions regarding future trends.

4.8.2 Methodology and Techniques--An important source of data for this analysis is reported in section 4.2. The multi-variate analysis of economies of scale and profitability provides insight into the effect of investment on operating expenses and profit considering other factors as well. Additionally, the un-depreciated price of assets were tabulated from the concessioner financial statements. These values were then divided by user days to develop a ratio of assets per user day. This figure enables a comparison of the range of investment for each concessioner on a common base. Averages for different types of concessioners were calculated and are present along with ranges in section 4.8.3. Finally, the extent to which each concessioner has depreciated its assets is determined. This figure enables the researcher to estimate the remaining life in years for each concessions assets; an important

recommendation if a change in asset structure for the industry becomes a mandated policy of GCNP.

4.8.3 Data and Findings--A tabulation of the undepreciated price of assets and the ratio of assets to user days reveals a wide range of asset prices. Concessioners with similar user days allotments have widely varying capital expenditures. * * *

The differences among firms when measured on the basis of assets to user days are equally impressive. The range is from \$1.62 to \$117.57. Seemingly impossible is the fact that both concessioners, at each end of the range, are profitable. The regression analysis of section 4.2 is useful in understanding the apparent insensitivity of profit rates to capital expenditures as measured by the undepreciated price of assets. The regression equations did not find a significant relationship between profitability and fixed costs (largely determined by capital expenditures). However, the equation did show some relationship between the method of financing capital expenditures and average costs and to a lesser extent profits. When firms must debt finance rather than self-finance, costs are higher and profits are lower.

However, these results are not too meaningful as again the range among all trips and concessions is so much larger than the difference between the averages. Certainly, the outliers are influencing the results.

Future capital expenditure patterns will probably follow current patterns. Any shift in capital expenditure patterns will occur slowly as most firms affect no more than 1/6th of the investment in any given year. Hence, changes at the margin are softened by the size of the total. Probably the assets to user day ratio suggests the management philosophy for each concessioner regarding capital expenditures. The diversity of extremes of expenditures is both important and good for the industry.

If GCNP decides to limit motor use of the river, the economic impact on existing concessioner and on price can be mitigated if this is done gradually. A three year period would allow most concessions to fully depreciate their remaining investment and would allow a gradual conversion to oars. However, the time limit could be much shorter than three years depending upon the firms' ability to sell equipment at an average book value price. That is, a loss on some partially depreciated assets could be offset by a gain on the sales of some fully depreciated assets. It is conceivable that some motor concessions could retool for oar trips within six months and show no economic hardship in so doing...perhaps even profit.

4.9 WHAT ARE THE PROJECTED EQUIPMENT AND PERSONNEL COSTS AT VARIOUS ALLOTMENT LEVELS?

4.9.1 Purpose--As a consequence of environmental and sociological studies GCNP could raise or lower the total number of user days allowed on the river. This could change the size of companies and their operating characteristics sufficiently enough to affect the price at which concessioners offer their services. Therefore, the NPS wishes to evaluate certain costs which they perceive to influence the performance of the concessioner at alternative use levels.

4.9.2 Methodology and Techniques--The analysis of performance at varying use levels is found in sections 4.2 and 4.5. The results of this analysis is based upon the data and financial ratios reported in section 4.1. Regression techniques and financial ratio analysis were used to project the relationship between costs and profitability. The performance issue was addressed on an aggregate basis for the firms on the basis of small, medium and large firms. If we assume that these past relationships will continue, then to project costs we merely need to know the rate of inflation for the various costs in future years. For our purposes here we will examine particular cost ratios from sections 4.1, 4.2, and 4.5 at different allotment levels.

4.9.3 Data and Findings--The size of the firm (in allotment)

is somewhat related to the investment in assets. The average investment in plant and equipment for the less than 2,00 passenger day firms (see Table 4.5-2) is \$44,041. The range is between \$2,013 and \$110,490. The average investment for the medium sized firms (see Table 4.5-3) is \$174,295 with a range between \$42,836 to \$444,421. The average for the large allotment firms (see Table 4.5-4) is \$217,307 with a range of \$15,003 to \$604,567.

Personnel costs show similar variability. The smaller concessions (again under 2,000 allotments) have an average personnel expense of \$20,278 with a range between \$3,024 and \$36,995. The medium sized firms (2,200 through 3,780 allocations) have an average cost of \$115,439 with a range of \$54,00 to \$132,703. The large allocation concessions (over 6,700 user day allocations) have an average salary expense of \$125,786 with a range of \$37,593 to \$200,568.

4.9.4 Discussion and Conclusions--There is too much variance among concessions to project costs for equipment and salaries at various allotments. One can conclude that at higher allotments there are higher costs, but as has been demonstrated in section 4.2, there are no changing rates of expenses at different levels of production. Some of the variance is due to differences in accounting methods. This is particularly true of salaries. Some of the variability of the equipment category may be a result of management decisions to lease rather than buy. The diversity is probably a healthy sign that the industry is responding to different expectations of consumers.

4.10 HOW MUCH AND WHAT TYPE OF ADVERTISING IS USED OR NEEDED BY THE CONCESSIONER?

4.10.1 Purpose--It is perhaps a fair observation that many people harbor a basic mistrust of advertising. Certainly, where a firm has a protected market position, it is a legitimate question whether that firm must inform potential customers of the availability of its services. In this case the NPS and GCNP in particular are directed by P.L. 89-249 to take an active interest in the advertising by concessions. For example, does over-advertising cause greater demand for and more impact upon the river resource? But, a question of potentially greater interest is; what would happen to advertising if GCNP further limited user days, implemented a lottery system, or mandated a change to oars? Hence, there are several more questions to be answered than "how much and what type."

4.10.2 Methodology and Techniques--The approach in this section evaluates advertising quantitatively and qualitatively. First, advertising as a percent of sales is analyzed. An industry average and range is calculated. Second, information about each concessioner is tabulated along with their allotments and allotments used. (We originally thought that the type of information would be related to allotments and user days; however, this was not the case. The allotment data are left in the table for information purposes.) A review of the information in the concessioner brochures

has been conducted from the point of view of readability, completeness and comparability among concessions.

4.10.3 Data and Findings--Advertising as a percent of sales averages 3.03 percent for the 17 firms reporting advertising expenditures over the last four years. However, this figure might substantially overstate the average expenditure. The 17 firms did not all report expenditures in 1975. If the only year for which data were reported was 1972, then 1972 is included. It might be more appropriate to interpret the 3.03% as a figure representative of advertising if and when firms advertise. In 1975 the average advertising expenditure was .8% for the industry. That is, some of the firms did not advertise in 1975. There has been a decline in advertising since 1972. However, the number of observations is too small and inconsistent to draw very significant conclusions from the data.

