

ALLOCATING RIVER USE*

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FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

FINDING: Allocation is a new problem in river management, but it has long been an issue in other areas. The most common criteria for "distributive justice" are equality, equity, need, and/or social efficiency. Assessing value is a major problem in allocating, particularly with non-market commodities (pp. 2-5).

FINDING: Resource scarcity generally creates a situation which fosters conflict among groups, as it has between private and commercial river runners (pp. 5-7).

FINDING: River running requires equipment, skills, and access to the river. Commercial passengers go on trips where outfitters provide all three; groups of private users possess the necessary equipment and skills, but access must be obtained from the managing agency. Allocations have generally been based on either 50-50 split or historical use (pp. 7-9).

FINDING: Arguments have developed about the amount of use each group ought to have. It helps to distinguish three segments of the "user public:" outfitters, commercial passengers, and private users. Managers arbitrate allocations to these groups (pp. 9-11).

FINDING: Managers, outfitters, and private users have a few allocation goals in common. Differences, which are more numerous, reflect different positions in the allocation process and a desire to protect access privileges (pp. 12-16).

CONCLUSION: Split allocations were first developed as the most reasonable approximation of the way things had been done in the past. It now appears that such systems have had unintended consequences, and they should be evaluated in terms of allocation criteria such as equality, equity, social efficiency, and need (pp. 16-20).

FINDING: Space on rivers has become a scarce resource. It appears that a market mechanism is free to operate in the commercial sector, and access permits have acquired considerable monetary value. In the private sector, a market mechanism is less free to operate, and agencies have involved a variety of non-market allocation mechanism (pp. 20-24).

CONCLUSION: Current allocation systems take public resource access rights and give them at little or no cost to outfitters and private trip leaders, who are then in a position to re-allocate (and perhaps sell) those rights back to the public (p. 24).

FINDING: Alternative allocation mechanisms include pricing, queuing, merit, reservation, and lottery. Each has advantages and disadvantages. Reservation systems have been used extensively for public campgrounds, and lotteries have been developed for hunting permits. Experience in these areas provides helpful ideas for river management (pp. 24-31, Appendices 2 and 3).

FINDING: Less restrictive mechanisms can be used to distribute use more evenly, sometimes increasing the supply of space on the river. Such mechanisms still require use limits, and allocation will still be necessary if demand continues to increase (pp. 31-32).

FINDING: Float use in Hells Canyon has increased an average of 22% per year in the past 5 years, which means that use is doubling approximately every 3-4 years. Increases in commercial use averaged 18% per year, while increases in private use averaged 36%. Both sectors had unused launches in 1978 (pp. 32-36).

CONCLUSION: Changes in allocation mechanisms will probably affect outfitting businesses, although there is little evidence for predicting what the changes may be. It is important to document the present situation of outfitters in Hells Canyon, in terms of financial status and the range of services offered (pp. 37-46).

RECOMMENDATION: Financial data on outfitters should be gathered immediately (format provided in Appendix 4).

FINDING: Licensing of guides by managing agencies has generally involved both certification of competence and allocation of access (p. 46).

CONCLUSION: Certification probably does not require allocation (p. 46).

CONCLUSION: Allocation decisions are usually made by choosing an allocation mechanism and then hammering it into a shape which approximately fits an area's specific needs.

RECOMMENDATION: A more productive approach is to decide the allocation goals for a specific area and then choose a mechanism or combination of mechanisms which will best accomplish those goals. Dissenters can then suggest better ways to accomplish specified goals or propose different goals; in either case discussions are more likely to be focused and productive (pp. 47-54).

RECOMMENDATION: Systems should be monitored to see how well they are accomplishing allocation goals. Uniform data should be collected so changes can be followed over time and different areas can be compared (pp. 54-58).

FINDING: Managers specified a list of allocation goals for Hells Canyon (pp. 58-59).

CONCLUSION: A more flexible and efficient reservation system will probably solve most of the present allocation problems in Hells Canyon (p. 60).

RECOMMENDATION: The most novel aspect of the recommended system is that individual users would obtain permits directly from the agency. This should create more equal permit procedures, with some differences designed to better meet user needs. Information given to users would allow them to weigh the probability of getting a permit against their own preferences for launch dates (pp. 60-63).

RECOMMENDATION: Several other factors need to be incorporated into a new system. Lead times should be based on user planning horizons, maximum

trip size needs to be reconsidered, and a system needs to be developed for re-allocating launches among outfitters if demand changes. (pp. 63-64).

I. INTRODUCTION

Not long ago, there were very few people running whitewater, and the opportunity to float a river was essentially an infinite resource which was available to anyone. But use has increased dramatically on popular whitewater rivers. During the period from 1967 to 1972, the number of floaters per season grew from 2,000 to 16,000 in Grand Canyon, from 2,500 to 17,000 in Dinosaur National Monument, and from 1,300 to 4,000 on the Middle Fork of the Salmon River (Interagency Whitewater Committee, 1976). Whether demand will continue to increase is a matter of speculation, but a variety of factors suggest that it will (see, for example, Parent 1978a).

Increases in use have brought problems of crowding, conflict, and resource deterioration. Managing agencies have responded by establishing carrying capacities, thereby limiting use. Once use is limited, however, space on the river becomes a finite resource. If the number of river runners exceeds the established use limit, a mechanism is needed for deciding "who gets to go." Permits are usually required, and some people are turned away. Allocating river access has become one of the most controversial aspects of river management, involving heated public debate, political maneuvering, and law suits. Public resource agencies have received the dubious privilege of overseeing the process.

It is important to distinguish between the carrying capacity and allocation issues, although the two are closely related. Carrying capacity determines the appropriate number of people for a particular kind of river experience; it involves setting a limit. Allocation distributes this limited number of river running opportunities among users; it means deciding who will get to go when demand exceeds capacity.

This project was designed to explore the allocation issue as it relates to river management. The introductory section discusses the general allocation principles which have been developed in economics, sociology, and political science, including the criteria by which allocation systems are judged and the conflict which often results from resource scarcity. Section II describes current systems for allocating river use, including the user "publics" involved, their differing allocation goals, the split allocation system which has developed, and the value which river access has acquired. Section III explores the advantages and disadvantages of alternative allocation mechanisms, including pricing, queuing, merit, reservation, lottery, and less restrictive measures such as redistributing use. Section IV describes the specific situation in Hells Canyon which prompted this study, and Section V outlines a general procedure for approaching allocation problems as well as specific recommendations for a new allocation system in Hells Canyon. The conclusion points out the need for an integrated approach to river allocation.

NORMS FOR ALLOCATING RESOURCES

Allocation only becomes an issue when resources are scarce, i.e., when the quantity demanded exceeds the available supply. Scarcity, then, requires distributive justice, which means allocating resources in a "fair" manner (Homans, 1961). Injustice can result from the values on which allocation is based, the rules for allocation, the implementation of the distribution process, or from the exclusion of certain groups from decision making (Deutsch, 1975).

The most common criteria for distributive justice are equality, equity, need, and/or efficiency. Equality means that individuals have

the same right to certain benefits. There are two ways of achieving equality: 1) give all persons an equal share, or 2) give all persons an equal chance to obtain benefits. Suppose that six people on a river trip are sharing one case of beer. The first form of equality would give each person four cans. The second form would probably not be used unless the group had only one or two cans. Rather than dividing them, our river runners might draw straws, guess numbers, or use some other mechanism which gave each person an equal chance to win but awarded a whole can of beer to the winner. Similarly, we might have six hunters and six hunting permits. "Equal shares" equality would give each person 1 permit while "equal chance" equality might assign each person a number from 1 to 6, roll a die, and give the winner all six permits. Where benefits are divisible, the first form of equality is usually used; where benefits are not divisible (such as 27 persons wanting 1 permit), the second is probably preferred (Pauly and Willet, 1972).

Equality is not always "fair," so in some situations people resort to unequal but presumably more fair allocation norms. Equity is a term with several meanings, but in allocation it refers specifically to "fairness." This has most often been defined as the ratio of "inputs" to "outcomes" for each individual (Walster et al., 1973). The contention is that if inputs are unequal then outcomes should be proportionately unequal. For people on a river trip, equity might mean dividing the beer (outcome) in proportion to the amount of "beer money" contributed by each individual (input). Equitable distribution is often more complex than equal distribution because there are many dimensions for measuring both inputs and outcomes. For example, it appears inequitable that a resident Alaskan pays \$25.00 for a brown bear tag while nonresidents pay

\$250.00. But residency connotes additional inputs (such as taxes), and nonresidents may place a higher value on the right to hunt (increasing their outcomes).

Recognizing need is another way of trying to assure fair rather than equal distribution; some individuals may have different requirements than others. In dividing beer on the river, some people may "need" more to quench their thirst or to put them in a relaxed state of mind. Giving larger shares of food to people who are larger, more active, or more hungry is another obvious example, and in game management some permit systems give priority to subsistence hunting. Similarly, land owners are often given special access privileges on rivers which have private inholdings. Need is often disregarded in favor of equality or equity because need is difficult to define.

Social efficiency is maximized when a resource is put to its most highly valued use. Some people really like beer, for example, while others would rather drink river water; efficiency requires that the allocation reflect this difference in value. Similarly, fine peeler logs can be used for firewood or chipboard, but it is more efficient to use them for making plywood because we can substitute less valuable resources for use as firewood. In relation to river access, imagine 5 permits to be distributed among 10 persons. If the value placed on the permit by each individual differed, ranging from 1 to 10, maximum efficiency would occur when those with potential benefits of 6, 7, 8, 9, and 10 were given permits (total benefit = 40). If anyone else were substituted, net benefit would decrease. The point is that tastes vary, and people value different experiences differently. Some might be willing to give up golf, skiing, fishing, desserts, and a \$1,000 bill to run a particular river,

while others would just as soon visit Disneyland, climb a mountain, or watch a stock car race. If the goal is to maximize the value of the resource, use needs to be shifted to those who value river running the most. The obvious problem lies in determining value.

To summarize, equality, equity, need, and social efficiency are all important factors in resource allocation. Equality is probably the simplest criterion; "all" it requires is equal opportunity or equal outcome. Equity, need, and efficiency are more complex because they require some means of assessing costs and benefits (value) for different individuals. In market economics, value is expressed in monetary terms, although economists recognize that dollars may have different values for different people (e.g., rich people vs. poor people). The assessment of value becomes increasingly difficult with nonmarket commodities such as recreation. Here the criteria for comparing values may include money, time, opportunities foregone, the effort invested in acquiring skills or equipment, or the availability of substitute activities. The complexity of these factors makes equitable and efficient allocation quite difficult. There are also trade-offs made in moving from one norm to another, which increases the difficulty of deciding on a norm or combination of norms. Past research suggests that equity is preferred when production or efficiency is the goal, while equality is stressed when units of comparison are unclear or when the goal is to reduce conflict (Leventhal, 1976; Deutsch, 1975).

CONFLICT AMONG GROUPS

Scarcity of resources creates a situation in which several factors foster the development of conflict (Deutsch, 1973). The competition

implicit in scarcity is an obvious factor. Social change is another factor which shifts the basis of various interests and creates a situation in which conflict is likely to develop. Finally, anything which identifies or increases group differences will promote solidarity within groups and increase the likelihood of conflict with out-groups. The cohesiveness within a group is also increased by physical proximity, amount of communication, success of the group, and the perception of threat from or conflict with outside forces. People are more likely to engage in collective action to further group goals when group size is small, the logistical costs of meeting and organizing are relatively low, and potential individual rewards are relatively large (Olson, 1975). In-group solidarity doesn't necessarily cause conflict between groups, but it does set the stage. Conflict may be decreased when people belong to a variety of groups which have different, cross-cutting interests.

As conflict develops, the power of a group to achieve its goals becomes an issue (Deutsch, 1973). Groups which are satisfied with existing relationships develop rationales for maintaining the status quo; it is likely that they will see change as a threat which would leave them in a powerless position. Groups with less power are more dependent on others. They may attempt to change power relationships by increasing their resources, finding allies, increasing the costs of power for more powerful groups, or inducing powerful groups to use their power benevolently (often through appeals for equality or equity). Changes of the status quo are more likely to be accepted if all groups expect to gain than if one will gain at another's expense.

The allocator's role varies greatly, but is likely to include preservation and protection of resources, specification of the goals or

values on which allocation is based, definition of rules for allocation and proper resource use, implementation of the allocation system, delegation of the authority to re-allocate, and supplying additional resources whenever possible. The allocator is obviously in a position to either alleviate or exacerbate conflict.

These concepts help in understanding conflicts over river use, and many findings from earlier studies are mirrored in the private-commercial controversy. For example, a river allocation system may have to be designed quite differently depending on whether the goal is equality or equity. The conditions for conflict among groups also exist in the river allocation situation, including scarcity, the potential for unpredictable change, the official designation of distinctly different groups (private and commercial), and differing degrees of group solidarity and willingness to engage in collective group action. It also appears that the private and commercial groups have different amounts of power and different interests regarding the status quo, and both groups have used the courts to make unilateral actions by managing agencies costly if not impossible. Finally, agencies have discovered from sometimes painful experience the difficulties inherent in the role of allocator.

II. CURRENT ALLOCATION SYSTEMS

There are several kinds of resources involved in river running, and it is helpful to distinguish among them. Resources can be categorized as physical or non-physical. Physical resources are "things" which have value to people, including natural objects (such as trees and water) and man-made objects (such as cars and buildings). Non-physical resources are less tangible assets such as education, knowledge, labor, or aesthetic

qualities. River running includes both kinds of resources. Physical necessities include natural objects such as the river and canyon as well as man-made objects such as rafts, oars, and sleeping bags. Non-physical resources include river running skill and, on regulated rivers, access rights to the river.

The point is that all these resources are necessary for a river running experience. The public at large owns the river-canyon resource, and managing agencies provide access privileges for groups or individuals. River running equipment and skills are provided by outfitters or by users themselves.

PRIVATE AND COMMERCIAL GROUPS

For the purposes of allocation, users have traditionally been divided into two groups, "commercial" and "private." Commercial trips are offered by outfitters who are in the business of running rivers, and they have "blocks" of access privileges. Passengers pay a fee, and the outfitter provides the necessary equipment, skill, and access. A part of trip revenue is profit for the outfitter.

Private trips, by contrast, are less formally organized by non-commercial "do it yourselfers." A group of private users possesses the necessary equipment and skill, but must acquire access privileges from the agency on a trip-by-trip basis. Private permits are granted on the assumption that trip members are sharing costs, with no one realizing financial gain from the venture (Interagency Whitewater Committee, 1976).

Allocations to these two groups have generally been made in one of two ways. The first is a simple 50-50 split; there are two groups, so each should get half of the "user pie." Although this division is

equal (because there are two groups), it is usually arbitrary and would be inequitable (and unequal on an individual basis) if, for example, one group were much larger than the other.

The other means of "dividing the pie" has been to base the division on established use during some base line period. A period is selected, the percentage of use in each sector determined, and those percentages become the basis for future allocations. This kind of division can also be arbitrary, since it does not (in its current form) allow for changes in the composition of the user population. The obvious problem with both options is that there is no reliable information about the amount of use desired by each sector. Equitable allocation requires either information about demand or a system which can operate independent of such information.

As the competition for space on rivers has increased, arguments have developed between the private and commercial sectors about the amount of use each group "ought" to have. The major points in the controversy have been discussed elsewhere (Shelby and Nielsen, 1976), but they will be briefly summarized here. In favor of commercial trips, it is argued that: 1) outfitters provide a service to that portion of the public which "wants to be outfitted;" 2) outfitters have faced use limitations similar to those imposed on private boaters; 3) managing agencies feel some degree of obligation to assure that commercial trips are available for those who wish them; 4) outfitters have made significant contributions to equipment development and resource preservation; and 5) it is more convenient for managers to deal with a small group of professionals. Arguments in favor of private trips are: 1) the "demand" for private trips have increased in recent years, generally with no increase in use allocations; 2) the higher

cost of commercial trips is discriminatory against private "do it yourselfers;" 3) recreational interests in public lands are held in trust for the "indefinite public," and should not be allocated to commercial interests which can monopolize them, and 4) commercial trips encourage use by people who otherwise would not run rivers, thus displacing those who have developed river related skills on their own. Private users also argue that permit application procedures are more cumbersome for them than they are for commercial users.

Distinguishing User Publics

In considering these arguments, it is most useful to distinguish three different segments of the "user public" (Shelby and Nielsen, 1976). Commercial outfitters form one segment, and they represent their own profit interest in addition to any more generalized interest in river running. Outfitters are relatively well organized because their numbers are low (17 on the Snake, 21 in Grand Canyon), they are usually concentrated geographically, many belong to formal associations which meet regularly, they interact regularly with agency personnel, and the potential individual gain from collective action is high (an outfitter stands to retain or acquire an allocation which is large enough to support a business and which may be worth a considerable amount of money). The number of outfitters on a given river is generally limited to those who were "in business" when the managing agency decided to regulate use. Each outfitter is given a specific allocation of use (user days, launches, etc.) which he/she controls. The size of the allotment depends on a variety of factors, usually including previous use.

Commercial passengers and private users form two additional segments, and they share a recreational interest in running rivers. Commercial

passengers presumably want to be "outfitted," a service provided by outfitters which has usually included procuring a space on the river.

Commercial passengers thus have little reason to interact with managing agencies, and they have been notably absent in public involvement concerning allocation. They are not usually organized except by the mailing lists of outfitters. It is often assumed that outfitters represent the commercial passenger group, an assumption that may result in the confusion of outfitters' profit motives with the recreational motives of their passengers.

Private boaters want to run their own trips. In the past their only organizations were local activity-oriented clubs, but recently ad hoc groups (such as the Wilderness Public Rights Fund) have formed around the allocation issue. In spite of a shared "cause," most factors work against unified political action. Private boaters are numerous, geographically scattered, most do not meet regularly, they do not have regular meetings with managers, and the potential individual gain from collective action is low (a person usually stands to gain access individually or for a single trip). Private permits have traditionally been acquired by a trip leader, who in turn selected other trip members. Some rivers now require trip members to be listed on the permit application, and some limit the percentage which can be changed.

These discussions often seem to imply that private and commercial users are radically different. Research done in the Grand Canyon (Shelby and Nielsen, 1976) indicates that these two groups are remarkably similar in terms of standard background characteristics. There are no significant differences in education, occupational status, marital status, number of children, or past residence. The private user tends to be slightly younger, more predominantly male, has slightly less income, and is more likely to

live in a rural area. There are larger differences between the two groups on outdoor experience variables. As one might expect, those who run their own trips are more likely to belong to outdoor clubs, have had their first wilderness experience earlier, have more experience running rivers, and are more likely to participate in other outdoor activities. Recent studies on the Rogue River in Oregon essentially replicate these findings (Shelby and Colvin, 1979).

Private trips are usually conducted differently from commercial trips (Shelby and Nielsen, 1976). In Grand Canyon, they tend to have less people, more boats, and less people per boat than commercial trips. They spend a longer time in the Canyon, and visit a greater number of attraction sites. Commercial oar trips differ from commercial motor trips in these same ways, but to a lesser degree (all private trips were oar trips).

ALLOCATION GOALS OF DIFFERENT GROUPS

The preceding section suggests that different groups may have different ideas about what an allocation system should accomplish. To explore this, we met separately with managers (Interagency Whitewater Committee), outfitters (Idaho Outfitters and Guides), and private users (an informal group organized by John Garren and ourselves). At each meeting, the group was asked to brainstorm about and then prioritize allocation goals. We later developed a comprehensive list of 16 goals integrated from the three sessions. The list was sent to the original participants and others, asking them to select their top five goals. The goals of each group were prioritized using a simple averaging procedure. The comprehensive list, response rates, and the complete rankings for each group can be found in Appendix 1.

Managers, outfitters, and private boaters share several concerns. All

three groups felt that an allocation system should be simple and easy to understand, with a minimum of "red tape," and efficient, minimizing "no-shows" and making unused launches available to other users. These two goals ranked in the top six for each group (see Table 1), and they provide points of consensus on which a system could be based.

Aside from this agreement, the three groups have quite different concerns. Managers felt that a system should: be defensible to diverse groups and fit legal and budgetary constraints; be responsive to the relative amount of use "demanded" by each sector; maximize use (fill available "slots") within environmental or social carrying capacities; be flexible (allow for changes in plans, group composition, weather, etc.); and provide business stability for outfitters. These goals reflect the constraints and political pressures faced by managers as well as their responsibility for accommodating unforeseen changes.

Outfitters have a somewhat different point of view. Their primary concern was that the system provide stability for their businesses. Another major concern was that procedures for obtaining a permit should be different, with outfitters distributing permits to commercial users and the managing agency distributing them to private users. Outfitters also felt that the system should penalize those who attempt to cheat, holding users and outfitters responsible for breaking the rules, and that user groups should not be given preference on the basis of past success, historical use, etc. The first two goals reflect outfitters' need for some kind of stability and their desire to maintain control of commercial allocations. The third goal may indicate a feeling that private users are beating the system or acting irresponsibly at outfitters' expense, and the fourth probably reflects a belief that a preference system would disadvantage commercial passengers.

TABLE 1

RANKED ALLOCATION GOALS OF DIFFERENT GROUPSManagers

- 1) The permit system should be simple and easy to understand, with a minimum of "red tape" for users, outfitters, and managers.
- 2) The permit system should be defensible to diverse groups and fit legal and budgetary constraints.
- 3) The permit system should be responsive to the relative amount of use "demanded" by the private and commercial sectors.
- 4) The system should be efficient by minimizing "no-shows" and making unused launches available to other users.
- 5) The permit system should attempt to maximize use within environmental or social carrying capacities (i.e., an attempt should be made to fill all available "slots" on the river).
- 6.5) The system should be flexible (allow for changes in plans, group composition, weather, water levels, etc.).
- 6.5) The permit system should provide business stability for outfitters.

Outfitters

- 1) The permit system should provide business stability for outfitters.
- 2) The permit system should be simple and easy to understand, with a minimum of "red tape" for users, outfitters, and managers.
- 3) Penalize applicants who attempt to "cheat" the system; hold users and outfitters responsible for "breaking the rules" (including bogus applications, no-shows, environmental damage, etc.).
- 4) Procedures for obtaining a permit should be different: outfitters should distribute the commercial users' permits and the managing agency should distribute the private users' permits.
- 5) The system should be efficient by minimizing "no-shows" and making unused launches available to other users.
- 6) Users should not be given preference according to past success at obtaining permits, historical use of a river, relative value they place on river running, or demonstrated environmental skill.

TABLE 1 (continued)

Private Users

- 1) Procedures for obtaining a permit should be the same for all users, regardless of whether they want to float a river on their own or with an outfitter.
 - 2) Permits should be issued to individuals, who then arrange the group, either private or commercial, with which they want to float the river.
 - 3) The permit system should avoid encouraging use by limiting advertising or promotion of river running.
 - 4) The system should be flexible (allow for changes in plans, group composition, water levels, etc.).
 - 5) The permit system should be simple and easy to understand, with a minimum of "red tape" for users, outfitters, and managers.
 - 6) The system should be efficient by minimizing "no-shows" and making unused launches available to other users.
-

The top two goals of private users were that procedures for obtaining a permit should be the same for all users and that permits should be issued to individuals, who then arrange either a private or commercial trip. The first is essentially a concern for equality in what private users feel to be an unequal and inequitable system, the second represents the alternative permit system most often supported by this group. Private boaters also felt the system should avoid encouraging use by limiting the promotion of river running. Many of them feel that advertising by commercial outfitters is crowding the rivers with commercial passengers who would be just as happy with some other form of recreation, displacing private users who presumably place a higher value on the experience. Finally, private boaters felt that any system should be flexible, allowing for changes in plans, water levels, etc.

SPLIT ALLOCATIONS FOR PRIVATE AND COMMERCIAL USE*

When it became necessary to limit use, most agencies simply developed allocation systems which approximated the way permits had been issued in the past; no one at that point questioned the desirability of separate allocations for private and commercial use. But as demand continued to exceed capacity, users first contested the percentage allocated to each sector and later argued against the concept of split allocations. These attempts to change the system had potential for success because allocation is political.

