AN ABSTRACT OF THE THESIS OF

Mark Stephen Danley for the degree of Master of Science

in Geography presented on May 2, 1980

Title: Resource Allocation and The Ability to Pay: A Case Study of Float Permits in Hells Canyon

Abstract approved: _____
Gordon Matzke

Rationing float use on many of the nation's whitewater rivers is a significant issue in recreation management. Alleged inequities in the rationing policies used in Hells Canyon National Recreation Area prompted an evaluation of procedures for allocating private and commercial float use on the Hells Canyon portion of the Snake River.

This paper proposed and tested a resource allocation model based on the theoretical assumption that identifiable user characteristics would influence both the perceptions and the evaluations of five rationing mechanisms: pricing, reservation, lottery, first-come/first-served, and merit. A literature review identified each alternative's "hypothesized currency" and helped develop a theoretical framework and testable hypotheses.

The model was tested using a questionnaire administered to private and commercial boaters in Hells Canyon during August, 1978. The

questionnaire first outlined the five alternatives and then asked respondents to evaluate their perceived ability to obtain permits, perceived fairness, acceptability, and willingness to try each alternative. It also measured relevant user characteristics.

Respondents preferred the reservation alternative, followed by pricing, lottery, merit, and first-come/first-served, respectively. User characteristics had little or no effect on perceptions or evaluations of allocation alternatives. However, several other interesting relationships were uncovered. Systems perceived as offering the best chance to obtain permits were most likely to be evaluated as "fair." In addition, systems were more likely to be judged "acceptable" if they were perceived as "fair." However, willingness to actually try a system was dependent on perceived ability to get a permit rather than on the more abstract notion of fairness. Theoretical and management implications of the findings are discussed.

Resource Allocation and the Ability to Pay: A Case Study of Float Permits in Hells Canyon

by

Mark Stephen Danley

A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Master of Science

Completed May 2, 1980

Commencement June 1980

APPROVED:

_____

Professor of Geography

_____

Chairperson, Department of Geography

_____

Dean of Graduate School

Date thesis is presented May 2, 1980

Typed by Roselee Hecht for Mark Stephen Danley

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Resource Allocation and the Ability to Pay: A Case Study of Float Permits in Hells Canyon

I. INTRODUCTION

Resource scarcity is rapidly becoming one of the most salient issues of modern society. Scarcely a day ends without news of attenuating oil reserves, over-exploited ground water, or over-cut forests. History is riddled with the struggle to control and to distribute nature's resources. Resources, however, are continually being defined and re-defined. "Resources are not - they become" wrote Zimmerman (1964) in Introduction to World Resources. He speculated that resources evole from "neutral stuff" as needs and technology change. As a resource evolves society decides how and by whom that resource should be used. Allocation, like Zimmerman's definition of resources, is a function of society's goals, needs, and experiences.

WHITEWATER AS A RECREATION RESOURCE

Whitewater rivers have recently evolved from "neutral stuff" to a recreational resource. Once considered barriers to navigation and commerce, many turbulent stretches of America's rivers are now valued for their recreational and aesthetic benefits. Use of whitewater by floaters for recreation has increased dramatically in recent years: in 1965, 597 people ran the Grand Canyon of the Colorado; by 1972, 16,428 people made the same trip. Similar increases can be cited for other American rivers (Interagency White-

water Committee, 1976). Increased leisure-time, improved technology (e.g., rubber rafts) and higher incomes have reduced the relative costs of floating rivers, while magazines, newspapers and river runners spread the gospel of whitewater boating, thereby increasing the perceived benefits. Whether the demand for whitewater boating will continue to increase or not is debatable, but evidence suggests that it will (Parent, 1978). Whitewater has become a resource.

With the evolution of whitewater rivers from "neutral stuff" to resource, there is a need to evaluate two questions. How is the resource used? To whom should the benefits accrue? Prior to the recent increase in demand for whitewater recreation, most rivers were "common-property" resources where participation was limited primarily by assessment of the personal costs by participants. As increased use precipitated site deterioration, crowding, and user conflicts, many managing agencies established use-ceilings or "carrying capacities" based on the perceived social and/or physical limits of the river. On many rivers, it wasn't long until use exceeded these carrying capacities, and the issue of "who gets to go" appeared. In summary, two recently emerged issues in whitewater resource management are: 1) determining the appropriate resource carrying capacities, and 2) establishing the criteria by which users are selected once the carrying capacities have been exceeded. This thesis deals with the second issue, allocation, as it applies to the Hells Canyon section of the Snake River.

The need to develop and test integrated recreation allocation models is acute. Although economists, social-psychologists, and

others have generated many assumptions regarding allocation, few of these have been empirically tested in recreation settings. For example, most recreation allocation research is remedial, attempting to define specific management alternatives and user preferences rather than to test and advance theory. Unfortunately, researchers and managers are unsure which theoretical assumptions and relationships are valid.

This thesis uses a floater's survey to test some hypothesized relationships between users' ability to pay for five rationing alternatives (pricing, reservation, lottery, first-come/first-served, and merit) and users' evaluations of equity, acceptability, and willingness to try those systems. The remainder of Chapter I is devoted to Hells Canyon and its float use. Chapter II is a review of allocation literature and the five rationing alternatives, and a discussion of theory and hypotheses used in this research. Chapter III outlines the data collection, measurement, and analysis procedures. Chapter IV presents results, and Chapter V discusses conclusions along with their management and theoretical implications.

HELLS CANYON WHITEWATER RECREATION

Hells Canyon, reported to be the deepest gorge in North America, was cut by the Snake River on its journey from the Grand Tetons in Wyoming to its confluence with the Columbia River near Pasco, Washington. Forming part of the border between the states of Oregon, Washington, and Idaho, the Hells Canyon section of the Snake has long been earmarked for hydroelectric development. The environmental movement of the 1970's, however, pushed for the

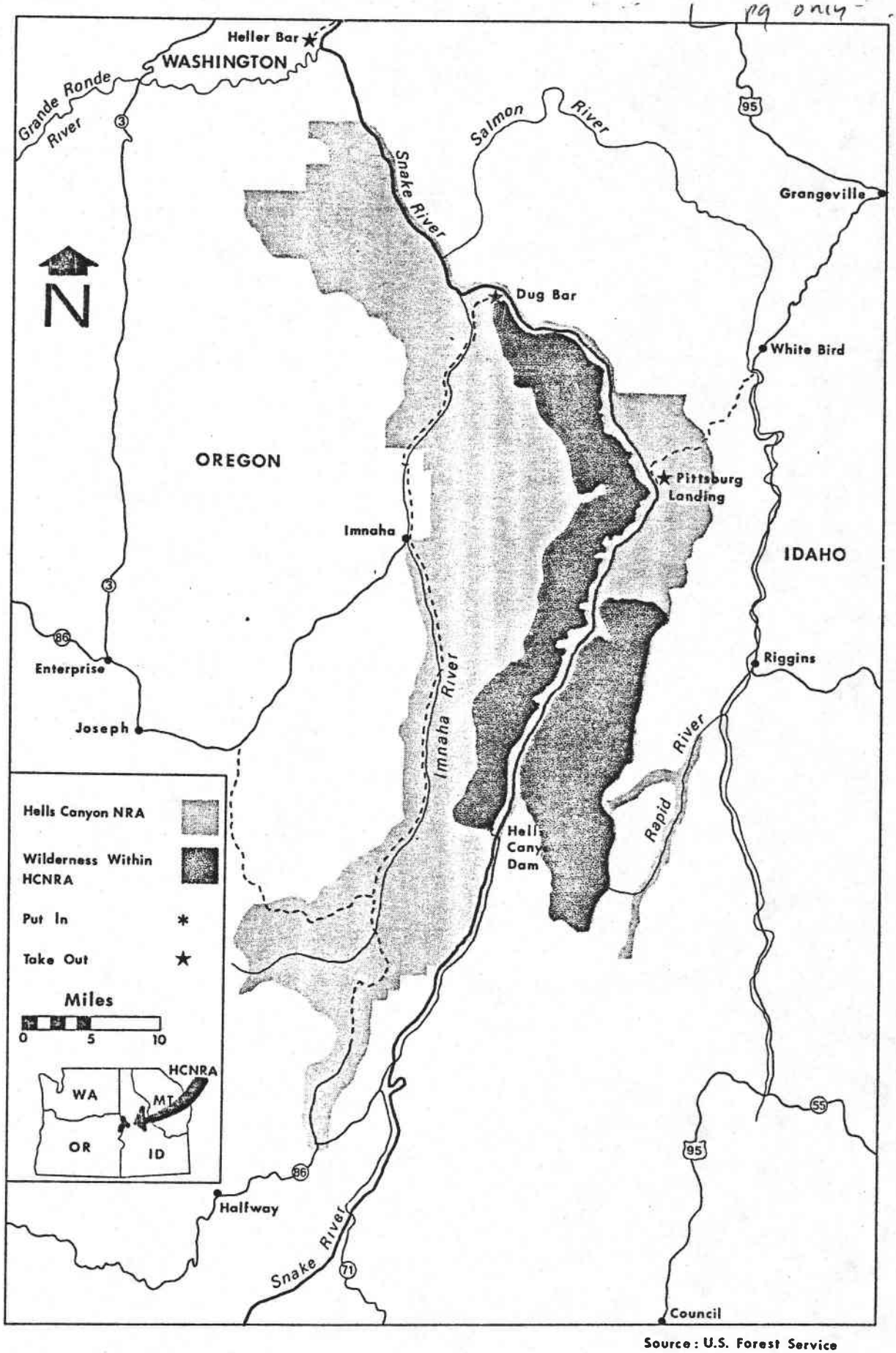
retention of Hells Canyon as a recreational and aesthetic sanctuary, and on December 31, 1975, Public Law 94-199 designated Hells Canyon as a National Recreation Area and portions of the Snake as a National Wild and Scenic River, both to be managed by the Wallowa-Whitman National Forest. The "Wild" section of the Snake runs from Hells Canyon Dam northward approximately 32 river miles to Pittsburg Landing; this section contains some of the best whitewater, including Wildsheep, Granite, and Rush Creek rapids (Figure 1). Downstream from Pittsburg Landing is the more accessible "Scenic" section, a 40 mile stretch with only a few moderate rapids and a higher concentration of jet-boats.

Physical Setting

Hells Canyon is wedged between the Wallowa Mountains of northeast Oregon and Idaho's rugged Seven Devils. The canyon is semi-arid, steep, and dissected by numerous tributary streams, including the Imnaha, Salmon, and Grande Ronde rivers. Summers are hot and dry, with cold, dry winters. The Snake above the confluence of the Salmon is regulated by several dams, including the Hells Canyon and Oxbow Dams. Runoff is usually higher in the spring and early summer, and periodic flooding is common below the confluence of the Salmon River. Water flow varies from 5500 cubic feet per second (cfs) to 45,000 cfs from May to October at Hells Canyon Dam (Holthus, 1978). Campsites along the river are generally scarce, especially above the confluence of the Salmon, where upstream dams have stopped the replenishment of sand and silt.

Hells Canyon is rugged and remote. Highway engineers have

Figure 1. Hells Canyon National Recreation Area.



Source: U.S. Forest Service

historically bypassed the canyon in favor of easier routes along the Salmon River in Idaho and west of the Wallowas in Oregon. In addition, the region surrounding Hells Canyon is sparsely populated, with concentrations in the Lewiston, Idaho area and along the Snake River plain near Boise, Idaho. The regional population centers of Portland, Seattle, and Salt Lake City are all at least 400 road miles from Hells Canyon Dam, further separating the canyon from its potential float-boating clientele. Access to the Snake throughout the Recreation Area is limited to roads at Hells Canyon Dam, Pittsburg Landing, and Dug Bar (see Figure 1). A few foot trails descend from the canyon rim. Jet boats run the entire river, but their use is concentrated below Pittsburg Landing. Circulation between the launch site at Hells Canyon Dam and the primary take-out point also hint at the canyon's inaccessibility: it takes approximately five hours to drive the 195 road miles between the launch site and the primary take-out at Heller Bar, Washington, a distance of 85 river miles. Although some work is being done to improve access, Hells Canyon remains one of the most isolated components of our National Wild and Scenic River system.

Float Boating

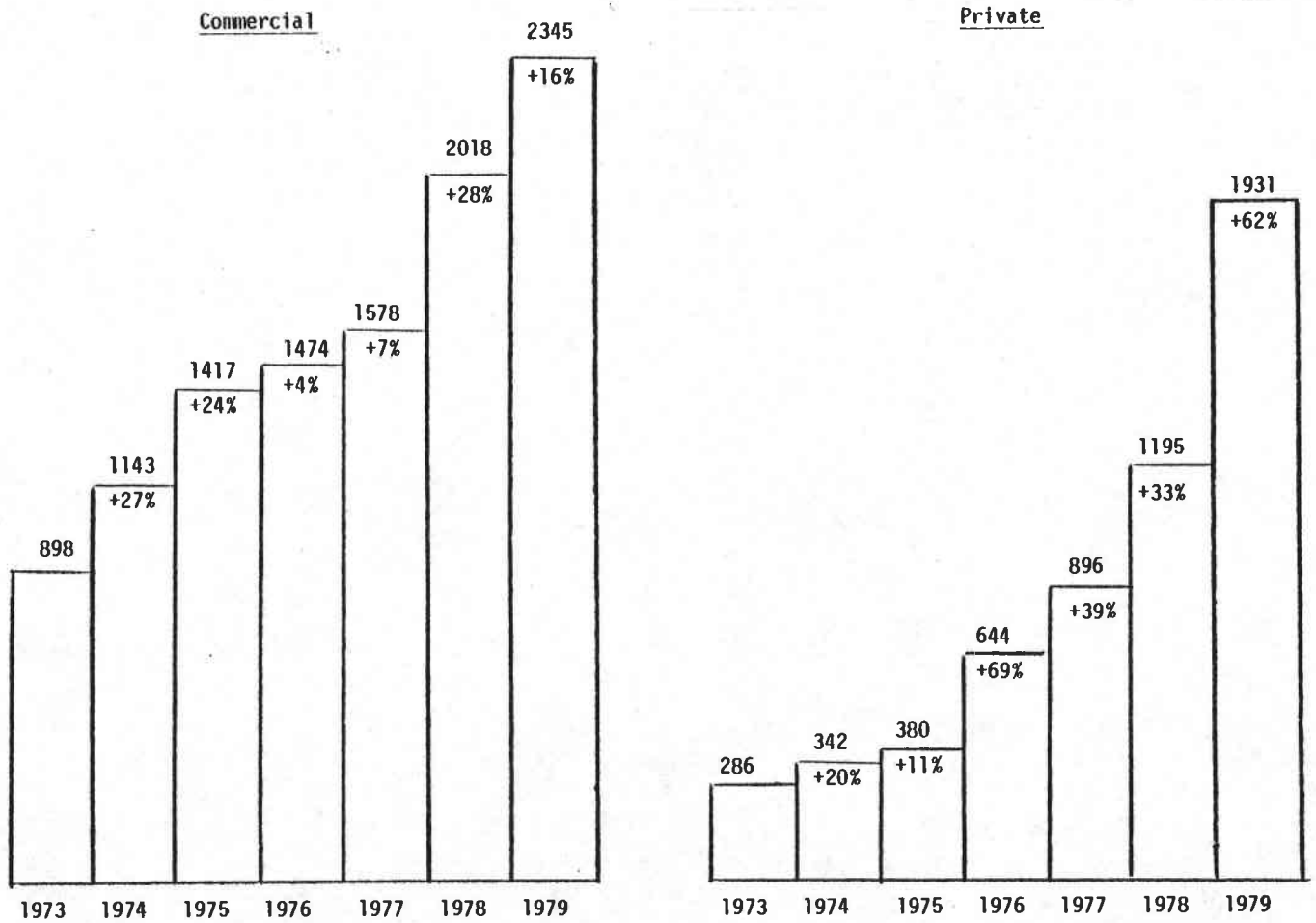
Whitewater recreationists are, in increasing numbers, willing to pay the high costs of travel to Hells Canyon. In 1973, a total of 1186 rafters, kayakers, and drift-boaters launched at Hells Canyon Dam between 14 May and 20 October. In 1979, 4276 people lauched at Hells Canyon Dam between 21 May and 15 October (see Figure 2). About half of this use was concentrated into July and

August, with few lauches in May or October (see Figure 3). In the 1978 season, most floaters (62%) took out at Heller Bar, Washington (83 miles) and 3% traveled as far as Dug Bar (51 miles). About one-third (35%) of the 1978 users floated to Pittsburg Landing (32 miles), an option which is growing in popularity (USFS, 1979; Wilmarth, 1979). Average trip length is five days with approximately twelve persons per trip (USFS, 1979). Users, however, are separated into two groups, private and commercial, and there are important differences in the characteristics of the two groups.