Table 4.10-1 provides a tabulation from the most recently available brochures. Some judgments are made. For example brochure quality and target market. Brochure quality refers to the art and information content of the brochures. Most brochures outlined the items of direct importance, launch and landing sites, duration of trips, and trip type. However, it is interesting to note the lack of consistent provision of other information. In particular price and transportation costs are not consistently reported. It is

Table 4.10-1

Summary of Advertising Information
Provided in Trip Brochures

	American River Touring Assoc.	Arizona River Runners, Inc.	Canyoneers, Inc.	* Colorado River Expeditions, Inc.
LAUNCH SITE	L.F. P.	L.F.	L.F.	
LANDING SITE	P. L.M.	D.C.	D.C. L.M.	
LENGTH (DAYS)	5 8 9 12 16	8	7 10	
TRIP TYPE	O M C	M	M	
BOAT TYPE	NA	BB	NA	
TRANSPORTATION	N.I. C.S.	Inc.	Inc.	
OTHER FLOATS/NUM.	Yes/30	No	No	
BEACH ITEMS	Rent	Inc.	N.I.	
SIZE OF PARTY	M-17 0-10	NA	NA	
BROCHURE QUALITY	Average	Low	Low	
TARGET MARKET	Wilderness	N.A.	N.A.	
ALLOTMENT	9,240	2,600	3,360	1,800
ALLOTMENT (USED)	(8,148)	(2,694)	(3,190)	(1,821)
PRICE	5-295-0 8-420-0 8-435-M 9-460-C 12-490-0 16-640-0	8-410-M	7-450-M 7-410-M 10-550-M	
DISCOUNTS	20%-child 10%-group	10%-youth 10%-group	10%-child seasonal discounts	

* No brochure available

NA = Not available

Table 4.10-1, Continued

	Cross Tours Expeditions, Inc.	Fort Lee Company	Georgie's Royal River Rats
LAUNCH SITE	L.F. P.	L.F.	L.F. Whit.
LANDING SITE	P. L.M.	D.C.	Whit. L.M.
LENGTH (DAYS)	3 5 8	8	5 6 10
TRIP TYPE	M	M	M
BOAT TYPE	BB	BB	BB/S.R.
TRANSPORTATION	N.I.	Inc.	Inc.
OTHER FLOATS/NUM.	No	Yes/1	Yes/1
BEACH ITEMS	Inc.	Inc.	N.I.
SIZE OF PARTY	NA	M-12 20-30 total	NA
BROCHURE QUALITY	Low	Average	Average
TARGET MARKET	N.A.	N.A.	Blue Collar
ALLOTMENT	6,720	2,200	2,000
ALLOTMENT (USED)	(4,372)	(2,020)	(1,988)
PRICE	3-190-M 5-260-M 8-375-M	8-595-M	5-125-M 6-225-M 10-350-M
DISCOUNTS	10%-second person group plan available	10%-group	None

NA = Not available

Table 4.10-1, Continued

	Grand Canyon Dories, Inc.	Grand Canyon Expeditions, Inc.	Grand Canyon Youth Expeditions
LAUNCH SITE	L.F.	L.F.	L.F.
LANDING SITE	P.F.	L.M.	D.C.
LENGTH (DAYS)	18	9	12 18
TRIP TYPE	0	M	0
BOAT TYPE	Dorie	BB	NA
TRANSPORTATION	Inc.	Inc.	Inc.
OTHER FLOATS/NUM.	Yes/5	No	No
BEACH ITEMS	Rent	Inc.	Inc.
SIZE OF PARTY	NA	M-14 28 total	18 day-16 12-12 per boat
BROCHURE QUALITY	Average	High	Average
TARGET MARKET	Nature	Segment or Interest	Youth 16-25
ALLOTMENT	3,025	8,400	1,125
ALLOTMENT (USED)	(3,017)	(8,941)	(1,219)
PRICE	18-650-0	NA	NA
DISCOUNTS	10%-youth	NA	NA

NA = Not available

Table 4.10-1, Continued

	Harris Boat Trips	Hatch River Expeditions, Inc.	Moki Mac River Expeditions	O.A.R.S. Inc.
LAUNCH SITE	L.F. P.	L.F. P.	L.F.	L.F. P. . . .
LANDING SITE	P. D.C. L.M.	P. L.M.	D.C.	P. P.S.
LENGTH (DAYS)	4 9 10 14	4 5 9	NA	5 8 13
TRIP TYPE	O M	M	NA	0
BOAT TYPE	NA	NA	NA	S.R.
TRANSPORTATION	N.I.	N.I.	NA	Inc.
OTHER FLOATS/NUM.	Yes/2	not listed	Yes/2	Yes/10-15
BEACH ITEMS	Inc.	N.I.	N.I./Rent	N.I.
SIZE OF PARTY	14/raft 28 total	NA	NA	16 total
BROCHURE QUALITY	High	Low	Low	Average
TARGET MARKET	Counter Culture Wldrns.	N.A.	N.A.	Wilderness-dif. for hikers
ALLOTMENT	1,680	10,080	2,050	1,600
ALLOTMENT (USED)	(1,628)	(9,944)	(1,112)	(1,677)
PRICE	NA	4-176-M 5-220-M 9-396-M	NA	5-275-0 8-395-0 13-565-0
DISCOUNTS	NA	4 day only groups	NA	None

NA = Not available

Table 4.10-1, Continued

	Outdoors Unlimited	Sanderson River Expeditions	Tour West Inc.	Western River Expeditions, Inc.
LAUNCH SITE	L.F. P.	L.F. P.	L.F.	L.F.
LANDING SITE	P. D.C.	P. D.C.	W	L.F. T.B.
LENGTH (DAYS)	5 8 12 14 18	4 6 9 8 12	6	5 7 10
TRIP TYPE	0	0 M	M	M
BOAT TYPE	Catamaran	BB	BB	J-rig
TRANSPORTATION	N.I. C.S.	Inc. return N.I.	Inc. + overnight motel	Inc. return to L.F.
OTHER FLOATS/NUM.	Not listed	Not listed	Yes/7	Yes/5
BEACH ITEMS	NI/Rent Inc. 5/8 day	Inc.	Inc.	Rent
SIZE OF PARTY	12-16 5-6/boat 24 total	28 max 14/boat	NA	NA
BROCHURE QUALITY	Low	Average	High	High
TARGET MARKET	N.A.	N.A.	1st Class	N.A.
ALLOTMENT	1,200	10,080	3,780	10,080
ALLOTMENT (USED)	(1,207)	(10,003)	(3,610)	(10,049)
PRICE	5-245-0 8-345-0 12-460-0	4-230-M 6-280-M 9-385-M 8-355-M 12-475-0	6-440-M	5-410-M 7-460-M 10-510-M
DISCOUNTS	30%-12 & under	15%-12 & under group discounts 5%	NA	NA

NA = Not available

Table 4.10-1, Continued

	White Water Expeditions	Wilderness World	Wonderland Expeditions *
LAUNCH SITE	L.F.	L.F. P.	
LANDING SITE	D.C.	D.C. P.	
LENGTH (DAYS)	6 8	14 6 9	
TRIP TYPE	M	0	
BOAT TYPE	BB	SR/GR	
TRANSPORTATION	Inc.	NA	
OTHER FLOATS/NUM.	Yes/5	Yes/12	
BEACH ITEMS	Inc.	NA	
SIZE OF PARTY	12/15 boat 25 total	4/boat	
BROCHURE QUALITY	High	High	
TARGET MARKET	Segment reg. 1st. class	Wilderness	
ALLOTMENT	3,780	2,520	1,680
ALLOTMENT (USED)	(3,832)	(2,668)	(1,569)
PRICE	6-315-M 8-345-M 8-440-delux	6-250 9-360 14-505	
DISCOUNTS	10%-13-18 25-30%-under 12	5-20% group & seasonal	

* No Brochure Available

NA = Not available

Source: Published brochures of river trip concessions

very interesting to note the frequency with which firms report the existence of other trips.