As was discussed earlier, increased demand is likely to increase the cost of gaining access (money in the commercial sector, time and hassle

*This section makes extensive use of reports from Parent (1978a) and Baden and Stroup (1978). Their contributions are acknowledged here to avoid interrupting the text with frequent references.

in the private). Some people will be priced out of commercial trips. These people can either engage in political action to change the system, attempt to substitute a private trip, or substitute a different recreational experience (another river trip or a non-river experience). But if commercial passengers place a relatively low value on the river experience, they would not engage in political activity; they would be more likely to substitute a private trip or try some other experience. In the latter case they no longer concern us. But if "priced out" commercial passengers attempt to substitute a private trip, everyone in the private sector has a lower probability of getting a permit. This means that private users who place a relatively high value on the experience are more likely to be denied access.

Private users then have three options: engage in political action, substitute a commercial trip, or substitute a different recreation experience. Private boaters usually have a more substantial investment in equipment and experience, so they are unlikely to give up river running. They also appear reluctant to go on commercial trips (primarily, we think, because they want to run their trips independently, although cost is often mentioned). That leaves political action, and private boaters have engaged in efforts to get permits for themselves as well as to change the allocation system.

Essentially, then, high-valuing private boaters have invested part of their consumer surplus in political action, just as commercial outfitters have invested part of their economic rents in similar activity. Commercial passengers have generally avoided political action, choosing instead to pay more money, substitute a private trip, or substitute some other activity. The preceding analysis has been theoretical rather than empirical, although it appears to fit what is known and makes sense in terms of economic and political theory.

Are Split Allocations Defensible?

Existing split allocation systems represent the way things have been done in the past. They are already developed and operating, they have been reasonably successful, and they are familiar to managers, outfitters, and users. But it now appears that existing systems have important unintended consequences; they should be carefully evaluated in terms of allocation goals such as equality, equity, efficiency, and need.

Current split systems aren't equal. Procedures for gaining access are different for commercial and private users, who "pay" in different currencies (money versus time and hassle). On high demand rivers such as the Colorado in Grand Canyon, commercial users apparently have the potential for more trips (unequal shares) and a greater likelihood of getting on a trip (unequal probability).

As far as we know, no river permit systems evaluate inputs in an attempt to make outcomes equitable. As will be discussed later, some hunting permit systems do so by giving preference to groups such as residents or those who have been unable to get a permit in the past. In these systems, inputs are defined as taxes paid or the effort expended on unsuccessful applications, and outcomes are defined as the chances of getting a permit; those with greater inputs have greater outcomes. Achieving equity of a more profound nature would require some very difficult assessments. For example, current river systems allow commercial users to pay with money while private users pay with planning and the time involved in getting a permit. Because the currencies are different, the inputs are hard to compare, even if the amounts of money and time could be specified. Comparing outcomes is at least equally problematic; the more profound benefits obtained

from a river experience are extremely difficult to measure and evaluate.

The extent to which split allocations are efficient is unknown.

Efficiency requires an assessment of the value of the resource so that it will be used by those who value it most highly. The current system may be efficient within the commercial sector; people willing to pay are those who get to go, and others are priced out. Within the private sector, however, lotteries tend to provide equal allocation, which is inefficient because it does not favor those who place a higher value on the experience. It is unlikely that split allocations are efficient between the two sectors, but it is difficult to tell because the two groups pay in different currencies.

Current systems recognize need in several ways. Most agencies provide for access by property owners, and some have set up special allocations for social service or educational groups. It is often argued that outfitters or lodge owners require river access for their livelihood, so their allocations are also a recognition of need.

Making Split Allocations Work

Split allocation systems have the advantages of incumbency. But a number of questions have been raised, and maintaining the status quo will mean defending it. Split systems are difficult to defend without accurate information about demand in the private and commercial sectors. Agencies have tried to estimate demand using private permit applications and the number of commercial "turn aways," but these measures are unreliable and subject to manipulation. Survey techniques might be helpful, but would be expensive. Any assessment of demand will also require forecasting and/or updating, because demand will probably change over time. It may also be necessary to determine the percentage of private demand created by those

priced out of the commercial sector, or the percentage of commercial demand made up of private users unable to get a permit.

The need to know demand is based on the assumption that allocations must be split. As was noted earlier, agencies developed split allocations because they were convenient at the time. It makes little sense to perpetuate such systems unless they accomplish allocation goals. We suggest working from goals and objectives to a specific system, as outlined in a later section. If a split allocation is necessary, a way to estimate demand can be found.

SPACE ON RIVERS AS A SCARCE RESOURCE

The central question is, "Who gets to use the scarce resource, and how will those people be chosen?" The "scarce resource" is space on the river, which managers measure in units called "user days."¹ In American society, the usual means for allocating scarce resources is the market system. In such a system, an excess of quantity demanded should cause the quantity supplied to increase and/or the price to rise. The number of people who want to run rivers is increasing, but the supply of available spaces has been limited by carrying capacities. If use were allocated by a market system, then, prices would increase until users unwilling to pay more were eliminated and the quantity demanded equalled the prescribed capacity.

It appears that the market mechanism is free to operate in the commercial sector. Although the supply of spaces on the river is fixed by

¹A user day is here defined as one person using the river for part or all of one day. Other units have also been used (e.g., visitor nights, trip launches), and this discussion applies to them as well.

managing agencies, it is possible to raise the "price" of a trip (either in dollars or by other methods such as requiring a reservation, collecting deposits, or cutting services). Good business practice would suggest such an increase rather than spending time and money turning away customers who couldn't be accommodated. It should also be noted that the quasi-monopolistic position enjoyed by outfitters is a result of agency limitations on number of outfitters and amount of use rather than a result of monopolistic practices by outfitters themselves.

The point is that this kind of increase in price is an economic "rent" which reflects the value of space on the river (as distinct from the outfitter's services, which also have a value). User days have taken on a monetary value, in spite of the contention by managing agencies that "passenger days are not a saleable commodity" (Interagency Whitewater Committee, 1976). User days can in some cases be legitimately traded (Yearout, 1975), it is rumored that they can be bought or sold, and it seems obvious that the net worth of an outfitter's business (i.e., equipment, real estate, mailing lists, etc.) is greatly enhanced if an allotment of user days can be assured.

The recent sale of several outfitting businesses provides some limited information about the value of use allocations. It is difficult to specify the price of the use permit by itself because the agencies' refusal to recognize a permit transfer requires the buyer and seller to pretend that only a business (equipment, buildings, etc.) is being sold. But Table 2 combines our best estimate of black market permit prices with information about average trip size and length and the assumption that the cost of the permit will be amortized over 5 years. The results

TABLE 2

ESTIMATED VALUES OF COMMERCIAL ALLOCATIONS

River	Price of Permit ^a	Allocation (Passenger Days Per Year)	Value per ^e Passenger Day	Percent of Commercial Allocation Used in 1978	
				Launches	User Days
Colorado (Grand Canyon)	\$500,000 (1978)	10,000	\$10.00	--	99%
Middle Fork Salmon (Idaho)	\$ 19,000 (1977)	518 ^b	\$ 7.25	83%	55%
Rogue (Oregon)	\$ 1,250 (1978)	52 ^c	\$ 4.75	73% ^f	66% ^f
Snake (Hells Canyon)	\$ 10,000 (1977) \$ 20,000 (1979)	845 ^d 845	\$ 2.25 \$ 4.75	40% ^g 57%	-- 30%

a Represents our best estimate of price for permit only.

b Assumes 6 launches x 16 passengers each x 5.4 days on river = 518.

c Assumes 1 launch x 13 passengers x 4 days on river = 52.

d Assumes 13 launches x 13 passengers each x 5 days on river = 845.

e Assumes 5 year amortization with no interest, rounded to nearest .25.

f These are 1977 figures; 1978 permit system used a "common pool" which made it non-comparable with systems on the other rivers.

g This is for the 1976 season, on which the sale was based.

suggest that permits have considerable value and that value varies depending on demand for the resource. The values range from about \$10.00 per user day in Grand Canyon to \$2.25 - \$4.75 in Hells Canyon.

In the private sector, space on the river has also been limited by use restrictions. In addition, however, the "price" of a user day is fixed (at zero) because trip members are sharing expenses only. The result is that there is no market mechanism to distribute the limited number of user days. Managing agencies have had to invoke various non-market allocation mechanisms to distribute private permits at no charge, including "first come, first served," one trip per season, one trip every other season, and lottery drawings. The value of access (the difference between what private users would be willing to pay and what they actually pay) is captured by private users as consumer surplus, which represents another form of economic rent. It is rumored that user days can also be bought or sold in the private sector, but such transactions are difficult to track down.

The upshot of this is that what was supposed to be a "free public resource" has become an economic commodity (as a result of its scarcity). It was originally intended that space on the river, which managing agencies held in trust, was to be distributed to the public at no charge. The agency's job was to see this was done in a fair and efficient manner, without undue damage to the resource. In the commercial sector, there was the added responsibility of assuring that the outfitting services available were of high quality. However, allotting blocks of the scarce commodity (user days) to either commercial outfitters or private trip leaders apparently defeats these original intentions, since it allows someone outside the agency to reallocate user days to individual users. By doing so the allocation system essentially allows individuals,

particularly outfitters, to acquire and control access rights to public river running resources.

The notion that allocations have no economic value is simply untrue; it should be replaced with the frank recognition that access rights to rivers are worth a great deal. But this recognition creates a major problem: Who should capture the value of a public resource? Should access rights be given away? Should agencies sell access to users? Should agencies sell access to entrepreneurs, who in turn re-sell to users? Should agencies give access to entrepreneurs, who in turn sell to users?

The answers to these questions are based on values, and research can't make value judgments for either managers or the public. But research can specify the consequences of different alternatives, thereby providing better information on which to base decisions. The foregoing discussion suggests that current allocation systems take public resource access rights and give them at little or no cost to outfitters and private trip leaders, who are then in a position to reallocate (and perhaps sell) those rights back to the public.

III. ALTERNATIVE ALLOCATION SYSTEMS

People use a variety of methods for allocating scarce resources. This section describes the five allocation alternatives identified in Stankey and Baden's (1977) paper on rationing backcountry use: pricing, queuing, merit, reservation, and lottery. Pricing and queuing have been thoroughly studied by economists and are fairly well understood; these two alternatives will be described briefly. Rationing by merit is a relatively untried option which will also be discussed briefly.

Reservation and lottery systems are widely used but have received little formal scrutiny; they will be discussed briefly in the text, but are treated in depth in Appendices 2 and 3. It should be pointed out that most allocation systems combine one or more of these five mechanisms in order to achieve allocation goals.

The reader will recall that equitable or efficient allocation requires an assessment of value. Value can be measured as how much a person is willing to give up to consume a commodity or as how much a person would have to be compensated to forego consumption. We most frequently think of value in terms of dollars, but other commodities such as time, effort, knowledge, or skill obviously have value also. As a "pure" concept, price refers to the amount of any commodity which is paid to receive another commodity. In the following discussion price will refer only to the payment of money.

PRICING

Many valuable resources are distributed by pricing in a market system. This is particularly true of private property resources because the owner can make unilateral decisions about selling. Common property resources are less likely to be marketed, especially when the property owners are numerous and the managing entity does not have clear guidelines for pricing and marketing. Public recreation resources are usually non-market commodities, although one can think of examples where contracts allow marketing (ski areas on public land) or where fees are charged in a quasi-market (public campgrounds).

In simplest terms, a market adjusts the quantity supplied and/or the price until supply equals demand. In the case of river recreation, supply is limited to the carrying capacity. In general, then, pricing

would mean charging a fee during times when demand exceeded carrying capacity. The fee would have to be high enough to cause those less willing or less able to pay to drop out of the market, decreasing demand until it equaled supply.

Pricing has several advantages. It encourages consumers to prioritize their desires, commodities are presumably distributed to those who value them the most (resulting in equity and efficiency), and demand is "automatically" balanced with available supply. Pricing would eliminate artificially low (zero) prices which encourage those who place little value on an experience to compete with people for whom the experience is important. Pricing would also require those who use the resource to pay for it, rather than having all taxpayers subsidize the recreational pursuits of the river running minority. It might even be possible to use revenues to provide alternative opportunities (such as softball diamonds) for those who don't use rivers.

There are also disadvantages of pricing. Efficiency may not be maximized because income is unevenly distributed; pricing discriminates against those who are unable to pay as well as those who are unwilling, and a person with little money who places a high value on river running might be squeezed out by a casual river runner with a higher income. However, the cost of a permit would probably be low in relation to the total outlay for equipment, food, travel to and from the river, and time and opportunity costs, and it appears that people who could afford these other costs could also afford a permit.

QUEUING

Queuing means waiting in line or "first-come/first-served" (FC/FS).

It is similar to pricing, but time rather than money is traded for the desired commodity. Queues are commonly used for admission to popular shows, sports events, or concerts, usually in combination with pricing. Queues have been used in backcountry permit systems, either for some percentage of use or for unclaimed reservations.

The advantage of queuing is that, like pricing, it allows individuals to assess the value of the resource in relation to their willingness to pay (in this case the time required to "get in"). Some argue that allocation by time is the most fair because time is evenly distributed; we all have 24-hour days. But there are also disadvantages to queuing. Time is worth a great deal to those with structured and busy lives, but has relatively less value for those with fewer demands; queuing therefore discriminates against those whose time is "precious." Because most rivers are in remote areas, queues for permits might cause other problems. If queues were held on the day of departure, people wouldn't know whether to plan for success or failure; if they were held in advance, people would have to make two trips. Queuing might also require facilities and administration for the people waiting in line (an added expense), and time spent waiting is "lost" for everyone (whereas a monetary fee becomes someone else's gain).

MERIT

A merit system would distribute permits on the basis of some demonstrable skill, knowledge, or past behavior. The idea is that people prove their commitment and qualifications by investing whatever it takes to

acquire merits. This is a relatively untried option, but qualifying exams for government employees, safety courses for hunters, or tests for drivers provide some examples. Comparable experience is already required on some rivers, which is an indirect merit requirement. An interesting variation proposed by Outdoor Program participants at the University of Oregon would allow people to earn merit points by working on ecology-related projects such as recycling or litter pickup.

Merit tends to be used for establishing minimum qualifications rather than for choosing from a surplus of qualified persons. The ability to eliminate the unqualified appears to be its primary advantage, although the time, effort, and money spent acquiring merits would encourage users to assess the value of the experience and might increase social efficiency. Requiring merit beyond minimum qualifications creates serious difficulties in deciding what makes a person "worthy." Add to this the problems of subjective judgement, favoritism, and possible black markets, and administration might be a nightmare.

RESERVATION

The notion of making a reservation is familiar to most of us. Spaces in airplanes, trains, hotels, and restaurants are often reserved through world-wide computer networks, although many reservations are handled by simpler systems. All reservation systems have one common effect: they place a premium on advance planning. People who reserve their "spot" the earliest are the preferred "customers." This emphasis on planning distinguishes reservations from other rationing techniques.

Reservations have been used for a variety of public recreation resources, but campgrounds are probably the best and most thoroughly

documented example. An extensive review of campground reservation systems is presented in Appendix 2; it discusses the uses of reservation systems, administrative problems, and possible solutions. The effects of such systems are not always consistent, but the following generalizations appear justified.

1. Reservations favor users who can and do plan ahead, so not everyone benefits from the change to such systems. Identification of and provision for users who do not plan ahead is important to avoid their exclusion.
2. Reservation systems involve a wide range of variables, including automation, centralization, method of making the reservation, and specific reservation policies. These should be carefully evaluated in light of agency goals and constraints because they significantly affect efficiency and acceptability of the system.
3. No-shows remain one of the significant drawbacks to reservations. Methods to reduce no-shows include prepayments, penalties, and adjusting the method by which reservations are made.
4. Reservation systems are expensive; it is important to consider who benefits from the service and who pays for it.
5. Overall use of campgrounds is reported to increase with reservations, probably as a result of visitor referral. Campers who would otherwise be turned away during peak times are referred by the system to less popular places or times (National Park Service, 1974; Burnett, 1973). This may result in more complete utilization of the resource.
6. Campgrounds using reservation systems show a significant reduction in visitor-related problems such as thefts and vandalism.

(National Park Service, 1974). This is apparently due to either the type of users most likely to make reservations or the accountability which results from recording names and addresses.

7. Users who obtain satisfactory reservations will be happy with the system; those turned away will probably be disgruntled, but may still support the system. Referral to available places or times is preferred to denial, both from an efficiency and a political standpoint.
8. Reservation systems are complex, but the effects of different variables on user behavior are rarely analyzed or considered. Agencies establishing new systems or changing existing ones should plan to collect data and monitor the effects.

LOTTERY

Lotteries have long been used to make social choices and allocate scarce resources; examples range from draft lotteries to sweepstakes drawings. Game permit selection procedures represent the best example of lotteries for recreation resources. But these systems have not been well documented; when reports exist at all, they are usually unpublished, widely scattered, and limited in scope. In order to gain a more comprehensive view, we contacted game management agencies in the west and midwest and attended a conference on administration and licensing which focused on lotteries. A complete review is presented in Appendix 3. As with the discussion of reservation systems, the idea is to describe the issues involved in the use and administration of lotteries. The following generalizations can be made.

1. Lotteries are historically well founded and are legally sanctioned.

They are currently and widely used for allocating resources, and Americans take them seriously.

2. It is important that lotteries be and appear fair.
3. Lotteries in their "pure" form represent the "equal chance" method of achieving equality, where each applicant has an equal probability of selection.
4. Many lotteries are not "pure;" they have been modified to serve specified equity or efficiency goals such as giving previously unsuccessful applicants a higher probability of selection.
5. Lotteries are flexible in other ways. They can a) handle a great number of applications and/or of drawings; b) be used to distribute use and maximize individual choice; c) be manipulated to provide varying rates of "turnover;" d) handle group applications; and e) vary in cost and efficiency.
6. Lotteries may pose problems for commercial guides, particularly when they rely on return business.
7. There are other potential problems which need to be considered if lotteries are used for river permits, including fees, permit transfers, advertising, and quasi-commercial operations.

NON-RATIONING MECHANISMS: LESS RESTRICTIVE MEASURES

There are a variety of ways to reduce congestion or crowding without actually rationing use. Most problems are caused by concentrations of use, either in time (days of the week, months of the season, etc.) or space (launch areas, attraction sites, etc.). Mechanisms which distribute use more evenly will increase the available supply of space on the river, thereby alleviating the "pinch" created by high demand.

Such mechanisms are extremely valuable for increasing utilization and gaining political acceptance. For example, the recent river management plan for Grand Canyon lowered the daily launch limit for social capacity reasons. But distributing use over a longer season allowed an increase in overall use, accommodating a larger private allotment without substantially cutting commercial use. This kind of "no one loses" solution is very appealing.

There are limitations, however. These mechanisms require use limits, so physical, ecological, and social carrying capacities will still have to be carefully considered. In addition, re-distribution is only a temporary solution. If demand continues to increase, it is only a matter of time before the newly available supply of spaces will be filled. Allocation will be necessary at that point, so the issue will only have been postponed. Agencies shouldn't miss the opportunity for a "no one loses" solution by waiting too long to develop an allocation system.

IV. THE SNAKE IN HELLS CANYON

Most of this report applies to allocation problems on any river. There are, however, some aspects of the situation in Hells Canyon which are more unique. This section will describe current use and discuss the issues surrounding use by outfitters.

CURRENT USE

The Snake flows from northwest Wyoming to the Columbia River near Pasco, Washington. The uniqueness of the section which forms the Oregon-Idaho border was recognized by Congress with the designation of the Hells Canyon National Recreation Area (HCNRA) in 1975. At the same time, Congress included the 58 mile stretch downstream of Hells Canyon Dam in the Wild and Scenic Rivers System.

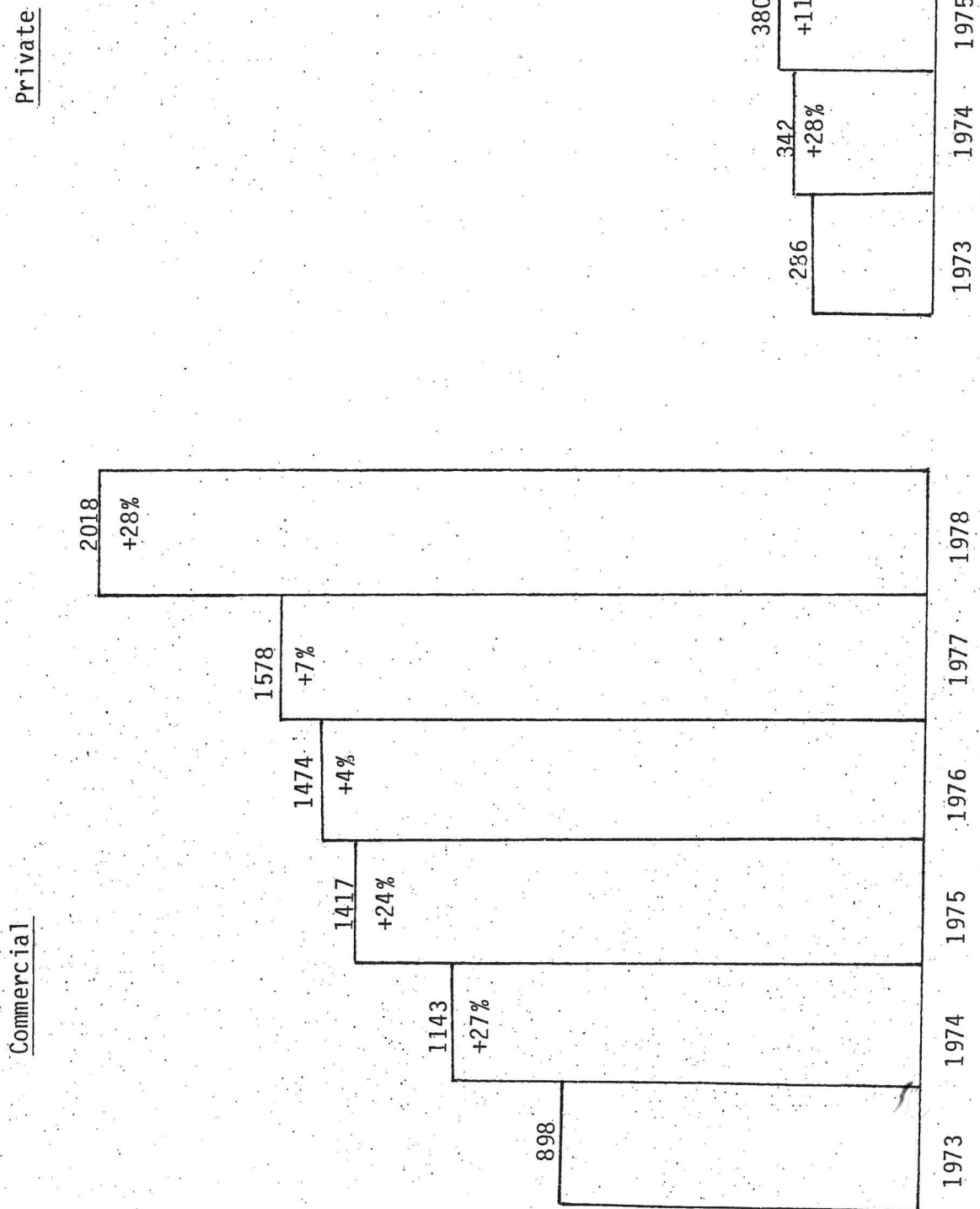
Whitewater boating is a popular activity on this section of the Snake. People launching at Hells Canyon Dam can float to Pittsburg Landing (33 miles) or the confluence with the Grande Ronde River (85 miles); most float the latter distance, averaging five days per trip (USFS, 1976). There are other activities which occur on or near the river, such as hiking and jet boating, but here we are only concerned with float-boating.