Private and Commercial Users

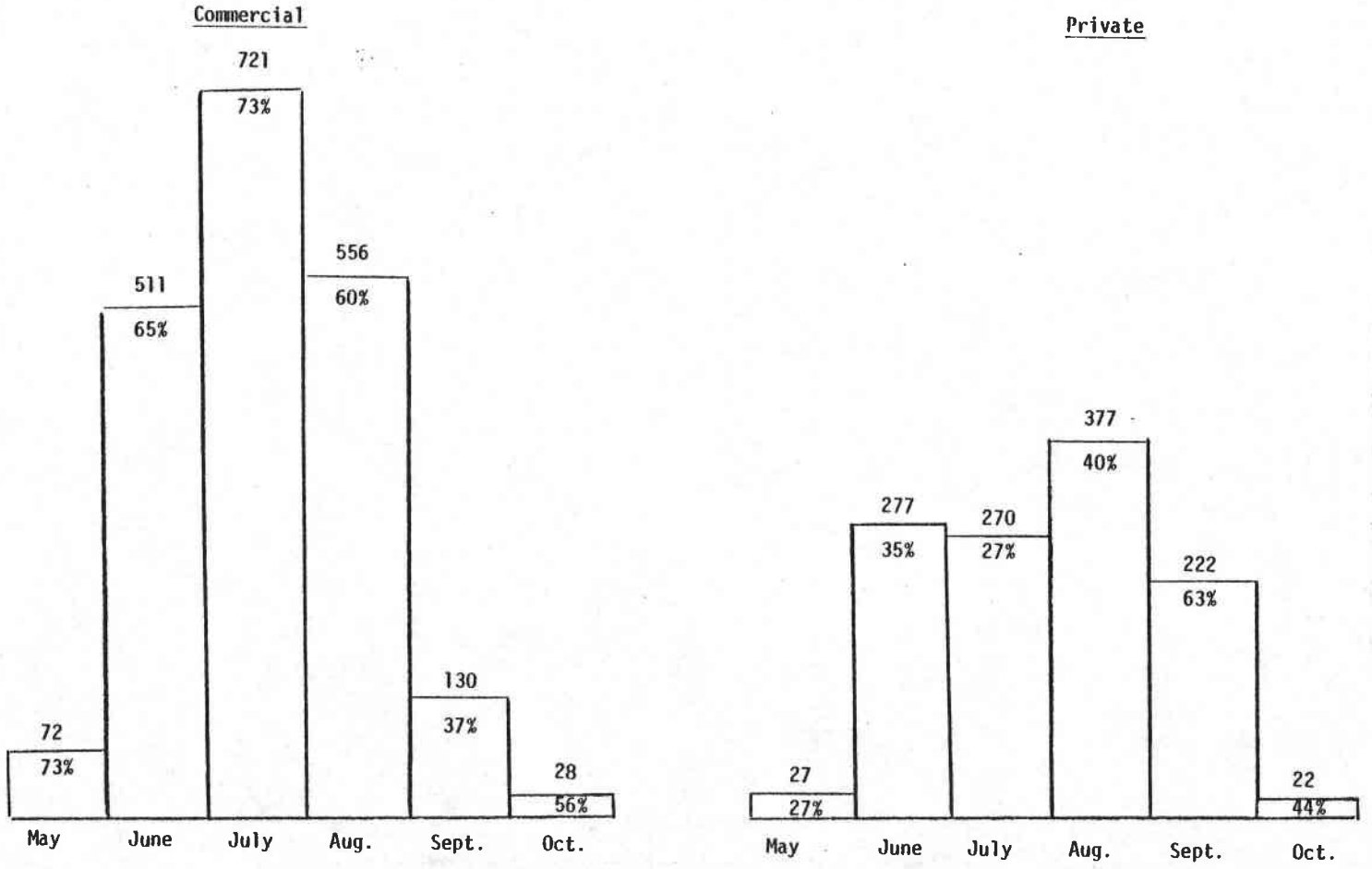
Private parties are those who run rivers using their own skills and equipment. Allocations to private parties are given under the assumption that costs are shared by the group (Interagency Whitewater Committee, 1976). Commercial groups, in contrast, are organized by licensed concessionaires who provide their skills and equipment to paying customers. Outfitters retain a portion of their revenues as profit, and allocations are granted by blocks from the managing agency to the outfitter. For both private and commercial groups, permits are first granted to a trip leader, or outfitter, who then re-allocates them to his chosen party or to paying customers. This split allocation system was presumably designed to recognize the characteristics of each user group and the needs of the outfitters. Although the delegation of allocation authority to outfitters and trip leaders may also have reduced administrative costs, the opportunity of private trip leaders and commercial outfitters to capitalize on escalating permit scarcity may be in-

Figure 2. People per year floating the Snake in Hells Canyon, 1973-1979.[a]



[a]Adapted from U.S. Forest Service data, Pine Ranger District, Wallowa Whitman National Forest. Percentages represent increase over previous year's use.

Figure 3. People per month floating the Snake in Hells Canyon, 1978.[b]



[b]Adapted from U.S. Forest Service data, Pine Ranger District, Wallowa-Whitman National Forest. Percentages represent relative use by each sector.

creasing (Shelby and Danley, 1979: 23-24).

On the Snake, use has been dominated by commercial groups, although the percent of private use has increased in recent years. In 1975, for example, 21% of the floaters were private, but by 1979, this had increased to 45% (USFS, 1979). Seventeen outfitters are currently licensed to run trips on the Snake, with four outfitters accounting for 47% of the 1978 commercial use, six others accounting for 48%, and seven outfitters sharing the remaining 15% (USFS, 1979). Outfitters also vary in the type, length, and quality of the trips they offer. A review of outfitter services in 1977 revealed price differences from $37.50 to $87.50 per day, with crafts ranging from inflatable kayaks to motorized 33 foot pontoons, and a wide variation of food, equipment, and supplementary activities (Shelby and Danley, 1979: 39-45). Commercial groups average almost twice as many persons per trip and stay on the river slightly longer than do private groups (USFS, 1979).

Present Allocation System

Although commercial groups have been regulated for a number of years, the present permit system, which regulates all float-boating from late May to mid-October, was initiated by Wallowa-Whitman National Forest in 1976. Designed primarily for the peak-use periods, this system allows two commercial and three private launches per day, with a maximum party size of 30 persons per launch. Outfitters' launches are scheduled months in advance with each outfitter receiving an equal portion of the total commercial launches. Private launches are reserved by mail on a first-come/first-served

basis beginning in December (Holthus, 1978). Because use is regulated by launch rather than numbers of people, a given day can be "filled" with less than 150 persons. For example, in 1979 the average commercial group had about 18 persons, private groups about 9 (USFS, 1979). If the five launches were filled with average-sized groups, then 63 persons would launch on this hypothetical date.

This permit system hit a snag during its first year of operation. On a day when all three private launches were reserved, John Garren, a private river runner from Portland, chose to run a river without a permit even though the Forest Service had made a permit available to him. Garren's dissatisfaction centered around the ratio of permits between the private and commercial sectors. Although Garren's petition was denied even after appeals to the Regional Forester and the Chief of the Forest Service (Garren, 1977; Jorgensen, 1976; McGuire, 1977), his protest raised some fundamental questions regarding allocation of permits in Hells Canyon. These include: 1) the identification of "proper" ratios between the private and commercial users; 2) the "equitable" distribution of permits within each sector; 3) the need for administrative flexibility and efficiency of a permit system; 4) the provision of a variety of experiences for float-boaters in Hells Canyon; 5) the recognition of the needs of managers, outfitters, and users; 6) the characteristics and preferences of users, both private and commerical; and 7) the necessity to evaluate and revise the permit system over time.

II. LITERATURE REVIEW AND THEORY

LITERATURE REVIEW

Micro economists study, among other issues, individual motives and behaviors of producers and consumers within market systems. Social-psychologists, in contrast, have researched the social norms of equity, equality and need to build theories of distributive justice. Recreation researchers (many of whom are geographers) concentrate on evaluation of allocation systems and their temporal, spatial, and management consequences.

Economic Theory

Several economic theories are relevant to a discussion of recreation allocation: allocation efficiency, willingness to pay, the nature of demand and supply of goods and services, consumer surplus, and diminishing marginal utility. Since these theories are well exposed in the economic literature, only a brief summary follows. For additional background, the reader is referred to Knetsch (1974), and Hughes and Lloyd (1977).

Willingness to pay. Goods and services, according to economists, are valued according to how much a consumer is willing to pay to use or control them. Willingness to pay measures the relative value of the good or service, and this value is usually expressed in monetary units. Economists recognize that units of exchange are not always monetary (that is, labor, ideas, or other goods could also be exchanged), but money is a handy common denominator. For non-market goods and services such as outdoor recreation, economists

generally transform consumer behaviors into expressions of monetary value. The travel-cost approach first developed by Clawson (1959) is a good illustration of this conversion.

The important concept of willingness to pay is that consumers weigh the relative values of one resource for another, and that some consumers are willing to travel further, pay higher entrance fees, and so forth for a given recreation experience. This implies that recreation experiences are not equally valued by all persons, which directs our attention to economic demand.

Demand. Willingness to pay can be translated into a graph which plots price of a good against the amount consumers choose to buy. These amounts vary according to four factors: the price of the commodity, the income of the individual, the price of complementary and substitute goods, and the tastes and preferences of individuals (Knetsch, 1974). The result is a demand curve or demand schedule, which graphs price against quantity demanded. Economists infer many useful concepts from demand curves, including consumer surplus, which is the positive net difference between what a consumer is willing to pay and what is actually paid to acquire a commodity or service. Recreation goods often exhibit high consumer surplus, especially those goods which are provided by government agencies at low cost. For example, most wilderness users pay only the costs of travel and equipment to experience (consume) wilderness; seldom are visitor fees levied. As wilderness becomes more valued (as tastes and preferences change in favor of wilderness), wilderness use increases. Economists might say this reflects increasing consumer surplus. People are willing to pay a higher

price for wilderness experiences, but biases against pricing wilderness keeps prices low and participation high. Excessive demand is a signal that recreationists may be capturing increasing consumer surplus, and artificial means (i.e., a permit system) must be instituted to raise the "price" of access and maintain economic equilibrium.

Allocation efficiency and decreasing marginal utility. Underlying the previous economic theories is the idea of decreasing marginal utility (sometimes called the law of diminishing returns) and the concept of economic efficiency. As people consume a particular good, increasing consumption results in ever-decreasing marginal satisfaction. Economists further recognize that all persons have budget constraints; that is, we have only so much time, money, expertise, etc., to trade for desired goods and services. It is assumed that we trade our resources to maximize personal utility for the least effort. Earlier we recognized that persons differ in their tastes and preferences: some like wilderness, others do not. Economic efficiency is the judgement that goods and services should go to those who desire them the most; that society is best off when those who really want something get it, and those who are indifferent do not. Optimal allocation, sometimes called pareto optimality, is the condition when no one in an allocation system could be better off without making someone else worse off. Many economists contend that the best way to approach pareto optimality is through a pricing mechanism, where consumers weigh the relative benefits and costs of all possible choices within their budget.

Social Psychology Theories

Social-psychologists have studied the norms by which society allocates scarce resources. Roughly, these norms fall into four categories: equality, equity, need, and social efficiency. The goal underlying each of these systems is the establishment of distributive justice, a hypothetical ideal where all individuals in an allocation situation obtain what they "ought" to have. Distributive justice is often measured by the "fairness" of a given allocation scheme (Homans, 1961). The basis for distributive justice include: 1) the values on which the rules for distribution are based; 2) the rules themselves; 3) the implementation of the rules; and 4) the procedures used to establish the foregoing (Deutsch, 1975).

The equality norm. Equality is perhaps the simplest allocation norm: it requires that individuals have equal rights to benefits. For example, American democracy was founded on the equality of "one man - one vote." Equality can be achieved by either dividing benefits equally or giving each individual an equal chance to obtain benefits. To illustrate we might allocate a parcel of land between two heirs by subdividing the land into equal portions, or by tossing a coin (or drawing straws, or any other unbiased selection), winner take all. The first method divides the benefits equally, the latter method give each an equal chance. When benefits are divisible (e.g., the land can be sub-divided) the first method is usually employed; where benefits are not divisible (e.g., the land cannot be sub-divided), the second method is usually preferred (Pauly and Willet, 1972). Equality, however, is

not always judged "fair," partly because some individuals "need" or "deserve" more or less than others.

The equity norm. A definition of allocation fairness, or equity, was first viewed by Homans (1961) as a balanced ratio of inputs to outcomes of all persons in an allocation system. Inputs include those factors perceived by a person to be relevant for getting some return on his personal investment (e.g., effort, education, age). Outcomes include factors perceived by the person as returns to himself (Pritchard, 1969). Simplistically, those who put more in should get more out, and vice versa. To illustrate how equity can differ from equality, in many states non-resident hunters often pay more for certain hunting rights than do residents. A resident of Alaska, for example, pays $25.00 for a brown bear tag, while non-residents pay $250.00. This clearly unequal treatment may be fair, given that residents often make additional contributions (e.g., taxes).

Homan's original equity ideas have been expanded into a substantial equity theory and literature, much of which is summarized in Equity Theory: Toward a General Theory of Social Interaction, edited by Berkowitz and Walster (1976). One of the more interesting propositions reviewed is that "individuals will try to maximize their outcomes (where outcomes equal rewards minus costs)," and its corollary "so long as individuals perceive that they can maximize their outcomes by behaving equitably, they will do so. Should they perceive that they can maximize their outcomes by behaving inequitably, they will do so." This individual selfishness supposedly is kept in check by group pressure and individual

guilt: the more inequity, the greater the guilt and pressure to restore equity (Walster, Berscheid and Walster, 1976: 2-7).

The need norm. Social psychologists also recognize that individual "needs" differ, and that allocation schemes often include an evaluation of individual needs (Deutsch, 1975). Within families, for example, infants are rarely expected to compete equally with adults for food, medical care, etc.: need is more important than individual inputs. Similarly, handicapped persons increasingly demand better access to public facilities, again because of their specialized needs.

The social efficiency norms. As mentioned in the economic theory section, efficiency is the norm of giving resources to those who value them the most. Thus, allocation of river permits is efficient if those who most desire the permits do indeed receive them. Similarly, the social efficiency norm would frown on using T-bone steaks to feed a pet dog because less valued resources could be substituted. Our society made an efficiency judgement when Congress designated Hells Canyon National Recreation Area: Hells Canyon is more valuable for its recreational and scientific benefits than for its hydroelectric potential. Note that efficiency is highly dependent on values.

A summary of allocation norms. All four allocation norms would rarely be maximized in a given allocation system. The values on which we base distribution systems depend on the conditions and participants of that system. For example, Deutsch (1975) proposed that equity would be preferred when cooperation and economic efficiency are the primary determinants; equality when maintenance

of social relations or reduction of conflict were important; and need when personal welfare or personal development takes priority. Equality may be the simplest norm to meet: equal opportunity or equal outcomes are relatively easy to measure. Equity, need, and efficiency are not so straight forward, requiring a measure of resource value, a determination of relevant inputs and outcomes, and/or knowledge of the requirements of each individual. The interaction of these factors makes distributive justice an elusive concept, and an understanding of the trade-offs of each norm is paramount to any allocation study.

Recreation Studies

Early thoughts on rationing recreation. As early as 1940, Alan Wager noted increased crowding of recreation areas and a deterioration of ethical standards for outdoor conduct; he proposed an outdoorsmen certification program to both control use and instill environmental ethics (and thus reduce the impact of use). This "merit" approach to rationing was reincarnated in the 1960's and 1970's by Garrett Hardin, Roderick Nash, and others.

By the late 1960's, heavy visitation to many of the nation's wilderness areas and National Parks caused several writers to speculate on the causes of this trend and possible remedies. Hendee et al, (1968) called for direct rationing of wilderness use in the Pacific Northwest in order to control visitor impacts. Also in 1968, the biologist Garrett Hardin likened overuse of public recreation areas to the natural tendency to over-exploit "free-access" resources. His argument assumed that a resource owned by

everyone, or no one, would be exploited beyond its natural capacity by individuals seeking to maximize their own rewards. This, according to Hardin, results because individual benefits are not commensurate with individual costs: those who benefit from over-exploitation pay only a fraction of the costs of that exploitation. This "Tragedy of the Commons" supposedly underlies such unrelated resource problems as water and air pollution, over-fishing, and crowded parks. Hardin's preferred solution to the Tragedy of the Commons was to promulgate mutually agreed upon rules regarding resource use (Hardin, 1968).

Hardin addressed recreation allocation more specifically in 1969 in his Economics of Wilderness, outlining what he considered potential methods for closing the recreation "commons:" pricing, queuing, lottery, and merit. Pricing, or market allocation, was thought to be unfair presumably because of the inequitable distribution of income. Queuing, or first-come/first-served, was discounted because although "fair," it was deemed inefficient in remote wilderness settings. Hardin considered lotteries (an example of equal chance equality) "eminently fair," but his preferred alternative was merit rationing by physical ability or earned worthiness (Hardin, 1969).