4.10.4 Discussion and Conclusions--The average rate for advertising expenditures is quite low. The range is small, 0-7.9%. The absolute magnitude is small. It's even smaller than the franchise fee which means that it's nearly non-existent. The answer then to how much, is very little judging from current performance. If we were operating a motor trip and GCNP decided on an oars only policy, then we would probably advertise heavily immediately before the change to our trip type. If a lottery type system were imposed, we would probably need to advertise quite heavily to first generate primary demand for river trips and then aggressively seek to stimulate selective demand for our trip. Hence, GCNP policies could affect future advertising expenditures. If the future is similar to the past, then one could expect even smaller advertising expenditures.

The content of the advertising brochure need not be edited by GCNP, but it would be in the consumers' interest to standardize the type of information in the brochure. In particular price and related items which are included or excluded in the price should be communicated to the consumer. Perhaps a rate card could be inserted with the standard "art work" of the brochure.

4.11 WHAT ARE THE ECONOMIC RAMIFICATIONS OF LIMITING COMPANY SIZE, SIZE OF RAFTING PARTIES, BOAT LIMITATIONS, ETC?

4.11.1 Purpose--Alternative management plans for river concessions in GCNP could require different methods of scheduling which would affect the type, number and capacity of boats in the Canyon. Also, the NPS may alter the allocation of user days between commercial and non-commercial river trips. An oars only policy could affect the size of various trips. Again the purpose for examining these issues is to minimize if possible any side effects associated with a change in NPS policy and to avoid a change in policy where certain side effects can't be minimized. Therefore, this section draws heavily on the analysis performed in sections 4.1, 4.2, 4.4, 4.5, 4.6, 4.8, and 4.9 to determine the potential economic implications for the concessioner and passenger as a consequence of any change in company size, party size, number of trips, boat limitations, etc.

4.11.2 Methodology and Techniques--To accomplish this task, concessioners were ranked according to size as determined by user day allotments. Additional data were collected which indicated party size, the number of boats per trip, type of trip, duration of trip, and the cost structure per trip as a function of the above. Regression techniques were used to measure the relationship between these trip characteristics and various measures of profitability

and the cost structure of the firms. The regression analysis techniques are discussed in section 4.2 and results of the analysis presented in sections 4.2, 4.5, 4.8, and 4.9. Finally, breakeven analysis provides a useful technique for determining what percentage revenues could be diminished for each concessioner given each concessioners fixed to variable cost ratios and still allow the concessioner to meet expenses. Such a percentage is reported in section 4.1 for each concessioner in the evaluation of each concessioner's operation.

4.11.3 Data and Findings--No significant economies of scale could be found for the river trip industry. That is, size was not found to be related to cost or profitability in a percentage sense. Of course as the percentages remain constant between large and small concessions the net profit can differ widely. The larger concessions ten to have larger absolute levels of profits; however, there are exceptions. Note, for example, Georgie and Hatch. Georgie earns substantial profits as a small concessioner while Hatch, a large concessioner, loses money.

The size of the rafting parties seems to make little difference among concessioner profitability. However, these data may measure more than the number of boats in one party, the number of people per party, as the smaller party size tends to be associated with oar trips the largers party size with motor trips. More variability was found among the trips of each type than was found between these

trips (see sections 4.5 and 4.6). This is true of both profit and cost levels measured as a percent of sales or on an user day basis.

The breakeven analysis performed and reported on a concessioner basis in section 4.1 reveals similar information. The average breakeven levels as a percent of total revenues are little different among the large and small allotment firms. Yet, there is substantial difference among the large allotment and small allotment firms. Most firms would be able to absorb moderate reductions in revenues associated with reductions in allocations. Or conversely, most firms could absorb moderate increases in costs associated with smaller trip sizes or fewer passengers per boat. However, consistent with an earlier reported finding concerning investment by oar versus motor trips, the breakeven level for oar trips is slightly higher than that of motor trips. This is true to the extent that fixed costs for the oar trips are slightly higher than the motors trips.

4.11.4 Discussion and Conclusions--It seems reasonable to conclude that most firms could reduce the size of their rafting parties without seriously impairing their profit position.

The firms which have high allotments of user days could be reduced in size without substantially affecting their average profit rates. However, such a reduction in their allotments would reduce their absolute level of profits, net profit after tax. The

average reduction in profits for the industry is just under \$5.00 per user day. For each firm individually, the reduction in profits due to reduction in allocation can be calculated from Table 4.4-1. Simply multiply the profit per user day for the particular concession times the reduction in user days. It doesn't follow that reducing the allocation of a firm with a negative profit per user day would reduce the firm's loss. They are covering variable cost and making some contribution to fixed cost. Therefore, reduction in allotments for certain concessioners, to the extent that a reduction in allotment would reduce user days, would further increase their losses at an increasing rate.

Limiting company size at the current levels would not have a detrimental effect on existing firms. Generally, firms have improved their profit positions during the period for which ceilings on allotments have been maintained. One could argue that limiting size would encourage more cost conscious behavior by firms. On the other hand, one could argue limiting company size could make the management of the river concessions less responsive to public needs as their allotments were filled. An interesting opportunity may exist if the sociological, scheduling and environmental studies demonstrate that more user days could be allocated. Some of the smaller firms could be allowed to grow while keeping the allocations of the larger firms constant. The result could be a more competitive industry.

Finally, this analysis requires a major caution. Percentages and averages have a legitimate role in research and policy making; however, depending upon the base on which they are calculated the meaning can be over or underestimated. For example, seven-tenths of a user day or four-fifths of a boat have little meaning. Trips with smaller allocations may have similar operating ratios to trips with larger allocations but they can't afford to lose an across the board reduction of the same percentage magnitude as a larger firm could. One trip or part of a trip could mean the difference between profit and loss to the smaller concessioner. Even though our analysis has found no substantial difference between large and small firms, equal percentage changes would present far more risk to the small firm than it would to the large firm.

4.12 WHAT ARE THE RATES CHARGED PASSENGERS VERSUS THE VALUE RECEIVED

4.12.1 Purpose--This issue is very closely associated with the question addressed in section 4.3. The purpose of responding to this issue is the concern of the NPS that river trip passengers receive fair value for their dollar. The issue has received fairly complete treatment in section 4.3, but perhaps some additional discussion is warranted by such an important issue.

4.12.2 Methodology and Techniques--The methodology and techniques are those used in section 4.3 and a reliance upon previously reported studies.

4.12.3 Data and Findings--Concessioners do not report expenditures by category of expenses. That is, the financial reports list operating expenses as the principal category of current expenses. Salary expense, transportation expense, advertising expense, officer salaries and interest expense among a few others are provided for but not often responded to by the concessioners. Frequently, concessioners double count expenses in an effort to itemize. That is, officer salaries may be reported separately and as a portion of total salaries. Creature comforts, food, interpretive personnel, etc. are not itemized and no data exist which rates consumer acceptance of these characteristics on a trip by trip basis.