Float use in Hells Canyon has increased in recent years (see Figure 1). In 1973, a total of 1184 persons launched at Hells Canyon Dam; by 1978, this had increased to 3213 persons, an average increase of 22% per year. Increases in commercial use averaged 18% per year during this period, while increases in private use averaged 36%. As with other popular rivers, use on the Snake is not evenly distributed throughout the year (see Figure 2). For example, 991 people floated Hells Canyon in July of 1977, while 50 floated the same stretch in October. The vast majority of commercial use occurs in June, July, and August, while a fair amount of private use also occurs in September. Further analysis would probably show that use is higher on some days of the week than others, but these data were unavailable. What this means is that crowding and the potential need for rationing are greater at some times than at others.

Hells Canyon National Recreation Area is administered by the Wallowa-Whitman, Nez Perce, and Payette National Forests under the terms of an "Interim Management Plan." The plan controls float use with a permit reservation system. During the use season (May 21 to September 9), two commercial and three private parties may reserve a launch each day with a maximum of 30 persons per party. The system, then, allows a total of 150 persons per day, but because use is regulated by party, launch capacity can be "filled" with fewer people. In 1978, for example, private launches averaged

FIGURE 1

People Per Year
Floating the Snake in Hells Canyon, 1973-1978^a



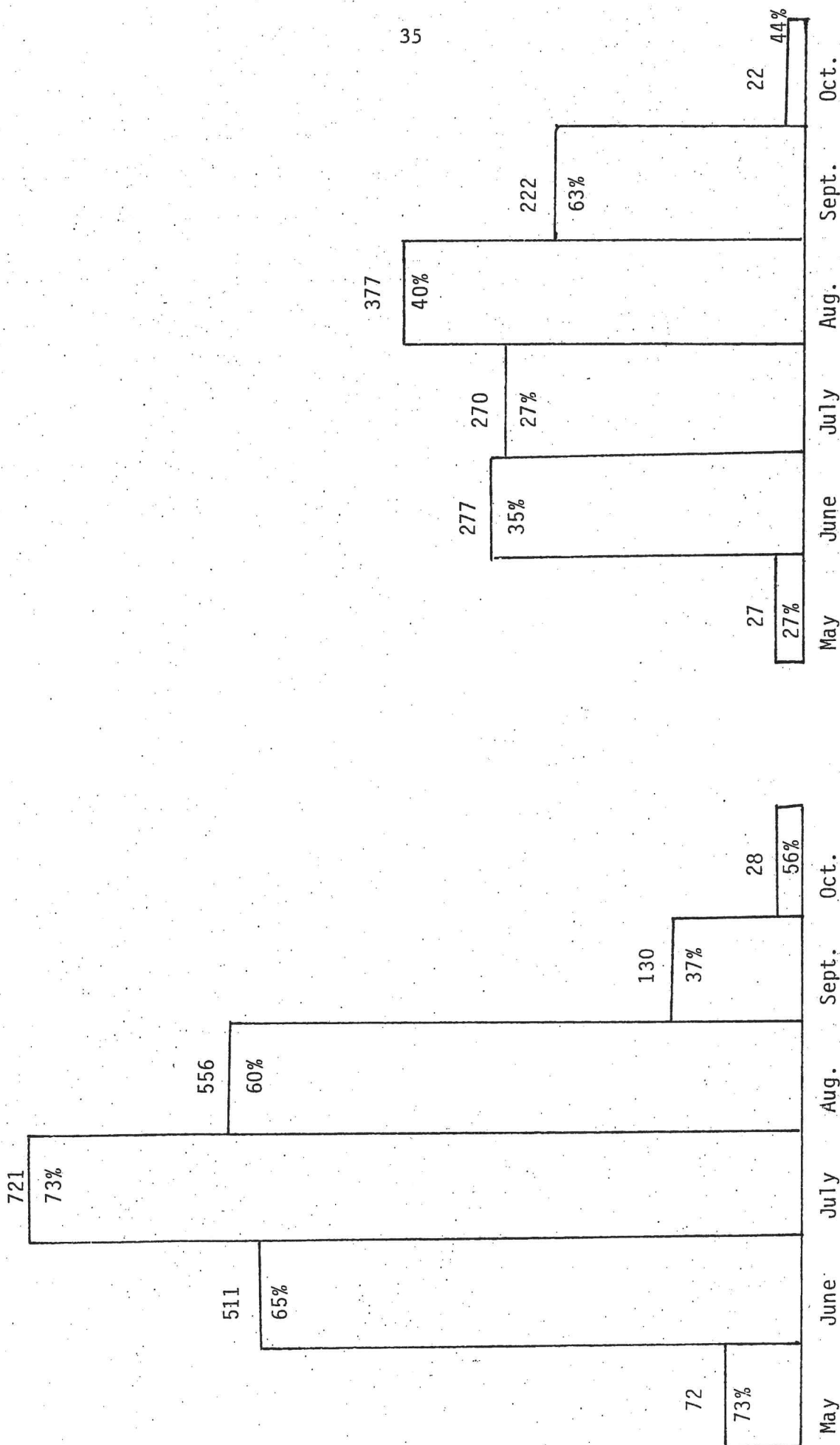
^a Adapted from U.S.F.S. Data, Pine Ranger District, Mallova-Whitman National Forest.

FIGURE 2

People Per Month Floating the Snake in Hells Canyon, 1978^a

Commercial

Private



^a Adapted from U.S.F.S. Data, Pine Ranger District, Wallowa-Whitman National Forest. Percentages represent relative use by each sector.

8 persons and commercial launches averaged 16. On a day where all allotments were filled with average sized trips, total people launching would be 56.

There are several good reasons for regulating the number of launches rather than the number of people. Physical carrying capacity is based on available campsites, and because the norm is one party per site, the canyon "fills" according to the number of launches rather than people. Similarly, social carrying capacity is based on the number of encounters among groups, which depends on the number of groups rather than the size of each one. Finding that the average number of people per trip is well below the allowable maximum suggests to us that agencies usually set the limit too high. In Grand Canyon, where the commercial maximum was 40 persons per trip, 57% of the users preferred groups of 20 or less and another 29% favored groups of 20-30 (Shelby and Nielsen, 1976).

Records show that commercial outfitters used 57% of the launches available to them in 1978, while private boaters used 44%. Both sectors, then, have space available to them. This under-utilization is an advantage at the present time because it should allow development of an allocation system without the political pressure typical of high demand situations. If agencies want to increase the utilization of available launches, recent experience on the Rogue River in Oregon suggests that placing unconfirmed launches in a "common pool" helps accomplish this. The problem is that most capacities are based on the assumption that use will approach the limit only on certain days (such as weekends), and launching the maximum every day may exceed physical or social capacities. If use continues to increase, popular rivers will approach full utilization even without a common pool. Agencies should be sure that the river system can handle maximum use.

The current allocation system on the Snake has come into question because of a protest by a private user. On a date when two commercial and three private launches were allowed, John Garren applied for a fourth private launch after the other three had been filled. Even though the Forest Service made a permit available to him, Garren chose to run the river without a permit to protest the current allocation system. In addition to specific complaints about the way permits are distributed, his concerns echoed the more general arguments of private users which were discussed earlier in this report.

The denial of Garren's application was upheld on appeals to the Regional Forester and Chief of the Forest Service (see Garren, 1977; Jorgensen, 1976; and McGuire, 1977; for further details). In responding to the case, two commitments were made. Jorgensen (1976) indicated that use ratios prescribed by the Interim Management Plan "can and will be changed . . . if use patterns indicate a different ratio would be more appropriate." Forest Service Chief John McGuire (1977) further indicated that "we will engage mechanisms to adjust the allocation ratio to demand levels which assure each type of user an approximate equal chance for a trip without prohibiting either."

OUTFITTERS IN HELLS CANYON

Commercial guides need to be considered in any allocation decisions; they are a vocal and politically well organized "public," all or part of their livelihood depends on river running, and they provide important services (as outlined earlier). Accordingly, the possible impacts of new systems on outfitters have received a great deal of attention. For example, Parent (1977) speculates that a lottery might have the following effects.

Outfitters who could afford to do so would invest in primary advertising to increase the size of the commercial sector, which would greatly increase demand for the resource. At the same time, both private river runners and small outfitters, who would be unable to compete with expensive advertising campaigns, would be forced off the river. The diversity of services offered by numerous small outfitters would be lost, private users would have little opportunity to run the river, and the already existing overdemand situation would be further exacerbated.

Such discussions quickly become extremely complex. The behavior of businessmen is based on a number of factors, ranging from well known business principles to unknown individual motives. The outcomes of policy changes also need to be considered in terms of value judgments about how commercial businesses and public resources ought to be "combined," as they are in commercial river running.

The point is that changes in allocation mechanisms will probably affect business behaviors, and it would be helpful to anticipate the changes which might occur. The only study which provides any documentation was done on the Snake River near the Grand Tetons in Wyoming (Parent and Robeson, 1977). The Park Service and Forest Service manage similar sections of the river, but the Park Service fixed the supply of trips by limiting use while the Forest Service allowed use to increase. From 1973 to 1976, trip prices increased on the NPS section but remained the same on the USFS section. Use was of course held constant on the NPS section but increased 25% per year on the USFS section, suggesting a general increase in demand as well as a shift from the higher priced trips to lower priced ones. The Forest Service was faced with problems of congestion and crowding.

There is little other evidence on which to base predictions about changes, although many people are willing to speculate. Given this, the next best alternative is to carefully document the present situation of outfitters in Hells Canyon; by collecting similar data in the future, we can begin to analyze the effects of allocation changes. We need to document the kind of services offered by outfitters as well as describe the financial characteristics of the industry.

Documenting Outfitter Services

To document the nature of commercial river trips, brochures were requested from each outfitter. Fifteen variables were then developed to describe trip characteristics such as length, price, cost per day, transportation and accommodations before and after the trip, types of boats, etc. These variables were listed across the top of Table 3, and the relevant information for each outfitter was then completed on the basis of the company brochure:

There is a considerable diversity of services. Trip prices range from \$37.50 to \$87.50 per day; some guides include transportation to and from the river, while others will arrange car shuttles at extra cost; water craft range from inflatable kayaks, dories, and small rafts to motorized 33 foot pontoons. One outfitter provides sleeping bags, mattresses, tents, and fishing gear, while others rent basic items like waterproof bags and camera boxes at extra cost; food ranges from "flapjacks and forty-mile stew" to "poulet ala moutarde and Indonesian Curried Lamb." Supplementary activities include massage and t'ai chi on some trips as well as the more standard hiking, swimming, and fishing; quality of advertising ranges from disorganized xerox fact sheets to well-designed 8-page color brochures. Readers interested in further details should consult Table 3.

TABLE 3

OUTFITTER SERVICES IN HELLS CANYON

VARIABLE GUIDE	LENGTH OF TRIP NUMBER OF TRIPS / SEASON	TOTAL COST AND COST PER DAY (Does not include Sales Tax) REQUIRED DEPOSIT	SPECIAL RATES	TRANSPORTATION TO AND FROM RIVER	ACCOMMODATIONS BEFORE AND AFTER TRIP
OMER DRURY, M.D.	4 Days	\$150/\$77.50 per day	Groups of 17-29 can charter (must provide own food \$1,250/float). (Not specified length.)	Not provided in cost; will arrange special shuttles for cars or w/airplanes at extra expense.	None specified.
Troy, ID	1 Trip/Season	\$50 per person deposit	Youth Discount - 25% Pre-season - 5% (book before January 1)	Provided as part of trip cost; transportation from Lewiston/ Clarkston and return.	Provide one night's lodging at Skyway Motel in Lewiston.
GRAND CANYON DORIES	6 Days	\$360/\$60.00 per day			
Stanford, CA	15 Trips/Season	\$40 per person deposit	Family Rates - 10% for 3+ persons.	Not included as part of price but will arrange car shuttles at extra cost.	None offered.
LUTE JERSTAD ADVENTURES	5 Days-14/Season 6 Days-14/Season	5 day = \$465/\$99 per day 6 day = \$400/\$66.67 per day	Children under 12: 25% discount.	Provides transportation from Cam- bridge Idaho to HCO, but must arrange own pick-up at end of trip @ \$35 - 70.	None offered.
Portland, OR	28 Trips/Season	\$50 per person deposit			
SEVY BROTHERS GUIDE SERVICE	4 Days 6 Days	4 day = \$350/\$87.50 per day 6 day = \$415/\$69.17 per day			
Sun Valley, ID	12 Trips/Season	\$100 per person deposit			
WILDERNESS ENCOUNTERS, INC.	3 Days-13/Season 6 Days-9/Season	3 day = \$245/\$81.67 per day 6 day = \$365/\$60.82 per day	Family Rates: first two pay full fare; third pays 85% additional pay 75% (for those 14 yrs and younger)	3 day price includes transport- ation to and from Boise. 6 day price includes transport- ation from Boise to Lewiston.	None specified.
Boise, ID	24 Trips/Season	\$152 per person deposit	"are available depending on group size, river, and antici- pated water levels."	3 and 4 day trips: transport- ation to and from Boise; 6 day: transportation from Boise and return to Lewiston.	None specified.
HUGHES RIVER EXPEDITIONS, INC.	3 Days- 4 Days- 6 Days- 21/Season	3 day = \$245/\$81.67 per day 4 day = \$310/\$77.50 per day 5 day = \$420/\$70.00 per day	"Group or family rates avail- able on request." Family rates allow children to go for 1/2 fare.	Price w/o fly back only includes transportation from Oxbow to put- in at HCD; car shuttle to Lewis- ton @ \$75/car.	Must provide own lodging. "Get ac- quainted meeting" at Oxbow includes one free drink.
Cambridge, ID	21 Trips/Season	\$150 per person deposit	Children 12 to 17: 15% discount; under 12: 20% discount	Transportation to and from Lewiston provided.	None specified.
HELL'S CANYON NAVIGATION CO.	5 Days	\$295 w/o fly back \$340 w/fly back \$59 to 68 per day 20% deposit			
Oxbow, OR	15 Trips/Season				
JAMES HENRY RIVER JOURNEYS	6 Days	\$365/\$60.83 per day			
Berkeley, CA	6 Trips/Season	\$100 per person deposit			
ECHO RIVER TRIPS	6-day trips 6 trips/season	\$370 adult-\$61.67/day \$295 youth-\$49.17/day \$90 deposit	"youth fare" for those 17 and younger. Discount rates for groups of 10 or more.	Transportation from Boise to river and return to Boise included in fare.	None specified.
Oakland, CA					

TABLE 3 (Pg. 2)

VARIABLE	TYPE OF CRAFT NUMBER OF INDIVIDUALS PER TRIP OR CRAFT	EQUIPMENT INCLUDED IN TRIP PRICE	EQUIPMENT AVAILABLE AT EXTRA COST	ADVERTISED PUT-IN/TAKE- OUT DISTANCE TRAVELED	ADVERTISED MEALS
OMER DRURY, M.D.					
Trow, ID	Not specified. "Sweep- powered" rafts shown in brochure. Maximum group size 30 including guide.	Waterproof bags with "foam"; some air mattresses and sleeping bags on request.	Eating utensils and drinking cup must be brought along.	Advertised as a 95 mile trip, but it goes from Hell's Canyon Dam Launch site to Grande Ronde.	Not specified. Liter- ature implies that guests must help with food preparation (all vegetarian).
GRAND CANYON DORIES	Grand Canyon Dories pat- terned after McKenzie River boat; 4 passenger/ boat maximum.	Waterproof duffie bags	Sleeping bags, case for camera/binoculars, eating and drinking utensils @ \$2.50/day.	Hell's Canyon Dam to mouth of Grande Ronde; about 85 miles.	All meals during trip are provided, menu not specified.
Stanford, CA					
LUTE JERSTAD ADVENTURES	Hypalon 12-17 foot infla- table rafts; trips usually have less than 20 persons; oar-powered.	Waterproof bags, boxes for belongings and tents in case of bad weather.	None specified. Must bring your own sleeping bag and clothing.	Hell's Canyon Dam to mouth of Grande Ronde about 80 miles.	"Lavish" meals of fresh meat, vegetables, fruit, steak, salmon, fresh salads and straw- berry shortcake and wine.
Portland, OR					
SEVY BROTHERS GUIDE SERVICE	"Medium-sized rubber rafts"; oar-powered.	Waterproof bags and water tight metal con- tainers, cooking supplies, tents, cups.	Sleeping bags @ \$12/ trip; fishing gear at \$15/trip.	6 day trip: Hell's Canyon Dam to Grande Ronde about 85 miles. 4 day trip: HCD to Pitts- burgh Landing about 32. 3 day trip: Hell's Canyon Dam to Grande Ronde about 36 mi. 6 day trip: Hell's Canyon Dam to Grande Ronde.	"Dutch-oven" cookery of gourmet meals. Logger- size breakfasts, thick steaks, chicken, ham, fresh vegetables, wine.
San Valley, ID					
WILDERNESS ENCOUNTERS, INC.	Not specified. Maximum load - 4 guests and 1 crew person per boat; paddle/oar- powered; "Salmon River, Green River & Yampa River boats HIGH WATER: motorized 27' and 33' pontoon rafts; LOW WATER: "smaller oar-powered rafts; groups of 10-12 and 1 guide." Yampa and Avon paddle boats; Harras III's and Green Rivers for gear boats; Netzel stalom kayaks available.	Waterproof duffie bags. Available list when trip is booked.	Sleeping bag, pad and ground cloth at \$25/ trip.	Type of meals not specified. Adverti- sized as "good" food. Fresh meats, vegetables, fruits, flapjacks, ham and eggs, steak, pork chops, chicken, biscuits, desserts, "forty-mile stew". "Full breakfasts, light lunch, fantastic suppers; sizzling steaks, baked potatoes, canyon stew, dumplings and cobbler.	
Boise, ID					
HUGHES RIVER EXPEDITIONS, INC.					
Cambridge, ID					
HELL'S CANYON NAVIGATION CO.					
Oxbow, OR					
JAMES HENRY RIVER JOURNEYS					
Berkeley, CA					
ECHO RIVER TRIPS					
Oakland, CA	4-6 persons per raft; rafts have 10' oars; offer in- flatible kayaks "on some rivers"	Waterproof bags for gear; water-tight ammunition boxes for cameras.	Sleeping bags @ \$5.00/trip.	Hell's Canyon Dam to con- fluence of Grande Ronde River about 85 miles. Hell's Canyon Dam to Grande Ronde about 85 miles.	Elaborate: ginger beef, poulet ala moutarde, Indonesian curried lamb, cay an vin, shish kebob, fruit meuniere are common. "Fresh food" of family style meals, fresh fruit salad, steak or stroganoff, dutch oven cakes."

VARIABLE	ADVERTISED ACTIVITIES (in addition to rafting or kayaking)	TYPE AND QUALITY OF ADVERTISEMENT BY OUTLETTER	DATE 1978 BROCHURE WAS RECEIVED	SPECIAL FEATURES	CANCELLATION PROCEDURES
GUIDE					
OMER DRURY, M.D.- Troy, ID	Hiking, swimming, Christain fellowship, photography.	Very poorly written and confusing (not well or- ganized). Literature appears xerox from copy. Also run Salmon.	2 Dec 77	*Auxiliary motors used on Snake appears to be a small organiza- tion which is primarily con- cerned with Christain fellow- ship (Adventist).	\$50 deposit returnable for illness. 1/2 dep. ref. w/ 21 day notice prior to launch. Other 1/2 applied to future river trips.
GRAND CANYON DORIES Stanford, CA	Swimming, natural his- tory, botanizing, geologizing, birding, historical scenery.	Very well done B&W bro- chure (24 pps.) describ- ing trip on Colorado, Salmon, Green, Owyhee, and Grande Ronde Rivers. Well done. B&W brochure 22 pps. describing trips throughout the west; also advertised in Mt. Travel brochure.	1 Dec 77	Offer special kayak trips at 1/2 price (will provide food and take gear) if you bring your own kayak. Custom trips for groups of 15+; can also schedule com- bination horse/float trip (16 day float trip) "details upon request".	\$40 non-refund. dep., bal. due 30 days prior to launch refund on dep. if before 20 days prior. no refund except if place filled. \$50 dep.; cancel up to 30 days prior to launch forf. dep; 30 days-1 wk, \$100, 1 wk-30r less all fee. Bal. due 30 days prior to launch
LUTE JERSTAD ADVENTURES Portland, OR	Flora and fauna watching, history and geology, exploration.	Well done B&W and color brochure. 8 pps. 2 page schedule, also run Salmon, Owyhee, Deschutes, and New Zealand Rivers. Fairly well done (but general) color brochure. xeroxed fact sheets of standard quality. Run Main and Middle Fork Salmon.	16 Dec 77	McKenzie River boats available at twice normal rate; charter trips for 8+ persons. Run "Shepp Ranch" on Salmon River in addition to float trips. Float trips seem to be an "extra" to business.	\$100 dep.; bal due bef. dep, dep ref. up to 60 days prior trip. or credit on future trip.
SEVY BROTHERS GUIDE SERVICE Sun Valley, ID	Photography, hunting, natural history, relax- ation, fishing, local history, hiking, swimming.	Well done color and B&W brochures on high quality paper. Also run Owyhee and Salmon Rivers.	2 Jan 78	Offer a 3-day backpack/3-day Hell's Canyon combination (24 river miles) for \$420/ person. Charter service upon request.	\$150 dep, bal due 60 days. prior trip \$25 service chg. if can. bef. 60 days after 60 days ref. if res. filled.
HUGHES RIVER EXPEDITIONS, INC. Cambridge, ID	Local lore, wildlife spotting, nature identification.	Well done color and B&W brochures on high quality paper. Also run Owyhee and Salmon Rivers.	1 Feb 78	June 14 trip includes a "wilderness workshop" as part of the price. (Can get one college credit through Eastern Oregon State College.)	\$150 dep. guarantees res.; if can. prior to 45 days, \$125 ref.; after 45 days, dep forfeited or to another trip.
HELL'S CANYON NAVIGATION CO. Oxlow, OR	Natural history, history, fishing, hiking, relax- ing, bird watching.	Poorly designed color bro- chure; low-key "River- Devil Review" newspaper. Run Hell's Canyon only.	4 Feb 78	Can take your own kayak for 1/2 price; seem oriented to younger, mellow "zen" trips and encounter groups; lower Salmon run includes 21 miles on Snake.	20% deposit, balance due 2 weeks prior to departure.
JAMES HENRY RIVER JOURNEYS Berkeley, CA	Fishing, hiking, swimming, history, wild- life, relaxing. Holistic blend: massage, dancing music, aikido & tai chi, swimming, fishing, natural & cultural history.	Very well designed B&W brochure on buff paper; run most major western rivers; also Alaska, Raja Kaya trips.	15 May 78	Orientation seems to be toward wilderness values.	\$100 dep. bal due 30 days prior launch, dep less \$20 fee ref. if res can be replaced.
ECHO RIVER TRIPS Oakland, CA	Wilderness, fishing, wildlife, history	Average black & white brochure and mimeo history of Hells Canyon. Run rivers in Cal, Ore, Id, Alaska.	7 Feb 78		\$90.00 deposit, balance due 60 days prior to departure; refund (less \$20.00 charge) up to 60 days before launch; refund less \$20 after 60 days if reservation filled.