Recent rationing studies. The 1970's saw an explosion of literature dealing with crowding in recreation areas. The first priorities of these studies were to assess where visitors were going and what their management preferences were. By 1974, nearly half of legally classified wilderness areas in the United States required user-permits (Hendee, 1974), and research revealed generally

favorable public reaction to the permit systems (Fazio and Gilbert, 1974; Hendee, 1974). Additional user data gathered by permit systems showed highly uneven spatial and temporal use-pattern, (Lime and Buchman, 1974; Stankey, et al, 1976), so crowding was apparently a function of location and time. Alternatives to direct rationing were proposed, including spreading use more evenly (Stankey, et al, 1976); increasing the facilities (e.g., trails) (Behan, 1976); increasing the supply of wilderness (Stankey, et al, 1976); and making access more difficult (e.g., closing access roads) (Wilderness and Individual Freedom Conference, 1976:33).

In 1977 a geographer and an economist (Stankey and Baden) published a distillation of wilderness rationing techniques, management implications, and proposed guidelines for rationing wilderness use. They evaluated five "direct" rationing techniques, advance reservation, lottery, queuing, price, and merit according to such criteria as: group benefitted or adversely affected by system, experience with system, user acceptability, administrative difficulty, efficiency (i.e., economic efficiency), and effects on user behavior. The five rationing techniques will be reviewed at length in a subsequent section. Stankey and Baden also proposed five guidelines which were to "aid managers in making good decisions." First, an accurate base of knowledge (a collection of detailed use statistics, characteristics and preferences of users, and environmental impacts) is essential. Second, direct rationing (i.e., one of the five systems) should be considered only when less restrictive measures (information programs, referrals, etc.) fail. Third, managers should consider combining rationing systems to minimize cost

and/or reduce bias toward user groups. The fourth guideline suggests managing for economic efficiency so that users judge the relative worth of the opportunity. Last, rationing programs should be monitored, evaluated, and adapted to changing conditions. In addition to reviewing five rationing techniques, Stankey and Baden emphasized that these techniques can only be evaluated against management goals.

Jack Utter, a doctoral student at the University of Montana, recently completed a substantial study of rationing and related issues on the Middle Fork of the Salmon River in Idaho. He explored two fundamental issues, allotment and use rationing. Allotment concerned the distribution of use between private and commercial users; rationing was described as the distribution of individual permits within the private sector. A user-questionnaire outlined six rationing techniques (lottery, skill and knowledge, advanced reservation, preference to first-come users, lottery/reservation combination, and preference to Idahoans) and asked people to respond to them. The lottery technique was most preferred by those surveyed, followed by skill and knowledge and advanced reservation. The data indicated that users preferred techniques which were familiar to them (Utter, 1979). Unfortunately, although both private and commercial users were surveyed, the rationing mechanisms were to apply only to private boaters. Thus, commercial users responded to techniques generally excluding them, making comparisons difficult.

A summary of recreation rationing studies. Rapidly increased popularity of outdoor recreation in the 1960's and 1970's precipitated numerous studies of use patterns, user characteristics, and

methods of reducing or distributing use. "Overuse" appears to be a function of time and space, making allocation decisions relevant only within certain confines.

Alternative Allocation Mechanisms

Several methods for allocating scare resources were cited in the previous section: pricing, first-come/first-served (queuing), merit, reservation, and lottery. These five rationing techniques appear to be the most relevant to recreation allocation, and will be reviewed here in greater detail. Pricing and queuing have been studied thoroughly by economists and others; merit rationing, championed by Wagar in 1940, is often praised, but rarely studied or applied; and lotteries and reservation systems, although widely used, are rarely documented. Although reviewed separately, actual allocation systems can and often do combine two or more techniques to achieve allocation goals.

Pricing. Most resources in a market economy are allocated by price. Simply stated, the market raises or lowers prices until quantity demanded equals quantity supplied. Because commodities are valued differently by individual consumers, some people are willing to pay more for certain resources than are others. As demand increases, prices also increase until those unwilling or unable to pay "drop out" of the market (Stankey and Baden, 1977). For most commodities, the market embodies a host of "signals" to producers and consumers to alter production or consumption as situations fluctuate.

Many public recreation resources are non-market goods, either

because pricing is deemed inappropriate or by historical precedent. However, if pricing was used to allocate river-use permits, supply would be fixed at the established carrying capacities, and user fees would be levied as demand exceeded supply. Fees would have to be sufficient to reduce quantity demanded to available supply.

Pricing recreation goods has several advantages. First, it requires consumers to weigh the relative value of river running, thereby maximizing efficiency. In addition, economists postulate that failure to market commodities such as recreation creates inflated demand, which is often cited by management agencies to justify increased budgets (Vars, 1975). Pricing also generates revenue, which can be used to support the recreation activity or to provide alternative opportunities for non-participants.

Pricing has several disadvantages. The equity of pricing depends on the distribution of income, which may or may not be equitable. Pricing discriminates against those unable to pay as well as those who are unwilling. Even though surveys of wilderness and campground users indicate willingness and ability to pay higher use-fees, Americans are generally biased against pricing public recreation (Stankey and Baden, 1977). In addition, becuase of the relatively high cost of equipment, food, travel, and time and opportunity costs of river running, permit prices may have to be substantial to effectively ration use (McConnell and Duff, 1976).

First-come/first-served. Waiting in line, or queuing, is similar to pricing, but time rather than money is traded for the commodity. Queues commonly ration (often in concert with pricing) popular sports events, theaters, concerts, and even gasoline.

People enter or drop-out of queues according to their perceived value of the commodity relative to their value of time.

Because consumers weigh the relative value of time against the value of the commodity, queues, like pricing, are generally considered efficient. In addition, because time is evenly distributed (we all have 24 hour days) some maintain queuing is fair, or at least represents equality. Contrarily, others note that time is more valued by those leading structured lives; queuing therefore discriminates against those whose time is precious. In addition, queues may be inappropriate for rationing river recreation due to the remoteness of most rivers. River runners investing time and money planning river trips may be unwilling to risk failure at a queue. Local users, who could easily "check out" the queue, would hold an advantage over those traveling long distances. Furthermore, queuing may require additional facilities and administration. And finally, unlike money spent on pricing, time spent in queues is non-recoverable (Stankey and Baden, 1977).

Merit. Rationing by merit distributes permits on the basis of substantiated skill, knowledge, or behavior. Merit implies that persons demonstrating certain attributes have proven their worthiness and "paid the price" of access. Direct application of merit rationing is relatively untried, except for hunter safety programs and comparitive experience tests on some whitewater rivers. One clever modification of merit rationing proposed by members of the University of Oregon Outdoor Program would distribute "eco-points" to environmental project participants which could be used to "purchase" access. However, merit generally establishes minimum

user qualifications for safety or environmental conduct rather than to ration outright. To the extent that users expend effort in qualifying for access, merit is efficient; unfortunately, merit systems might be self-limiting, initially selecting only those with skills and thereby reducing the opportunity of others to acquire them. Furthermore, establishing relevant criteria and administration of merit rationing would be highly subjective and possibly open to abuse.

Reservations. Reservations are widely used for rationing outdoor recreation, particularly campgrounds. Reservation systems vary widely and are often complex; consequently, only a summary of reservation systems will follow. Additional details can be found in Burnett (1973); National Park Service (1974); Magill (1973 and 1976); and Shelby and Danley (1979).

The notion of reserving is familiar to most of us. Spaces on airline flights, trains, hotel rooms, and restaurants are often reserved through world-wide computerized networks, although not all systems are that complex. Reservation systems have one common attribute: they place a premium on advanced planning. Those who reserve their "spot" the earliest are the preferred "customers." This emphasis on planning distinguishes reservations from other rationing techniques.

One of the significant drawbacks to reservations is no-shows. Because people sometimes reserve spots on speculation, techniques to reduce no-shows include raising the "cost" of not claiming a reservation or reducing the costs of cancelling unwanted reservations. Alternatives such as deposits or advanced payments of fees have been

successfully applied; penalties and over-bookings, although feasible, are as yet untried in recreation reservation systems. Administration of reservation system, particularly the automated ones, can also be expensive. Most state park agencies, for example, are now charging users for reservation services to help defray costs. Reservation systems have generally been well accepted by users and managers, but research indicates that spontaneous users are less likely to prefer reservations (Magill, 1976). Reservations may be most appropriate for activities which are planned well in advance.

Two additional variables relevant to reservation systems are establishing the percentage of use to be reserved and the "lead-time."[1] Because reservations may discriminate against spontaneous users, many campground agencies set aside a portion of their sites for first-come/first-served users. Because user planning horizons vary, agencies either establish maximum times in which reservations can be made or set an opening date to begin taking reservations for an entire season. User planning horizons are obviously important in establishing both the percentage of use to be reserved and the lead-time.

Lotteries. A "pure" lottery represents the unbiased selection of applicants where each individual has an equal probability of being selected. This characterizes "equal chance" equality discussed earlier. Lotteries are widely used to distribute game permits in the United States, and lotteries have been used in a

---

[1] Lead-time refers to the maximum time allowed between reservation and use.

variety of ways historically, including legal decision-making, draftee selection, and staterun gambling (Fienburg, 1971; Brunner and Clotfelder, 1975). Pure lotteries, however, are often modified to meet management goals such as equity or need. Many state game agencies, for example, recognize priority of certain applicants (e.g., landowners, previously unsuccessful applicants, residents) by staging "priority" drawings for these groups, thereby adjusting for equity norms. Similarly successful applicants are denied future permits for specified lengths of time, again as a method to balance equity (Shelby and Danley, 1979: 103-106).

Lotteries have been criticized for their failure to maintain social efficiency. Casual applicants share similar probabilities of being selected as do afficiandos (Stankey and Baden, 1977). Additionally, lotteries normally require application in advance which could have similar rationing effects as reservations. Unfortunately, low social efficiency remains one of the serious criticisms of lotteries. Lotteries are also criticized because of their reported negative effects on commercial guides. Objections are often raised by river guides, many of whom feel that most commercial passengers would be unwilling or unable to participate in a lottery (Shelby, 1978). In addition, river guides question whether lotteries allow commercial passengers to specify preferred guides and/or launch dates.

THEORY

Previous research, most notably by Stankey and Baden (1977) indicates that certain user attributes (situational variables) will

affect user perceptions and evaluations of a given rationing system. The situational variables include the system's hypothesized "currency," the importance of river running, and the trip type (i.e., private or commercial). The perceptual variables include perceived ability to obtain permits and perceived fairness of the system, evaluative variables consist of overall acceptance and willingness to try the rationing system. These relationships will be integrated into a model to be tested on the five "direct" rationing techniques listed by Stankey and Baden (1977): pricing, reservation, lottery, first-come/first-served (FC/FS), and merit.

The Situational Variables

Rationing currencies. Previous studies of the five rationing techniques suggest that each system benefits or disadvantages certain users. We might generalize that each system rations via a different "currency," be it money, time, skill and knowledge, or advanced planning, and that possession of these currencies varies among users. Each technique's hypothesized currency and general characteristics are shown in Table 1. Users who possess relatively large amounts of a given system's currency should be more able to obtain a permit under that system. The lottery model poses some difficulties. Lotteries are supposed to be "currency-less;" that is, all users should have equal chances at obtaining a permit by lottery. However, lotteries do impose costs. Lottery drawings are held at some specified time prior to launch, so users who need more lead-time than our hypothetical system allowed could be disadvantaged by a lottery system. Although this relationship is quite speculative,

TABLE I. HYPOTHESIZED RATIONING CURRENCIES.

Rationing system	Hypothesized currency	Users favored by rationing system	Users disadvantaged by rationing system
Pricing	Income	Wealthy	Poor
Reservation	Ability to plan	Planners	Spontaneous users
Lottery	Lottery lead-time	Those who need short lead-time	Those who need long lead-time
Merit	Number of river trips	Experienced river runners	Novice river runners
FC/FS	Distance to Hells Canyon	Local users	Non-local users

lottery lead-time was included as a possible currency of the lottery system to be tested under the same criteria as the other currencies.

Importance of river running. We noted that some people value river running more than others; therefore, we would expect users who judge river running as "important" to be more likely to try a given rationing technique regardless of the amount of currency controlled, because the perceived "benefits" (running a river) for these people may outweigh the "costs" of rationing.

Trip type. Although relationships between trip type and the perceptual and evaluative variables are not clearly defined by past research, many presume that private and commercial users are significantly different in their abilities to obtain permits under each system. These assumed differences are often used to justify separate permit procedures for the two groups. Trip type was therefore added to the model to test whether private and commercial users differed in their perceptions or evaluations of the five rationing techniques.

The Perceptual Variables

Perceived ability to obtain permits. From a user's viewpoint, the perceived ability to obtain permits under a given technique should correspond directly to the amount of currency he/she possesses. Perceived ability should be higher for systems which "cost less" to users than those which cost more.

Perceived fairness. Equity theory states that, in order for an allocation mechanism to be "fair," perceived inputs must be commensurate with perceived outcomes. If we conceptualize a permit

as an "outcome" and the amount of currency one must pay for that permit as an "input," then we would expect perceived fairness of a system to be related directly to the possession of the related currency. Similarly, perceived fairness should be directly dependent on the perceived ability of obtaining permits: those who perceive their chances of getting a permit as "good" should be more apt to judge the system "fair."

The Evaluative Variables

Acceptability. Overall acceptability should be directly related to the amount of currency one controls as well as to perceived fairness and perceived ability to obtain permits. Stankey and Baden (1977) implied that acceptability of each system would be strongly dependent on the personal costs users incurred. We could therefore hypothesize that users who possess greater quantities of a given system's currency to be more likely to accept that system. We could also hypothesize, although more tentatively, that users who perceive a system as "fair" and whose perceived ability to obtain permits as good would likewise judge a system as "acceptable."

Willingness to try. The hypothesized relationships between willingness to try and the perceptual and situational variables is based on the assumption that people will be more willing to try rationing systems which maximize individual outcomes and minimize individual costs. We would therefore predict that people who possess a large amount of a given rationing currency to be more willing to try that system. In addition, we would expect somewhat weaker influences from perceived ability, perceived fairness, and accept-

ability: users would likely be willing to try systems which maximized outcomes, and which were perceived as "fair" and acceptable. And finally, as noted under the situational variables, those who judge river running as "important" should be more willing to try even "costly" rationing systems.

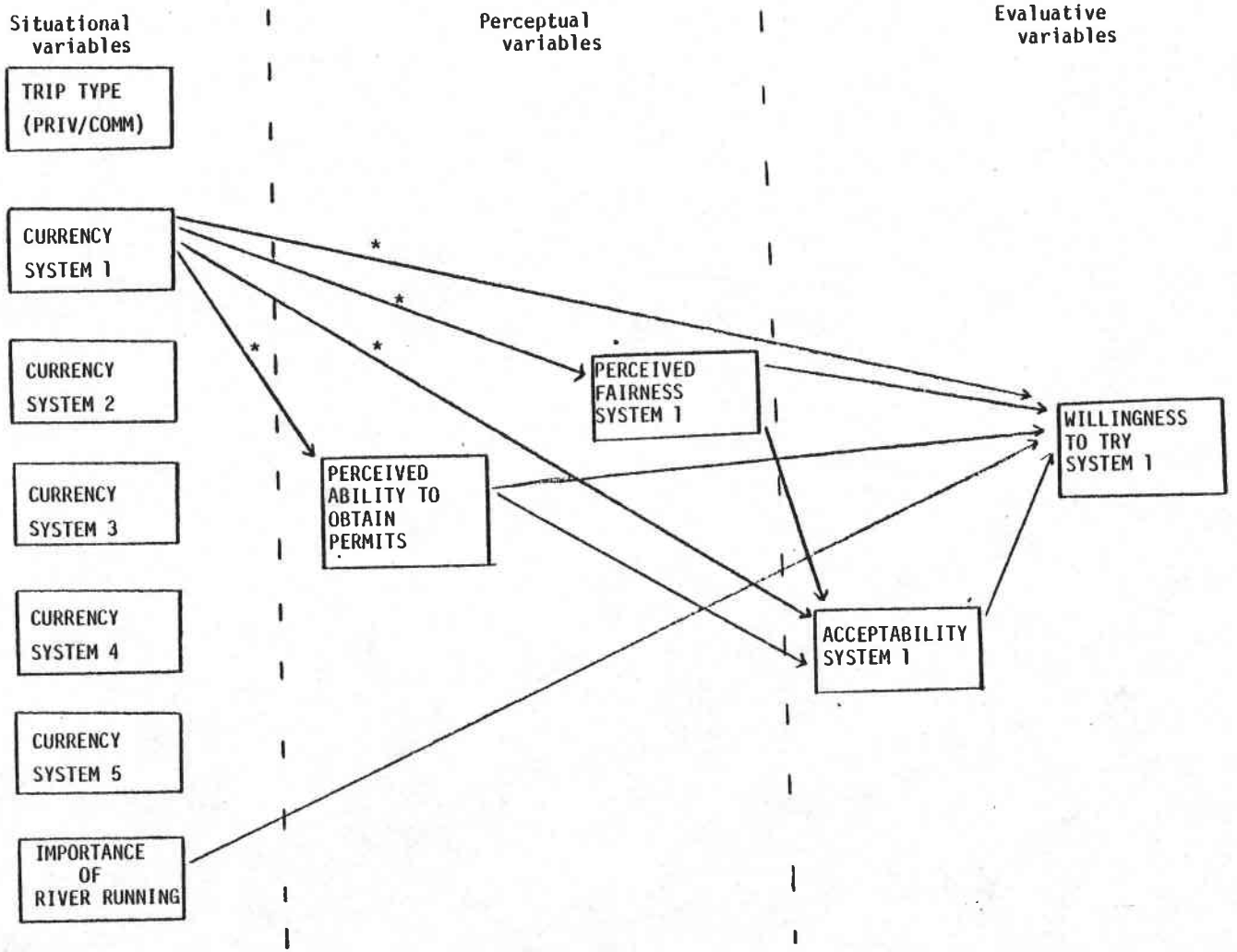
The Generalized Model

The hypothesized connections among these variables are illustrated in Figure 4. On the far left are the seven situational variables: importance of river running, trip type (i.e., private or commercial), and five measurements of hypothesized currency variables, one for each of the five rationing sytems. One step to the right is "perceived ability," followed by "perceived fairness," "acceptability," and "willingness to try." The model illustrates the hypothesized casual ordering of the variables, whereby variables are determined or caused by variables to the left of it. Thus, perceived ability is shown to be related to the relevant currency; perceived fairness to perceived ability and the system's currency, and so on. The hypothesized relationships are indicated by one-way arrows. Indirect relationships are inferred by the successive connection of arrows from the situational variables to the perceptual and evaluative variables. Thus, currency 1 is shown to be directly related to perceived ability and both directly and indirectly linked to perceived fairness, acceptability, and willingness to try. The model includes the situational variable "trip type" to explore whether private or commercial users differ in their perceptions or judgements of the rationing systems. Lack of connective arrows

Figure 4. Generalized rationing model.[c]

[c] All paths are positive except those indicated by an asterisk(*).