Given the findings in section 4.3, a wide range of prices based upon a wide range of trip types and durations, excess demand, consumer

surplus, the use of superlatives by passengers to describe the trip, it follows that components of the trip should be providing value if the trip provides value. Additionally, the price does not differ greatly from other recreational activities and is considerably less than some. Average profit per user day is slightly less than \$5 which is reasonable. The sociological study did not provide information which suggests any dissatisfaction with food or interpretive personnel and only a very small percentage wanted more development in the Canyon.

4.12.4 Discussion and Conclusions--Again we must reiterate what has been stated in section 4.3, the absence of any data to the contrary, a river trip through the Grand Canyon offers high value relative to the rates charged. A questionnaire could be structured and data collected which would enable scaling this value. The data could help explain the underlying components of value and the perception of passengers towards various aspects of particular trips. However, on the basis of existing data and the current situation such a study does not seem warranted.

4.13 HOW MANY PASSENGER DAYS DOES A COMPANY NEED TO PROVIDE A GOOD SERVICE?

4.13.1 Purpose--It appears certain that there is some upper limit to the number of individuals who may take the river trip down the Colorado through the Grand Canyon. The level of use could remain the same, but the number of user days available to commercial outfitters could be reduced if a larger percentage is allocated to the private user. Future GCNP concessioner policies towards the commercial outfitter will undoubtedly be constrained by the limit on user days and therefore will have to address the problem of allocating or reallocating user days. In several prior sections we have examined the issue of size and allocations. In fact many of our analyses have included ratios of profits, prices, investment, and costs to user day allocations.

In an economic sense, perhaps the single most important aspect of the current GCNP regulation of river concessioners is the arbitrary assignment of user days. Hence, this section focuses upon a review of the findings relating to the issue of concessioner size. The final result of this review will be a recommendation concerning user day allotments.

4.13.2 Methodology and Techniques--In an earlier section, 4.4, we made the attempt to relate profitability and trip quality. Absolute levels are somewhat related to user days; hence, passenger days may affect trip quality to the extent that trip

quality is associated with profitability. The true test will come when and if a marketing research study is conducted.

4.13.3 Data and Findings--Absent the kind of hard primary data that a marketing research study could provide, it is difficult to make any observation concerning passenger days and trip quality. The available data show no economies or diseconomies of scale. Size is not related to profit or cost percentages. Profitability appears slightly related to trip quality at least at some minimum level.

4.13.4 Discussion and Conclusions--Data were not available or collectable which enabled a direct comparison between good service and passenger days. However, other, indirect relationships suggest that some minimum level of user days is important for the commercial firm in providing a good service. There is no evidence to suggest that too many passenger days mean a poor service will be provided. Of course the problem is getting a concessioner to use their allotments.

4.14 WHAT IS THE EXTENT OF REPEAT BUSINESS? HOW IMPORTANT IS THIS TO A COMPANY? WHY?

4.14.1 Purpose--The initial reaction to a rapid increase in the number of private river permit requested was to promulgate a rule that private, non-commercial river users could not take trips in consecutive years. This rule was subsequently rescinded when it was determined that the rule was arbitrary and discriminatory. Presumably, a non-commercial user could not make the trip privately but could take the trip as frequently as desired with a commercial outfitter. Future GCNP policies and the Colorado River Management Plan may include restrictions on multiple trips. Hence, the need to examine this issue.

4.14.2 Methodology and Techniques--The only way to accurately determine the importance of repeat business is to collect data from users by concession over several years time. Unfortunately, the concessions themselves do not have accurate data on such repeat use nor does the NPS. A search of secondary sources of data was only slightly more successful. Two studies have been performed which have isolated the frequency of repeat floating experiences. The Nielsen and Shelby study reports on the frequency of repeat trips for both commercial and non-commercial floaters. And, data were collected for a soon to be published paper (Parent and Robeson, "A Comparison of National Park Service

and U.S. Forest Service Regulations and Their Effects on Concession Efficiency,") which include some measure of repeat performance.

4.14.3 Data and Findings--The Nielsen and Shelby study did not intentionally set out to measure repeat usage, and they did not in any statistically significant way; however, they have found more repeat river users among the private, non-commercial user than the commercial trips.

The study of NPS and USFS regulations on the Snake River in Wyoming provides some evidence that repeat business may be more important to one concessioner than another. The trips in GTNP are single day trips of 3 and 6 hour duration conducted on a scenic, non-whitewater section of the Snake River. The section of the Snake outside the Park flows through a canyon and offers a 3 hour whitewater trip. Several river companies operates on both sections of the Snake River. Several boatmen for different concessions on each section of the river kept an account of user characteristics, demographic variables, attitudes, vacation plans and whether or not they had taken a river trip before, where and with whom. The sample was not statistically designed and was for the purpose of generating hypotheses not testing them.

The results, however, are interesting. One concession had seven times the repeat business of the others. Yet, the percent of the total was less than 2%. However, where a river operation offered a trip on both sections of the river, the three operations surveyed

had 25% to 30% recapture from the other of their trips. That is a boatman in GTNP may sell 30% of his/her passengers on taking a trip on the whitewater section under U.S.F.S. jurisdiction. One firm which does not provide trips on the U.S.F.S. section of the Snake provides a reservation service for a firm on the other section.

Finally, we have analyzed the advertising content for any hints that repeat business is sought by the concessioners. Some concessioners maintain mailing lists for the purpose of sending direct mail notices and brochures to former passengers. The most aggressive in this regard is Georgie whose brochure is unique! She also aggressively seeks repeat business as is evidenced by the fact that she organizes "alumni gatherings" at different locations around the country presumably in close proximity to her major markets. To what extent she is successful in capturing repeat business is not known. However, it is clear that she operates one of the most successful concessions. Perhaps this aggressive reinforcement type advertising is particularly effective in promoting word-of-mouth support for her trips.

4.14.4 Discussion and Conclusion--We can't find any strong evidence that repeat business is important, and without any direct evidence we can't measure the extent of repeat business. We can offer several hypotheses however, which is one way of saying,

"These are our conclusions, but we are not overly impressed with significance of the results."

First, repeat business is probably more important for some concessions than others. We would further suggest that repeat business is probably more important to the small concessioner than the larger concessioner. Of course this is true because at the margin any customer is more important (in an economic sense) to the small concessioners. The oar trips probably attract a higher percentage of repeat business than the motor trips. This is related to the attitude differences measured by Shelby and Nielsen. The oar trips probably recapture a higher percentage of the second trips: again reflecting attitudinal preferences found by Shelby and Nielsen.

Second, as many concessioners offer other trips on other rivers and advertising material covers these rivers as well, perhaps referral to other trips is a more important form of repeat business than subsequent trips on the Colorado. We have heard several individuals comment that river trips are an "in" kind of vacation experience. Certainly the Colorado is important; others probably have additional appeal to the hard-core river runner.

Again, the above are not strong conclusions, and certainly this potentially important issue may require more study over time.