TABLE 3 (Pg. 4)

VARIABLE	LENGTH OF TRIP NUMBER OF TRIPS/ SEASON	TOTAL COST AND COST PER DAY (Does not include Sales Tax) REQUIRED DEPOSIT	SPECIAL RATES	TRANSPORTATION TO AND FROM RIVER	ACCOMMODATIONS BEFORE AND AFTER TRIP
GUIDE					
WALKER RIVER EXPEDITIONS	2 day trip-6/season 4 day trip-7/season 5 day trip-6/season 13 Launches/season	2 day=\$155-\$77.50/day 4 day=\$235-\$58.75/day 5 day=\$295-\$59.00/day \$50.00 100 dep.	5 day discounts - 5 or more people, \$265 each; children under 17 w/ parents, \$250 each.	Transportation to and from Enterprise included in fare.	None offered
ENTERPRISE, OR					
WILDERNESS RIVER OUTFITTERS	4 day raft: 7/season 3 day raft w/ back- pack (1 trip/season) 7 different trips/s.	4 day \$125-\$81.25/day 3 day + 4 day backpack \$425 25% deposit	No special rates listed	Transportation to and from Boise included in fare.	None offered
Salmon, ID	6 day trips	\$435-\$72.50/day	1 1/2% per person discount to students under 19 when accompanied by 2 full fares; 10% discount to groups greater than 10 people.	Transportation to and from either Boise or Lewiston as part of price.	None offered
IDAHO ADVENTURES	19 trips/season	\$100/person deposit	Group discount: 5 guests - 5% 10 or more - 10%; 100% reduction for children aged 12-15.	Round trip transportation provided.	None offered
Salmon, ID	3 day 9/season 6 day	3 day \$225-\$75/day 6 day \$420-\$70/day			
ROCKY MOUNTAIN RIVER TOURS	9 trips/season	\$100 per person dep.			
Pocatello, ID	5 day (private) 27/s. 6 day (group) 13/s. will run 4 day on request. total 35/season	5 day Private \$325 (4 person minimum) \$65 per day \$50 deposit/person	25% children's discount - 10% to students and first repeats; 25% to 2nd time repeats; groups rates available upon request min. group 20 persons.	Price includes transportation from Boise to Hells Canyon Dam & from Grande Ronde to Lewiston; car shuttle to Lewiston @ \$85.	None offered Pick-up at Holiday Inn at Boise, but does not include accommodations in price.
PRIMITIVE AREA FLOAT TRIPS					
Salmon, ID	3 day } 13 trips 5 day } per season	3 day \$215-\$71.67/day 5 day \$295-\$59.00/day	no group rate specified	Doesn't specify where passengers are picked up; all are returned to Lewiston by jet boat.	None specified
SNAKE RIVER OUTFITTERS	13 trips/season	25% discount	"family rates available" but not specified	Heller Bar to Heller Bar	None specified
Lewiston, ID	3 day } 17 trips 5 day } per season	3 day \$200-\$66.67/day 5 day \$300-\$60.00/day			
HELLER BAR EXCURSIONS	17 trips/season	25% deposit			
Astoria, WA					
WHITWATER GUIDE TRIPS	6 day 6 trips/season	\$190/person-\$65/day \$150 deposit	12 or more persons 10% discount; children under 15 - 15% discount.	Transportation provided from Lewiston and return.	None specified (break- fast first day and din- ner last day not provide)

VARIABLE	TYPE OF CRAFT NUMBER OF INDIVIDUALS PER TRIP OR CRAFT	EQUIPMENT INCLUDED IN TRIP PRICE	EQUIPMENT AVAILABLE AT EXTRA COST	ADVERTISED PUT-IN/TAKE- OUT DISTANCE TRAVELED	ADVERTISED MEALS
GUIDE WALKER-RIVER EXPEDITIONS	oar and motor powered 17 and 20' long rafts	None provided	Camera box @ \$1.00 Waterproof bag @ \$4.00 Sleeping bag, air matt. & waterproof bag @ 18.00	2 day - Hells Canyon Dam down- stream 25 miles (Pittsburg?) 4 & 5 day - HCD to Grande Ronde. Put in at Hell's Canyon Dam (except backpack option); Take out Pittsburg Landing = 32 miles.	"Steak, spaghetti, chicken, tossed salads, pancakes"; "Wholesome, delicious, home-cooked"
Enterprise, OR WILDERNESS RIVER OUTFITTERS	oar powered rafts	waterproof pack for gear and camera and cooking and eating utensils	Sleeping bag, air mattress & tent @ \$30 Fishing tackle @ \$15		Not specified
IDAHO ADVENTURES	oar powered rafts with a maximum of 6 persons/raft average 4 persons/raft	tents, eating utensils	sleeping bags @ \$20 camera boxes @ \$1.00	Hells Canyon Dam to Grande Ronde River = 85 miles.	"Delicious fresh food served in a fine Western manner" "Thick steaks"
Salmon, ID ROCKY MOUNTAIN RIVER TOURS	Not specified Inflatable rubber rafts	waterproof bags & water- proof camera cases.	None listed	3 day - Hells Canyon Dam to Pittsburg Landing 6 day - Hells Canyon Dam to Heller Bar.	Burch oven cookery, "var- iety of fresh meats, salads & vegetables....dutch oven beer bread..."
Locatello, ID PRIMITIVE AREA FLOAT TRIPS	4 passengers/boat	Sleeping bags, nylon tent, mattresses, hunting & fishing gear, knives, & paddle, rafts free on req.	LONGER OPTION: (showers, "gourmet meals", cabin @ \$30/person. McKenzie boats avail. 2x price.	Hells Canyon Dam to confluence of Grande Ronde River = 85 miles	"Thick steaks, broiled trout, ice, prime rib, fresh vegetables are standard fare"
Salmon, ID SNAKE RIVER OUTFITTERS	None specified (show large pontoon craft in color brochure)	None specified (We furnish everything but personal items.)	None specified	3 day - Hells Canyon Dam downstream 45-50 miles return by jetboat; 5 day to mouth of Grande Ronde = 85 miles.	"Home cooking" provide ice and coolers for drinks.
Lewiston, ID HELLER BAR EXCURSIONS	None specified	nothing except meals, raft, lifejacket	none specified	Hells Canyon Dam to Heller Bar	Type of meals not specified.
Asotin, WA WHITEWATER GUIDE TRIPS	Type of craft unspecified; 4-5 persons per craft carry inflatable kayaks	waterproof duffie bag	None specified	Hells Canyon Dam to mouth of Grande Ronde = 85 miles	"Good cooks"
Portland, OR					

VARIABLE	ADVERTISED ACTIVITIES (In addition to rafting or kayaking)	TYPE AND QUALITY OF ADVERTISEMENT OTHER RIVERS RUN BY OUTFITTER	DATE 1978 BROCHURE WAS RECEIVED	SPECIAL FEATURES	CANCELLATION PROCEDURES
WALKER RIVER EXPEDITIONS	Swim, sunbath, fish, hike, explore, history and wildlife.	Fair black & white brochure and reservation form. Also run Salmon River.	7 Feb 78		Bal. due 21 ds. prior dept. deposit refund up to 45 ds prior to dept. & if cancell- led, can be filled.
Enterprise, OR					
WILDERNESS RIVER OUTFITTERS	Excitement & relaxation, hiking, swimming, fishing, hunting.	Fairly well done color brochure but lacks in infor- mation. Also run Bruneau, Owyhee, Salmon.	14 Feb 78	Back packing trip combination in Seven Devils Wilderness Area, Oregon.	25% deposit; balance due 45 days prior to launch; deposit refund up to 45 days prior to launch.
Salmon, ID					
IDAHO ADVENTURES	Wildlife, hiking, fishing, hunting, history.	Well done but general color brochure; well-worded letter on each river. Also run Salmon and Owyhee.	16 Feb 78	Fall trips feature chuckar hunting and fishing.	\$100 dep - bal due 20 days prior to launch. Dep refund (less \$10 fee) up to 30 days prior to trip.
Salmon, ID					
ROCKY MOUNTAIN RIVER TOURS	Swimming, sight-seeing, wildlife appreciation.	Average b & w brochure w/ mimed fact sheet not too professional; also run Salmon River.	1 April 78	Can arrange car shuttle for \$75 reduction on 6 day trip, \$55 reduction on 3 day trip.	\$100 dep-bal due 30 days prior to trip; ref (minus \$25 fee) up to 30 days prior to launch.
Pocatello, ID					
PRIMITIVE AREA FLOAT TRIPS	Hunting, fishing, photo- graphing, archeology, scen- ery, Indian habitat, swimming.	Full color brochure w/4 page cover letter; reasonably well presented. Run Selway, Owyhee & Salmon.	29 Oct 77	Chuckar hunt available after 1 August.	Ref. taken up to 1 week prior dept; \$50 dep will apply to future trips if cancelled.
Salmon, ID					
SNAKE RIVER OUTFITTERS	Swimming, fishing, photography.	General color brochure not very good; other brochures o.k. but not specific on details. Run only Snake.	25 March 78	Run lodge w/showers at Kirby Creek south of Pittsburgh landing.	25% deposit; cancell- ation policy not listed.
Lewiston, ID					
HELLER BAR EXCURSIONS	Swimming, wilderness	General color brochure not too well designed; card describing river trips very brief. Also run Salmon.	1 April 78	Combination jet boat and float trips.	25% deposit made 30 days prior to launch; balance due at least 7 days prior to launch; deposit non- refundable on cancellation.
Asotin, WA					
WHITEWATER GUIDE TRIPS	Fishing, hiking, swimming, sunbathing, photography, drawing, rock bounding.	Very well done brochure w/1 color photo; newspaper. Run Salmon, Grande Ronde, Desch- utes, Owyhee, Rogue.	2 May '78	Seem to run family-type trips; excellent advertising, can charge on Mastercard or Visa	\$150 deposit. Refundable up to 30 days prior to departure.
Portland, OR					

It is difficult to comprehend the range of river experiences offered by outfitters without this kind of systematic analysis. Similar information collected in the future will help document changes associated with different allocation procedures. Managing agencies may want to organize the information at more frequent intervals for other purposes.

Financial Information on the Outfitting Industry

Regulating an industry requires specific financial data in addition to the more general descriptive information presented above. Because this is a fairly specialized topic, it is treated in Appendix 4, written by C. R. Michael Parent. Dr. Parent is an economist in the School of Business at Utah State University, and he prepared for the National Park Service an economic analysis of outfitters operating on the Colorado River in Grand Canyon. His report for the present project describes the position of outfitters under current agency regulation and discusses regulatory systems and financial reporting procedures.

Certification versus Allocation

Certification requires guiding services to meet minimum standards for health, safety, and quality of services. Allocation gives outfitters control of a certain amount of space on the river, for which they become "brokers." Licensing by managing agencies has usually involved both procedures, but certification probably does not require allocation. The problems associated with allocating large blocks of use to outfitters may be a reason to separate the two. Other goals (such as limiting the number or size of outfitting businesses) could be accomplished by other means (such as establishing an upper limit on the amount of use by any one outfitter).

V. DEVELOPING NEW ALLOCATION SYSTEMS

This report has covered a great deal of material. From a manager's point of view, the question now is "What do I do with all this?" Our answer is in two parts. The first, presented in this section, is a general framework for thinking through an allocation decision on any river. The second, presented in a following section, is a more specific discussion of the situation in Hells Canyon.

There are many "formulas" for making decisions; none makes a tough decision easy, but there are some common characteristics. Most decision processes recognize the need to: define the problem, decide what you want to accomplish, generate alternative methods for reaching goals or objectives, choose an alternative, and implement and evaluate the chosen program. All are an attempt to move from general, often nebulous goals to specific management and allocation decisions in a clear, reasonable, and traceable manner. A specified decision process ties the decision to management goals, insures that crucial steps are not forgotten, gives documentation of the decision process, and provides a basis for more reasonable discussion of the issues by supporters and dissenters alike. The idea here is to outline such a structure for making allocation decisions.

IS THERE A PROBLEM?

Allocation only becomes an issue when the number of people wanting to run a river exceeds carrying capacity. If your river doesn't have an established use limit, or if use pressures don't exceed the limit at least some of the time, then you do not yet have an allocation problem. This does not preclude permits as a way of documenting use; it just means that rationing is not yet necessary.

Not having a problem now doesn't mean you won't have one in the future.

The past 10 years have seen rapid increases in the use of whitewater rivers, sometimes as great as 50 - 60% per year. If a use limit hasn't been set, start thinking about the kind of river experience you're trying to provide and the appropriate number of people for that experience. If use might approach capacity in the foreseeable future, think about allocation. It is always easier to set capacities or make allocation decisions before acceptable limits have been reached; everyone can still "win," and it is possible to try different ideas without intense political pressure. Developing a comprehensive scheme at the start will also make it unnecessary to back track later from an unsatisfactory piecemeal solution. Keep in mind that "indirect" allocation mechanisms which redistribute use are usually temporary solutions.

WHAT SHOULD THE SYSTEM ACCOMPLISH?

Deciding what you want an allocation system to do is a difficult but crucial task. It is hard enough to make unilateral decisions about such things, but the job becomes increasingly difficult with the need to consider legal guidelines, agency mandates, court rulings, and the concerns of different interest groups.

We have found it useful to distinguish between goals and objectives. Goals provide a starting point and general direction, but they are by nature somewhat vague and nebulous. Objectives help to define and clarify goals; they should be specific enough so that you can tell when you are getting closer or further away. For example, "fairness" is a likely goal for allocation, but it needs clarification. One objective might be "giving everyone an equal chance for a permit;" another might be "giving preference

to people who haven't been able to get permits in the past." Obviously the general goal can be defined with specific objectives which have quite different implications.

Equity, equality, efficiency, and recognizing need are frequently mentioned goals for allocation. The concerns of outfitters, private users, and managers discussed earlier are other examples of goals or objectives (depending on their specificity) for river use allocation. Start out by listing all the goals which seem appropriate for your particular situation. Each goal should then be defined with more specific objectives. As you proceed, you may discover conflicts or inconsistencies among goals. Some examples of goals and objectives are given in Table 4; these ideas are meant to be suggestive rather than exhaustive.

ARE THERE ANY CONSTRAINTS?

Constraints usually make themselves known, but listing them helps to avoid their appearance at inopportune times and sometimes suggests ways to avoid them. Common constraints are time, budget limitations, manpower, legal or administrative guidelines, political considerations, and the way things have been done in the past. While constraints deserve recognition and healthy respect, you probably want to avoid assuming that there is no room for planning or change. A well thought out innovation may overcome constraints which appeared intractable.

GENERATING AND EVALUATING ALTERNATIVES

There are lots of ways to do things. The idea is to consider different alternatives for accomplishing your objectives. It may be easier at the

TABLE 4

EXAMPLES OF GOALS AND OBJECTIVES FOR ALLOCATION

GOAL: Equality. Everyone gets an equal share of the resource or has an equal likelihood of getting to use it.

POSSIBLE OBJECTIVES: Give equal shares or equal opportunities.

- 1) See that no one gets to use the resource more often than anyone else.
- 2) Give everyone an equal probability of getting a permit, regardless of past success, need, value placed on running the river, willingness to pay, type of trip desired (private or commercial), etc.
- 3) Charge all users the same fees.
- 4) Require everyone to use the same procedure for getting a permit.
- 5) Reduce conflict by minimizing group differences.

GOAL: Social Efficiency. Produce maximum benefits by seeing that the resource is used by those for whom it has the greatest value.

POSSIBLE OBJECTIVES: Require users to assess the value of running the river relative to the value of other desirable activities by giving the permit a "cost" in terms of:

- 1) Money for permit fees.
- 2) Time and effort required to carry out application procedures.
- 3) Planning in advance of the point when use will occur.
- 4) Skills or equipment required to run the river.

These costs might be: a) equal for all users, but higher for users than non-users, or b) different for different users, giving those willing to "pay" more a greater likelihood of getting a permit.

TABLE 4 (continued)

GOAL: Equity. Those who put more into the system (money, time, effort, etc.) get more out of the system (greater likelihood of running the river).

POSSIBLE OBJECTIVES: Give a better chance of obtaining a permit to groups such as:

- 1) Taxpayers or residents.
- 2) Those who have been unsuccessful at getting a permit in the past.
- 3) Those who are willing to pay higher permit fees.
- 4) Those who are willing to spend more time applying.
- 5) Those who have acquired river running skills or equipment.
- 6) Those who have run the river more in the past.
- 7) Those willing to donate time and effort (e.g., restoration or hauling trash).
- 8) Those who abide by regulations (e.g., those who show up to claim reservations, follow use practices, etc.).

GOAL: Recognize Need. Give more to those who need more.

POSSIBLE OBJECTIVES: Allow greater access to groups such as:

- 1) Those owning land along or near the river.
- 2) Those who depend on the river for their livelihood (such as fishermen or outfitters).
- 3) Public service organizations (such as boy scouts, remedial or correctional programs).

start to consider the options for each objective separately; you can then combine and integrate these "small" options into several comprehensive alternative plans. On the other hand, you may do better by starting with more comprehensive alternatives.

It usually helps to set up a matrix something like the one in Table 5. The boxes can be filled in with a simple "yes" or "no," brief comments, numerical rankings or values, etc. The objectives and constraints essentially become the criteria for evaluating the desirability of different alternatives. Allocation alternatives include the pricing, queuing, merit, reservation, and lottery mechanisms described in this report; retaining an existing system is a "no change" alternative. You may be able to come up with others depending on the situation. Keep in mind that most systems combine different mechanisms in order to meet allocation goals, and you may want to do the same.

MAKING A DECISION

This involves choosing and justifying a plan. Although making decisions isn't easy, this should be fairly straightforward if the previous steps have been carefully thought out and well integrated. You need to explain why the chosen alternative best satisfies constraints, accomplishes objectives, and moves towards goals; it is important that people understand the trade-offs among different alternatives. It is of course possible that the plan you have chosen cannot accomplish all the objectives, and that, too, will need explaining.

No mention has been made of public participation. The public can be consulted at every stage or at selected points; it is also possible to use less formal mechanisms (such as key contacts or advisory groups) at some

TABLE 5 CRITERIA FOR EVALUATING ALTERNATIVES

	Alternative 1	Alternative 2	Alternative 3	Etc.
Objective 1				
Objective 2				
Objective 3				
Etc.				
Constraint 1				
Constraint 2				
Etc.				

stages and full public review at others (agency or federal guidelines may dictate this). In any case, public involvement usually means presenting what you've done, getting people's reactions, and then going back and revising your work in light of the new information.

IMPLEMENTATION

Implementation is difficult to discuss at this time because it really depends on the approach which is adopted. The problem is to turn the chosen alternative into a workable plan. It helps to develop scenarios, starting with the user who wants a permit and ending with that user getting on the river. Major issues include handling requests for information, making the reservation (in person, by phone, by mail), handling applications (by hand or automation), issuing permits (by mail, at the launch site), necessary personnel and facilities (both office and field), costs, handling foul-ups, and the problems of converting from an old to a new system.

FOLLOW UP AND ADJUSTMENT

The system needs to be monitored on a long term basis to see that it continues to meet allocation goals. The goals themselves may also change in time. Record keeping and data analysis are quite easy with a properly designed computerized system, but hand-kept records shouldn't be too much of a burden if the process is carefully thought out. We suggest collecting the following information each year, even if you decide to stick with your present system. Information about outfitting businesses, as discussed earlier, is also important. Uniform data collection allows a comparison of different allocation systems.

Data Describing the New System

User data should be collected on a routine basis at three different times: when the user requests a permit, between initial contact and launch, and on launch day. Data need to be analyzed each year at the end of the season. Other information about user characteristics and management preferences, when necessary, is collected by sampling the user population; this requires a special research effort.

Initial Contact. Data collection begins when a user contacts the agency for a permit. The agency records the application date, how the application is made (mail, personal visit, telephone, etc.) and the expected trip description (who will go and length of trip). This forms the baseline from which later calculations are made. Information is organized most simply by assigning each permit request a unique identification number under which information gathered at later times can be added.

Between initial contact and launch. Requests are treated in one of three ways: a permit is issued as requested, a permit is issued with modifications (e.g., reschedule launch date), or the permit is denied. If a permit is issued, any modifications are noted. If the permit is denied, the reason for denial is recorded and data collection for that application ends. If there is a cancellation any time before launching, the cancellation is recorded and data collection ends.

Launch day. If a permittee fails to show up on launch day, this information is recorded and data collection ends. If the permittee arrives as scheduled, data describing the trip are collected. These include: the final trip roster, length of trip, type and number of craft, and type of trip (private or commercial). The entire data collection process is summarized in

Table 6.

TABLE 6

SUMMARY OF DATA COLLECTION PROCEDURE

Initial Contact

- 1) Give each request unique ID number.
- 2) Record how the request is made (personal visit, telephone, mail, etc.)
- 3) Record date application was received.
- 4) Record requested launch date.
- 5) Record expected trip length.
- 6) Record expected trip roster (names).

Between Contact and Launch

Is permit rejected? yes —————→ Record reason, stop recording

no

Is permit modified? yes → Record modification

no

Record permit issue date ←

Did the group cancel before launch? no —————→ Go to launch day

yes

Record cancellation date, stop recording

Launch Day

Did the group show up? no————→ Record as "no-show," stop
recording

yes

- 1) Record date of launch.
- 2) Record type and number of craft (raft, kayak, drift boat, etc.).
- 3) Record length of trip.
- 4) Compare actual roster with original and record number of passengers requested, final number taken, and percentage of names changed.

Data analysis. Most agencies collect use data, but the information is often left in a raw form which isn't useful. Data analysis means deciding what aggregate figures are desired and then compiling the information from the raw data. Some of the more useful computations would include:

1. The number of applications received each day from private and commercial users, tallied on a calendar. This would show planning horizons.
2. The number of launches requested for each day aggregated by day of the week, month of the season, and total for the season. This would show use patterns, peak use periods, and yearly changes for different user groups.
3. Percentage of applications which are issued, rescheduled, and rejected, and the reasons for rescheduling or rejecting.
4. Percentage of cancellations and no-shows (by user group, method of making reservation, and length of lead-time).
5. Number of trips and people launching, aggregated by day of the week, by month, and by season. When compared with (2), this would show how actual use patterns compare with requests.
6. The average number of days in advance of launch that permits are requested, separated by user group. This will give information about lead times.
7. Percentage of names changed from initial to final roster, and average increase or decrease in group size.

System costs. The costs of the permit system should be separated from other management expenditures and divided into non-recurring development and recurring operating costs. Combining the two will give the

total cost of administering the system. Cost data will be useful in determining the cost-effectiveness of different alternatives. Cost data should include:

Development Costs

wages and salaries

planning

equipment and hardware

computer programming

uniforms

training

facility construction or

modification

Operating Costs

wages and salaries

expendable materials

management and supervision

utilities (e.g. telephone)

facility maintenance

AN ALLOCATION SYSTEM FOR HELLS CANYON

How does this information apply to Hells Canyon? This is a difficult question, to which we will provide only a partial answer. The aim in this project has been to identify and explore allocation issues, analyze the effects of current river allocation systems, and explore alternative systems and their possible effects. Putting this into practice is management's job. But because of our experience, we have a point of view which should be helpful in developing new systems. As a result, we have responded to the Forest Service's request for recommendations.

A draft of this report was submitted to the Forest Service. We later met with managers, who specified the following goals (1 and 2) and objectives (3 to 9). They felt that the allocation system in Hells Canyon should:

1. Be administratively feasible.
2. Be politically acceptable to outfitters, private users, and commercial users.

3. Recognize the needs

- of outfitters to know launch dates before the season.
- of commercial passengers to travel in groups and connect with an outfitter, a launch date, or both.
- of private boaters to organize groups and connect their group with a launch date.
- of all users to have reasonable (neither too short nor too long) planning horizons.

4. Specify equal permit procedures for private and commercial users while recognizing user needs.

5. Make efficient use of the resource by

- minimizing no-shows.
- making cancelled launches available to other users.
- allowing for spontaneous use.
- referring unsuccessful applicants to open dates.
- discouraging groups from showing up without a permit, hoping for an unclaimed launch.

6. Provide flexibility by

- allowing for changes in group composition.
- allowing changes in launch dates.
- responding to changes in demand over time.
- specifying procedures which will be used when applications exceed capacity.

7. Minimize the incentives for creating "artificial" demand in either sector.

8. Provide information to users about selection procedures and the probabilities of success.

9. Simplify application procedures as much as possible.

Overall use of Hells Canyon in 1978 was well below capacity, so little rationing is needed at this time. A more flexible and efficient reservation system would solve most problems, although provision should be made for rationing in the future (if use continues to increase at 22% per year, total use will double in approximately 3 years). Given the goals and objectives specified by the Forest Service and our knowledge of allocation mechanisms and river management, we recommend the following system. This isn't the "last word" in allocation; it represents one among many combinations of alternatives, and there will probably be faults in the logic and unforeseen problems for implementers. Managers will have to decide on their preferred alternative, defend whatever they endorse, and work out the bugs which appear during implementation.