Figure 4.



* These paths are positive in the pricing, merit, and reservation models, negative in the FC/FS and lottery models.

between trip type and the other variables signifies undetermined hypothetical relationships.

Hypotheses

The preceeding discussion is distilled into 11 testable hypotheses. Hypothesis 1 deals with the relationship between perceived ability and the currency of the rationing system. Hypotheses 2 and 2A relate to the determinants of perceived fairness. Hypotheses 3 through 3B explore the relationships between acceptability and the situational and perceptual variables. Hypotheses 4 through 4D are concerned with willingness to try the system.

Hypothesis 1. The more of a given currency controlled, the greater the perceived ability to obtain permits.

Hypothesis 2. The more of a given currency controlled, the more likely the system will be perceived "fair."

Hypothesis 2A. The greater the perceived ability to obtain permits, the more likely the system will be perceived "fair."

Hypothesis 3. The more of a given currency controlled, the more likely the system will be judged "acceptable."

Hypothesis 3A. The greater the perceived ability to obtain permits, the more likely the system will be "acceptable."

Hypothesis 3B. "Fair" systems will be more acceptable than "unfair" ones.

Hypothesis 4. The more of a given currency controlled, the more willingness to try the system.

Hypothesis 4A. The greater the perceived ability to obtain permits, the more willingness to try the system.

Hypothesis 4B. Users will be more willing to try "fair" systems than "unfair" systems.

Hypothesis 4C. Users will be more willing to try "acceptable" systems than "unacceptable" ones.

Hypothesis 4D. Users who consider river running to be important will be more willing to try a rationing system.

III. METHOD

Testing the hypotheses developed in Chapter II involved administering a questionnaire to Hells Canyon floaters during the summer of 1978. Data collection procedures, development of the questionnaire, and data analysis techniques are summarized in Chapter III.

DATA COLLECTION

Hells Canyon river parties (private river runners and commercial passengers) taking out at Heller Bar, Washington between 4 and 22 August 1978 were met by a researcher and asked to complete a "short" questionnaire[2] which included the respondent's name and address; in addition, each participant was given a longer allocation questionnaire (Appendix) and stamped, addressed envelope with instructions to "complete and return it as soon as possible." Approximately 400 persons were contacted, and 383 of those agreed to participate (due to inclement weather, 32 of the 383 completed a name and address card only) and were given the longer questionnaire. Twenty-seven of the 383 wrote illegible names and/or addresses, leaving a total possible sample of 356. Follow-up reminders were mailed to non-respondents on 25 August, 12 and 26 September 1978 using names and addresses collected during initial contact. Three-hundred eight questionnaires were returned for a response rate of 84%. Of those returned, 13 were unuseable

---

[2] The "short" questionnaire contained questions regarding perceived crowding satisfaction of the respondent's river trip.

or refused to answer questions. Final sample used in calculations included 128 private boaters and 167 commercial passengers for a useable sample of 295. Four variables assessed by researcher on site (trip length in days, name of guide if any, user origin[3] and distance to Hells Canyon Dam from residence[4]) were added to each case prior to coding and analysis.

No attempt was made to obtain a random sample of all 1978 boaters in Hells Canyon. Specifically, users completing shorter trips (e.g., from Hells Canyon Dam to Pittsburg Landing or Dug Bar) and those taking trips during lower-use period (e.g., May or September) were not included in the sample. Readers should be aware of potential sample biases which, although undetermined, may result from the limited sampling frame.

QUESTIONNAIRE DEVELOPMENT

Items measuring the situational and theoretical variables used to test the hypotheses were developed, along with additional questions regarding administration of permit systems in Hells Canyon, by the author and Dr. Bo Shelby, principal investigator. The following discussion outlines only the development of items relevant to this thesis; the entire questionnaire is found in the Appendix.

The basic procedure used to measure the theoretical and situational variables of respondents were to: 1) outline each of

---

[3] User origins were classified by place of residence as either local, regional, or other United States.

[4] The distance variable was calculated using map measurements.

the five rationing techniques in brief, based on the authors' best judgement of how these techniques may apply to Hells Canyon float-boat rationing; 2) list the main implications of each system following each outline; 3) generate specific questions to measure respondents' perceived fairness, perceived ability to obtain permits, and willingness to try each technique; 4) develop a question to ascertain which techniques, if any, were "acceptable" following the presentation of all five techniques; and 5) develop questions to measure respondents' characteristics, including the "ability to pay" for each rationing method.

Outlining and Summarizing Alternatives

A review of literature on the theoretical basis for each rationing alternative was used to generate brief descriptions of the five systems as they might apply to Hells Canyon. The outlines avoided identifying specific management alternatives, such as "reservations to be made X days in advance." Implications of each system followed the brief descriptions. The completed description of the pricing alternative illustrates this outline:

> Alternative 1
>
> PURCHASE PERMITS
>
> All individual users would be required to purchase permits from the Forest Service during the May 21 - September 9 river season. A nominal fee would be charged for permits during "low-use" days (such as mid-week). For the high-use days (weekends and holidays), the permit would cost more.
>
> This would mean:

1. Individuals could purchase permits from the Forest Service for as many launch dates as they wished.

2. Permits could be transferred to individuals other than the original purchaser.

3. Individuals could choose between the "low-use" permit and the "high-use" permit (depending on which day they wished to launch).

4. Permits could be purchased at any time prior to launch, including the day of the launch, until all launches for the day were taken.

Measuring Perceptual and Evaluative Variables

Perceived fairness, perceived ability to obtain permits, and willingness to try items followed each system's brief description. Modified Likert scaling was used to measure perceived fairness and willingness to try:

Do you think that this is a fair method of distributing permits?

_____Definitely yes

_____Probably yes

_____Don't know

_____Probably no

_____ Definitely no

Would you try to obtain a float permit by purchase?

_____Definitely yes

_____Probably yes

_____Don't know

_____Probably no

_____Definitely no

Perceived ability was measured along a four-point continuum, attempting as much as possible to keep choices perceptually equidistant:

How would this sytem affect your chances of obtaining a Hells Canyon float permit?

_____It wouldn't affect my chances at all; I would purchase a permit whenever I wished to float the Snake.

_____It would limit my chances of obtaining a permit only occasionally; most of the time I would be able to purchase a permit.

_____My chances of obtaining a permit would be greatly restricted; most of the time I would be unable to purchase a permit.

_____I could never obtain a permit under this system.

_____I don't know how this would affect my chances.

Overall acceptance and rankings of the five systems followed the presentation of all alternatives:

Several methods of issuing permits to float-boaters were outlined in this questionnaire: purchase, reservation, lottery, first-come/first-served, and merit. Each of these "systems" could be used to issue all of the boating permits, or a combination of two or more systems could be used. Below you will find a list of the five permit system alternatives. Please indicate which system(s) you think are acceptable for issuing permits on the Snake River (you may think several systems are acceptable). Then rank these alternatives from most acceptable (#1) to least acceptable (#5).

Unacceptable	Acceptable	Alternative	Rankings
_____	_____	Purchase	_____
_____	_____	Reservation	_____
_____	_____	Lottery	_____

Unacceptable	Acceptable	Alternative	Rankings
_____	_____	First-Come/First-Served	_____
_____	_____	Merit	_____

Measuring User Characteristics

Hypothesized currencies. Items measuring income and river running experience were adapted from questionnaires used in previous research[5]:

Please check the space that comes closest to your total family income before taxes:

_____$0 - 3,999
_____$4,000 - 7,999
_____$8,000 - 11,999
_____$12,000 - 15,999
_____$16,000 - 19,999
_____$20,000 - 23,999
_____$24,000 - 27,999
_____$28,000 - 31,999
_____$32,000 - 35,999
_____$36,000 - 39,999
_____$40,000 - 43,999
_____$44,000 - 47,999
_____More than $48,000

Before this trip on the Snake, what was your river running experience?

_____total number of float trips on the Snake
_____total number of jet boat trips on the Snake
_____total number of other whitewater river trips

Items measuring lottery-lead times and planning horizons were:

---

[5] Rogue River and Grand Canyon User Surveys conducted by Bo Shelby, Oregon State University.

> Assuming a lottery/reservation system was adopted, what would be the minimum lead time you would need between the notification of a successful or denied application and your intended launch date?
>
> I would need _____months _____weeks _____days of lead time.
>
> How far in advance does your job permit you to plan your vacation?
>
> _____months _____weeks _____days

The distance variable was calculated by measuring map distance from respondent's residence to Hells Canyon Dam.

Measuring other variables. Other background characteristics, including importance of river running, were also adapted from Rogue River and Grand Canyon User Surveys:

> For some people, running river is one of the most important things in their lives. To others, it may be just one of a number of interests -- something they enjoy but to which they are not strongly committed. Check one statement below that best describes your own position.
>
> _____If I couldn't go river running, I would soon find something else I enjoyed just as much.
>
> _____If I had to give up running rivers, I would miss it, but not as much as many other interests I have.
>
> _____If I couldn't go river running, I would miss it more than almost any other interest I have.
>
> _____Running rivers is one of the biggest things in my life; if I had to give it up, a great deal of the total enjoyment I now get out of life would be gone.

Demographic variables (sex, age, education, occupation, marital status, number of children) were also measured using scales from the Rogue River surveys (see the Appendix for completed items).

DATA ANALYSIS

The hypotheses were tested using "path analysis," a computational technique utilizing a series of multiple regressions on the variables in the hypothesized model. Path analysis produces a series of path coefficients (p) which are interpreted as the proportion of standard deviation of the dependent variable for which the designated variable is directly responsible (Land, 1969). Path analysis also permits calculation of the indirect effects of independent variables[6], as long as certain assumptions are made: 1) that the casual ordering of the variables is theoretically correct in that the specified casual linkages conform to reality; 2) that correlations in the model are linear , and 3) that the system contains no reciprocal causations or feedback loops (Heise, 1969). Models meeting these criteria are called linear, recursive models, but additional assumptions concerning the independence of error terms must also be made (Heise, 1969: 56).

Casual linkages in path analysis are represented by linear, one-way arrows which indicate significant ($p \leq .05$) casual relationships between variables; path coefficients are listed above each casual arrow; error terms (proportion of unexplained variance) are indicated as short arrows pointing to dependent variables and are calculated as $\sqrt{1-R^2}$ (Land, 1969). Significant zero-order correlations between the predetermined variables (in our case, the five currencies, trip type and importance of river running) are normally shown as curved, double-headed arrows signifying

---

[6] See, for example, Finney (1972) for a discussion of the calculations of indirect effects.

undetermined and uncontrolled linkages, but due to the large number of these relationships, bivariate correlations were reported in Table VII.

IV. RESULTS

This chapter: 1) outlines demographic characteristics of respondents including differences between private and commercial users sampled; 2) reports results of path analysis for the five allocation techniques; and 3) summarizes relationships revealed by path analysis corresponding to the stated hypotheses.

DEMOGRAPHICS AND CHARACTERISTICS OF USERS SAMPLED

Demographics

Characterizing the respondents of this survey as a group, we find well-educated, moderately high income people in their early 30's. About 60% were male, the median age was 31 years, and half earn more than $20,000 annually (see Table II). Most users attended some college, and 25% of them held at least a Bachelor's degree. A high percentage of respondents (66%) were professionally employed. Over half (54%) were married and 45% has children. Although 65% of the users came from the Pacific Northwest, only 15% lived within about a 4 hour drive of the river, reflecting the sparse local population. Ten percent of the respondents lived within 100 miles of Hells Canyon Dam, 40% lived from 100 to 300 miles, and 50% traveled from 300 to 2300 miles.

River Running Experiences

For one-third (37%) of the users sampled, this was their first river float trip and only 20% had previously floated the Snake. Three-fourths of the users (74%) started river running less than

TABLE II. CHARACTERISTICS OF PRIVATE AND COMMERCIAL RIVER RUNNING.

Variable	Median Responses			Correlation (r) with trip type[d]
	All users	Private	Commercial	
Age (in years)	30.8	27.9	34.8	.245***
Sex[e]	1.3	1.3	1.4	.075*
Education[f]	13.5	13.5	13.6	.017*
Occupational status[g]	5.3	4.7	5.6	.191***
Income[h]	6.3	5.7	7.4	.160***
Marital status[i]	1.7	1.6	1.7	.048*
No. of children	0.4	0.3	1.1	.232***
Residence[j]	2.2	2.1	2.3	.023*
Distance from Hells Canyon[k]	310	290	330	.266***
Vacation time per year[l]	3.3	3.0	3.5	.116**
Maximum planning horizons[l]	93	62	179	.240***
Planned for this river trip[l]	120	60	150	.233***
Length of river trip[l]	5.3	5.2	5.3	.184***
No. years river experience	1.7	3.0	0.4	-.095*
No. of other river trips	1.5	3.9	0.4	-.355***
No. of river trips in Hells Canyon	0.1	0.2	0.1	-.144**
No. of jet boat trips in Hells Canyon	0.1	0.1	0.1	-.039*
Importance of river running[m]	2.0	2.5	1.7	-.342***

[d]Coded 1 for private, 2 for commercial; [e]coded 1 for male, 2 for female; [f]coded 1 through 16 as indicated in Appendix; [g]coded 1 through 7 after Hollingshead (1958); [h]coded 1 through 13 as indicated in Appendix; [i]coded 1 for single, 2 for married, 3 for other; [j]coded 1 for local, 2 for regional, 3 for other U.S.; [k]miles; [l]in days; [m]coded 1 through 4 as indicated in Appendix.

* p>.05
** p=.05<.005
*** p<.005

five years before this survey, and for 39%, 1978 was their first year of river running. Only four percent reported having floated the Snake more than three times in the past. In addition, only 12% reported taking jet boat trips on the Snake. Although river running is a modestly important activity for those sampled, over one-third (35%) felt that they could soon find other activities to replace river running. The average trip length for sampled users was just over five days (5.3).

Other Background Characteristics

Table II also reports the sample user's planning horizons and the average length of their vacations. The median number of vacation weeks per year is just under three and a half. Users also reported planning their Hells Canyon float trip well in advance: half planned at least four months ahead of their launch. Planning for this river trip roughly corresponded with the number of weeks users report as their maximum planning horizon. Another variable, lottery lead-time (indicating the minimum number of days needed between notification and launch date) revealed that the average user needs two months notification to plan his/her river trip.

Differences in Private and Commercial Users Sampled

Although the two groups were virtually identical in educational attainment, region of residence, sex, and marital status, the sample showed significant differences in age, occupation, income, and number of children. These differences are reflected in the correlation coefficients (r) in Table II. On the average, commercial

users were older (r=.245), were employed in slightly higher-status occupations (.191), earned slightly more (.160), and had more children (.232) than the private users sampled. In addition, commercial users travelled further on the average to Hells Canyon than did private boaters (r=.266).

Private river runners reported more river running experience than did commercial users. Although 54% of the commercial users reported this to be their first river trip, only 12% of the private boaters did likewise. Although two-thirds of the private boaters had not floated the Snake previously, over 90% of the commercials had not. Nearly half (48%) of the private sectors had taken more than four float trips prior to this sample, compared to seven percent of the commercial users. Importance of river running was also significantly higher for private than it was for commercial users . (r=.342). For this sample, commercial users took slightly longer trips (r=.184). Commercial users, however, report longer planning horizons than private users: medians were 5 months for commercial, 2 months for private (r=.240). Commercial users reported having slightly longer vacations than did private users (r=.116), and they reported planning further in advance (r=.233) for this river trip.