4.15 WHAT IS THE EFFECT OF RIVER RUNNING ON LOCAL ECONOMIES?

4.15.1 Purpose--The issue was raised in the Utah State Legislature and reported in the Congressional Record that dramatic shifts in the number of user days could have major negative economic impacts on certain Utah communities which provide services for the river running industry. Some have suggested that a shift in emphasis to an all oar trip would result in an adverse economic impact as fewer people would be able to take the river trips and as employers, river concessioners, would reduce employemnt by reducing their staff. It is therefore of some interest to determine just how significant is the impact on surrounding communities.

4.15.2 Methodology and Techniques--To measure local economic impact, data were collected from the concessioner financial statements. Among the different types of data collected were: sales; salaries; operating expenses; net fixed investment; undepreciated price of assets; real, sales and personal property taxes; and license fees. Additionally, the place of business was determined and reported for each concessioner.

Next a list of possible impacts was hypothesized and the likely sources of economic impact set aside for further investigation. These included taxes, employment, purchases, secondary employment, opportunity costs, seasonal nature of the industry, and seasonal unemployment. Where hard data were available the analysis tabulates and quantifies

the impact. In lieu of hard data, the issue is examined argumentatively while relying upon input from various concessions, observation, published reports on rural economic development and for the Utah communities, data collected and reported by the Bureau of Economic and Community Development as reported in the Utah Industrial Development Information System.

4.15.3 Data and Findings-- Specific economic impact information was collected from the various individual concessioner reports. The twenty-one concessioners represent 16 different base locations in four states. One should also note the relatively poor reporting by the concessioners of their taxes. Also, salaries are not reported separately. Hence, it is difficult to determine which type of employee, seasonal or permanent, is receiving how much.

Total taxes by category reported by concessioners are reported in table 4.15.2. By far the most significant local contribution results from personal property taxes paid in Utah, \$7,839. A further look at the Utah condition is therefore warranted as it appears that Utah with 9 concessions may receive the largest economic impact.

The Utah impact is spread among five cities and five counties: Salt Lake City, Vernal, Orem, Kanab, and Green River; Salt Lake County, Uintah, Utah, Kane, Emery. From the Utah Industrial Information System, the major employers, total employment, sources of taxes, retail sales and non-retail employment were evaluated for

each Utah county and city involved in the river trip business. The county for which tourism/recreation was listed as a major employer was Kane County. In Kane County the seasonal employment in motel and food service establishments and other related activities account for 11.1 percent of all employment in the county. The float trip companies combined influence on retail sales is 7.4%. Their tax contributions amount to considerably less than one percent of the receipts in the county. While these figures are not substantial, they are important for a relatively small community.

A study of employment related to expenditures in the retail sector of several small Utah towns indicates that it requires approximately \$30,000 in new retail trade to support one additional individual to be employed by the retail industry. (Parent, "Study of Small Town Retail Market Structures in Utah, 1973") It was found that for each additional 15 individuals added to the retail sector work force one additional retail sector job was created. An estimate of the seasonal employment of the river running concessions located in Kane County is 70 individuals. (Utah State Legislature, 1973) Unfortunately, a single family may include 4 or 5 individuals employed by the concessioner which tends to overstate the number of permanent, year-round equivalent employees. Hence, after adjusting for seasonality the river concessions may contribute 21 full time equivalent jobs and an extra two service jobs to the Kane County economy. However, we should note that the river running businesses

Table 4.15-2

Taxes by Type and Concessioner Location

<u>Taxes</u>	<u>Location by State</u>			
	<u>Arizona</u>	<u>California</u>	<u>Nevada</u>	<u>Utah</u>
Real:				
State	0	423		0
Local	0	16		422
Sales:				
State	8,772	1,306		12,627
Local	0	1,275		0
Personal Property:				
State	1,263	119		0
County	368	1,363		7,839
Amusement Tax	0	0		0
License Fees	603	4,410		1,730
No. Of Concessions Reporting	5	6	1	9

Source: Concessioner Financial Statements

in Kane County run rivers other than in GCNP. Hence, the impact due to the GCNP operation is somewhat less than the employment reported above.

Also, during the course of our research we have been able to talk with river guides for 13 of the concessioners. It appears that most of the guides live in other locations during the winter season. They are employed as winter season tourism employees at ski areas, they are students, they are educators, and they collect unemployment. Certainly, these individuals do not live predominantly on the local economy during the summer when they are on the river.

4.15.4 Discussion and Conclusions --Eliminating all commercial trips through GCNP would not have a major negative economic impact on most communities in which these companies are based. Kane County is a possible exception. However, since no one has indicated the elimination of all commercial river trips as even a remote possibility and since we wished to evaluate the largest of all possible impacts, it is quite likely that any small adjustment in commercial river trips would have only a very slight measurable impact on the local economy.

A shift to oars only could have a slight positive impact on the local and regional economies. As new investment takes place, property tax receipts would increase.

An interesting hypothesis was also considered. If all commercial

floats were eliminated and 10% of the passengers were to vacation in the area anyway, the economic benefits realized by the local communities could be larger than that currently received. The local opportunity cost is having the tourist on the river rather than in a motel and some local restaurants.

One also has to examine the original assumption upon which predictions of adverse economic impact were made. That is, the concessions could not adjust to the higher operating costs of an oar trip, ceilings on use would dramatically limit growth or cause fewer user days per concessioner and the higher price of an oar trip would drive consumers out of the market. First, these impacts if they were to occur are spread over 16 different locations and would therefore be felt primarily privately not by the public sector. Second, operating costs don't appear to be higher for an oar trip. Third, in 1972 Kane County based concessions used significantly less than their allocated number of user days. In 1975, they were closer to their allotments. Fourth, the price of oar trips does not appear to be significantly higher. Hence, we expect demand for oar trips to remain very similar to motor trip demand. Therefore, the assumptions upon which adverse economic impacts were predicted do not hold. Hence, we cannot conclude that shifts in user days, different types of trips, changes in trip duration, pricing policies, advertising policies or any other policy decision made by GCNP would have any significant economic impact on local communities or regional economic performance.

4.16 A REVIEW OF THE PROPOSED LOTTERY SYSTEM

4.16.1 Purpose--The NPS wishes to provide fair and equitable access to the Colorado River. In recent years, requests to run the river have increased rapidly, and increasing proportions of non-commercial users are not receiving float trip permits. The NPS Act (16 U.S.C. 3) states in part that "no natural curiosity, wonder, or object of interest shall be leased, rented or granted to anyone on such terms as to interfere with free access to them by the public..." The question of whether concession contracts violate the NPS Act is a serious one even if the current allocation system is ruled consistent with public law.

One proposal which on the surface appears interesting involves a lottery system. Under such a system every individual would have to obtain a permit from the NPS. After securing the permit, the individual would then choose the method of travel down the river; i.e., if he had the expertise, he might then choose to take his own boat or he might choose to contract with a private, commercial outfitter.

Three important questions are raised by the lottery system.

- (1) What would be the effect upon existing concessioners and their ability to do business?
- (2) Would a lottery system be an equitable means of allocating user days?
- (3) Would administrative costs and problems be consistent with existing NPS budget and personnel constraints?

The purpose of this section is to answer these three questions

within the constraints of existing data while addressing other issues related to the equitable use of the resource.