For the first year, the launch schedule will remain exactly as it is now (3 private and 2 commercial launches per day, with outfitters assigned their present launches). In subsequent seasons, daily launches would be assigned similarly, but the proportion allocated to each sector might change, based on the number of permit applications the previous season. It would also be possible to adjust the proportions of trips based on seasonal variation in demand (e.g., private boaters currently use more launches in September). To provide stability, no more than one launch per day would change sectors from one season to the next. Both outfitters and private groups could exchange launch dates among themselves, but no one outfitter could exceed the 13 - 14 launches allowed by his permit.

All users (commercial passengers and private boaters) would apply for permits as individuals. Time of application would be based on user planning horizons, which we will be able to determine from data collected

during the 1978 season. The application form would include the user's name and address, four launch dates in order of preference, and whether the person wanted a private or commercial trip. Social security numbers would be helpful but not necessary. Commercial passengers wanting to go with a particular outfitter would have contacted him to find out his launch dates, while passengers more concerned with a particular date would apply for a permit first and later contact whoever had a trip at that time. Persons who wanted to go in groups would submit their applications together in the same envelope (private parties would also designate a trip leader). Maximum number of applications in one envelope would be maximum trip size (private) or maximum trip size minus crew (commercial).

Completed applications received by the Forest Service would be sorted according to the first choice launch date. Commercial applications would then be selected until the number of successful individuals equaled the number of launches for the day times the number of passengers per trip (currently 2 launches times approximately 25 passengers = 50). If the final selection were a group which caused the total to exceed 50, that group would be rejected and a smaller one would be chosen (it would be possible to specify an acceptable range here, e.g., 45 - 52). Successful applicants would contact outfitters.

Private applications, already arranged into groups by users, would be selected until the number of groups equaled the number of private launches for the day. Private groups will probably be smaller than the maximum trip size, but this does not concern us because carrying capacity is based on the number of trips launching. As demand increases, group size will probably increase, but if not, it would be possible to specify a minimum size for private trips on high use days.

The procedure outlined in the preceding paragraphs would provide more equal treatment than current split systems, helping to eliminate the different allocation mechanisms now operating in each sector. However, procedures would still be somewhat different because some inequality better meets the needs of users and outfitters.

If applications for a given day exceeded the maximum allowed, selection of successful applicants for that day would be by order of post-marks or lottery. The former is used currently; it works well as long as the number of applications does not greatly exceed capacity. For days when applications are more than 1 1/2 times capacity, a random selection procedure would probably be more workable.

Applications rejected in the first round would be placed in a pool to give second choice launches. As in the first round, applications would be sorted by date and selected until all second choices were granted or days were full. Third and fourth choices would be handled similarly. Any launches left open would be available on a first come/first served basis.

All trips would have to be confirmed by mail or telephone, at least 30 but not more than 60 days in advance of the launch date (our data indicate that this fits with user planning horizons). Confirmation would be by the outfitter or private trip leader. All unconfirmed launches would be considered cancelled and would become available to either sector on a first come/first served basis. This would allow more complete utilization and provide opportunities for those with shorter planning horizons. If competition for cancelled launches became intense, a random selection process might be needed.

The need to transfer permits should be minimized if application procedures fit with user planning horizons, but some flexibility is desirable. It makes sense to allow the transfer of some portion (e.g., 25 - 33%) of the individual permits for any given launch. Changes in excess of this would require cancellation and re-issue of permits through the Forest Service. Occasional identification checks could be made while checking permits at the launch site. Trips with excessive transfers would not be allowed to launch.

Information given to users prior to application should describe application procedures and provide a basis for judging the likelihood of getting a permit for different days. Two simple bar graphs showing the number of private and commercial permits applied for each day during the previous season would probably suffice; the commercial graph should show individuals while the private shows trips. Such information would allow users to weigh their own preferences against the probability of success and would help distribute requests throughout the season.

The procedure outlined above would be somewhat cumbersome if done by hand but fairly simple for a computer program. The Pine Ranger District office will soon have a computer terminal, making the system convenient. Computerizing would also simplify mail-outs and record keeping. We suggest collecting data in the manner outlined earlier in this report.

Several issues need to be resolved before this system can be implemented. First, we need to know the planning horizons of private and commercial users. This information was collected last summer, and it will be available in the next few months.

Second, the Forest Service needs to reconsider the 30 person trip size maximum. Average sizes for both private and commercial trips are much smaller, suggesting that the limit is too high. The proposed system will, over time, push commercial trips to maximum size.

Finally, how will launches be re-allocated among outfitters if demand changes? We suggest that the number of outfitters be increased or decreased rather than changing the number of launches for each outfitter. Allowing increased launches might provide incentive to generate demand through advertising as well as promote larger size and lack of diversity among outfitting businesses.

VI. CONCLUSION

Allocation problems are seldom easy, and the distribution of river use is no exception. It would be a major accomplishment to begin to move toward systems which are designed to accomplish specific allocation goals. Initially this will be done on a case by case basis, but there is a need for a more integrated approach. In a study of the Snake River in the Grand Tetons, Parent and Robeson (1977) found that Park Service policies regarding the river section in Grand Teton National Park affected congestion and crowding on the adjoining Forest Service section. These two areas are in closer proximity than most other management units, but it is likely that policies for one river will affect the use of others. As problems on individual rivers are solved, managers will have to broaden their views. Research also requires a more comprehensive point of view. We needed to understand factors such as interrelationships in use patterns, displacement of users from one area to another, and the substitutability of one river experience for another.

LITERATURE CITED

- Alaska, State of. 1977. Special Hunt Seasons and Regulations. Alaska Department of Fish and Game. Pamphlet.
- Arizona, State of. 1977. Hunting Regulations, 1977-1978. Arizona Department of Fish and Game. Pamphlet.
- Atchison, Alan. 1978. Personal Correspondence. Chief Park Ranger, Grand Teton National Park, Wyoming.
- Baden, John and Richard Stroup. 1978. Toward the Equitable and Efficient Allocation of River Recreation Resources. Consulting report to project.
- Barber, Rodney A. 1978. Personal Correspondence. Commissioner, Virginia Division of Parks.
- Bolen, Ben H. 1978. Personal Correspondence. Commissioner, Virginia Division of Parks.
- Branham, Bud. 1977. Personal Correspondence. Registered Hunting Guide, Anchorage, Alaska.
- Brunner, R. E. and C. T. Clotfelder. 1975. An Economic Appraisal of State Lotteries. National Tax Journal, 17(4).
- Burnett, James T. III. 1973. Campground Reservation Systems... A Study. Trends, April-June.
- Cahill, Russell W. 1978. Personal Correspondence. Director, California Department of Parks and Recreation.
- California, State of. 1970. Things are Looking Up, Reservation Wise. News and Views, August.
- Clapsaddle, Claude and Joseph C. Greenley. 1979. Handling of Special Hunt Applications. Idaho Department of Fish and Game. Mimeo.
- Collins, Bill. 1978. Personal Correspondence. Head, Concessions Management and Contracts Section, Texas Parks and Wildlife Department.
- Datamation. 1976. And Then There Were Three. Datamation, 22(6).
- Deutsch, Morton. 1973. The Resolution of Conflict: Constructive and Destructive Processes. New Haven, Connecticut: Yale University Press.
- Deutsch, Morton. 1975. Equity, Equality, and Need: What Determines Which Valve Will be Used as the Basis of Distributive Justice. Journal of Social Issues, 31(3).
- Downie, N. M. and R. W. Heath. 1974. Basic Statistical Methods. New York: Harper and Row, Publishers.

- Faro, Jim. 1975. Guidelines for the McNeil State Game Sanctuary Permit System. State of Alaska, Department of Fish and Game, Mimeo.
- Fienburg, Stephen E. 1971. Randomization and Social Affairs: The 1970 Draft Lottery. Science, 171, January 22.
- Garren, John. 1977. Letter to District Ranger, Pine Ranger District, Halfway, Oregon, March 11.
- Hardin, Garrett. 1969. The Economics of Wilderness. Natural History, 76(6).
- Hartzell, James F. 1978. Personal Correspondence. Visitor Protection Specialist, Sequoia/Kings Canyon National Parks, California.
- Heberlein, Tom. 1977. Density, Crowding, and Satisfaction: Sociological Studies for Determining Carrying Capacities. In Proceedings, River Recreation Management Research Symposium, Minneapolis, Minnesota, January, 1977. USDA Forest Service Technical Report NC-28.
- Homans, George C. 1961. Social Behavior, Its Elementary Forms. New York: Harcourt, Brace and World.
- Institutions. 1974. Computer Magic: Hotel Presses Button, Labor Waste Vanishes. Institutions and Volume Feeding, May 1.
- Interagency Whitewater Committee. 1976. Interagency Whitewater Management Guidelines, April.
- Jarvis, Robert L. 1977. Personal Correspondence. Assistant Professor Wildlife Ecology, Oregon State University.
- Jorgensen, C. G. 1976. Decisions of the Regional Forester in re Mr. John Garren. November 18.
- Joyner, Steve. 1977. Personal Correspondence. Director, Catahoula National Wildlife Refuge, Louisiana.
- Koontz, Keith C. 1977. Personal Correspondence. Registered Guide and Outfitter, Savoonga, Alaska.
- Kuhn, Lee W. 1977. Personal Correspondence. Professor of Wildlife Ecology, Oregon State University.
- Leventhal, G. S. 1976. The Distribution of Rewards in Groups and Organizations. In: Advances in Experimental Social Psychology, ed. L. Berkowitz. New York: Academic Press.
- Magill, Arthur W. 1973. An Overview of Campground Reservation Systems. USDA Forest Service Pacific Southwest Forest and Range Experiment Station. Mimeo.

- Magill, Arthur W. 1976. Campsite Reservation Systems... The Camper's Viewpoint. USDA Forest Service Research Paper PSW-121.
- McGuire, John R. 1977. Letter to Bob Packwood, U.S. Senate. March 4.
- Meyer, Robert. 1973. Statement for the State of California. Hearings for the Subcommittee on National Parks and Recreation of the Committee on Interior and Insular Affairs, U.S. House of Representatives.
- Miller, William T. 1978. Personal Correspondence. Chief, Parks and Recreation Unit, State of Connecticut.
- Morris, Bob. 1978. Personal Correspondence. Manager, North Region of Colorado Division of Parks and Recreation.
- Murhammer, David. 1977. Personal Correspondence. Computer Specialist, Arizona Game and Fish Department.
- National Park Service. 1974. The Campsite Reservation System, A Pilot Program in Six National Parks. Washington, D.C.: National Park Service.
- National Park Service. 1976. Plans for the Management of Backcountry Use, Sequoia and Kings Canyon National Parks, California. National Park Service. Mimeo.
- Olsen, Mancur. 1975. The Logic of Collective Action. Cambridge, Massachusetts: Harvard University Press.
- Oregon, State of. 1977. Controlled Hunt Seasons and Regulations. Oregon Department of Fish and Wildlife. Pamphlet.
- Parent, C. R. Michael. 1977. Personal Correspondence.
- Parent, C. R. Michael. 1978a. Private and Commerical Use Allocations in Hells Canyon. Consulting report to project. Mimeo.
- Parent, C. R. Michael. 1978b. Measuring Economic Performance of River Outfitters. Consulting report to project. Mimeo.
- Parent, C. R. Michael and F. E. Robeson. 1977. Effects of National Park Service Regulations on Concession Operations. In: Proceedings, River Recreation Management Research Symposium, Minneapolis, Minn., January, 1977. USDA Forest Service Technical Report NC-28.
- Pauly, M. V. and T. D. Willett. 1972. Two Concepts of Equity and their Implications for Public Policy. Social Science Quarterly, 53(1).
- Rausch, Robert A. 1977. Personal Correspondence. Director, Division of Game, State of Alaska.

- Rinehart, John. 1977. Personal Correspondence. Licensing Director, Wyoming Wild Game and Fish Department..
- Rollins, Bill. 1977. Personal Correspondence. Nevada Department of Fish and Game, Reno Office.
- Runyan, R. E. 1977. Personal Correspondence. Registered Hunting Guide, Palmer, Alaska.
- Sandfort, Wayne. 1977. Personal Correspondence. Licensing Section, Colorado Division of Wildlife.
- Shelby, Bo and Rick Colvin. 1979. Managing Use Levels on the Rogue River. School of Forestry, Oregon State University, Corvallis.
- Shelby, Bo and Joyce M. Nielsen. 1976. Private and Commercial Trips in the Grand Canyon. National Park Service, Grand Canyon, Arizona.
- Stankey, George H. and John Baden. 1977. Rationing Wilderness Use: Methods, Problems, and Guidelines. USDA Forest Service Research Paper INT-192.
- Stevens, J. S. 1978. Personal Correspondence. Director, North Carolina State Parks.
- Tippets, Harold J. 1978. Personal Correspondence. Director, Utah Parks and Recreation Department.
- United States Forest Service. 1976. Hells Canyon NRA Interim Recreation Management Plan. Nez Perce, Payette, and Wallowa-Whitman National Forests. Mimeo.
- United States Forest Service. 1978. Snake River Float Trip Use. Pine Ranger District, Halfway, Oregon.
- Vanzant, Ralph. 1978. Personal Correspondence. Chief, Ohio Division of Parks and Recreation.
- Walker, Ronald H. 1973. Statement for the National Park Service. Hearings of the Subcommittee on National Parks and Recreation of the Committee on Interior and Insular Affairs, U.S. House of Representatives.
- Wall Street Journal. 1976. Boom in the West: Buying Frenzy Hits Southern California Housing. 27 September.
- Walster, E., E. Berscheid, and G. W. Walster. 1973. New Directions in Equity Research. Journal of Personality and Social Psychology, 25(2).
- Wendt, Charles W. 1978. Personal Correspondence. Chief Ranger, Yosemite National Park, California.

Whitam, Mike. 1978. Personal Correspondence. Assistant Director, Oregon Department of Parks and Recreation.

Wolfle, D. 1970. Chance or Human Judgment? Science, 167(3922).

Wright, Robert J. 1977. A Study of Automated Parks Campsite Reservation Systems. Parks and Recreation Branch, Oregon Department of Transportation. Mimeo.

Wright, Robert J. 1978. Personal Correspondence. Computer Specialist, Oregon Department of Transportation.

Yearout, R. K. 1975. Letter to Grand Canyon river running concessionaires. March 29.

APPENDIX 1

ALLOCATION GOALS OF DIFFERENT GROUPS

In November 1978, a comprehensive list of 16 goals for river permit allocation was mailed to 34 outfitters, 17 whitewater managers, and 16 private river runners. The questionnaire, which asked respondents to list their top 5 goals, is included at the end of this appendix. Non-respondents received a reminder post card and two follow-up letters. Final response rates were 88% for outfitters, 100% for whitewater managers, and 100% for private boaters.

Group rankings of the 16 goals were obtained by averaging individual rankings. Scores were assigned according to the Spearman rank order technique for tied ranks (Downie and Heath, 1974) as indicated in Table 1-1. Because respondents only prioritized 5 of the 16 goals, unchosen goals were treated as "ties" and assigned an average of the remaining scores.

Table 1-1

Assigning Scores for Top Priority Goals

<u>Chosen Priority</u>	<u>Assigned Point Value</u>
First Priority Goal	16
Second Priority Goal	15
Third Priority Goal	14
Fourth Priority Goal	13
Fifth Priority Goal	12
All others (assumed to be "tie" or average of the remaining scores)	$\left[\begin{array}{l} 11+10+9+8 \\ +7+6+5+4+ \\ 3+2+1 \end{array} \right] \div 11 = 6$

The value assigned to a non-chosen goal (for those who chose 5 "top goals") was 6 points. For respondents who listed less than 5 goals, the unchosen goals took correspondingly higher values. Scores for each goal were averaged across all group members, and these averages were used to rank goals for that group. Average scores and rankings are reported in Table 1-2.

TABLE 1-2
AVERAGE SCORES AND RANKINGS FOR DIFFERENT GROUPS

Goal	Outfitters		Managers		Private Boaters	
	Average Score	Rank	Average Score	Rank	Average Score	Rank
1) Simplicity	12.93	2	14.47	1	8.81	5
2) Efficiency	9.80	5	10.59	4	8.75	6
3) Flexibility	7.30	10.5	8.53	6.5	9.25	4
4) Variety of Methods	6.73	13	6.00	15	6.00	15
5) Penalize Cheaters	10.43	3	8.47	8	7.19	10
6) Variety of Experiences	7.30	10.5	7.24	12	8.44	8
7) Business Stability	13.83	1	8.53	6.5	6.00	15
8) Avoid Encouraging Use	6.10	15.5	6.00	15	11.13	3
9) Maximize Use	7.93	8	8.76	5	6.94	11
10) Equal Procedures (private & commercial)	6.40	14	6.00	15	14.63	1
11) Different Procedures (private & commercial)	10.08	4	7.65	9	6.00	15
12) Permits to Individuals	6.10	15.5	7.35	11	13.50	2
13) Equity	6.90	12	6.47	13	7.56	9
14) Equality	8.28	6	7.59	10	6.38	13
15) Defensible & Workable	7.43	9	11.59	2	6.75	12
16) Responsive to Relative Demand	8.10	7	10.76	3	8.69	7

QUESTIONNAIRE REGARDING ALLOCATION GOALS

Managing agencies currently issue permits to regulate river running on a number of western rivers. Everyone agrees that use should be maintained within the constraints of environmental and social carrying capacities. But there is some disagreement about how permits should be distributed to individuals and/or groups. Assuming that any permit system must control use within the river's carrying capacity, we would like you to identify the other goals that a permit system should accomplish.

Below is a list of 16 goals which users, outfitters, and managers have suggested. Read through the entire list, making sure you understand each one. Then, in the space provided at the end, list your top five goals in order of priority. In all of the following the word "users" refers to private boaters and commercial passengers together. Commercial operators are referred to as "outfitters."

LIST OF GOALS

Goal
Number

1. The permit system should be simple and easy to understand, with a minimum of "red tape" for users, outfitters, and managers.
2. The system should be efficient by minimizing "no-shows" and making unused launches available to other users.
3. The system should be flexible (allow for changes in plans, group composition, weather, water levels, etc.).
4. Users should be able to obtain permits by a variety of methods (reservation, lottery, purchase, first-come-first-served, etc.).
5. Penalize applicants who attempt to "cheat" the system; hold users and outfitters responsible for "breaking the rules" (including bogus applications, no-shows, environmental damage, etc.).
6. The permit system should provide for different kinds of experiences (some periods reserved for "high-use," other periods for "low-use").
7. The permit system should provide business stability for outfitters.
8. The permit system should avoid encouraging use by limiting advertising or promotion of river running.
9. The permit system should attempt to maximize use within environmental or social carrying capacities (i.e., an attempt should be made to fill all available "slots" on the river).
10. Procedures for obtaining a permit should be the same for all users, regardless of whether they want to float a river on their own or with an outfitter.

(go on to next page)

11. Procedures for obtaining a permit should be different: Outfitters should distribute the commercial users' permits and the managing agency should distribute the private users' permits.
12. Permits should be issued to individuals, who then arrange the group, either private or commercial, with which they want to float the river.
13. The permit system should give certain users a better chance of getting a permit (please check all of the categories you think should be given preference).
 - ☐ Users who have been less successful at getting a permit in the past.
 - ☐ Users who have floatated a particular river the most.
 - ☐ Users who value the experience the most.
 - ☐ Users who demonstrate the most skill in environmental practices, river running, and/or safety.
 - ☐ Other (please explain) _____
14. Users should not be given preference in any of the ways listed in #13.
15. The permit system should be defensible to diverse groups and fit legal and budgetary constraints.
16. The permit system should be responsive to the relative amount of use "demanded" by the private and commercial sectors.

MY TOP FIVE GOALS ARE:

- First priority is goal # _____
- Second priority is goal # _____
- Third priority is goal # _____
- Fourth priority is goal # _____
- Fifth priority is goal # _____

APPENDIX 2

RESERVATION SYSTEMS IN PUBLIC CAMPGROUNDS

Campground reservation systems have been in operation for a number of years, and comprehensive reports have been published by the National Park Service and U.S. Forest Service. In addition, we obtained information from 25 state park agencies. This appendix includes a brief history of the use of reservations by public recreation agencies, an overview of manual and computerized campground reservation systems, a discussion of other issues such as no-shows and costs, and a consideration of the effects of reservation systems on users and managers. Although the discussion focuses on campgrounds, many of the issues are common to the administration of other reservation systems and other allocation mechanisms. The aim here is to discuss the uses of reservation systems, point out administrative problems, and explore possible solutions.

The first campground reservation system began operation in 1946 in Vermont State Parks (Burnett, 1973). It was not until the late 1960's, however, that reservations in campgrounds and back-country areas became common. A 1972 survey showed that 17 state and 6 federal agencies had adopted reservations of some kind in their recreation programs (Burnett, 1973). By 1978, three of the state agencies had expanded their systems, three additional states had developed systems, and one more state was considering a reservation system (Morris, 1978). Reservation systems are well established and will probably be used more as the demand for recreation increases.

It is hard to find a typical reservation system. Each agency has developed a unique strategy as a result of different conditions and needs.

Most agencies start with a simple manual system, which becomes more complex as numerous applications demand increased sophistication to provide efficient operation. In a few instances, highly technical, capital-intensive systems have developed. Systems currently in use range from simple to complex; some agencies may never need greater sophistication, while others may evolve too far and return to simpler methods.

MANUAL RESERVATION SYSTEMS

As of July 1978, manual systems were used by all of the national parks and all but three of the state parks allowing reservations. These systems are characterized by (1) low volume, (2) decentralized control by park or area, (3) intensive labor inputs, and (4) infrequent use of sophisticated equipment. Manual systems are less likely to charge users a fee for making the reservation and usually require that users contact the agency or park directly.

Decentralization allows users to make requests for specific sites. If space is unavailable, park personnel can suggest alternate sites or dates. Referral within the park, then, is quite efficient, but because manual systems are usually confined to one park there is no opportunity for referring excess requests to another park. Oregon, however, has an "Information Center" which users call first to find which state parks have vacancies. The user then contacts the appropriate park directly. Although it adds some advantages of centralization, this system requires two long distance phone calls, and during busy weekends the center's information is often outdated (Wright, 1977).

Keeping records of use is difficult with manual systems. In most cases, parks record reservations on coding sheets designed by that park's

administration, and data are not comparable among parks. The National Park Service has avoided this by designing uniform back-country permits for several of their parks. Permit systems are decentralized, but the information is coded on standard forms and sent to Washington, D.C. for analysis.

Manual systems are labor intensive. Using the standardized forms described above, Grand Teton National Park staffs 24 temporary and 4 permanent employees to handle 35,000 people who use the park's 90 back-country campsites each year. Just filling out the permit takes an average of ten minutes (Atchison, 1978).

Although decentralization is normally associated with manual systems, the Oregon system described earlier suggests that some central control is possible. Several national parks have developed a centralized manual system for back-country use. Visitors contact one of several locations within a park and permits are issued after checking with a central clearing house via radio or telephone. Although the basic system is manual, the clearing house provides up-to-date information on sites throughout the park. The most developed system of this type operates in Sequoia/Kings Canyon National Parks in conjunction with three adjacent national forests. It manages 116 entry points and 68 camping zones, and was used by over 51,000 visitors in 1975 (NPS, 1976; Hartzell, 1978). State agencies in Connecticut and Vermont use centralized control of manual systems for off-season reservations. Because many parks are not open during the winter, reservations are taken at the state headquarters until spring, when the separate parks resume this function (Barber, 1978; Miller, 1978).

Summary

Manual systems allow users to specify individual sites, provide direct contact between users and managers, and probably favor local users. Referrals are limited within the system, data collection and analysis are cumbersome, and more labor is required than with automated systems. Although manual systems are the most frequently used, they often fail to keep pace with changing conditions or agency goals, and many are eventually replaced by automated programs. Other issues which are common to all reservation systems, such as reservation fees or handling methods, will be discussed in a later section.