THE RATIONING TECHNIQUES

Summary of Rationing Systems

Overall ratings and acceptability. Table III reports rankings and acceptability of the five rationing systems. Reservations were ranked the highest followed by pricing, lottery, merit, and

TABLE III. OVERALL RATINGS OF ALLOCATION SYSTEMS.

System	Percent who accept system	Average rank[n]	Correlation (r) with trip type[o]
Pricing	66	2.7	.224***
Reservation	95	1.4	-.022*
Lottery	50	3.1	-.265***
FC/FS	25	3.9	-.114**
Mérit	37	3.6	.139**

[n] Ranked 1-5, 1=high 5=low;

[o] Coded 1 for private, 2 for commercial, 1 for unacceptable, 2 for acceptable.

* $p>.05$
** $p\leq.05>.005$
*** $p\leq.005$

first-come/first-served. Reservations were evaluated as "acceptable" by 95% of those surveyed, again followed by pricing (66%), lottery (50%), merit (37%), and FC/FS (25%).

Perceived fairness of systems. Perception of "fairness" for each system (Table IV) corresponded roughly to the overall ratings: reservations were perceived as fair by 78% of the respondents followed in order by pricing (45%), lottery (39%), merit (23%), and FC/FS (12%).

Willingness to try systems. Not surprisingly, reported willingness to try each system (Table V) corresponded with perceived fairness and with overall ratings of those systems. Eighty-four percent reported a willingness to try reservations, followed by 62% for pricing, 51% for lottery, and 36% and 18% for merit and FC/FS respectively.

How systems affect perceived chances of getting permits. For the most part, perceived chances correspond with overall rating and perceived fairness, indicating possible linkages between these variables (see Table VI). Only 16% of respondents reported that reservations would greatly restrict or eliminate their abilities to obtain permits, followed by pricing (26%), merit (37%), lottery (42%), and FC/FS (66%).

Private and commercial differences. Overall, the differences between private and commercial users are slight, particularly for the reservation system. Commercial users were more likely to accept pricing (r=.224) and merit (r=.139) and less likely to accept lottery (-.265) and FC/FS (r=-.114) than were private users. Similarly, commercial users were more likely to view pricing

TABLE IV. PERCEIVED FAIRNESS OF ALLOCATION SYSTEMS.

System	Percent perceived as fair	Percent perceived as unfair	Percent don't know	Correlation (r) with trip type[p]
Pricing	45	46	8	-.165***
Reservation	78	8	6	.044*
Lottery	39	53	8	.152***
FC/FS	12	84	4	.062*
Merit	23	64	13	-.116**

[p] Coded 1 for private, 2 for commercial; 1 for fair, 5 for unfair.

* $p>.05$
** $p\leq.05>.005$
*** $p\leq.005$

TABLE V. WILLINGNESS TO TRY ALLOCATION SYSTEMS.

System	Percent willing to try	Percent unwilling to try	Percent don't know	Correlation (r) with trip type[q]
Pricing	62	23	14	-.077*
Reservation	84	6	10	.136**
Lottery	51	31	18	.213***
FC/FS	18	72	10	.153***
Merit	36	44	20	.113**

[q] Coded 1 for private, 2 for commercial; 1 for willing to try, 5 for unwilling to try.

* $p>.05$
** $p\leq.05>.005$
*** $p\leq.005$

TABLE VI. PERCEIVED ABILITY TO OBTAIN PERMITS.

System	Percent perceived low ability	Percent perceived high ability	Percent don't know	Correlation (r) with trip type[q]
Pricing	26	48	26	.128**
Reservation	16	64	20	-.005*
Lottery	42	31	27	-.194***
FC/FS	66	14	20	-.156**
Merit	37	37	26	-.265***

[q] Coded 1 for private, 2 for commercial

* P>.05
** p≤.05>.005
*** p≤.005

(r=.165) and merit (r=.116) as "fair," less likely for lottery (r=-.152) than were private boaters. Differences in private and commercial users' willingness to try are somewhat less pronounced than for the other evaluative variables, but one notes that private users are more willing to try merit than are commercials (r=.133), a reversal from overall rating and perceived fairness, and that private boaters are also more willing to try reservations (r=.136), lottery (r=.213), and first-come/first-served (r=.156) than are commercials. Private boaters report better chances of receiving permits under lotteries (r=-.194), first-come/first-served (r=.156), and merit (r=.265) than commercial users, but commercials perceived purchase as less risky (r=-.128).

Theory accounts for some of these differences. For example, commercial users were more likely to accept pricing and less likely to accept FC/FS, which may be explained by commercial's slightly higher income (r=.160) and distance to Hells Canyon (r=.226). However, commercials were slightly more accepting of merit (r=.139), which is contrary to theoretical expectations given commercial's lower average river experience (r=-.355). These relationships will be discussed further under each rationing system.

The Models

Figure 5 through 9 show the results of path analyses on the five rationing systems. All paths with significance $\leq .05$ are shown; path coefficients are located above each path arrow and statistical significance is indicated by asterisks. Heavy arrows denote paths from a given system's hypothesized currency to

the dependent variables of perceived ability, fairness, acceptability, and willingness to try that system. Bivariate correlations between the situational variables are reported in Table VII. The lottery model is reviewed in detail, followed by the FC/FS, pricing, reservation, and merit models.

The lottery model. The lottery model is shown in Figure 5. We see that two situational variables, the currency of lottery systems (lottery lead-time) and trip type both have significant effects on the dependent variables. Perceived ability is influenced by both of these variables, but a relatively small percentage of the variance is predicted by either one. Thus, lottery lead-times do influence perceived ability in the predicted direction, but the relationship is not strong. Predicted direct relationships between lottery lead-time and perceived fairness, acceptability, and willingness to try did not materialize, however. Interestingly, some of the relationships between the perceptual and evaluative variables were quite strong (e.g., between perceived ability and perceived fairness), but others were non-existent (e.g., between acceptability and willingness to try).

The relationships between lottery lead-time and the perceptual and evaluative variables (hypotheses 1, 2, 3, and 4) were quite weak. Direction and indirect effects of lottery lead-time are:

Total effect of lottery lead-time on perceived fair-	=	Indirect effects due to: ability-fairness path	-residual due to model which is not fully recursive.

TABLE VII. BIVARIATE CORRELATIONS BETWEEN SITUATIONAL VARIABLES.

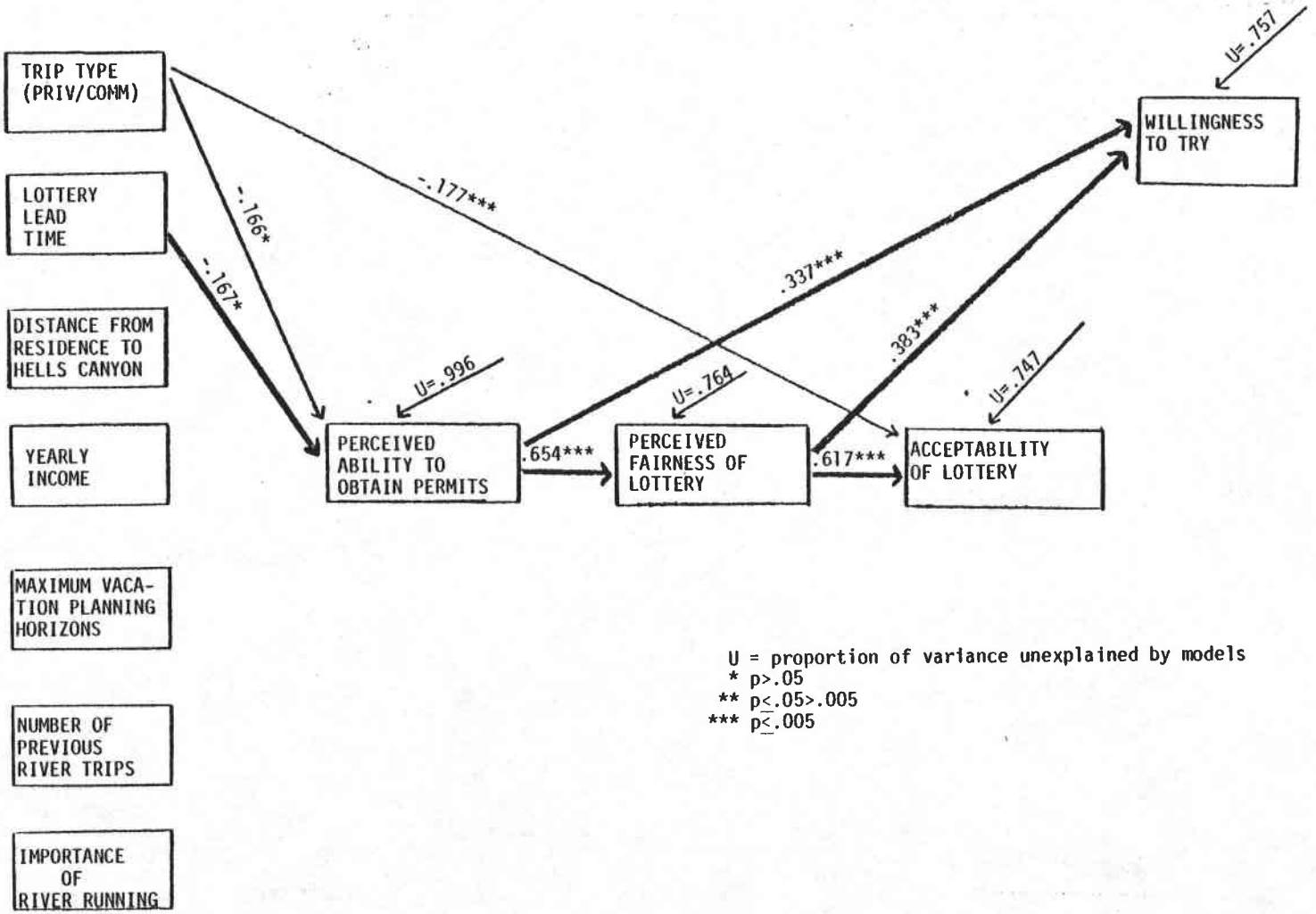
	Lottery lead-time	Distance to Hells Canyon	Yearly income	Planning horizons	Number of river trips	Importance of river running
Trip type (priv/comm)	.193	.226	.160	.240	-.355	-.342
Lottery lead-time	-	.152	.118	.192	NS	NS
Distance to Hells Canyon		-	.160	.136	NS	NS
Yearly income			-	.170	.129	NS
Planning horizons				-	NS	.118
Number of river trips					-	.283

NS = Not significant at .05

Figure 5. The lottery model[r].

[r] Bivariate correlations between the situational variables are reported in Table VII. Heavy arrows denote paths between the hypothesized currency and the perceptual and evaluative variables.

Figure 5.


TRIP TYPE (PRIV/COMM)
LOTTERY LEAD TIME
DISTANCE FROM RESIDENCE TO HELLS CANYON
YEARLY INCOME
MAXIMUM VACATION PLANNING HORIZONS
NUMBER OF PREVIOUS RIVER TRIPS
IMPORTANCE OF RIVER RUNNING
PERCEIVED ABILITY TO OBTAIN PERMITS
PERCEIVED FAIRNESS OF LOTTERY
ACCEPTABILITY OF LOTTERY
WILLINGNESS TO TRY
U=.996
U=.764
U=.747
U=.757
-.177***
-.166*
-.167*
.337***
.383***
.654***
.617***
U = proportion of variance unexplained by models
* p>.05
** p≤.05>.005
*** p≤.005

ness of lottery

-	.152	=	-	.108 71%	-	.044 29%

Total effect of lottery lead-time on willingness to try lotteries	=	Indirect effects due to: ability-try path		-ability-fair-try path	
- .212	=	-	.056 26%	-	.041 19%

-residual due to model which not fully recursive.

- .115
54%

Total effect of lottery lead-time on acceptance of lotteries	=	Indirect effects due to: ability-fairness path		-residual due to model which is not fully recursive.	
- .105	=	-	.067 63%	-	.038 37%

Respondents who reported needing longer lead-time were slightly more likely to label lotteries unfair, or unacceptable, and were less willing to try such a system, but the effects were indirect and accounted for a very small percentage of the variance of the perceptual or evaluative variables. Apparently lottery lead-time is not a good predictor of the perceptual or evaluative of the lottery model, rejecting hypotheses 1, 2, 3, and 4.

The path coefficients between perceived ability and fairness, acceptability, and willingness to try (hypotheses 2A, 3A, and 4A) lotteries tend to support hypotheses 2A and 4A and refute

hypothesis 3A. Hypothesis 2A, the predicted relationship with perceived fairness, is quite strong (p=.645); those who perceive their abilities of obtaining permits by lottery as poor are more likely to label them "unfair." In contrast, the lack of a direct path between perceived ability and acceptability indicates that, when controlling for the effects of perceived fairness, perception of chances of obtaining permits by lottery are unrelated to acceptance. Willingness to try lotteries (hypothesis 4A) is directly influenced by perceived ability, but the relatively weak path coefficient (p=.337) suggests a tenuous relationship.

Perception of fairness is significantly related to acceptance (p=.617) and willingness to try (p=.383), supporting hypotheses 3B and 4B, respectively. Those who perceive lotteries as "fair" are more likely to accept and try a lottery system.

Acceptance of lotteries was not related to willingness to try when controlling for the effects of perceived ability and fairness. Therefore, acceptance is a poor predictor of users' willingness to try lotteries, rejecting hypothesis 4C. Additionally, hypothesis 4D was also refuted: users who place high values on river running are just as willing to try lotteries as those who do not.

Commercial users reported slightly worse chances of obtaining permits (p=-.166) and lower overall acceptance of lotteries (p=-.167) than did private users, but the weak path coefficients make inferences difficult. It may be that private river runners have had better exposure to lotteries (on rivers such as the Salmon and Grand Canyon) which would tend to increase perceived ability, but

this is speculative.

In summary, the lottery model negates several hypotheses and supports others. First, lottery lead-times do not strongly influence the perceptual and evaluative variables (hypotheses 1, 2, 3, and 4) casting doubt on whether lead-times are a realistic currency of lottery. Second, there is no significant link between acceptability and willingness to try lotteries (hypothesis 4C), between importance of river running and willingness to try (hypothesis 4D), or between perceived ability and acceptability (hypothesis 3A). However, the hypotheses that willingness to try lotteries is dependent on perceived ability (hypothesis 4A) and perceived fairness (hypothesis 4B) were substantiated, in addition to the correlation between perceived ability and fairness (hypothesis 2A), and between perceived fairness and acceptability (hypothesis 3B).

The first-come/first-served model. The results of path analysis on the first-come/first-served rationing mechanism are shown in Figure 6. Four situational variables, lottery lead-time, distance from Hells Canyon (the predicted currency), income and number of river trips all have direct and/or indirect influences on the theoretical variables. As with the lottery model, direct and indirect influences of the predicted currency on the perceptual and evaluative variables are rather weak. However, most hypotheses relating the perceptual and evaluative variables to one another were significant and several were rather strong. These results will be summarized briefly, followed by a discussion of the relationships between lottery lead-time, income, and number of river trips and the perceptual and evaluative variables.

Distance to Hells Canyon was directly related only to perceived ability (p=-.202), and the indirect influences of distance on the perceptual and evaluative variables were weaker than our theory would suggest:

Total effect of distance on perceived fairness of FC/FS	=	Indirect effects due to: ability-fairness path	+residual due to model which is not fully recursive.
- .113	=	- .139 84%	+ .026 16%

Total effect of distance to FC/FS acceptability	=	Indirect effects due to: ability-acceptance path	-ability fairness-acceptance path
- .008	=	- .003 17%	- .069 35%

+residual due to model which is not fully recursive.

\+ .094
48%

Total effect of distance on willingness to try FC/FS	=	Indirect effects due to: ability-try path	-ability-fairness-try path
- .144	=	- .118 71%	- .024 14%

-ability-acceptability try path	-ability-fairness-acceptability-try path	-residual due to model which is not fully recursive.
- .004 2%	- .009 5%	- .011 7%

These data tend to support hypothesis 1, and refute hypothesis 3. The predicted relationship of distance with fairness and willingness

to try (hypotheses 2 and 4) are still rather tentative.

The relationships between perceived ability, perceived fairness, and the evaluative variables (hypotheses 2A, 3A, and 4A) all were significant, but the relationship between perceived ability and acceptability of FC/FS was very weak (p=.162). Thus, hypotheses 2A (p=.690) and 4A (p=.582) were substantiated, and 3A is doubtful. People who find FC/FS to be "risky" are somewhat less accepting of the system, and they are less apt to try and more apt to judge FC/FS "unfair."

Perceived fairness is likewise associated with acceptability and willingness to try as predicted in hypotheses 3B and 4B. People who judge FC/FS as "fair" are more likely to accept FC/FS (p=.497) and somewhat more willing to try FC/FS (p=.175).