4.16.2 Methodology and Techniques--As no data are available on such a lottery system for river use, this analysis must rely on information from a somewhat analogous situation, logic, and an economic analysis of the conduct options available to firms given the lottery system as an enforced, by the NPS, element of structure.

There are numerous lottery systems used by various institutions when resources are limited and a policy decision has been reached by the institution that price will not be used as the only criterion to allocate the resource. Frequently, these systems use price as a partial allocation technique combined with a drawing of sorts. A few examples of these include parking, country club memberships, tennis courts, duck clubs, fishing rights, campgrounds and even leases of oil and gas rights and various rights to do business in a particular geographic area.

There seems to be an administrative philosophy commonly shared by those who administer lottery systems. First, high prices are unfair to someone. Second, we should pay some price for what we get. Hence, some modest price may be charged...less than the true value of the resource...then a lottery allocates the resources among those who have paid the entry fee. In the GCNP case the entry fee could be considered the cost of floating the river.

An analogous case is the method by which big game hunting licenses are allocated to out-of-state hunters by the state of Wyoming. Several

big game outfitters in Wyoming were interviewed. All operated hunting camps which relied on the out-of-state hunter. All were licensed by the state of Wyoming and operated under a U.S. Forest Service special use permit. Additionally, Wyoming Game and Fish and Forest Service officials were interviewed. Wyoming Wildlife, a magazine published by the state game and fish department was the source of additional data on the lottery system used by the state. The consequence of the lottery system was then qualified on the basis of its impact upon commercial outfitters, administrative problems, and the extent to which the program accomplished the state objectives.

The second step in evaluating the proposed lottery system involved drawing appropriate inferences from the outfitter data. Here, the logical consequences for the river concessions were hypothesized given the results of the outfitter and administrator surveys. Third, and not unrelated to each of the preceding, the resulting structural changes in the industry were hypothesized and the effect on conduct was considered.

4.16.3 Data and Findings--Under the current allocation system the number of potential private users not awarded a river running permit has increased. The principal reason for this has been the rapidly increasing number of potential private users and the ceiling on user days. However, there is another interesting change in the composition of private users. A larger percentage have requested the oar type experience rather than the motor trip. This parallels the growth in oar type trips provided by the commercial outfitters.

Advertising expenditures for the various float trips are quite low. The range is from 0 to 7.9 percent of sales. (See sections 4.1 and 4.10.) The advertising messages are more informative than persuasive in their content. We have concluded that this relatively low advertising expenditure and approach suggests a high rate of referral and basic interest in the Colorado River trips through G.C.N.P. These data and findings are important considerations for our subsequent discussion and conclusions.

In gathering data on an analogous lottery system, the following characteristics were discovered. Commercial outfitters were granted permits, for a fee, to guide hunters into the mountain and wilderness terrain of Wyoming. The outfitter licenses are issued by the Wyoming Game and Fish Department. A wide range of outfitter sizes exist from those capable of guiding several hundred hunters a season, for ten days each, to those who guide fewer than fifty. Some outfitters personally guide hunters while others operate large, permanent base camps and employ several guides to escort the hunting parties. Nearly all outfitters hunt on public lands, primarily National Forest. Wyoming specifies that all out-of-state hunters must be accompanied by a guide while hunting in areas designated as Wilderness.

One interesting finding was that the three outfitters questioned perceived different impacts on their business. The largest outfitter reported little or no change in business. However, the firm said that they had to rely on direct mail advertising and expanded media advertising in various outdoor magazines.

Before the lottery system, the limited number of out-of-state hunting permits were allocated on a first-come, first-served basis and the outfitters were allowed to purchase licenses directly before mail requests were filled by what amounted to a drawing. Hence, by signing on with an outfitter, an out-of-state hunter was virtually assured a hunting license. Repeat business and referrals were an important component of the system under which outfitters operated.

When the lottery system was initiated, all out-of-state licenses were allocated by drawing. Hence, some repeat hunters and referral hunters could not get licenses. Many who did get licenses were not aware of the total cost of the hunt, had no allegiance to the existing outfitters, and if they hunted at all, they hunted in non-wilderness areas. Where outfitter reservation systems had controlled the distribution of the hunters over time and geographically, the new system caused localized crowding and inappropriate harvesting of game. In other words, the resource was poorly used. Game was lost due to crippling of animals but hunters without guides did not pursue wounded game as guided hunters did. Hunter injuries became more common.

While the largest outfitter indicated that his business remained the same, the two smaller outfitters noted a marked decrease in their outfitting business. The smaller outfitters were more dependent upon referral and repeat business. In addition, they were less able to generate competitive advertising programs due to their high initial cost. The smallest outfitter indicated several had left the industry and that he was considering it. His client list declined by fifty

percent the first year. He maintained the same reduced level the second year despite a 60 percent increase in price to cover fixed costs no longer shared among a larger client base and increased advertising costs. No doubt two years of inflation also contributed some to the increased costs.

But, the outfitters were not the only group to feel the effects of the change in policy. As the outfitters pointed out, the character of the hunter changed. Their clients were no longer as serious or "hunt wise" as they had formerly been. And several serious, highly motivated hunters were not able to plan for and purchase the Wyoming hunting experience. The outfitters and some game and fish personnel believe that the new lottery system encouraged many to apply just in case they wanted to hunt in Wyoming. Besides the effect on those who may have been more serious about the Wyoming hunting experience, there were other ramifications for the regulating agency.

First, after hunters had drawn licenses and learned of the total cost of the hunt, many did not participate in the Wyoming hunt. This, of course, results in kills being down and game management problems were increased. Also, no shows kept those interested in the hunting experience from participating...the resource was used inefficiently. Second, the administrative agency was forced to combat this problem by essentially requiring prepayment to insure use of the allotted licenses. While the source, the outfitters, may be biased, complaints concerning the quality of hunting and abuse of private lands were said to increase. However, all of this was not without its benefits

according to the outfitters. As license sales are an important source of revenue for the game and fish department and as hunter success was down, more licenses were able to be sold, hence increasing revenue without altering the game population.

4.16.4 Discussion and Conclusions--A complete study and analysis of the Wyoming Game and Fish Department's lottery system and its economic impact on outfitters could require more funds than were available for this complete research project. However, informal questioning of several outfitters and W.G.F. and U.S.F.S. officials provided some information from which to draw some conclusions. Additionally, financial data and use trends discovered and reported in other sections provide collateral support for this analysis.

Low advertising expenditures and the obvious attractiveness of the river trip support the conclusion that the services of the various concessioners is sought by vacationers. To some extent the current level of advertising by the industry reminds the potential customers of the product's availability. Essentially, there are two types of advertising related to demand, primary and selective. Much of the current advertising probably affects primary demand that is the size of the available pool of river trip passengers. Selective demand, the choice by the passenger from among the available concessioners, is probably more related to referral or word-of-mouth than formal advertising. Hence, under a lottery type system we could conclude that the concessioners would attempt the following. First, as most of the individuals capable of running their own trip probably apply

for private permits, it would be in the best interest of concessioners to encourage large numbers of potential users to apply for permits. This would increase the likelihood that permit recipients would require a concession provided trip. (It would also lessen the chance for qualified private river runners to obtain permits.) Second, large groups would be encouraged to apply for permits. A single permit would be able to fill one firm's trip. Third, an industry trade association for concessioners would probably evolve to counter the influence of private river runners and their champions. This trade association would further stimulate primary demand. The result would be a rapid increase in advertising expenditures to promote primary demand.