COMPUTERIZED RESERVATION SYSTEMS

Computerized reservations of campground facilities began in 1970 when the State of California contracted with Computicket to handle their growing reservation program. Since 1970, four more states and the National Park Service have tried this option and three other state park agencies are considering it. Computerized systems do have problems, however. Two state agencies and the National Park Service have returned to manual systems after brief encounters with automation. In California, Computicket folded after three months, and several other reservation contractors have also discontinued their services (California, 1970; Datamation, 1976). But as of July 1978 computerized systems were operating in New York, Virginia, and California state parks, and Oregon and Texas are scheduled to switch from manual systems within a year.

Ticketron

Present computerized systems are easy to typify because all are run by Ticketron, Inc., a New York-based organization. In general the

Ticketron system allows campers to reserve a site up to the Friday preceding the first day of the reservation period. These reservations can be made at Ticketron outlets in person, by telephone (in the New York and Virginia systems only), or by mail. The Virginia system also allows individual users to make reservations in person at the park without paying a reservation fee. In all other cases, Ticketron charges \$1.50 or \$1.75 for the reservation, a portion of which is returned to the state park agency. Every Monday, parks using the system receive a list of the week's reservations from a computer terminal located at the park. Ticketron requires that all camping fees be paid in advance, and refunds can be obtained only after payment of a cancellation fee (usually the same as the reservation fee). Reservations and cancellations are handled by using the "validation number" printed on each reservation ticket. If a camper's first choice is booked, the Ticketron computer will search for a spot in a different campground or on a different date and transmit this information back to the requesting outlet. This kind of referral is one feature of computerized systems which is virtually impossible with manual systems (Burnett, 1973).

Ticketron outlets are located primarily in department stores in the metropolitan centers of the states in which Ticketron operates. Because the eastern states are small, users can make reservations conveniently from most states near the Virginia or New York parks. Ticketron's western outlets are also in metropolitan areas, but because of the greater distances between cities the outlets are less accessible. In California, no outlets are located north of Santa Rosa or Yuba City, a large region with numerous people which includes many of the parks in the reservation program (Walker, 1973). This "favoritism" toward people in urban areas has been a major

objection to the Ticketron systems, and it was a primary consideration when Ohio State Parks discontinued their Ticketron system (Vanzant, 1978).

Reservation Outlets

Because computerized systems have not been located in parks, the nature of the outlet where reservations are made is important. Most of Ticketron's business is with theater or sporting event reservations, so Ticketron clerks are generally unfamiliar with camping and are unable to offer suggestions or answer questions (Cahill, 1978). The American Express reservation system for National Parks in 1972 had the same problem. Most outlets were located in American Express offices, Ramada Inns, and Hertz Rent-a-Car locations, and clerks' unfamiliarity with the camping system led to confusion, improper reservations, and, in some cases, hostility toward the camper making reservations (National Park Service, 1974; Magill, 1973). Lack of knowledge about camping has also led to a misunderstanding of the need to specify camping "craft" when a reservation is made. Communication errors on this point have caused problems when a camper shows up to claim a site which will not accommodate his or her particular rig. Many of these problems can be handled when sites are assigned at the park, but this prevents users from choosing sites when reservations are made (National park Service, 1974; Magill, 1973). California Ticketron applications now require campers to check one of seventeen descriptions which best fits their equipment, and other Ticketron operations are adopting similar strategies. Vendor familiarity with camping has also improved since these problems were reported in the "old" California and Virginia systems.

Flexibility and Recording Information

Ticketron (New York and California systems) has compromised some flexibility by the way the system handles the reservation "cut-off" date.

Ticketron issues a reservation list only once a week in order to allow park personnel to plan the upcoming week's roster. This means that reservations cannot be made on a "last-minute" basis, and that users claiming "no-shows" at the park must check with park officials each day in order to stay in a given site. In contrast, American Express allowed reservations to be made up to midnight of the day prior to the reservation period, and reservations could also be made at the park. This allowed more flexibility for persons who were unaware of the system before their arrival (National Park Service, 1974; Burnett, 1973). The Ticketron system persists probably because it benefits managers despite the user's inconvenience. The Virginia Ticketron system, however, because it is patterned after the old American Express system, allows campers to make reservations at the park at any time.

Data collection and analysis is easy with a computerized system, but Ticketron has made a compromise here by not including names on reservations. Identification is by the user's initials and a "ticket validation number." State park agencies say they find names to be of little value, but others claim that vandalism at campgrounds is reduced when names are recorded, and names might be useful in emergencies or for information purposes (Magill, 1973). Names might also facilitate checking for habitual "no-shows," a problem which will be explored in a later section. The defunct American Express system recorded campers' names, apparently without compromising efficiency (Magill, 1973).

Alternatives: Computerized Systems Run by State Parks

State parks in Oregon and Texas are currently switching from manual reservations to computerized systems, although neither will be contracting with Ticketron. Ticketron does not currently operate in either state,

and the agencies feel they can provide better service to their dispersed populations at lower cost (Wright, 1977; Collins, 1978).

The Texas system uses an inward WATS line to a central reservation office. Information is coded directly onto a teleprocessing terminal, and the person making the reservation is given immediate feedback on site availability. A \$2.00 reservation fee and one night's camping fee must be mailed to the park department before a reservation is "confirmed." This system began operation September 1978 in 17 parks on an experimental basis, and may include 45 or 50 parks in the next few years (Collins, 1978).

Oregon's two proposals both use a reservation center which processes all applications (mail, telephone, or in person) and then prints lists at each of the 15 reservation parks. Campers will also be able to make reservations in person at each of the parks. The state's charge of \$2.00 for a reservation (\$3.00 in 1982 and beyond) is expected to pay for operations 2.4 to 3.6 years after the system begins in 1978. The system will handle 10,000 reservations per year by 1984 (Wright, 1978).

Summary

Computerized reservation systems typically have (1) capital intensive programs, (2) efficient referral services, (3) no direct park-visitor contact which reduces planning flexibility, (4) efficient data collection and analysis, and (5) vendor contracted services.

OTHER DIMENSIONS OF RESERVATION SYSTEMS

Problems faced by all reservation systems include handling of no-shows, setting up and implementing lead times, and the logistics of making the reservation. These variables may be the most important considerations of any system because they affect user behavior, management costs, and

efficiency. Whether a system is manual or computerized, centralized or or decentralized, these issues need to be evaluated carefully in relation to agency goals.

No-Shows

One of the drawbacks of the reservation mechanism is that people speculate about their use of a service in the future. Because the costs of making a reservation are usually low, people often reserve a spot even if they may not claim it; the resulting "no-shows" can be a real management problem, particularly in campgrounds where unclaimed spots may be visible to those arriving without reservations. The techniques which have evolved in response include deposits, advance payments, or penalties assessed after the fact. All attempt either to make the "cost" of not claiming a reservation greater than the "benefit" of speculation or to make cancelling easy enough that people will do so. Another technique is overbooking based on past "no-show" rates, but this is used rarely in recreation systems. An associated problem is deciding when a reservation becomes a no-show. These issues are discussed in the following sections.

Deposits and advance payments. There are several ways to raise the "cost" of not claiming a reservation, but deposits and advance payment of fees are the most common. The Ticketron/American Express systems require that users pay in advance the entire camping fee plus a reservation fee. If the reservation is cancelled prior to the first day of a reservation period, the camping fee is refunded; if cancellation occurs later, part or all of the fee is forfeited. In any case, a cancellation fee (usually equal to the reservation fee) is deducted from the refund. The same principle is used in manual reservation systems.

Data regarding the effectiveness of prepayments are not conclusive. One expects that no-show rates would be lower if (1) cancellation is easy for the user, and (2) substantial prepayment is required. The American Express system used by the Park Service in 1973 offered easy cancellation and refunds to no-shows, while Oregon's 1977 manual system offered easy cancellation prior to the reservation period but no refunds for no-shows. Oregon's no-show rate was slightly lower (at 11%) than American Express' 14.8% (National Park Service, 1974; Whitam, 1978). The size of the prepayment also appears to affect no-show rates. Midway through the 1972 camping season, Congress eliminated camping fees in most Federal campgrounds. A survey of the National Park reservation system in that year indicated that no-shows and cancellations were substantially higher after fees were eliminated (Magill, 1976). This suggests that deposits and prepayment, which are essentially pricing mechanisms, might be effective. Most agencies are reluctant to levy such fees because they are hard to handle administratively.

Penalizing no-shows. A relatively unexplored technique for reducing no-shows is to penalize habitual offenders by denying them future permits. The only system attempting this kind of control is in the North Carolina State Parks, where users are permitted only two cancellation or no-shows per year, but details of how the technique is applied are not available (Stevens, 1978). Computerized systems could do audits for habitual no-shows, but Ticketron, for one, does not collect user's names. The American Express system did collect users' names, but no-show audits were not made during the program's one-year history (National Park Service, 1974; Magill, 1973).

Audits are apparently difficult to administer, but evidence from a game permit system suggests that they are possible. The Wyoming Wild Game and Fish Department, which licenses about 350,000 hunters every year, audits all of its hunting permit applications for compliance using that year's applicants and previous records. Questionable applications are listed by the computer and checked by hand (Rinehart, 1977). Although the Wyoming system catches most of the bogus applications, its effectiveness as a deterrent is unknown. In addition, the Wyoming system tabulates and checks all of the users' names, while campground reservation systems require only one name per group, allowing habitual no-shows to "beat the system" by making reservations under a different name.

Overbooking. Airlines and hotels often make reservations for more spaces than they have available. The idea is to compute average no-show rates on the basis of past behavior and then book reservations that far beyond capacity. Reservation systems which record user characteristics might also use differential overbooking, a technique which discriminates according to the past performance of different groups. Hotel reservation networks have found, for example, that business travelers are less likely to honor reservations than are families, and the system compensates by overbooking the business travelers at a correspondingly higher rate (Institutions, 1974). Although such practices have caused trouble for airlines recently, campgrounds might be better suited to overbooking because most systems withhold a percentage of sites as a "fudge-factor." No-show rates for different categories of campers could be monitored for a season or two, analyzed, and used to establish overbooking rates. Evidence suggests that no-show rates do vary according to the reservation method, (by mail, phone, or through ticket agencies), and keeping records on

other categories of campers might add to this knowledge (National Park Service, 1974; Burnett, 1973).

Establishing no-show times. A problem related to the no-show issue is deciding when unclaimed reservations become no-shows. This seemingly simple decision is difficult in the real world. In most cases, campers are required to claim their spot by a given time or forfeit to those who are waiting. Agencies taking a hard line by scheduling the deadline early in the day may face irate campers who were late due to reasonable delays. Such agencies maintain that it is more important to utilize facilities fully than to worry about occasional complaints, but in popular parks complaints can be serious (Tippets, 1978). If an agency takes the opposite stance and doesn't fill no-show campsites until the morning after, then there is a need to justify empty campsites to those without reservations who are waiting. Some of this conflict can be reduced by locating reservable campsites out of the sight of entrance stations and highways; this system also reduces the "claim jumping" which is common in parks where a percentage of sites are withheld from the reservation system (National Park Service, 1974).

No-show problems might be more easily handled if park agencies clearly specified the consequences of arriving late through their advertising and at the time reservations are confirmed. Users should also be given the telephone numbers for notifying the park if they expect to arrive late.

A review of state park literature indicates that this information is generally lacking.

Summary. It appears that no-show rates can be lowered by techniques which raise the "cost" of making a reservation, although no-shows will probably never be eliminated. Techniques for allocating unclaimed slots

should be developed if reservation systems are to be efficient and flexible. No-show rates are also affected by the way in which reservations are made, an issue which will be discussed in the following section.

Making the Reservation

Reservation systems use one or more of three means for reserving spaces: mail, telephone, or personal visit. The ways in which systems coordinate these alternatives vary, but evidence indicates that the method of reserving campsites affects no-show rates as well as user and management preferences. At present, nearly all agencies accept mail or personal visit reservations, but over half also accept telephone reservations, and many plan to add this option.

The popularity of the three alternatives varies. The American Express system used in National Parks in 1973, which allowed campers to reserve by all three methods, resulted in 53% telephone reservations, 41% in person (either at the park or a Ramada Inn), and 6% mail requests (National Park Service, 1974). A similar analysis of the Ticketron/American Express system operating in Forest Service and National Park campgrounds in California in 1973 revealed that 23% of the reservations were made by telephone, 68% in person, and 9% by mail (Magill, 1976).

Reservation by mail. Although the use of mail reservations is nearly universal, campers seem to prefer other methods when given a choice. Magill's 1976 report on reservation systems in California indicated that, of those making reservations, only 9% preferred mail, 38% preferred telephone, and 53% preferred ticket office reservations. Data from potential users and cancellers show the same relationship. This is understandable given that mail reservations usually have to be made two or three weeks in advance of the reservation period, while other methods are more convenient for users.

As mentioned earlier, however, easily-made reservations apparently result in higher no-show and cancellation rates. Mail reservations may be more effective for reducing no-shows.

Reservation by telephone. Campers prefer telephone reservations to mailed requests, but telephone systems are plagued by high no-show rates, inefficiency, and high costs. Users normally call a reservation office and request a given spot, and system personnel either confirm availability or refer the user to another time or place. When a reservation is issued, fees or deposits are required by a given date or the reservation is forfeited. Telephoning is convenient because users receive immediate feedback on site availability. But evidence suggests that telephone reservations result in a high percentage of no-shows; reducing the "hassle" of making reservations apparently increases the number of speculative requests. The convenience of telephones also increases operation costs. The system requires operators to answer phones as well as clerks to process the mailed fees. In addition, the costs of long distance telephone calls must be paid by the individuals reserving or by the state via installation of inward WATS lines. A Texas WATS line proposal would cost the state over \$15,000 per year (Collins, 1978). An Oregon analysis estimated that campers now pay \$37,000 to \$50,000 per year for reservation phone calls to state parks, and that the installation of an inward WATS would cost the state \$35,000 per year (Wright, 1978). The increased convenience to users may not be worth this expenditure.

Yosemite National Park's 1974 reservation system experienced peak load problems in processing telephone reservations. Not only were the reservation lines jammed, but visitors unable to contact the reservation office called other Park numbers, tying up both Park Service and contractor telephones.

If a reservation system is adopted again in Yosemite, it will probably exclude telephone reservations (Wendt, 1978). Similar problems were reported in the 1973 National Park reservation system (National Park Service, 1974).

Reservations by personal visit. In-person reservations favor those who live near ticket outlets and/or parks. One would guess that urban dwellers generally prefer this method, but only indirect evidence suggests this is true (Vanzant, 1978). Overall preference for ticket-office reservations was high in Magill's 1976 survey of California campers, and the greatest support came from Forest Service campers, 80% of whom were from the Los Angeles metropolitan area. Although campers generally accept the philosophy of "in person" reservations, it's unclear what effect this system has on no-shows or other important dimensions of reservation systems. It is apparently somewhere between telephone and mail reservations in terms of cost, efficiency, and convenience, and much depends on whether the system is centralized or not.

Summary. The effects of telephone, mail, or in-person reservations are not clear-cut. Three points are important: situations tolerant of no-shows and those with low volume might best be served by telephone, mail requests have a lower risk of no-shows, and mail-ins are a reasonable alternative when advance planning by users is possible. The balancing of convenience, efficiency, and cost depends on a variety of specific situational factors.

Should Everything be Reserved?

Reservation systems discriminate against "spontaneous" users, those who cannot or do not wish to plan ahead. User data from California suggest that nearly one quarter of the campers prefer drop-in camping (Magill, 1976).

Because of this discrimination, many campground reservation systems set aside a portion of their sites for first-come/first-served (FC/FS) users.

This portion ranges from none to 90% of the sites.

Arriving at this portion has generally been arbitrary; the "right" percentage depends on local conditions and agency goals. Primary destination parks generally set aside less for FC/FS than local, stopover, or weekend parks. Most park agencies also feel that a 10% FC/FS "fudge-factor" is helpful in dealing with the inevitable problems which occur with reservations (National Park Service, 1974, et al.).

At least two agencies, Virginia and California State Parks, take an opposite view: all of the sites within their reservation campgrounds can be reserved. These agencies feel that setting aside a portion of sites for FC/FS encourages people to take chances at obtaining those sites without getting a reservation. These "speculative campers" can cause the congestion and conflict which the reservation system seeks to avoid (Bolen, 1978 and Meyer, 1973). In addition, FC/FS purportedly gives unfair advantage to local users (Burnett, 1973).

The best comparative data on this issue comes from the National Park Service's 1973 reservation system, where the six participating parks set aside anywhere from 10% to 73% of their sites for FC/FS. The park with the highest percentage of FC/FS, Yellowstone, reported the highest overall acceptance of the reservation system, while Grand Canyon National Park, with only 10% of the sites in FC/FS, reported the lowest acceptance (National Park Service, 1973). These data suggest that liberal portions of FC/FS are necessary even in destination parks. On the other hand, the National Park reservation system was poorly advertised, and the apparent preference for FC/FS may be due to the uncertainty caused by the change in

reservation systems. The California and Virginia systems, which set aside no sites FC/FS, are two of the longest surviving computerized reservation systems; either California and Virginia campers are used to making reservations, or the system has excluded spontaneous users, or the supply of sites meets the demand. Magill's 1976 analysis of the California reservation system in federal areas revealed that user perceptions of the "proper" ratio depend on personal preference for planning:

Proportion of camp-ground to be reserved:	Planners (n = 558)	Non-Planners (n = 200)
all	24%	9%
three-quarters	37%	15%
one-half	33%	34%
one-quarter	2%	13%
none	4%	24%

Summary. New reservation systems or systems designed for the more spontaneous user would best place a low percentage of spots on a reservation basis. Additional spots could be added as users become familiar with the system or as use patterns change. In addition, agencies may want to avoid eliminating spontaneous users from recreation areas, even if doing so is more convenient from an administrative standpoint.

Lead Time: How Far in Advance?

The allowable time between making the reservation and using it depends on the users being served and the demand for a given facility. Agencies which manage popular parks usually establish a maximum time in advance (such as 60 or 90 days) before which no reservation can be made. Users familiar with such systems (used in California, New York, Florida, and Virginia) have an advantage because popular parks are often sold out on the

first day reservations are allowed. Proponents of this system claim that it is more fair to lower income campers, who may not have the money to place a reservation in January for a spot during the summer (Meyer, 1973). Indirect evidence from Magill's 1976 study does not support this contention.

The other way to approach this issue is to set a beginning date and then take reservations until spots are filled for the entire season. For example, Connecticut State Parks start taking reservations for their summer season on January 15 (Miller, 1978), a pattern which is followed by most state park agencies. The problem is that people with exceptionally long planning horizons get first choice and those who cannot plan ahead may be left out.

User planning patterns are obviously important. Magill's analysis of California campers in federal campgrounds suggests that they generally plan their trips five weeks or less in advance, and 41% of the Forest Service users plan only one to two weeks in ahead. Only one-tenth of the campers planned their camping trips more than 12 weeks in advance (Magill, 1976). One might conclude from this information that 90 or even 60-day lead times will systematically favor the relatively small proportion of "planners" in the most popular parks.

The minimum time required for making reservations is related primarily to the reservation system and the method of making reservations. Most non-computerized systems require a 6 to 10 day lead time to insure that confirmation or denial notices will reach the user in time.

Costs of Reservation Systems

Reservation systems are expensive. Even the smallest program requires labor, equipment, and office space. Whether these costs are absorbed in the

operating budget of the agency and passed on to taxpayers, or whether the reservationists pay, costs cannot be ignored. This section is not intended to be a benefit-cost analysis; rather, it is a brief report on the financial liability of some existing reservation systems.

In 1971, the cost of Oregon's decentralized reservation system with an information/referral center was \$44,469, or 94¢ per reservation (Burnett, 1973). By 1977, this same system cost \$96,975, or \$1.23 per reservation, and the proposed change to a computerized system would cost an estimated \$2.60 per reservation in 1979 and \$1.76 per reservation by 1980 (Wright, 1978).

Contracting the reservation system to a private corporation does not necessarily spare an agency from additional expenses. The National Park Service's contract with American Express in 1973 resulted in additional non-contract expenditures of \$.17 to .76 per site-night (National Park Service, 1974).

Park agencies are increasingly likely to pass on the costs of reservation systems to users, either directly or through contractors such as Ticketron. Even some decentralized systems charge \$1.00 (Utah) to \$3.00 (Michigan and New Jersey) per reservation. All contracted or computerized systems levy a reservation fee ranging from \$1.50 (New York) to \$1.75 (California and Virginia). These charges provide vendor profit, but they don't always pay the agency's expenses, even though some contracts allow the state to receive a portion of the reservation fee. Rising costs and concern for government spending will probably increase the pressure to charge users the costs of reservation systems. These systems are not free; if users want them, users will probably have to pay for them.

Getting the System Going: Advertising

An efficient change from FC/FS to reservations is not easy. Advertising apparently smooths the transition and increases acceptance (National Park

Service, 1974; Burnett, 1973), so most agencies sponsor extensive publicity efforts prior to the change. Burnett (1973) found that advertisements should be aimed at carefully identified user groups well in advance. The Park Service (1974) reported that word of mouth and newspapers were the most effective means of advertising and that poster displays, radio, and T.V. were the least effective. Transition from a FC/FS to a reservation system should emphasize the advertising method which reaches the appropriate user groups most effectively.

POSSIBLE RESULTS OF RESERVATION SYSTEMS

The effects of reservation systems on users, managing agencies, and facilities are not always consistent. However, the following generalizations appear to be justified.

1. Reservations favor users who can and do plan ahead, so not everyone benefits from the change to such systems. Identification of and provision for users who do not plan ahead is important to avoid their exclusion.
2. Reservation systems involve a wide range of variables, including automation, centralization, method of making the reservation, and specific reservation policies. These should be carefully evaluated in light of agency goals and constraints. These variables will significantly affect efficiency and acceptability of the system.
3. No-shows remain one of the significant drawbacks to reservations. Methods to reduce no-shows include prepayments, penalties, and adjusting the method by which reservations are made.
4. Reservation systems are expensive; it is important to consider who benefits from the service and who pays for it.

5. Overall use of campgrounds is reported to increase with reservations, probably as a result of visitor referral. Campers who would otherwise be turned-away during peak times are referred by the system to less popular places or times (National Park Service, 1974; Burnett, 1973). This may result in more complete utilization of the resource.
6. Campgrounds using reservation systems show a significant reduction in visitor-related problems such as thefts and vandalism (National Park Service, 1974). This is apparently due to either the type or users most likely to make reservations, or the accountability which results from recording names and addresses.
7. Users who obtain satisfactory reservations will be happy with the system; those turned away will probably be disgruntled, but may still support the system. Referral to available places or times is preferred to denial, both from an efficiency and a political standpoint.
8. Reservation systems are complex, but the effects of different variables on user behavior are rarely analyzed or considered. Agencies establishing new systems or changing existing ones should plan to collect data and monitor the effects.

APPENDIX 3

LOTTERIES AS AN ALLOCATION MECHANISM

Lotteries are a frequently mentioned but poorly understood allocation

mechanism. In the context of this discussion, a "pure" lottery refers to the random, unbiased selection of applicants, where each individual has

an equal probability of being selected (an example of the "equal chance" method of achieving equality). Using randomization to make social choices

has been called "eminently fair" by some (Hardin, 1969) and "a denial of rationality ... and a denial of man's humanity" by others (Wolfie, 1970).

This appendix will briefly describe the uses of lotteries in non-recreation situations and then explore in depth the use of lotteries for

allocating game permits. It will conclude with a summary of the characteristics of lotteries as they relate to recreation. Many of the issues are common to the administration of other allocation systems.