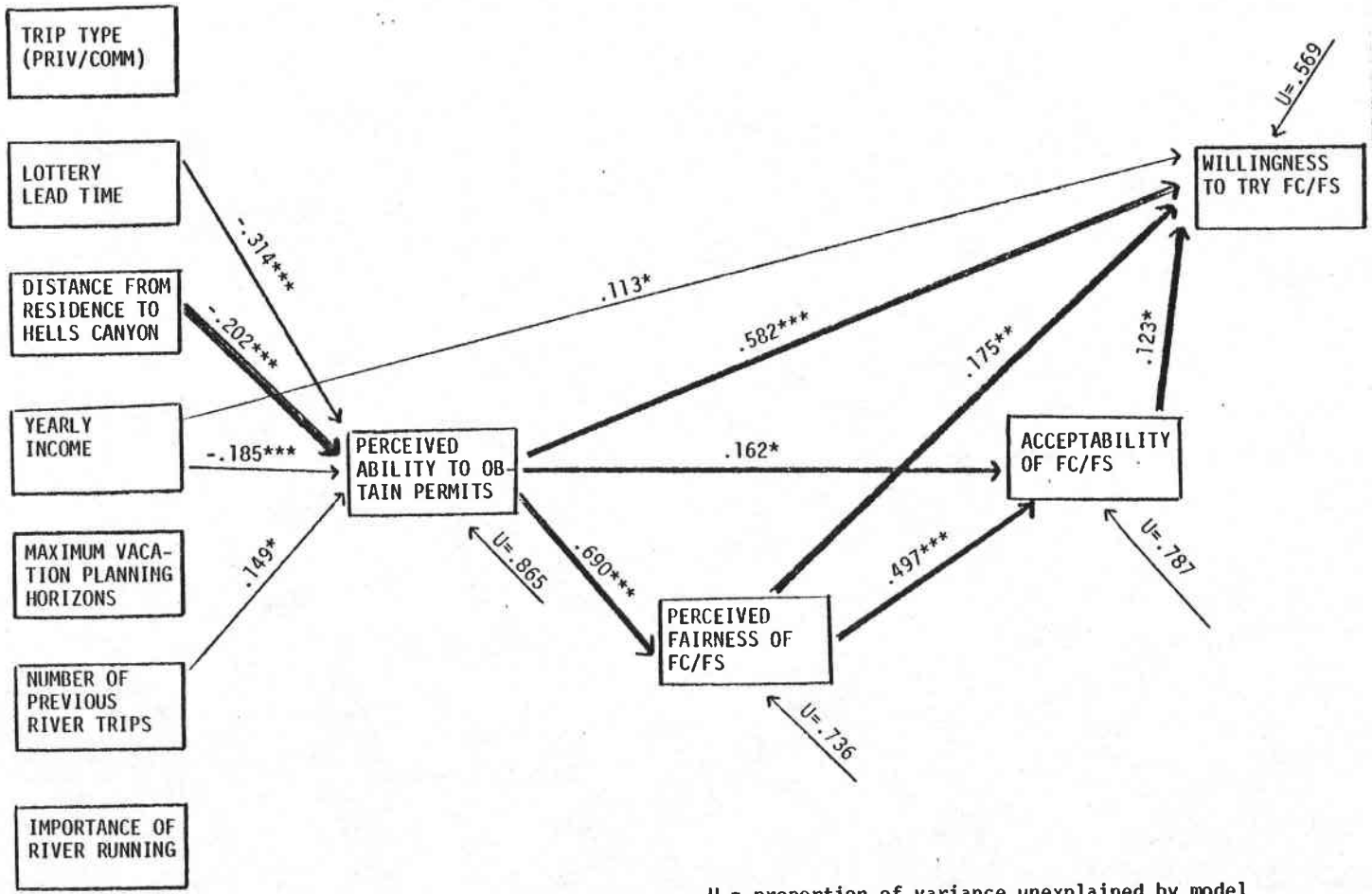
Those who find FC/FS acceptable are slightly more willing to try FC/FS (p=.123) as predicted in hypothesis 4C, but the relationship is rather weak. Importance of river running had no influence on willingness to try, rejecting hypothesis 4D.

Unexpected relationships between lottery lead-times, income, and number of river trips with the perceptual and evaluative variables are rather interesting. Those who need advanced lottery notices, have higher incomes, and who have been on more river trips tend to perceive their chances of obtaining a permit by FC/FS as low, with indirect connections to fairness, acceptability, and willingness to try FC/FS. We would expect "planners" to perceive FC/FS as risky, reflected by the fairly strong coefficient (p=-.314) between ability and lottery lead-time. Apparently high income respondents also find FC/FS risky (p=.185), presumably because

Figure 6. The first-come/first-served model[S].

[S] Bivariate correlations between the situational variables are reported in Table VII. Heavy arros denote paths between the hypothesized currency and the perceptual and evaluative variables.

Figure 6.



U = proportion of variance unexplained by model
* p>.05
** p<.05>.005
*** p≤.005

wealthy individuals place a high value on time. Veteran river runners believe FC/FS increases their chances of obtaining permits (p=.149) perhaps because these folks are more flexible and willing to wait longer to launch than novices.

In summary, the FC/FS model indicates that perceived ability is a function of the hypothesized currency distance from Hells Canyon, but the effects are slight, suggesting a weaker relationship than hypothesis 1 would predict. Fairness is strongly dependent on perceived ability as predicted in hypothesis 2A and similar expected linkages between perceived fairness and acceptability (hypothesis 3B) were substantiated. Willingness to try FC/FS is primarily influenced by perceived ability, less so by fairness and acceptability. Relationships between lottery lead-time, number of river trips, and income and the willingness to try and acceptability are somewhat unexpected, but they generally make intuitive sense. The fact that these "unexpected" variables are as good or better predictors than distance suggests possible weaknesses in the hypotheses linking distance to preference for FC/FS.

The purchase model. As represented in the model for purchase (Figure 7), the situational variables of income and importance of river running are linked directly to perceived ability to obtain permits, but the relationships are rather weak. Number of river trips and importance of river running are also directly related to perceived fairness and acceptability, respectively. Perceived ability to obtain permits affects both perceived fairness and willingness to try, and fairness is related to acceptability which

in turn affects willingness to try purchase.

As with the lottery and FC/FS models, the hypothesized currency (income) only weakly influences the theoretical variables. The direct and indirect effects of income are broken down as:

Total effect of income on perceived fairness of purchase	=	Indirect effects due to: ability-fairness path	-residual due to model which is not fully recursive.
.075	=	.082 92%	- .007 8%

Total effect of income on acceptability of purchase	=	Indirect effects due to: ability-fairness-acceptability path	+residual due to model which is not fully recursive.
.130	=	.052 40%	+ .078 60%

Total effect of income on willingness to try purchase	=	Indirect effects due to: ability-try path	+ability-fairness-acceptability-try path
.072	=	.068 68%	+ .019 19%

-residual due to model which is not fully recursive.

- .015
14%

These data strongly suggest that income is not a good predictor of fairness, acceptability, or willingness to try purchase, shedding doubt on hypotheses 2, 3, and 4. Those with higher incomes perceive their chances of obtaining a permit by purchase as slightly higher ($p=.167$), suggesting that hypothesis 1 is weakly supported. Indirect effects of income on perceived fairness run through the

perceived ability path, but total influence is quite low, accounting for less than one percent of the variance in perceived fairness. The above table also reveals a very small effect of income on the acceptability of purchase, and a relatively small percentage of that relationship is explained by the model (40%) via the ability-fairness path. Users appear to accept or reject purchase on grounds other than personal income. Indeed, both importance of river running and number of river trips explain more variation in acceptability than does income.

Perceived ability directly influences perceived fairness ($p=.483$) and willingness to try ($p=.400$), substantiating hypotheses 2A and 4A, although perceived ability has no direct effect on acceptability as predicted in hypothesis 3A. Those who perceive their chances of obtaining permits by purchase as good are more willing to try purchase and more likely to perceive purchase as "fair."

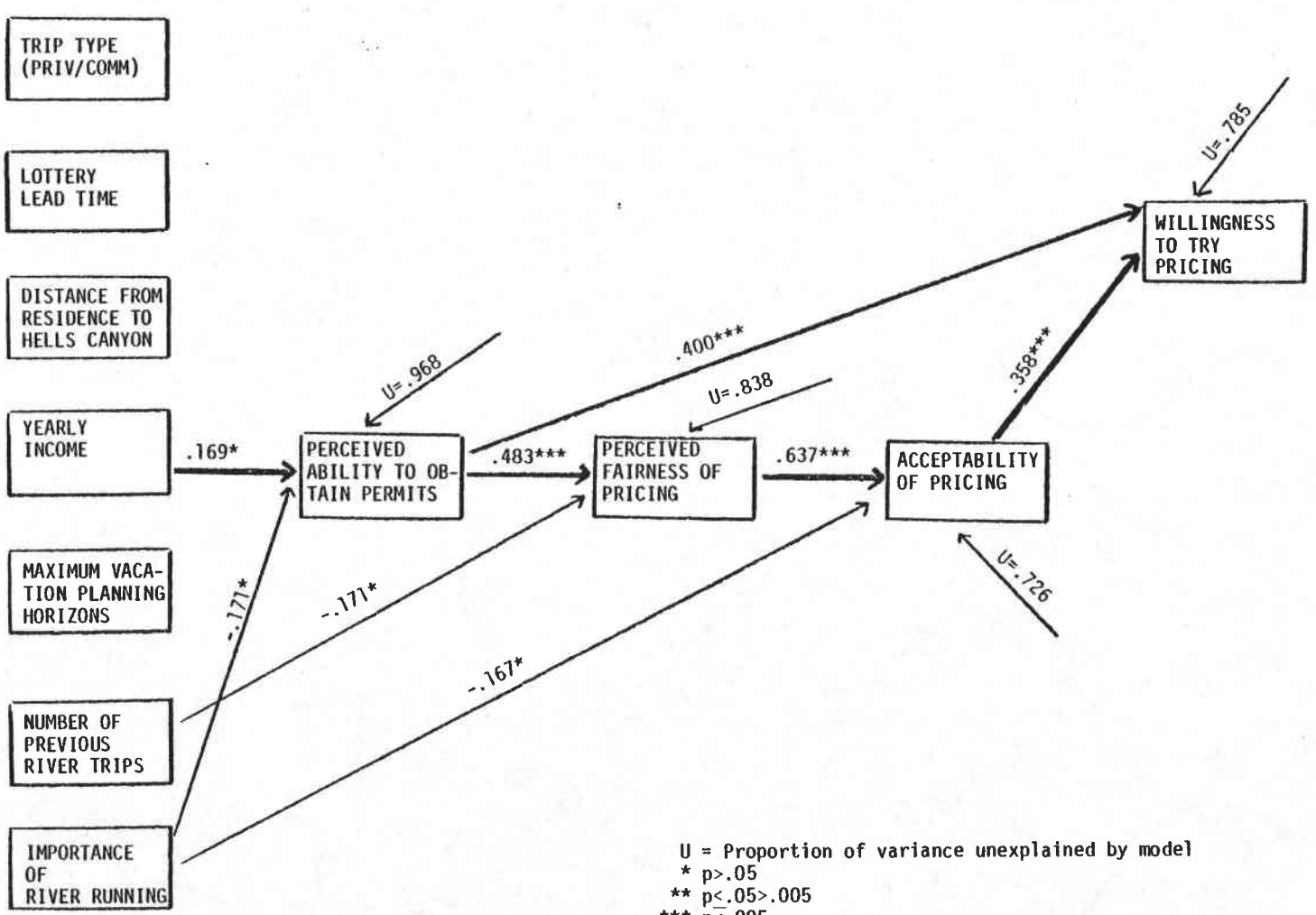
Perceived fairness directly influences acceptability ($p=.637$), substantiating hypothesis 3B that fair systems are more likely to be acceptable. However, perceived fairness did not affect willingness to try when controlling for the effects of acceptability (hypothesis 4B), suggesting that users who judge purchase "unfair" may be willing to try purchase as long as their chances of obtaining a permit are good.

The predicted relationship between acceptability and willingness to try (hypothesis 4C) was confirmed ($p=.358$), although not strongly. People are slightly more willing to try purchase if they find purchase to be acceptable. Importance of river running

Figure 7. The pricing model[t].

[t] Bivariate correlations between the situational variables are reported in Table VII. Heavy arrows denote paths between the hypothesized currency and the perceptual and evaluative variables.

Figure 7.


TRIP TYPE (PRIV/COMM)
LOTTERY LEAD TIME
DISTANCE FROM RESIDENCE TO HELLS CANYON
YEARLY INCOME
MAXIMUM VACATION PLANNING HORIZONS
NUMBER OF PREVIOUS RIVER TRIPS
IMPORTANCE OF RIVER RUNNING
.169*
PERCEIVED ABILITY TO OBTAIN PERMITS
PERCEIVED FAIRNESS OF PRICING
ACCEPTABILITY OF PRICING
WILLINGNESS TO TRY PRICING
.483***
.637***
.358***
.400***
-.171*
-.171*
-.167*
U=.968
U=.838
U=.726
U=.785
U = Proportion of variance unexplained by model
* p>.05
** p≤.05>.005
*** p≤.005

did not directly influence willingness to try as predicted in hypothesis 4D. Weak indirect influences of importance of river running via acceptability were noted, but opposite the predicted direction; people who judge river running as important are more likely to find purchase unacceptable (p=-.167), and in turn would be slightly less willing to try purchase. Those for whom river running is important find purchase to be risky (p=-.171), which may be due to the uncertainty of competing with casual but relatively wealthy river runners.

The unexpected relationship between river running experience and perceived fairness (p=-.171), although weak, suggests that veteran river runners are more likely to judge purchase "unfair." Apparently veteran river runners believe their experiences to be important inputs into rationing by purchase and that purchase does not recognize these inputs. Perhaps experienced users perceive their long-term inputs into a purchase system to be unnecessarily high; purchasing one or two river-permits in a lifetime may not be a financial burden, but purchasing several per year may be.

In conclusion, the purchase model substantiated several hypotheses and negated others: first, income has relatively little total effect on either willingness to try, acceptability or fairness of purchase (hypotheses 2, 3, and 4), and only moderate affects on perceived ability (hypothesis 1). Perceived fairness is linked to perceived ability, (hypothesis 2A), but not as strongly as in the lottery or FC/FS models; acceptability, as predicted in hypothesis 3B, is determined considerably by perceived fairness, and willingness to try is largely a function of

perceived ability and acceptability, supporting hypotheses 4A and 4C. No direct correlation between fairness and willingness to try or perceived ability and acceptability was revealed, rejecting hypotheses 4B and 3A. And finally, importance of river running and past river running experience both affected the dependent variables in unexpected directions.

The reservation model. Figure 8 shows the results of path analysis on the reservation model. Lottery lead-time influences all of the dependent variables through perceived ability, and importance of river running influences acceptability of reservations directly. The hypothesized currency of reservations, ability to plan vacations in advance, did not enter the model at all.