However, this isn't the only result which might be anticipated. After permits have been drawn, one would expect more advertising by concessioners to generate selective demand with an advantage to the larger concessioners. The F.T.C., in fact, believes that advertising expenditures can be a source of entry barriers which encourage the development of large firms and cause the demise of small firms. A certain result would be higher advertising expenditures and higher prices. The higher prices would be caused by higher advertising expenditures and supported by greater consumer surplus relative to the increase in primary demand.

The analysis contained in previous sections of this report may not explain the new conditions should a lottery system be adopted. However, several of the existing firms may be just large enough to be economically viable. Should the lottery system as proposed change

the cost structure of the industry these smaller firms would probably become inefficient competitors. Certainly, the Wyoming outfitter case supports this hypothesis even though the Wyoming case was only a change in the rules of an existing lottery system. Should these industry changes occur, the resulting change in market structure would result in less diversity among river trips and greater similarity in price.

While it is a question amenable to empirical resolution, should the lottery system result in more non-commercial users, the NPS may find a higher degree of misuse of the Canyon environment due to two factors: less control over the private user and more experience among the commercial river guides. We would hypothesize higher accident rates on the non-commercial trips and perhaps an inability to purchase necessary sanitary facilities. However, we should note that in the long run, 3 years perhaps, as the pool of total potential users is increased a relatively smaller number of private users may get permits.

There are other problems which would have their principal impact upon the NPS management plan and GCNP administrators. The commercial trips through their reservation system and required deposits insure the appearance of passengers on schedule. If the relative percentages were to change among river users, the NPS may need to institute some kind of fee to insure attendance or available user days may be unused. The result would be a less than optimal use of the resource. Additional personnel requirements, office expenses and promotion costs would also undoubtedly occur. Finally, there is no evidence to suggest that a lottery system would be equitable or even any better than the current

allocation system.

We have demonstrated the existence of many different market segments; one of which, the private user, is quite visible. If equivalent data were available on other market segments, one might find the current allocation system discriminates against those who do not have the time or money (remember equipment and training expenses are not included in the cost of the private trip) to prepare for a private trip. It is not a fair comparison to match total private user applicants to actual commercial users. The correct comparison would be between all private user applicants and all potential users without required skills or equipment. The results would be considerably different.

5.0 APPENDIX

Appendix - A.1 Review of the Safir study, "An Economic Assessment of Commercial White Water Boating Operations on the Colorado River through the Grand and Marble Canyons."

A recently completed paper by Mr. Safir concerning river concessions in GCNP was submitted to Dick Tousley of the Washington office of the NPS. Many of Mr. Safir's comments correspond to our research, but several statements, conclusions, and recommendations in the paper are difficult to accept. Since this is an important research effort that is likely to receive the attention of the NPS in Washington and eventually in GCNP, we have included some brief comments concerning Mr. Safir's study.

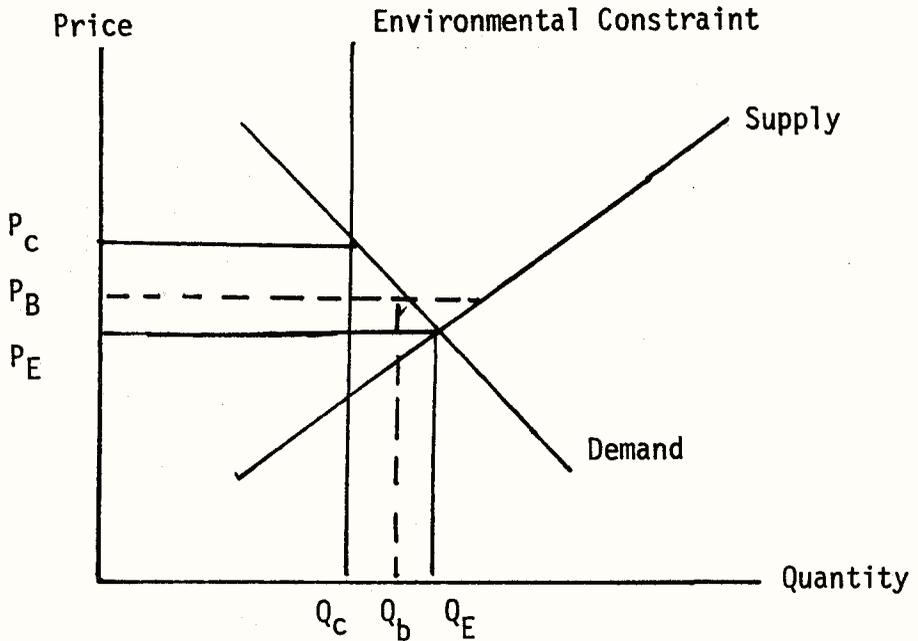
Basically, Mr. Safir researched the economic characteristics of river concessions and their performance as measured by return on net worth. Based on this review, he concluded that the rate of return was too high and signified that the Park Service should encourage lower prices to reduce the excessive profits. Mr. Safir recommends that a bidding procedure be implemented that would give existing concessioners preference in the process and result in lower prices. Essentially, concessioners would bid on recreational units in terms of services to be provided and the price the concessioner would charge. In this way, the NPS could select those who would provide specified services at the lowest prices.

We would concur with Mr. Safir that a few concessioners are earning excessive profits and some bidding procedure might prove beneficial. However, we depart with many of his conclusions and recommendations. These points are detailed below.

1. Excessive profits - Mr. Safir states that the 21% return on equity is excessive since manufacturing firms only average a return of 14%. This comparison makes little economic sense. The industries are not in the same risk class. Also, many operators are sole proprietors that keep net worth positions low. Record keeping is sloppy and net worth positions fluctuate wildly. We believe a more appropriate measure of performance is dictated by industry characteristics as noted in Sections 4.5 and 4.6 i.e., return on investment, return on net worth, and profit as a percent of sales.

The difficulty with the concept excessive profits is determining what is excess and what is a reward for superior management. In a competitive environment, the market would make the determination. But, the river concession industry is not truly competitive. What has happened in the river running industry can be shown in Figure A-1.

The demand and supply curve slopes are demonstrative only. Notice that the equilibrium price, P_E , and quantity, Q_E , is to the left of the environmental constraint. This environmental constraint is consistent with the river use limitations imposed in GCNP. This artificial



supply constraint at Q_C will force the price up to P_C in order to clear the market. Yet, this price is not cost justified, resulting in excessive profits; but, the market has been cleared.

2. Resolving the problem of excessive profits - The problem becomes how to reduce this level of economic or excessive profit. One way would be to increase the franchise fee. Second, the price could be lowered by the bidding procedure suggested by Safir. This, for example, could force price down to P_B . But, at price P_B , people would demand Q_B trips which is in excess of Q_C . This excess demand will force the NPS or concessioners to "clear" the market by some other method than price. Yet, experience suggests that when the distance between Q_B and Q_C becomes large, black markets or collusion in bidding is likely. Notice

that this gap from Q_C to Q_B would become larger as the demand curve shifts through time.