NON-RECREATION LOTTERIES

Lotteries have been used in a variety of ways (see Fienburg's 1971 discussion). In the Bible, the drawing of "lots" was seen as divinely guided, an event now considered to be ruled by chance. The Bible describes situations where lotteries were used for the fair allocation of duties and rewards. Lots were used in Assyria and Athens to select rulers or officials, and the Dalai Lama of Tibet has been chosen by drawing. More recently, political leaders in the European state of San Marino have been chosen at random after initial selection procedures. Other historical uses of random mechanisms include the division of Israel between the tribes, the selection of the scapegoat on the Day of Atonement, the allocation of

duties in the temple, lots to select sacrifices, and lotteries to decide guilt in civil law. Primitive tribes also used random methods to decide such things as the direction of hunting, attributing the selection to divine guidance. Random selection is an old social tradition.

Some legal processes currently used in the United States are based on random selection. Federal juries, for example, are initially selected randomly as a means of "preventing bias and discrimination." Randomization also tends to displace the responsibility for selecting jurors from any one individual, even though final selection is by attorneys.

One of the most interesting situations where lots were legally sanctioned was an 1842 case involving a seaman charged with manslaughter (See United States vs. Holmes in Fienburg, 1971). Faced with the risk of sinking a crowded lifeboat, the crew (including Holmes) selected by lot fourteen passengers to be thrown overboard. In the ruling, the judge argued that the selection was essentially an "appeal to God" which was fair, humane, and just.

The law has also placed limits on the application of lotteries. Selection by lots among public housing applicants was deemed fair by the U.S. Court of Appeals only when applicants were equally qualified "under some standard of neediness." In this case, then, the equality of the lottery was justified only after the equity issue had been resolved.

Other applications of lottery drawings include gambling, housing allocation, and college entrance. In 1974, thirteen states operated lotteries or "sweepstakes" where gambling tickets were sold to the public and winners were selected at random. These create revenue because only 40 - 45% of the gross is returned to winners (Brunner and Clotfelder, 1975). Recent housing shortages in southern California caused some developers to select buyers by lottery; prices were already so high that random selection appeared more

justifiable than further price increases (Wall Street Journal, 1976). The Federal City College (Washington, D. C.) and the University of Illinois also select applicants by lottery when standard admission requirements do not effectively limit enrollment.

The draft lotteries of World War I, World War II, and the Vietnam War represent the most sober use of lotteries in the recent past. Faced with allegations that local draft boards were not uniformly administering deferments, randomization was viewed as a "democratic" and "fair" method of distributing military obligations (Fienburg, 1971). But randomization was difficult to achieve. Statistical analysis of the 1940 and 1970 lotteries revealed biases (persons born during certain months were more likely to be chosen in the draw). Subsequent publicity caused restructuring of drawing procedures, and great pains were taken to advertise that fact. As Fienburg points out, "These two components are reminiscent of a commonly held lay interpretation of both American and English jurisprudence--that a court trial must not only be fair and just but must also give every appearance of being fair and just."

ALLOCATING GAME PERMITS

The random selection of game permits is a well-established application of lotteries, and because the situation is similar to river allocation the issue will be explored in depth. Randomly drawn permits are used extensively by game and fish departments throughout the United States. By 1972, thirty-five states were using some kind of random allocation system and thirteen of those systems were computerized (Clapsaddle and Greenley, 1974).

The Basis for Rationing Hunting

Game management involves two basic goals: maintaining the resource (animals and habitat), and providing optimal recreation experiences for

hunters. Game agencies also manipulate the structures of their permit systems to meet secondary goals of equity, efficiency, and agency constraints (financial, political, etc.).

Managing the resource. Maintenance of the natural resource is generally achieved by manipulation of habitat, predators, and/or hunting pressure. Habitat and predator manipulation are relatively long-term controls which regulate populations through activities such as planting desirable range plants or protecting breeding grounds. Variation in hunting pressure is a short-term management tool used for relatively fine adjustments in game populations. Length of hunting season, methods of take, bag limits, sex or age of eligible animals, and restrictions on the number of hunters are common means of varying hunting pressure.

Animals are sometimes so abundant that agencies need only manipulate a single variable such as the length of the season. This is the case with the open buck deer season in eastern Oregon; the 1976 season lasted seven days, but in 1977 animal populations allowed for 12 days of hunting. Restriction of the number of hunters was unnecessary because variation of the season was adequate (Jarvis, 1977). This kind of open season is probably the best known application of "equal portion" equality, where all hunters have an equal opportunity to hunt.

If potential hunting pressure on a particular management unit exceeds that unit's ability to provide game, even with restrictions on season, bag limit, and method of take, then the alternatives are to increase the population of game animals or restrict the number of hunters. Because most game populations fluctuate slowly, game managers are more likely to restrict the number of hunters, at least on a short-term basis.

Managing the experience. Maintaining biotic resources is one justification for restricting the number of hunters; providing a "desired recreation experience" is another. This is an example of social carrying capacity (Heberlein, 1977), where the goal is to protect the "experiential resource." Game managers recognize the limits of each hunting unit's ability to provide quality recreation experiences. Defining and managing this social carrying capacity is not easy, because quality experiences are not the same for all hunters. But regardless of the details, game agencies do restrict hunters to maintain certain hunting experiences (Clapsaddle and Greenley, 1974; Rollins, 1977), usually by manipulating length of hunt, number of people in groups, areas of hunt, and total number of hunters per game management unit.

Equity, Efficiency, and Equality

The preceding discussion suggests that rationing hunting involves biological and social carrying capacities. Allocations based on these capacities must also fit norms of equity, efficiency, and equality.

Equity in game management requires two conditions: proper "turnover rate" and recognition of the priority or need of certain individuals. Turnover rate describes the length of time (number of seasons) necessary for all hunters who desire a particular hunting permit to receive it. Priority and need refer to recognized preferences for groups such as residents, landowners, or subsistence hunters; most systems allow them a better chance to get a permit.

Game agencies use three basic methods to achieve equity, efficiency, and equality: pricing, reservations/queuing, and lotteries. Each is usually combined with one or more of the other allocation mechanisms.

Pricing

All states charge for game permits, so limited market mechanisms operate in every system. But the right to hunt is generally considered a merit good¹, and as a result, game permit fees are usually well below the market price. There are some notable exceptions; big game permits in Alaska frequently exceed \$100, and the maximum fee for musk ox is \$1000. Obviously, fees of this magnitude contribute to limiting the number of applications (Alaska, 1977). Pricing does not necessarily insure a reasonable hunter turnover because wealthy persons are continuously favored by this form of rationing (Alaska waives resident fees upon demonstration of financial need). Pricing, then, can ration use and give preference to residents, but turnover and equity may not be achieved.

Queuing and Reservation

Some states issue limited hunt permits on either a queuing (FC/FS) or reservation basis (Rinehart, 1977; Alaska, 1977). In Wyoming, for example, applications are received in person or by mail starting on a particular date. Persons living near the distribution center or those who can buy the services of a proxy are virtually assured of a permit, while those relying on mailed reservations risk denial if their letter is either too early or too late. As a result, local residents and wealthy hunters almost always get permits while others are turned away, a situation which creates an undesirable turnover rate (Rinehart, 1977). Many hunts are still allocated by this method, but most states seem to be moving away from it.

¹A merit good is a commodity whose consumption shouldn't depend on income.

Queuing is often used to distribute unclaimed permits. Where no-shows are numerous and where hunting is concentrated, FC/FS seems to be a good way to maximize hunting usage and favor spontaneous, local users (Joyner, 1977). Hunters simply "show up" on the day of the hunt and claim permits not picked up by winners of the draw (Catahoula National Wildlife Refuge, Louisiana, and California waterfowl permits). People living great distances from the hunting area are disadvantaged by this method; this method also appears limited to relatively short hunts in concentrated areas.

Game Lotteries

The remaining method of allocating game permits is the lottery.

Game lotteries vary tremendously from state to state; they are used to handle anywhere from 1,000 applications for three hunts on the Catahoula National Wildlife Refuge in Louisiana (Joyner, 1977) to 350,000 applications for 273 hunts in Wyoming (Rinehart, 1977). The characteristics of specific lotteries are summarized in Table 3-1.

Manual or computerized lotteries. Most agencies handling a low number of hunts draw successful applicants by hand from a "squirrel cage" (e.g., Catahoula NWR, British Columbia, Washington). As the number of permits and hunts increase, states tend to automate or computerize their systems to handle the increased data. The decision to computerize usually depends on some kind of cost/benefit analysis. Some benefits of computerization are: broader, more complete data base; automatic check for compliance with regulations and edit for applicant errors; automatic selection, billing, and permit mailing; automatic printing for lists and reports; and savings in time and possibly money. Idaho Fish and Game analyzed their computerized system, which handles about 200 hunts and 90,000 applications. The system cost \$16,000 to design and 24¢ to 27¢ to process each application (Clapsaddle

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TABLE 3-1
LOTTERIES FOR GAME PERMITS

AGENCY	SPECIES FOR ARE HANDLED WITH LOTTERY	LOTTERY APPLICATION FEE AND/OR PERMIT PAID IN ADVANCE	RANGE OF FEES FOR TAGS USED ON LOTTERY: RESIDENT/NON-RESIDENT	PRIORITY APPLICATIONS	METHOD OF DRAW	GUIDING SERVICES REQUIRED FOR PERMITTEES
Alaska Department of Fish and Game (Game Permits)	Brown, grizzly, and polar bears; bison; caribou; elk; moose; muskoxen; bighorn & tok sheep.	\$5 to \$10 non-refundable application fee; permits billed after selection in lottery.	Resident: \$25-\$500 Non-Res.: \$35-\$1000	Most hunts drawn without resident priority; some Kodiak bear tags issued on 40% non-resident/60% resident ratio.	Computer	For non-residents in bear & sheep hunts only.
Alaska Department of Fish & Game (McNeil River Reserve)	Permits for non-consumptive (Photographic) use of a game preserve frequented by brown bears in spring.	No Fee.	No Fee or Tag.	None.	Hand	None; access by sea plane only.
Arizona Game & Fish Department	Deer, elk, archery elk, antelope, buffalo, Javelina, archery Javelina, turkey, bighorn sheep.	No application fee; permits are paid at time of application and refunded to unsuccessfuls.	Resident: \$2-\$500 Non-Resident: \$10-\$250.	None; want to adopt "extra-point system" giving unsuccessful applicants greater chance for future permits.	Computer	None
British Columbia Fish & Wildlife	Mountain sheep, grizzly bear, moose & antlerless moose, mountain goat, elk, mule deer.	\$5 "Limited Entry Hunting License" fee; returned to unsuccessful applicants.	\$5 in addition to hunting license.	Closed to non-residents - no other priority recognized.	Hand ("Squirrel cage")	None (required for non-resident, but lottery closed to them).
Catahoula National Wildlife Refuge	White-tailed deer.	No Fee	No Tag (except state hunting license)	None.	Hand	None
California Department of Fish & Game	Mostly waterfowl; also antelope, special deer and elk.	No application fee; successful applicants pay for permits at hunting time (waterfowl)	Resident: \$1-\$50 Non-Res.: \$25-\$35; daily user fee, waterfowl	Only residents can apply for antelope and elk permits. 5 year waiting period for successful applicants (elk).	Hand; elk & antelope; machine sorted; waterfowl	None.
Colorado Division of Wildlife	Deer, elk, mountain lion, bear, antelope	None	Resident: \$510-\$25 Non-Res.: \$50-\$200	"Preference-point system" on antelope. Each unsuccessful applicant is given 1 preference point/year. Drawing based on preference point totals-most points last.	Computer	None
Idaho Fish & Game Department	Moose, sheep, goat, antelope, deer, elk	\$1 non-refundable controlled hunt application fee; billing sent to successful applicant		2 yr wait period for successful applicants for all species except deer; life-time exemption for successful moose & sheep applicant	Computer	None
Michigan Department of Natural Resource	Waterfowl	No, except return postage must accompany permit.	No fees except state hunting license.	None.	Unknown.	None.
Montana Fish & Game	Antelope, moose; sheep, goat, special deer & elk	\$1 non-refundable special deer & elk application fee; all others must pay for permits which is refunded if not drawn	Resident: \$6-\$25 Non-Res.: \$35-\$135	15% land-owner preference (drawn first) then draw last 5 years unsuccessful applicants, then last 5 year successful.	Ellen-D Master File & mechanical selection.	None.
Nevada Department Fish & Game	All big game.	\$1 non-refundable application fee; tag fee required with application, returned to unsuccessfuls.	Residents \$8-\$50 Non-Res.: \$10-\$250	Waiting period of up to 5 years for successful applicants; residents generally given 90% permits, drawn last.	Computer	None
New Mexico Department Fish & Game	Elk, antelope, ibex, bighorn & barbery sheep, Javelina, gemsbok, special deer	\$1 non-refundable application fee; permits paid in advance & refunded to successful applicants.	Resident: \$10.50-\$100.50. Non-Resident \$50.50-\$300.50	Landowner priority for elk (selected "off of top"). Waiting period: antelope, 1 yr; barbery sheep, 2 yrs; lifetime for ibex.	IBM Machine Sorter	None
Oregon Department of Fish & Wildlife	Antelope, cougar, bighorn sheep, antlerless deer and elk.	No application fee; successful permittees billed after selection	Resident \$4-\$15. Non-resident \$5-\$75.	No resident priority. Persons w/4 unsuccessful notices can apply for priority drawing until 1977; waiting period (varies w/species).	Computer	None
Utah Division of Wildlife Resources	Elk, antelope, buffalo, bighorn sheep, moose, special deer.	No application fee; hunting tag fee required w/application (except deer)	Resident \$10-\$100 Non-Res.: \$75	Non-residents may not apply for special hunts; waiting period (some hunts)	Hand drawn.	None
Washington Game Department	Goat, sheep, moose, special deer & elk	No application fee required - Dept. notifies successful applicants who must pick up permit at license agency.	Resident \$11 Non Resident \$42	Waiting period for successful applicants. moose-lifetime goat-2 years sheep-3 years elk-2 years	Hand drawn "squirrel cage"	None
Wyoming Wild Game and Fish	Elk, antelope, moose, special deer, bighorn sheep	No application fee; fee for tag required for application, returned to unsuccessfuls.	Resident \$5 - \$30 Non-Resident \$5-\$75	Landowners can get special license and not go through lottery; 80% resident priority for deer; waiting period for successful applicants.	Computer	None

MAX GROUP SIZE IN DRAWING	NO HUNTS HANDLED W/LOTTERY	MAX NO PERMITS ISSUED BY LOTTERY (ie TOTAL HUNT QUOTAS)	NUMBER OF APPLICATIONS HANDLED BY THE AGENCY.	MAXIMUM NUMBER OF ALTERNATE CHOICES ALLOWED	TIME BETWEEN DRAWING AND HUNTING	OTHER FEATURES
2	105 (1977)	2026 (1977)	6,796	1 to 4, depending on hunt	40 to 110 days	
3	46	460; 276 five-day permits, 184 one-day permits.	Unknown.	1 (can check "any available date")	30 to 45 days	Persons apply for either a 5 or 1 day permit; higher chance of receiving 1 day permit.
4 (2 big-horn sheep)	167 (1977-78)	107,835. Does not include antelope. (1977-78)	Unknown.	1	30 days	If first applications don't fill quota, second draw scheduled; then permits given on first-come/first served basis.
2	18	831	5700 (1977)	2 to 3, depending on hunt.	6 to 260 days	
Single app. only	3	300	1000 (1977)	None	30 days; no shows first-come/first served	100 permits per day for 3 day spec. hunt. '77. 1st lottery nec.
Antelope 2, elk 1, waterfowl can be accompanied by 1 "guest"	Waterfowl: 741 Game: 20	Waterfowl: 1,977,729* Game: 5100 *Maximum	Unknown.	Deer-1, elk none, antelope-1, waterfowl: 1 choice per 1/2 season	Waterfowl: selected 10 days prior to hunt & mailed. Game: 30 to 90 days.	Waterfowl: if under-prescribed, given out on 1st come/1st served on day of hunt. Game: "access-fee" for some lottery drawn permits. (paid to landowners)
					90 days	Trying to change preference point system so those w/most points are given priority but others are also in draw.
2 for deer & elk. All others single applicant only	177 (1972)	14,165 (1972)	91000 (1974)	1	90-100 days	Design cost of system \$14,154; system change cost \$2,200; cost 244/application, 1974; 274/application, 1973.
2 or 3; no one is permitted	97	5649	21,698	2	40 days	
3 for antelope & Deer; 2 for elk, 1 for all others	284	35,105	100,000	2	4 to 216 days	
Single applicant for "Trophy Hunt" Unlimited for deer	95	24,067	Unknown	None for trophy hunts; 5 for deer hunts.	15 to 60 days.	Unfilled quotas are drawn from 2nd lottery; if still unfilled, given on first-come/first served.
2 (1 for elk, Barbary Sheep, Gemsbok, Ibex)	48	16,759	25,936	No alternatives	3 to 95 days	Persons are allowed to apply for only one special lottery drawn hunt per year.
2	106	58,309	Unknown	2	30 to 310 days	
Single Applicant only	44	3,705	Unknown	No alternatives	5 to 104 days	Special 5-day notice deer hunt run on lottery-announced by radio, sent by mail or person to S.L.C. - successfuls pick up or are mailed permits.
2 for goat; all others are single.	122	21,248	117,930	No alternatives	30 to 120 days	1 moose hunt had 3 permits available, 1500 applications! and
2 moose 2 bighorn sheep 6 antelope	273	91,451	350,000	0 to 4	90 to 100 days	

and Greenley, 1974). Comparable data for non-computerized systems are not available.

Equity and equality. Lotteries usually handle equity and equality by establishing priority classes, adjusting turnover rates, and permitting group applications. A "pure" lottery would allow all individuals, regardless of circumstance, an equal chance of selection for any given hunt. This kind of total equality is not usually preferred in game hunting because residents, landowners, and other "priority classes" have recognized preference. Priority is handled by differential pricing and by establishing separate drawings for each priority class. For example, in the Nevada buck-deer hunt, non-residents are given 10% of the permits. The pre-determined number of non-resident permits are selected at random from the list of non-resident applicants, and then resident hunters are selected from resident applicants. Residents are thus assured of their "rightful" share of permits without eliminating the non-resident. Other states recognize landowner priority in addition to residency (e.g., Montana, New Mexico). Variations of the above range from no preference for in-state hunters (e.g., Oregon) to exclusion of non-residents from lotteries (e.g., British Columbia, Utah).

Persons who were unsuccessful in previous drawings are often given preference in subsequent drawings. The idea is to insure that all who apply for a particular permit will eventually get one, so some of the chance is removed from an otherwise random draw in order to maintain a turnover of hunters. This is usually done in one of two ways: previously successful applicants are denied permits for a certain number of years (ranging from one year to a lifetime), or unsuccessful applicants participate in a precedence drawing based on the number of accumulated unsuccessful applications (Sandfort, 1977; Oregon, 1977).

The latter system is illustrated by the Colorado preference point system for antelope hunts. Unsuccessful applicants are awarded one preference point, and points are accumulated from year to year. Persons with the highest number of preference points are drawn first, until all of the available permits are gone. Since the ratio of applicants to permits every year averages around nineteen to one, this system eliminates those who are entering the drawing for the first time (Sandfort, 1977). One proposed remedy is to put all applicants into one drawing but to give the person with the most preference points the greatest chance of selection. This would allow for hunter turnover, but would not eliminate those who are entering for the first time (Sandfort, 1977; Murhammer, 1977).

Game agencies recognize that social aspects of hunting are important and that hunting without partners may be dangerous. Therefore, most states issue lottery-drawn permits to groups as well as individuals. The most common example is the "buddy" or two-person application. Other variations include groups up to six persons (e.g., Wyoming) and an unlimited number of persons per group (e.g., Nevada deer permits). In all drawings where group applications are accepted, each group is treated as one selection number; if that number is chosen by the draw, all persons in the group receive permits.

For example, Wyoming allows antelope hunters a maximum party of six. The group application is submitted to the agency in one envelope, each envelope is given one permit number, and winning numbers are selected by hand or computer. Each group, regardless of its size, has an equal chance of being selected. Because this method risks exceeding the draw quota by the number of persons in the group, two procedures are used. For hunts where the total number of permits is critical, as it is with moose and

goat hunts in Wyoming, group size is often restricted to two or even one. The other procedure simply programs the computer to stop when the number of selected permits is equal to the draw quota minus the maximum group size allowed (Arizona, 1977).

Through manipulation of preference and allowable group size, game agencies adjust the "equal chance" of a pure lottery to better achieve specific equity goals. Maximizing efficiency (giving permits to those who value them the most) is a more difficult problem which will be discussed in the following section.

Efficiency and no-shows. Efficiency in game permit allocation is partially served by pricing and the hassle of application procedures. Beyond that, agencies try to provide information which allows hunters to assess their chances of obtaining any given permit. Due to the uneven distribution of animals and hunting pressure, game agencies divide states into game management units. Prior to each hunt, managers decide how many permits to issue for each management unit. These quotas are published in controlled-hunt regulations along with descriptions of the areas and the lengths of the hunts. Hunters can then consider their area preference in light of permit quotas. Hunters may also indicate second or third choices so that unsuccessful applicants can be referred to units with remaining permits. This system allows hunters to maximize individual preference and helps to distribute hunting pressure more uniformly. Unfortunately, game agencies usually publish only the quota and not the probability of success in the draw, so hunters base their decisions on incomplete information.

Alaska's McNeil River Game Preserve permits represent an interesting alternative where applicants are given information about their chances of obtaining different kinds of permits. These permits are for non-consumptive

(photographic) use of areas frequented by brown bears in early summer. The goals of the permit system are to maximize public use within capacity constraints during the regulatory period and to manage for wilderness values with only minimal development (Faro, 1975). Permits are for one or five days, and Alaska Fish and Game publishes the probability of receiving either based on previous seasons' data. Each individual can make a decision based on desired date, length of permit, and the chances of selection. As with other game permits, first, second, and third choices are allowed to distribute and maximize use. Even though permits are selected at random, individuals can exercise some control and thereby increase efficiency.

Increasing efficiency is one way to deal with no shows: those placing higher value on permits are less likely to "waste" them by not using them. One of the problems with lotteries is that hunters often apply for as many tags as possible, whether they intend to use them or not. To reduce "frivolous" applications, some states charge a non-refundable application fee for each lottery. These fees range from \$1.00 in Idaho and Montana to \$10.00 in Alaska (musk ox). Other states (e.g., New Mexico) place limits on the number of lottery hunts one can apply for. Issuing more permits ("over-booking") is another way of dealing with no-shows, a system which works well when a slight over- or under-harvest isn't critical. But where game populations are low and harvest rates are critical, agencies usually choose a potentially low harvest rather than risk over-harvest (Kuhn, 1977). Another method of handling no-shows is to issue unclaimed permits on a first-come/first-served basis. This favors local and spontaneous use, but it would be difficult to adopt on large hunts (Joyner, 1977). Requiring some sort of confirmation is an untried option.

In general, then, lotteries can be adopted to distribute use and increase efficiency. Users can be given information which allows them to exercise personal preferences in light of selection probabilities, which is likely to result in lower no-show rates.

Game lotteries and commercial guides. It is difficult to determine the effects of lotteries on guides because there have been no systematic data collection efforts. The following is the best we could do by talking informally with game managers and a few guides.

States with a high ratio of guides to hunters have experienced difficulty with lottery drawings (e.g., Wyoming, Alaska, Montana, and Colorado). The most frequently mentioned problem is that guides do not have enough time between the drawing and the hunt to schedule trips. One guide reported that some clients were scheduling hunts five or six months before the drawing (Koontz, 1977), a situation which would probably lead guides to over-book. A realistic draw date which considers planning horizons appears to be a reasonable solution.

The other common complaint is that guides relying on return business can't serve past clients who have been unable to get permits. While this is obviously true, the return of the same hunters year after year may conflict with the agency's goal to achieve a reasonable turnover. There may be a trade-off here.

Other problems mentioned by guides are that: available permits will be purchased by anti-hunting groups to "save the animals," areas restricted by permits attract hunters who believe "it must be a good area" (Koontz, 1977), and lotteries may cause hunting to become "unprofessional" (Branham, 1977). To one guide, "Drawings do not have any personality. Any client, no matter what his degree of sportsmanship or ability, can be

successful" (Branham, 1977). One might note that few permit systems discriminate on the basis of sportsmanship or ability.