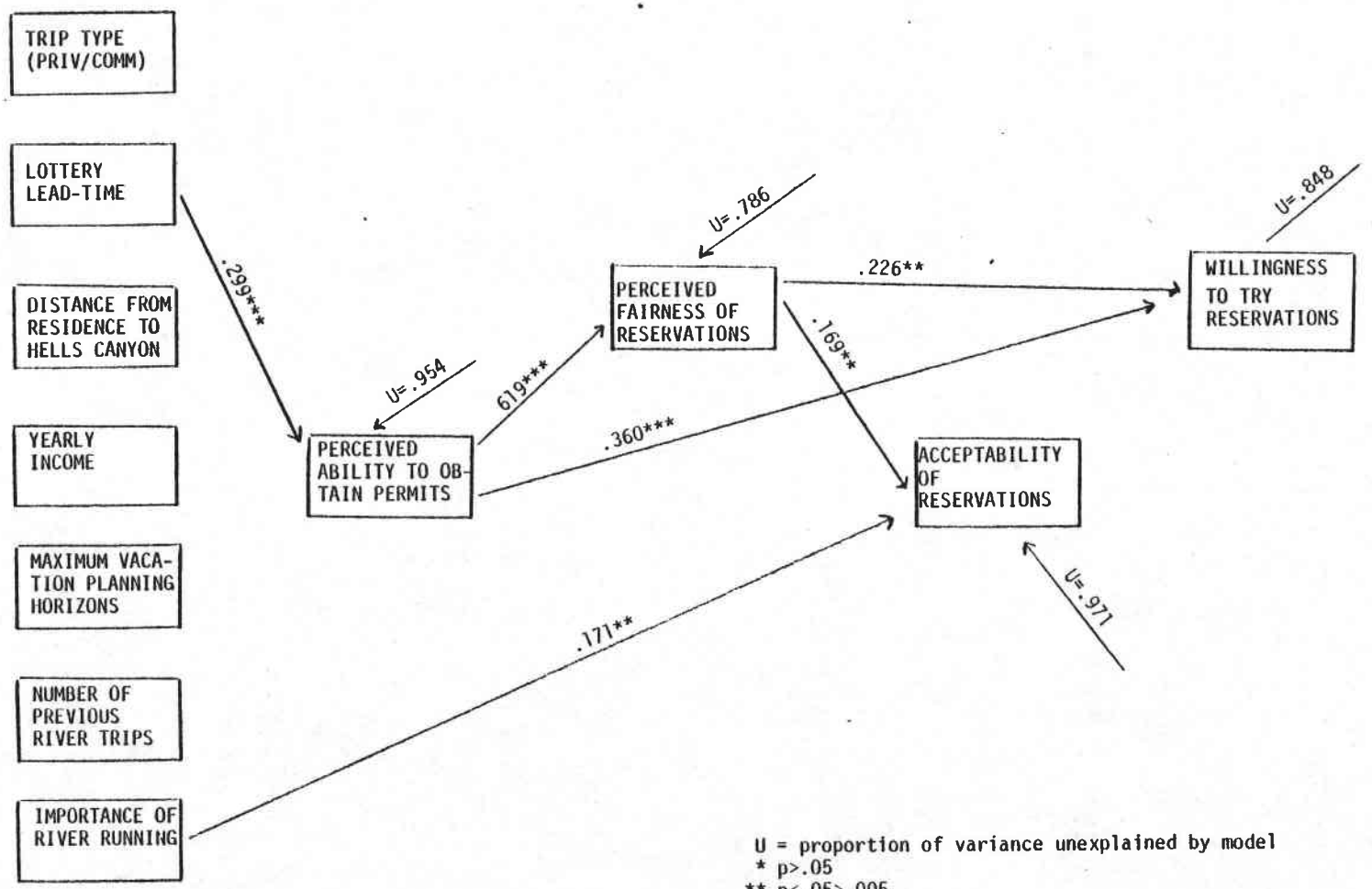
Perceived ability to obtain permits by reservation is linked fairly strongly ($p=.299$) with lottery lead-time: those who "need" more lead-time find reservations less risky than those who need less lead-time. Perhaps lead-time is a rough measurement of the actual planning horizons of river runners, which may explain the lack of correlation with vacation planning horizons and perceived ability of a reservation system. If this is the case, then minimum planning horizons are a more meaningful measurement than maximums to predict perceived ability. However, hypotheses 1, 2, 3, and 4 were all rejected by the model if we strictly apply vacation planning horizons as the system's currency. If we use lottery lead-time as a surrogate measurement of currency, only hypothesis 1 would be substantiated, directly linking lottery lead-times with perceived ability to obtain permits by reservation.

The relationships between perceived ability with perceived

Figure 8. The reservation model[u].

[u] Bivariate correlations between the situational variables are reported in Table VII. Heavy arrows denote paths between the hypothesized currency and the perceptual and evaluative variables.

Figure 8.


TRIP TYPE (PRIV/COMM)
LOTTERY LEAD-TIME
DISTANCE FROM RESIDENCE TO HELLS CANYON
YEARLY INCOME
MAXIMUM VACATION PLANNING HORIZONS
NUMBER OF PREVIOUS RIVER TRIPS
IMPORTANCE OF RIVER RUNNING
.299***
U=.954
PERCEIVED ABILITY TO OBTAIN PERMITS
.619***
U=.786
PERCEIVED FAIRNESS OF RESERVATIONS
.226**
U=.848
WILLINGNESS TO TRY RESERVATIONS
.169**
.360***
ACCEPTABILITY OF RESERVATIONS
U=.971
.171**
U = proportion of variance unexplained by model
* p>.05
** p≤.05>.005
*** p≤.005

fairness and the evaluative variables (hypotheses 2A, 3A, and 4A) are somewhat more encouraging. As with the other models, a strong relationship exists between perceived ability and perceived fairness (p=.619). Users judged reservations fair if their perceived ability to obtain permits was high (hypothesis 2A). A somewhat weaker relationship links perceived ability and willingness to try reservations (p=.360), suggesting that respondents were somewhat more willing to try reservations if they perceived their chances of obtaining permits as good (hypothesis 4A). No significant relationship between perceived ability and acceptability were uncovered, rejecting hypothesis 3A.

The path coefficients linking perceived fairness with acceptability (p=.169) and willingness to try reservations (p=.226) only weakly support the hypotheses that people accept and are willing to try a "fair" system (hypotheses 3B and 4B). However, reservations were judged to be unacceptable by only 5% of the respondents, unfair by 17%, and only 6% were unwilling to try reservations. Perhaps the relatively weak path coefficients are due to the small number of respondents perceiving reservations as unfair, unacceptable, or who were unwilling to try reservations.

Hypothesis 4C, users will be more willing to try acceptable systems than unacceptable ones, was not supported by the path analysis. As with the other models, willingness to try is primarily a function of perceived ability to obtain permits. In addition, hypothesis 4D, linking importance of river running with willingness to try, was not verified, although people for whom river running is important were slightly less likely to find

reservations "acceptable" (p=-.171). Perhaps river running afficionados resent the additional hassle of making reservations.

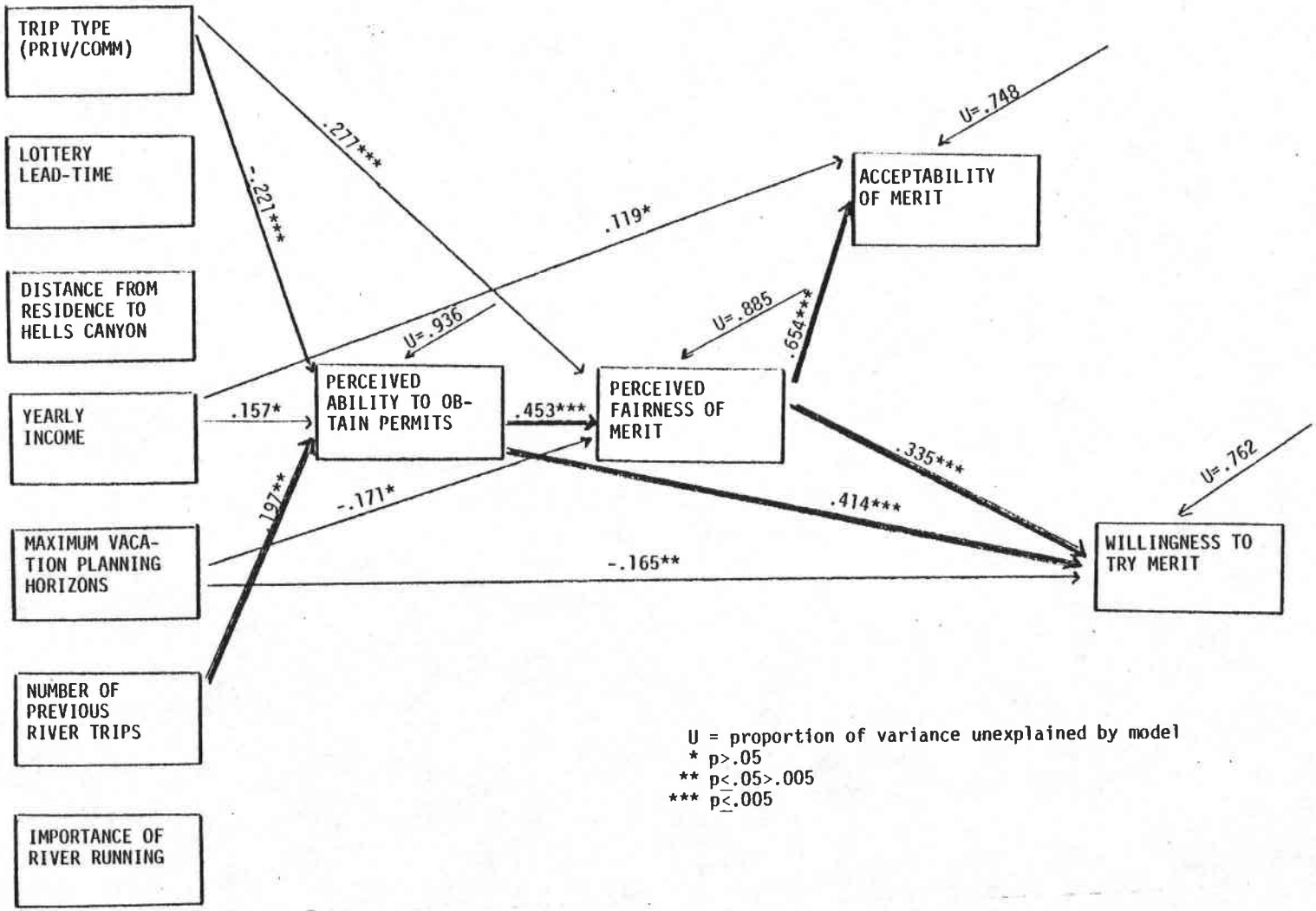
In summary, the reservation model refutes hypotheses 3 and 4 that the predicted currency has considerable effects on acceptability or willingness to try a reservation system. The perception of ability to obtain permits does influence perceived fairness as well as willingness to try reservations in the predicted direction, but the latter relationship is weaker than was expected (hypotheses 2A and 4A). The length of a user's planning horizon appears to have little effect on the reservation model, but lottery lead-time does influence perceived ability, possibly signaling that minimum planning horizons are more critical than maximum ones as the currency of a reservation system. The model only accounts for 3% of the variance in acceptability of reservations, which may be due to the large percentage of respondents who found reservations "acceptable" (95%). Overall, the respondents in this survey seemed to accept reservations regardless of background characteristics.

The merit model. The merit model, shown in Figure 9, indicates that, compared to the other models, the situational variables have more influence on the dependent variables: trip type, income, planning horizons, and number of river trips influence some or all of the dependent variables either directly or indirectly. The predicted currency of merit rationing, number of river trips, directly influenced only perceived ability to obtain permits, with weak indirect influences on the other variables. The perceptual and evaluative variables were inter-

Figure 9. The merit model[v].

[v] Bivariate correlations between the situational variables are reported in Table VII. Heavy arrows denote paths between the hypothesized currency and the perceptual and evaluative variables.

Figure 9.


TRIP TYPE (PRIV/COMM)
LOTTERY LEAD-TIME
DISTANCE FROM RESIDENCE TO HELLS CANYON
YEARLY INCOME
MAXIMUM VACATION PLANNING HORIZONS
NUMBER OF PREVIOUS RIVER TRIPS
IMPORTANCE OF RIVER RUNNING
PERCEIVED ABILITY TO OBTAIN PERMITS
PERCEIVED FAIRNESS OF MERIT
ACCEPTABILITY OF MERIT
WILLINGNESS TO TRY MERIT
U=.748
U=.885
U=.936
U=.762
.277***
-.221***
.119*
.654***
.157*
.453***
.335***
.414***
.197**
-.171*
-.165**
U = proportion of variance unexplained by model
* p>.05
** p≤.05>.005
*** p≤.005

related, especially perceived fairness and acceptability.

Predicted relationships between number of river trips and the perceptual and evaluative variables were only weakly substantiated. The direct path coefficient between number of river trips and perceived ability (p=.197) substantiated hypothesis 1: people who have more river running experience perceived their chances of obtaining a permit by merit as somewhat better. However, number of river trips did not directly affect perceived fairness, acceptability, or willingness to try merit, and indirect influences are quite weak:

Total effect of number of river trips on perceived fairness of merit	=	Indirect effects due to: ability-fairness path	+residual due to model which is not fully recursive.
.094	=	.089 95%	+ .005 5%
Total effect of number of river-trips on accept-ability of merit	=	Indirect effects due to: ability-fairness acceptability path	-residual due to model which is not fully recursive.
.023	=	.058 63%	- .035 37%
Total effect of number of river trips on willing-ness to try merit	=	Indirect effects due to: ability try path	+ability-fairness-try path
.103	=	.082 68%	+ .030 25%

-residual due to model which is not fully recursive.

- .009
7%

These data indicate that previous river running experience has little effect on the perceptions of merit rationing. Ability to obtain permits, however, is correlated with number of river trips. Between 63 and 95% of the total correlations between number of river trips and the perceptual and evaluative variables are accounted for via the perceived ability path. Although these paths are not strong enough to support hypotheses 2, 3, and 4, they do give some credence to the hypothesis that number of river trips influences respondents' perceptions of the merit system.

Perceived ability directly influences both perceived fairness ($p=.453$) and willingness to try ($p=.414$) as predicted in hypotheses 2A and 4A, respectively. Those who perceive their ability of obtaining a permit as good are more apt to judge merit fair and are more willing to try merit. However, no direct path coefficient linking perceived ability and acceptance of merit was found, refuting hypothesis 3A. Users apparently accept or reject merit on grounds other than perceived ability to obtain permits.

Both hypotheses linking fairness with acceptability and willingness to try were substantiated (hypotheses 3B and 4B). The path coefficient between fairness and acceptability was quite strong ($p=.654$) indicating that users who judge merit fair are very likely to accept merit. As with the other models, the path between fairness and willingness to try was rather weak (.335), but as predicted in hypothesis 4B users report more willingness to try fair systems than unfair ones.

Hypotheses 4C and 4D were not verified by the merit model. Acceptance of merit has no influence on willingness to try when perceived fairness and perceived ability are in the model. In addition, importance of river running has no influence on willingness to try, rejecting hypothesis 4D. Willingness to try merit is primarily a function of the perceptual variables.

The merit model also revealed several unexpected relationships of trip type, income, and planning horizons with the perceptual and evaluative variables. First, commerical users perceived their chances of obtaining permits by merit as slightly lower ($p=-.221$) which probably reflects their lack of river running experience. However, commercial users were more likely to judge merit "fair" ($p=.277$), a reversal from what we might expect from the commercials' experience and from their perceived ability to obtain permits by merit. Income had direct effects on both perceived ability and overall acceptance of merit. Those with higher incomes perceived their ability of obtaining permits as greater ($p=.157$), and were more apt to accept merit ($p=.119$). Perhaps wealthy people have more opportunity to run rivers and hence perceive better chances to acquire the necessary skills to compete in a merit rationing system. And finally, users who plan well in advance were more likely to judge merit unfair ($p=.171$) and were less willing to try merit ($p=-.165$). Perhaps planners were concerned that the merit criteria were to be tested at the launch site, where failure could seriously alter trip plans.

Overall, the merit rationing model substantiated the hypothesized linkages between perceived ability and perceived

fairness (hypothesis 2A), perceived ability, and willingness to try (hypothesis 4A) and perceived fairness and acceptability of merit (hypothesis 3B). No linkage was found between acceptance of merit and willingness to try (hypothesis 4C), suggesting that willingness to try is dependent upon fairness and perceived ability rather than on general acceptance of the system. Once again the predicted currency of merit, number of river trips, was only a weak influence on the dependent variables, especially fairness, acceptability, and willingness to try (hypotheses 2, 3, and 4). Additional unexpected influences of income, planning horizons, and contradictory influences of trip type were also detected.

Discussion of the Five Models

Taken as a group, the five rationing system models exhibited some remarkable similarities as well as several important differences. In general, we see relatively little influence, either directly or indirectly, of the hypothesized currencies of each system. In contrast, most models showed strong connections between perceived ability and perceived fairness, perceived ability and willingness to try, and between perceived fairness and overall acceptability of each system. However, the hypothesized link between perceived fairness and willingness to try was weak or non-existant. Hypotheses are discussed below in more detail.

Hypothesis 1: The more of a given currency controlled, the greater tha perceived ability to obtain permits. Overall, the

hypothesized currencies had very little direct or indirect effect on perceived ability to obtain permits. Table VIII summarizes these effects. If lottery lead-time is substituted for maximum planning horizons as the currency of the reservation model, the path coefficients range from .167 to .299, accounting for from 2.8% to 8.9% of the total variance in perceived ability. Although each path is in the hypothesized direction, the overall conclusion is that perceived ability is not highly dependent on the five hypothesized currencies. This strongly suggests that the theoretically predicted "costs" of rationing with each system are different from the actual costs perceived by users. Only a fraction of the variance in perceived ability is explained by what many have assumed to be the actual costs of the rationing systems. Although the currencies reported in Table VIII for lotteries and reservations are rather speculative, the consistency of these relationships from model to model suggests that "the ability to pay" under a given system is, as yet, very poorly defined.

Hypothesis 2: The more of a given currency controlled, the more likely the system will be perceived as "fair." Table IX summarizes the effects of the hypothesized currencies on perceived fairness. No model reported significant direct effects, and indirect effects are rather weak, with no model accounting for more than three percent of the variance in perceived fairness. It appears that the predicted currencies do not significantly influence perceived fairness, rejecting hypothesis 2.

TABLE VIII. SUMMARY OF EFFECTS OF HYPOTHESIZED CURRENCIES ON PERCEIVED ABILITY: HYPOTHESIS 1.

System	Hypothesized currency	Path coefficient	Percent of variance in ability explained
Merit	Number of river trips	.197	3.9
Lottery	Lottery lead-time	-.167	2.8
Reservation	(Lottery lead-time[W])	(.299)	(8.9)
Purchase	Income	.169	2.9
First-come/ first-served	Distance to Hells Canyon Dam	-.202	4.1

[W] The variable lottery lead-time replaced maximum planning horizons after path analysis revealed no significant influence on the dependent variables; lottery lead-time should be viewed as a possible surrogate measurement (see page).