Our recommendation is to allow the price to increase close to P_C (or keep the distance between Q_C and Q_B manageable). But, also bid away the rights for the concession permit. This will capture much of the excess profits. This procedure is similar to bidding for oil drilling rights as practiced by the Department of Interior.

Finally, GCNP could regulate price directly. This would be similar to utility type regulation previously discussed. This could prove costly from an administrative perspective.

6.0 BIBLIOGRAPHY

BOOKS AND MONOGRAPHS

1. James L. Murphy, Introductory Econometrics, (Homewood, Ill.: Richard D. Irwin, Inc., 1973)
2. Parent, M. and Robeson, F. E., Economic Aspects of Concessioner Regulation (Logan, Ut.: U.S.U. Division of University Research, 1974.)
3. Pyndrick and Rubinfeld, Econometric Models and Economic Forecasts (New York: McGraw Hill Book Company, 1976)
4. Roger Sherman, The Economics of Industry (Boston: Little, Brown, and Company, 1974)
5. J. Fred Weston and Eugene Brigham, Managerial Finance 4th ed. (New York: Holt, Rinehart and Winston, 1972)

REPORTS AND OTHER DOCUMENTS

6. Dekker, E., "Private Use of the Colorado River in Grand Canyon and Canyonlands National Parks," unpublished interim report, Denver Service Center, 1976.
7. Grant Canyon National Park, "Synthesis and Management Implications of the Colorado River Research Project, Rough Draft" an unpublished report, 1976.
8. Public Law 89-249, The Concessions Policy Act, 1965.
9. Shelby, B. and Nielsen J. "Sociological Research in Grand Canyon" unpublished study for GCNP, 1976.
10. "Snake River Management Plan" Grand Teton National Park, 1975.
11. "Yearly Concessioner Financial Statements" for years 1971-1976 where available, Grand Canyon National Park.
12. U. S. Senate, Congressional Record (Vol. 119 No. 115) July 20, 1973.

13. 94th Congress, "National Park Service Policies Discourage Competition," Committee on Government Operations and Committee on Small Business, 94-869, 1976.
14. 94th Congress, H. Con. Res. 331: Equitable Allocation of River Recreation, 1975.
15. 94th Congress, S. Con. Res. 56: Equitable Allocation of River Recreation, 1975.

7.0 RECOMMENDATIONS

7.1 More Complete Data Collection--Many of the concessionaires don't provide detailed information concerning such items as advertising or officers' salaries. There are some other items as well. It's possibly true the reason for not providing the data is that some of the people don't want to disclose that kind of information even though it's called for under the concession contract. Having more complete data would have made the study more precise and would lead to better analysis for policy development in the future.

7.2 Consistent Record Keeping and Audited Reports--The Park Service should establish certain kinds of accounting guidelines for the river concessioners. For example, it was clear to us that some of the officers' salaries were probably included in wages and salaries shown elsewhere on the concession statement, but in order to be entirely sure, one would have to audit the records. Also, the NPS should develop guidelines concerning capital inputs and inventory policies concerning capital inputs such as trucks, vans, planes, in order that the NPS can determine whether or not certain fixed assets are actually required for providing services on the float trip. Also, there are several different ways concessioners treat customer deposits. However, there is only one correct way.

7.3 Audit a Sample of Successful and Unsuccessful Firms on the River--The reason for doing a case study approach on some of the

successful and not so successful firms is in order to better understand the business practices required for successful river concession operations and also evaluate those practices that may be contributing to unsuccessful results for a limited number of concessions. This would be an important step forward if the NPS contemplates rate approval for the concessions. If competitive bidding or a lottery system is to be implemented, these data would be necessary base line information.

7.4 The Proposed Lottery System--We strongly recommend that the "lottery system" as outlined by GCNP not be introduced. The problems, economic and administrative, are considerable. It is doubtful that the allocation under a lottery will be any more equitable; it could easily be less equitable. Certainly, the effect would hurt the smaller concessioners and would cause added expense to be incurred by the NPS. A better approach would be a reallocation of commercial unused capacity. However, this depends upon the result of the oar/motor decision.

7.5 Competitive Bidding--We strongly recommend that the bidding process should not be used solely to force down price. It would prove difficult to administer and would yield many undesirable results. There are bidding procedures which might be workable; however, better data are required on the concessioners.

7.6 Franchise Fee--We recommend an evaluation of the current franchise fee. It probably substantially understates the value of the resource. However, GCNP is not the only NPS area where this is true. Artificially low franchise fees cause over use and windfall profits.

7.7 Peak Load Pricing--GCNP should encourage a wider separation between the price charged in July and August and non-peak use months.

7.8 Rate Parameters--We strongly discourage GCNP from becoming involved with the direct manipulation of price through establishing rate parameters. Currently, prices are reasonable, and there is a wide variety of trips and prices from which to choose. The rate setting process is a difficult and expensive process. "Jaw-boning" is a better approach as the market is workable and responsive.

7.9 Length of Concession Contract--We recommend the length of the concession contract should be more closely tied to the kinds of capital assets required and asset life. Four years seems more reasonable than three. If new investment is required due to an oar only policy, five years may be appropriate for the next contract length.

7.10 Diversity--As many different market segments are river users, GCNP should encourage trip diversity and approve concession contracts accordingly. This primarily refers to amenities included, boat and trip size.

7.11 Advertising--We don't recommend control of advertising; however, we feel consumers would be better able to choose among trips if the following data were included if a concession chose to advertise. Information should include such items as 1) price of trip, 2) those items included in the price, 3) those items not included--for example, beach items, the length of the trip, point of departure, point of return, nature of any transportation provided, boat type, size of party, nature of food provided, and beverages, and whether or not, especially beer,

is included. Such completeness in advertising will ensure that the consumer is adequately informed and can make the most intelligent decision possible. It would also not discourage innovativeness in terms of advertising design.

7.12 Oar vs. Motor--We have no recommendation on this issue, at least not directly. There is no economic evidence that price would increase or decrease, trip quality would decrease or increase, or that profitability would fall more than 2 percentage points. There seems to be very little difference between oar and motor trips from an economic performance standpoint. However, if an oar only decision is reached, GCNP can mitigate the financial impact of the decision by implementing the policy over a three year period. This will allow amortization of existing investments and disposal of equipment not required for an oar only operation.

7.13 Mergers--The smaller concessions should be allowed to merge and perhaps even encouraged to do so. This would increase competition and produce more economically viable units.

7.14 Private Users--Private, non-commercial, users should be investigated and perhaps categorized as: 1) users with recreational motives only, 2) users with legitimate research motives and, 3) quasi concessioners. This latter group may be assigned a concession contract as a cooperative. Their allocation may be the sum of the unused allocation of existing concessioners. Some "private users" may not be motivated by profit (some commercial operators are not so motivated); yet,

some do charge non-reported "leader fees" and find ways to amortize equipment. They may be "frustrated concessioners" who don't have a permit.

Both price and number of users must be considered when developing policy based upon demand. There are two components of demand: 1) price and 2) quantity. Readjusting the current allocation percentages based upon carrying capacities and the oar/motor decision may generate an equitable solution to the current situation.