In Alaska, where lottery permits were issued for the first time in 1976, some guides felt there were no "biological reasons" behind the system (Koontz, 1977), a situation which sounds as if the agency didn't do its homework. One guide claimed that lotteries in Alaska had been beneficial in checking the growth of "guiding services" which were in actuality used to entertain business clients. When game agencies give each guide a quota, "guides" more interested in entertaining are apparently able to capture a large portion of the hunting rights in an area. Those who rely on guiding for a living resent this displacement (Runyan, 1977).

States agencies seem to take one of five positions on the lottery-guide issue: (1) Let the guides handle the situation as best they can, and if some cannot adjust, too bad (e.g., Wyoming and Colorado). (2) Give the guides some kind of pre-arranged percentage of the permits. Alaska does this indirectly with some hunts by giving a high percentage of permits to non-residents, who tend to seek guiding services (Rausch, 1977). (3) Release the names of successful applicants to interested guides so they can contact successful applicants. States normally charge a nominal fee to cover costs (e.g., Idaho, Nevada). (4) Increase the time between drawing and hunt, giving guides more planning time (e.g., New Mexico). (5) Require non-resident hunters to obtain a guide. Non-resident guiding requirements were used until recently in Colorado, Wyoming, and Montana, but all have retracted them because non-resident hunters found the laws too restrictive, and/or because courts found them unconstitutional. British Columbia has retained the nonresident guiding requirement, but lottery-drawn hunts are currently closed to non-residents.

Of these alternatives, guides understandably prefer their own quotas rather than the risk of not obtaining clients after a lottery.

Guides seem to recognize the need for control of hunting and guiding, but disagree about the methods which best accomplish this. Communication between guides and agencies often appears to be poor, and many guides' comments are directed at poor planning or unclear goals rather than at the lotteries themselves. Certainly outfitters deserve consideration, although agency goals and user needs may conflict with those of guides.

Administration. Game agencies use lotteries for selecting thousands of permittees, but not without some administrative headaches. Processing applications, collecting fees, and checking for compliance with rules are big jobs.

Processing applications for lotteries creates peak work loads. Agencies either smooth out the loads by staggering application deadlines for various hunts or hire additional workers during peak times. The California waterfowl lottery is a good example of the former strategy. Drawings for each day of hunting are held ten days prior to that hunt, so the 39 separate lotteries are distributed throughout the 3-month season. This allows California Fish and Game staff to process applications without hiring additional workers and shortens the lead-time between drawing and hunt to allow for more spontaneous use. Wyoming Game and Fish uses the other strategy. Most deadlines for fall hunts are in June, when the licensing division hires temporary student workers to process applications for the computerized drawing. Once the data are in the system the drawing can be held any time; the system also prints and mails permits automatically.

Collecting fees can also be a problem. States which issue permits prior to billing run the risk of not collecting (Idaho's 1973 "no-pay" /

rate was 2.2%). One way to avoid this is to collect the fees before the drawing and then return those of unsuccessful applicants (e.g., Wyoming). Some states are reluctant to do this because the benefits of eliminating no-pays seldom exceed the costs of handling the checks and reimbursements.

Game agencies also try to check for compliance with regulations (multiple applications, priority applications). The simplest method is hand-screening after the draw. This works well for relatively small lotteries, but isn't effective when thousands of applications are handled. Spot-checking by hand is a variation of this method. Most states with automated lotteries run compliance checks by computer. This method automatically checks applicants by name, social security number, address, and/or hunting license number and rejects all "illegal" applications. Lists of rejected applicants are screened by hand before final rejection to guard against computer error. Computerized systems such as Wyoming's appear to eliminate most applications which do not comply with regulations.

Lotteries for River Permits?

Most of the issues which have been discussed in relation to game permits need to be considered if lotteries are to be used for allocating river access, but several additional points deserve brief mention. As was noted earlier, most game permits involve fees. This means that a pricing mechanism is involved, but the permit price is by definition below market clearing price (otherwise the lottery would be unnecessary). Successful applicants, then, pay less for their permits than the permit is "worth."

River permits obtained by lottery would be similar. Managers would have to decide what price to charge and whether to allow permit sales or transfers. The pricing options are fairly clear: no charge, a modest

fee to cover costs of administering the system, or a price high enough to discourage some applicants. Transfers are another potential problem because permits are obtained for less than their market value; users are tempted to sell them (this is discouraged in game management by requiring hunters to carry identification). The transfer of permits is beneficial in that efficiency is served and some degree of flexibility is introduced, but some entity other than the managing agency is re-allocating the resource. The seriousness of this depends on the number of transfers and the sizes of the "blocks" of use involved (e.g., one person's trip versus many trips), and the trade-offs will have to be considered.

Advertising is another issue which may be affected by lotteries. For example, Parent (1977) speculates that a lottery would encourage large outfitters to invest in primary advertising to increase the size of the commercial sector, which would greatly increase demand for the resource. At the same time, both small outfitters and private river runners, who would be unable to compete with expensive advertising campaigns, would be forced off the river. The diversity of services offered by numerous small outfitters would be lost, private users would have little opportunity to run the river, and the already over-demand situation would be further exacerbated.

This scenario is speculative, but private users have expressed related concerns about advertising, and the point is well taken; any allocation system must consider the effects of advertising. The solution may be to structure systems so that the incentive to advertise is minimized (e.g., by limiting the size of outfitting businesses). It is also important to collect data on the outfitting industry so that changes can be documented (see Appendix 4).

SUMMARY

Lotteries have long been used to make social choices and allocate scarce resources. Game lotteries represent the best model of random selection of a recreation resource. At least 35 states use lotteries to select game permits, and lottery systems have been adapted to fit a variety of situations and needs. Although lotteries do not assure that people who value permits the most are those who get them, their extensive use by game agencies in game management shows that lotteries are a well accepted and feasible allocation mechanism. The following generalizations can be made:

1. Lotteries are historically well founded and legally sanctioned.
They are currently and widely used for allocating resources, and Americans take them seriously.
2. It is important that lotteries be and appear fair.
3. Lotteries in their "pure" form represent the "equal chance" method of achieving equality, where each applicant has an equal probability of selection.
4. Many lotteries are not "pure;" they have been modified to serve specified equity or efficiency goals such as giving previously unsuccessful applicants a higher probability of selection.
5. Lotteries are flexible in other ways. They can (a) handle a great number of applicants and/or of drawings; (b) be used to distribute use and maximize individual choice; (c) be manipulated to provide varying rates of "turnover;" (d) handle group applications; and (e) vary in cost and efficiency.
6. Lotteries may pose problems for commercial guides, particularly when they rely on return business.

7. There are other potential problems which need to be considered if lotteries are used for river permits, including fees, permit transfers, advertising, and quasi-commercial operations.

MEASURING ECONOMIC PERFORMANCE OF
RIVER OUTFITTERS

PREPARED BY

C. R. MICHAEL PARENT

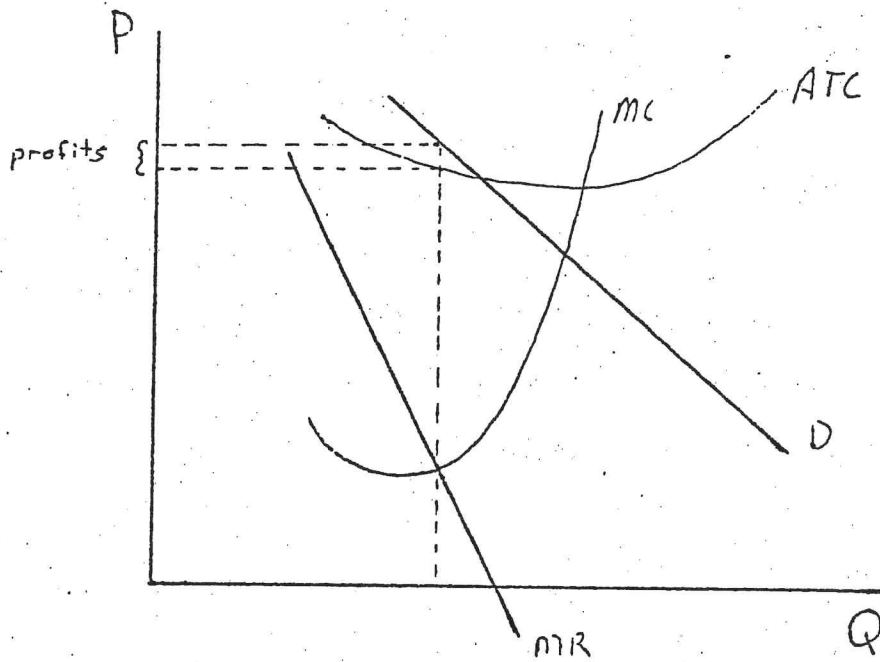
Unlike the monopolist who will increase price and reduce output to generate excess profits (monopolistically competitive industries in the short run can maximize profits in a similar way), the commercial outfitter may not want to restrict output, and price increases are inevitable assuming constant supply and increasing demand or constant demand and decreasing supply. Curiously, higher prices and excess profits are caused by regulatory action of the resource management agency, not by monopolistic practices of the commercial outfitter. Table III illustrates this situation. The increase in profits is a consequence of the limit on the number of user days (supply) the firm is allocated and the increases in demand which occur over time. (Note: The firm described in Figure I is very similar to a composite of all firms operating on the Colorado River under NPS jurisdiction.)

As monopoly profits are not generally consistent with the philosophy of granting special use permits, the resource management agency may want to regulate the economic aspects of the industry. Price ceilings are convenient, but they've never worked. The elimination of one allocative mechanism requires the substitution of another. Black markets, hidden charges, reduced service, and increased oversight responsibility are all very real possibilities. Franchise fees, taxes and bidding have been used

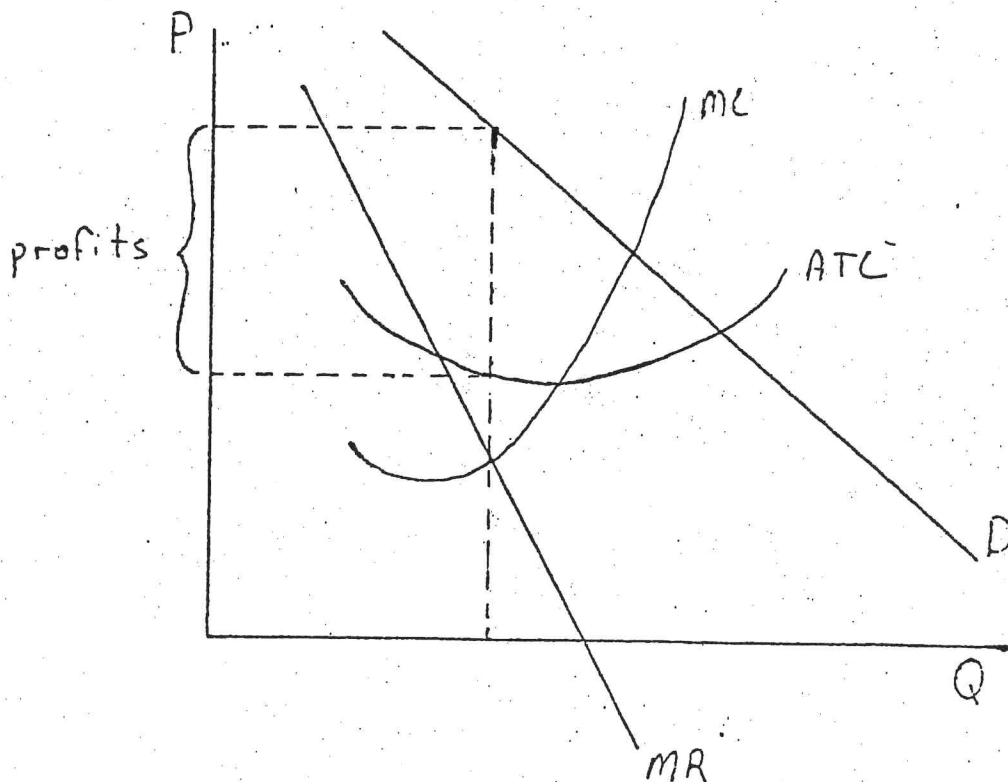
TABLE III

Figure I

MONOPOLISTICALLY COMPETITIVE FIRM BEFORE REGULATION

Figure II

MONOPOLISTICALLY COMPETITIVE FIRM AFTER REGULATION



with varying degrees of success in extracting surplus profit. To some extent, all of these are passed through to the consumer in the form of higher prices.

It is interesting to note the similarities between the current situation on rivers and the one which prompted Congress to establish the first of the regulatory commissions in 1880 in part because of allocation problems on public waterways. The Interstate Commerce Commission was established and charged by Congress with the responsibility to protect the consuming public from the potentially pernicious actions by "natural monopolies." A central responsibility is the constant collection of financial data to monitor the effect of public policy towards the transportation industry.

In the remaining sections of this paper, we will examine the current status of financial reporting under two jurisdictions where river use is regulated, the USFWS and the NPS. The national and legislatively mandated support of the two regulatory systems will be briefly described. Following this, we will present a discussion of the kinds of economic and financial information which should be collected from commercial outfitters. Finally, possible uses of this data for analyzing the effect of policies toward river users and for developing certain aspects of a river management plan will be outlined.

USDAFS and NPS Financial Reporting Requirements

Economic regulation of resource users has been a major concern of the USDAFS since its origin. The national forest system was established to regulate a publicly owned resource where private individuals and firms could extract lumber and other valuable resources for subsequent sale. The USDAFS has well established procedures for extracting payment for these resources. As recreation, and those who provided access to recreation for a price, became an increasing use of USDAFS land the application of existing fee setting technology was a logical development. In all probability, the "multiple use concept" forced USDAFS personnel to think in economic terms requiring an application of some sort of calculus to determine the maximum return to the resource under competing or complementary uses.

The NPS, however, was the product of an entirely different political force. Many national parks were established to prevent the very practice, multiple use, which was considered so appropriate by the USDAFS. Yet, from the beginning, the Yellowstone Park Act of 1872, the Secretary was authorized to set aside areas and grant leases to firms to accomodate visitors. The Secretary, therefore, was required to protect and promote the public interest by regulating business practice. This power was enlarged and defined through a series of legislation until the Concessions Policy Act (P.L. 89-249) in 1965. This act provides for the regulation of specific activities by concessioners, eg. pricing, promotion, product design and service, location, and employment practices among several

others. In fact, one section of the act appears to be an insurance policy unlike anything any freely competitive firm could purchase let alone receive constructually at no cost! "Such terms and conditions may include an obligation of the United States to compensate the concessioner for loss of investment..." and, the concessioner must have "... a reasonable opportunity to realize a profit on his operation as a whole commensurate with the capital invested and obligations assumed." For its part, a concessioner would pay a franchise fee in practice between one-half of one percent and three percent of gross receipts of that portion of the operation on public lands. Of course, to regulate the operations of a firm under such specific guidelines, the NPS was also empowered to collect whatever financial data were required to calculate franchise fees and determine the reasonableness of price and profit.

Couriously, under neither jurisdiction has the economic regulation of commercial activity been consistant. Policies and fees vary widely over the parks and forests.

Copies of the basic reporting forms for the USDAFS and NPS are provided at the end of this appendix. Notice the simplicity of the USDAF financial statement as opposed to the financial report required by the NPS. Under the USDAFS form as currently used, a river outfitter would provide only a single entry, "Packer-Outfitter," under the heading "kind of business." On the other hand, notice the complexity of the "Fee Calculation" document. In fact it is so complex that it is seldom used for small, recreation oriented firms. Instead, the fees charged most outfitters is a straight per person fee.

The USDAFS financial data for river outfitters do not allow for many of the economic evaluations which could be applied. Given the paucity of data, it is impossible to determine the level of performance by firms in the industry. Recent experience with legislatively and court mandated evaluations of river management plans require an analysis of secondary impacts, general price level, excessive profits, economies of scale, etc. To do this requires the collection of the kinds of data listed on the NPS concessioner financial report.

If one were to read the Concessions Policy Act, they would find an explicit document governing the regulation of commercial conduct rather than structure. That is, the focus of the Act is on the behavior of firms in an industry rather than the structure of the industry.

There are two basic approaches to economic regulation: structure and conduct. The Industrial Organization model suggests that the structure of an industry (number and size of firms, ease of entry and exit, fixed-to-variable cost ratio, etc) constrains the conduct (pricing, promotion, product decisions, etc.) of firms in the industry. Performance of the industry and firms in the industry is measured by sales, consumer satisfaction, profits, cash flow among other variables.

The point is this. One can achieve a specified level of performance by regulating structure as the USDAFS and NPS do in certain cases, eg. regulating the number of firms, (permits issued) the size of firms (user days), entry (sale and purchase

of permits), fixed cost ratios (type of equipment), etc. However, the same agencies also regulate conduct directly by approving price changes, advertising, duration of trips, etc.

It is clear that regulation in an economic sense is occurring in an effort to serve the public and protect the resource. Public Law 98-249 specifically provides for this regulation by the NPS. The USDAFS has a similar mandate in the Code of Federal Regulations (36 CFR 251.1 (5) and 251.3 (a,b)). Specifically the CFR provides "... the permittee to charge reasonable rates and furnish such services as may be necessary in the public interest." Also, the CFR specifies "... the Secretary of Agriculture shall require the payment of a fee or charge commensurate with the value of the use authorized by the permit..."

It is interesting to note the different philosophies of the USDAFS and NPS towards fees charged commercial outfitters. The legislative mandate for the NPS specifically states that revenues received by the government shall not be a primary concern when setting fees. However, the USDAFS mandates that fees represent the value of the resource used. In a purely objective analysis of each position, financial data would have to be collected by the NPS to insure that visitor needs are being met. And, the USDAFS should collect financial data to determine whether the rates are reasonable and the fees are appropriate for the value of the resource. In the near future, however, the economic consequences of public policy will need to be measured and justified because of potential effects on resource use, resource users, and the need for equitable, non-arbitrary treatment of commercial outfitters.

Reporting Financial Data

Unlike most other products or services which are based on a variety of raw materials and resources, one cannot expand the supply of rivers as the basic demand for river recreation increases. The resource is fixed. Some method of rationing the resource, generally price, must increase if the resource is to be appropriately valued and protected from over use. Regardless of one's economic position, overcrowding seems a high price to pay for a low price. The question which must be answered by the resource manager is, "where should the price be set?"

As an initial and minimum collection of financial data, the resource manager should require an annual (before the season) report from each commercial river outfitter listing the proposed price, type of equipment, duration of trip, other services provided (meals, beverage, transportation, etc.) and copies of the advertising material used to promote the outfitter's business. A special use permit should be designed based upon this information. For example, a special use permit should list the rafts by number and type and specify in a general way what services are to be provided by the permittee.

A general right-to-operate is not sufficient to provide control over the permittee. If a permit is granted by the USDAFS in response to a measured need, the USDAFS should be in a position to measure the behavior of the commercial outfitter through the course of the season against a specified standard. Under one NPS jurisdiction, the concession permit provides the concessioner with a specified number of user days. This

encourages overcrowding during peak times and peak use periods of the summer as well as on the rafts. The USDAFS in a nearby area provides that the permittee may only have a specified number of rafts on the river at a given time. By making this specification, the USDAFS is able to relieve some of the potential congestion on the river. And, perhaps more importantly, the USDAFS is in a position to respond to the almost certain situation within the next few years where permittees will have to bid on the permit in response to a prospectus issued by the resource management agency. The prospectus will be developed within the constraints of some river management plan which has undergone the EIS review process. If the issue today is an allocation between private and commercial river users, then almost certainly the USDAFS will have to address the issue of who gets a right to make commercial use of the river. For these reasons, the financial data collection should begin before the season with a statement of what the commercial outfitter intends. This should be formalized in a special use permit and then evaluated by collecting operating information after the season. Certainly, this is no different than the current process followed by researchers: RFP, Proposal, Contract, Evaluation of the Report.

Minimum Information

The following information should be collected each year as a minimum:

Income from operations (does not include income earned from other permits of business)

Other income (income from interest related to outfitter business, lease of equipment, gain on sale of equipment, etc. but must be related to river operations)

- Operating Expenses
 - Salaries and Wages
 - Officers Salaries
 - Operating expenses (to be reported in general categories: transportation, food and beverage, maintenance, rent, depreciation, others)
- Depreciation Schedules for boats, auto/trucks or busses, and other to be specified by the permittee.
- Taxes (U.S., State, County and Other)
- Permit Fees
- Number of Passengers (This should be reported as full fare, partial fare and non-paying. Also, the permittee should report trip duration and number of total user days in a manner to be determined by managing agency)

The actual format could be similar to the Concessioner Annual Financial Report required by the NPS. This is recommended for two reasons. First, the data would be collected in a form very similar to the tax return provided by the IRS. The financial data could be compiled at very little additional cost and effort to the permittee. Second, the data would be collected in a form that would allow easy comparison with existing cross-sectional and time series data on Grand Canyon outfitters.

More Thorough Analysis

Collecting the above information will allow further analysis. A special study could be made as needed, or the figures could be calculated routinely with a simple computer program. The following ratios are commonly used to evaluate the performance of a wide range of commercial and not-for-profit firms. They would provide useful statistics for evaluating the performance of a commercial outfitter.

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. Commercial outfitters 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 invariable 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 commercial river outfitters may be 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.

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 firm.
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 outfitter would still meet total costs. If the figure is over 100 percent, the outfitter must increase sales in order to breakeven.

6. 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 firm.

7. 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.

8. 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 the river running industry because of the wide variations in equity and net asset positions among firms.

9. Average Revenue per Trip - This is found by dividing Gross Income by Trips. It indicates the funds contributed by each trip.
10. 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. The difference between average revenue and average cost per trip is the profit provided on a per trip basis.
11. Average Revenue per Passenger Day - This is found by dividing gross income by passenger days used in a calendar year.
12. 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.

13. 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.

14. 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 firm's 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.

15. Dividends - Dividends should be compared with net profits and officers' salaries to provide a more complete statement of financing sources and income levels of the typically closely held concessioner.

16. Advertising as a Percent of Sales - This figure shows the relative importance of advertising to each concessioner. A comparison of advertising before and after the application on user day limits would provide an interesting statistic. One would expect the ratio to decline substantially unless some form of lottery were

initiated for both the commercial and private sector. As commercial advertising would likely attract more non do-it-yourselfers, the outfitter could maintain their market share through advertising and perhaps even expand it.

17. Net Worth - This measures the investment in firm made by the stockholders. It is the sum of contributed capital and accumulated retained earnings.
18. 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.
19. Net Profit After Tax - This is the net profit for each concessioner.
20. 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.
21. 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.
22. Officer Salaries as a Percent of Sales - This provides a comparison of officers' salaries holding size constant.

It is interesting to note that with little or no economic justification, the various river management agencies have limited the number of commercial operators. One way to eliminate excess profits is to increase the number of commercial outfitters. Since prices will go up, as previously discussed, we could extract some of the excess profit by encouraging more inefficient firms to enter the industry. Note that this would have the effect of distributing the profit over more firms rather than concentrate the profit in the bank accounts of a few. It would also provide access to the river for a few more individuals as guides and commercial operators. Actually, the new firms would not necessarily be inefficient; they would cause all firms to operate at a less efficient level, e.g. equipment would have to be purchased and maintained, but if used less often, the average cost per trip would be higher. (I don't support this approach; however, it leads to some interesting thoughts on whether or not the current policy limiting the number of concessions accomplishes anything positive).

The above financial information and economic rations would enable the resource management agency to monitor changes in the industry over time as well as empirically evaluate the effect of various regulations. Most industries have industry averages against which a firm may compare its performance. Industry averages are also a useful index against which regulatory agencies can evaluate the impact of a regulation in one jurisdiction versus the average performance of the industry. While this is not required today, it will certainly be mandated by legislative action as allocation issuers become even more significant and politically visible.