TABLE IX. SUMMARY OF EFFECTS OF HYPOTHESIZED RATIONING CURRENCIES ON PERCEIVED FAIRNESS: HYPOTHESIS 2.

System	Hypothesized currency	Total effect	Direct effect	Indirect effect	Residual
Merit	Number of previous river trips	.024	0	.089 58%	-.065 42%
Lottery	Lottery lead-time	-.152	0	-.108 70%	-.044 30%
Reservation	(Lottery lead-time[x])	(.131)	(0)	(.186) 77%	(-.155) 23%
Purchase	Yearly income	.075	0	.082 92%	-.007 8%
First-come/ first-served	Distance from residence to Hells Canyon	-.113	0	-.139 84%	.026 16%

[x] See footnote page .

Hypothesis 3: The more of a given currency controlled, the more likely the system will be judged "acceptable." Influences of the systems' currencies on acceptability are summarized in Table X. As with hypothesis 2, no direct effects and only weak indirect effects were actually found. The indirect effects are even weaker than for hypothesis 2, with only the FC/FS model accounting for about one percent of the variance in acceptability. The predicted currencies apparently do not significantly influence acceptability as hypothesis 3 predicted.

Hypothesis 4: The more of a given currency controlled, the more willing users will be to try the system. As Table XI indicates, currencies had no direct effects and only modest indirect effects on willingness to try. Distance explains about 2.5% of the total variance in willingness to try FC/FS, being the best overall predictor. We would therefore conclude that willingness to try is not dependent on the amount of hypothesized currency users control.

Hypothesis 2A: The greater the perceived ability to obtain permits, the more likely the system will be perceived as "fair." Perceived ability to obtain permits strongly influences perceived fairness, as Table XII indicates. The path coefficients range from a low of .453 in the merit model to a high of .690 in the FC/FS model, and account for from 21 to 48% of the total variance in perceived fairness. The overall consistency from model to model vigorously supports equity theory that perceived fairness is highly correlated with perceived outcomes: fair systems are ones which maximize personal outcomes.

Hypothesis 3A: The greater the perceived ability to obtain

TABLE X. SUMMARY OF EFFECTS OF HYPOTHESIZED RATIONING CURRENCIES ON ACCEPTABILITY: HYPOTHESIS 3.

System	Hypothesized currency	Total effect	Direct effect	Indirect effect	Residual
Merit	Numer of river trips	.023	0	.058 63%	-.035 37%
Lottery	Lottery lead-time	-.105	0	-.067 63%	.038 37%
Reservation	(Lottery lead-time^{y})	(.006)	(0)	(.031) 55%	(-.025) 45%
Purchase	Income	.130	0	.052 40%	-.078 60%
First-come/ first-served	Distance to Hells Canyon Dam	-.008	0	-.096 52%	.088 48%

^{y} See footnote page .

TABLE XI. SUMMARY OF EFFECTS OF HYPOTHESIZED RATIONING CURRENCIES ON WILLINGNESS TO TRY: HYPOTHESIS 4.

System	Hypothesized currency	Total effect	Direct effect	Indirect effect	Residual
Merit	Number of river trips	.103	0	.112 93%	-.009 7%
Lottery	Lottery lead-time	-.212	0	-.098 46%	-.114 54%
Reservation	(Lottery lead-time^z)	.123	(0)	(.149) 85%	(-.026) 15%
Purchase	Income	.072	0	.086 86%	-.014 14%
First-come/ first-served	Distance to Hells Canyon Dam	-.144	0	-.155 94%	.011 6%

^{z} See footnote page .

TABLE XII. PATH COEFFICIENTS LINKING PERCEIVED ABILITY WITH PERCEIVED FAIRNESS, ACCEPTABILITY, AND WILLINGNESS TO TRY SYSTEMS: HYPOTHESES 2A, 3A and 4A.

System	Path coefficient of ability-fairness	Path coefficient of ability-acceptability	Path coefficient of ability-willingness to try
Merit	.453	NS	.414
Lottery	.645	NS	.337
Reservation	.619	NS	.360
Purchase	.483	NS	.400
First-come/ first-served	.690	.162	.582

NS = Not significant at .05

permits, the more likely the system will be "acceptable." Table XII also reports the path coefficients for hypothesis 3A. Only the FC/FS model revealed a significant relationship, with a path coefficient of .162, accounting for about two and one-half percent of the variance in acceptability. Once again the consistency between models indicates that acceptability is not dependent upon perceived chances. Users accept systems on grounds other than perceived ability to obtain permits.

Hypothesis 4A: The greater the perceived ability to obtain permits, the more willingness to try the system. The last column in Table XII reports the path coefficients for hypothesis 4A. Although the coefficients are not as strong as for hypothesis 2A, we see consistently that users are more willing to try systems which give them the best chance to obtain permits. The lottery model reported the weakest relationship (p=.337) which may reflect the uncertainty of outcomes of lottery rationing. On the other hand, willingness to try FC/FS was highly dependent on perceived ability (p=.582). It appears likely that systems which pose obviously high personal costs (e.g., FC/FS) influence willingness to try more extensively than systems where personal costs are not as clear-cut (e.g., lottery). Regardless, river runners are more willing to try systems when the perceived chances of obtaining a permit are high.

Hypothesis 3B: Fair systems will be more acceptable than unfair ones. The results of path analysis on hypothesis 3B are shown in Table XIII. Respondents generally accepted fair systems and rejected unfair ones. With the exception of the reservation

TABLE XIII. PATH COEFFICIENT LINKING PERCEIVED FAIRNESS WITH ACCEPTABILITY AND WILLINGNESS TO TRY: HYPOTHESES 3B and 4B.

System	Path coefficient of fairness-acceptability	Path coefficient of fairness-willingness to try
Merit	.654	.335
Lottery	.617	.383
Reservation	.169	.226
Purchase	.637	NS
First-come/ first-served	.497	.175

NS = Not significant at .05

model, this relationship is quite strong, especially for the merit (p=.654), lottery (p=.617), and purchase (p=.637) models. The relatively weak coefficient of the reservation model (.169) may have resulted from the small percent of users who found reservations unacceptable (5%). Nonetheless, acceptability is consistently dependent on perceived fairness as predicted in hypothesis 3B.

Hypothesis 4B: Users will be more willing to try "fair" systems than "unfair" ones. As we see from Table XIII, this relationship was substantiated by all but the purchase model, although the path coefficients are not particularly large. It is interesting to note that the lottery coefficient was the largest (.383), suggesting that users are more willing to try lotteries on the basis of fairness than they are the other systems. In contrast, reported bias against pricing recreation goods did not influence willingness to buy permits. This suggests that river runners are willing to try lotteries because lotteries represent "equality," but do not reject pricing because of supposed negative effects on the poor. Overall river runners were somewhat more willing to try fair systems than unfair ones, thereby supporting hypothesis 4B.

Hypothesis 4C: Users will be more willing to try acceptable systems than unacceptable systems. As Table XIV indicates, the data do not support the hypothesis that willingness to try is influenced significantly by overall acceptability of a system except in the purchase model, where the relationship is moderate (p=.358), and in FC/FS where it is very weak (p=.123). This suggests that people are willing to try systems they don't like,

TABLE XIV. PATH COEFFICIENTS LINKING ACCEPTABILITY WITH WILLINGNESS TO TRY: HYPOTHESIS 4C.

System	Path coefficient acceptance-willingness to try
Merit	NS
Lottery	NS
Reservation	NS
Purchase	.358
First-come/ first-served	.123

NS = Not significant at .05

especially if they perceive their chances of obtaining a permit as good. Perhaps this indicates a trend of accommodating behavior, whereby users are more concerned with obtaining a permit than whether they like or dislike the method of selection. This trend breaks down in the purchase model, perhaps because pricing recreation goods seems especially repugnant to certain users. However, one wonders why perceived fairness did not similarly influence willingness to try the purchase model. Regardless, the model data do not support hypothesis 4C.

Hypothesis 4D: Users who consider river running important will be more willing to try a rationing system. This hypothesis was totally refuted by the five models, with no significant correlations between importance of river running and willingness to try. However, as the discussion for hypothesis 4C indicated, accommodating behavior was not limited to those for whom river running was important. All respondents were more willing to try systems which offered the best chance of success. This may be due to a tendency to maximize personal gain in systems where competitors are not socially involved with each other, as suggested by equity theory. These data indicate that, even though river running is valued more highly by some users, this does not make them more willing to try a given rationing scheme.

Total variance explained by rationing models. Table XV shows that, on the average, more variance is explained the further one moves toward the dependent variables along the casual paths. Relatively little variance is explained by the reservation model,

TABLE XV. PERCENT OF VARIANCE OF DEPENDENT VARIABLES EXPLAINED BY MODELS.

Model	Perceived ability	Perceived fairness	Acceptability	Willingness to try
Merit	6	12	25	24
Lottery	1	24	25	24
Reservation	5	21	3	15
Purchase	1	16	27	22
First-come/ first-served	14	26	21	43
Average	5.4	19.8	20.2	25.6

in contrast to the FC/FS model which is relatively complete given the uncontrolled nature of the study. Consistencies in the casual paths between models as described earlier seem to indicate reasonable accuracy for such an exploratory study. Although improvement could be made both in the measurement of variables and in the casual ordering of variables, overall the data appear reliable enough to make inferences for further study and analysis.

V. SUMMARY, IMPLICATIONS, AND CONCLUSIONS

Most recreation allocation research has been remedial, and for good reason. Wildland managers must know how allocation alternatives are perceived and what effects they will have on wildland users. Accurate measures of user characteristics and management preferences are an important first step in solving the allocation puzzle. Unfortunately, management decisions are often based on deductive, but unvalidated theory. As relative scarcity intensifies, relying on these unconfirmed theories could lead to serious problems. This research attempted to test theory and to touch base with the management concerns and needs for Hells Canyon. Hopefully both ends were served, first by giving the managers of Hells Canyon National Recreation Area greater insight into the structure and needs of Hells Canyon floaters, and secondly, by testing allocation theory, with implications which go beyond the rim of Hells Canyon. This chapter first summarizes the findings of this research, followed by theoretical and management implications.

SUMMARY OF RESULTS

Perhaps the most startling finding of this research was that ability to pay for the rationing systems had little effect on respondents' perceived fairness, acceptability, or willingness to try the five systems and only modest effects on perceived ability to obtain permits. The ability to pay for the lottery and reservation systems were particularly poor predictors of

respondents' perceptions and evaluations of those systems. Apparently the "costs" of each system as perceived by the users are not well identified by present allocation theory.

Perceived fairness of the five systems was highly dependent on perceived ability to obtain permits. Hells Canyon floaters consistently viewed those systems which gave them the best opportunity to run Hells Canyon as "fair" systems.

If we use the two perceptual variables, perceived ability and perceived fairness to predict users acceptance and willingness to try a given system, some interesting patterns develop. First, little direct connection is found between perceived ability and acceptance, but generally strong correlations link perceived fairness and acceptability. Acceptability, according to these data, is directly dependent only with perceived fairness. Because direct correlations between ability and acceptability were weak and/or non-significant, we might conclude that perceived ability to obtain permits influences acceptability only indirectly via perceived fairness. Therefore, people accept what is perceived as fair, which is in turn partly determined by perceived ability to obtain permits.

Willingness to try a rationing system is entirely a different matter. In general, willingness to try is determined most strongly by perceived ability, less so by perceived fairness, and lowest by overall acceptability. People are more likely to try systems which incur the lowest perceived costs, regardless of overall acceptance and with only moderating effects from perceived fairness. This indicates that people will try a system

if they think their chances of getting a permit are good, regardless of whether the system is fair or acceptable to them. This practical approach to willingness to try suggests that people are willing to tolerate less-than-fair systems as long as those systems don't interfere with their chances of obtaining a permit.

Importance of river running or differences in trip type (i.e., private or commercial) had little effect, if any, on the perceptions of the five rationing techniques, with the exception of trip type on the merit system.

Overall, reservations were accepted by the most respondents, followed by purchase, lottery, merit and first-come/first-served. Perceived fairness and willingness to try roughly followed overall acceptability, with respondents highly favoring the reservation system.

THEORETICAL IMPLICATIONS

It is not surprising that each of the five rationing mechanisms, merit, reservation, pricing, first-come/first-served, and lottery, were met with varying levels of acceptance. What is more exciting is that the structures of these relationships follow very similar paths in each of the five models. This suggests uniform casual links which may have significant theoretical consequences.

People presumably weigh the relative costs and benefits of "consuming" a vast array of goods and services. Consumption is a function of the costs, benefits, and budget of the consumer, regardless of whether the budget consists of available dollars,

skill, or time. This is as true of river running as it is of candy bars or X-rated movies. Even though river running is gaining in popularity, most Americans choose not to run rivers. Apparently the benefits are simply not worth the costs for most people.

For those who do run rivers, rationing imposes additional costs above the obvious expenses of travel, equipment, and so forth. Past theory suggests that these costs are relatively straight-forward, as represented in the currencies of the respective rationing alternatives. Unfortunately, data from this research do not substantiate this. We simply do not know to a sufficient degree what determines people's perceptions of the costs imposed by any of the five rationing techniques studied in this research.

This situation could be troublesome. For example, since efficiency proposes to raise the "price" of permits so that indifferent people "drop out" of the market, the problem may be in determining the appropriate currency. The predicted currencies had relatively little overall effect on willingness to try any of the systems, and future research will be necessary to isolate the perceived personal costs of each permit system. Otherwise, systems may impose unreasonable and unnecessary burdens which do little to influence casual river runners to withdraw from the competition for permits. Maximizing social efficiency will require much greater understanding of the actual costs river runners face when deciding to run rivers.

Maintaining equity as allocation gets tighter will be increasingly difficult. This research indicates that fairness is

strongly dependent on perceived ability to obtain permits. We could expect, therefore, that as more people are turned away from running rivers equity challenges will also increase. Although equity issues will never be solved, several guidelines may be useful.

First, distributing use in time will provide maximum opportunity for all applicants to obtain float permits. Managers could lubricate the process by advertising the virtues of the "off-season." Next, and most importantly, managers should fully disclose the probabilities of obtaining permits throughout the use season. Awareness of relative scarcity will allow users to weigh probabilities to best satisfy their needs. This at least moves "perceived ability" a bit closer to actual probabilities by reducing applicants uncertainty. And lastly, identifying the characteristics of user-groups disadvantaged by a given allocation scheme may illuminate where inequitable exchange relationships exist. This research strongly indicates that "unfair" systems may not be challenged except by those who are excluded from obtaining permits. If a group whose political influence is weak is disadvantaged by an unfair system, incentives to change that system will also be weak. Unfortunately, this research did not conclusively identify which users are consistently disadvantaged by the five rationing mechanisms.

Because overall acceptability of a system is tied to perceived fairness, managing to maintain a "fair" system will probably sustain acceptance of that system. Perceived ability to obtain permits, of course, indirectly influences acceptability via

perceived fairness. As indicated earlier, a well-managed referral program where users choose when to apply for permits based on relative probabilities will help insure keeping a system "acceptable" to users.

Using willingness to try as an indication of tacit approval of a system appears dangerous. Most people are willing to try systems which will maximize personal gain. Systems which have a great deal of slack before a high percentage of users are turned away may appear to be functioning smoothly and perhaps fairly. Unfortunately, complacency may be unwarranted and short-lived as politically active users are denied access. John Garren's appeal on the Snake, for example, may be an early warning signal of an unfair system approaching its limits. Apparently most users will tolerate unfair systems until they become unsuccessful at getting a permit.

Maintaining separate permit procedures solely on the basis of presumed differences between private and commercial users may not be justified. The present data indicate small or insignificant effects of the type of trip on any of the evaluative or perceptual variables in the models. Only the lottery and merit models revealed significant (but weak) influences of trip type on perceived ability, fairness, acceptance or willingness to try those systems. This may indicate that suspected differences between the two groups are insufficient in themselves to warrant entirely separate permitting procedures. Although commercial users are significantly different from private users in several background characteristics, the direct or indirect effects of

type of trip controlling for these background variables are insignificant, except in the merit model, as discussed in the previous chapter. However, because interactions between background variables were not critically evaluated in the models, future study will be beneficial.

IMPLICATIONS FOR MANAGING HELLS CANYON

Present use trends indicate that relative scarcity of float permits on the Snake will only increase, particularly during the peak use months of June, July, and August. If we further assume relatively static carrying capacities at or near the present use-limits, then referring users in time and space will be increasingly more difficult, but at the same time more essential.

Research can't dictate management policy; it can only enlighten alternatives. Ultimately, decisions are only made considering management objectives, goals, and constraints, none of which were measured or elucidated by this research. However, several interpretations of the results may be helpful for future decision-making.

As the data indicated, users are most favorable toward a reservation rationing system, and fewer users objected to reservations on equity grounds than for the other systems. We would expect, as allocation in Hells Canyon gets "tight," that reservations will continue to be widely accepted by floaters.

First-come/first-served was judged as clearly inappropriate by respondents for Hells Canyon float permit rationing. This is not surprising given Hells Canyon's remoteness and the relatively

long planning horizons of most Hells Canyon users. FC/FS, however, should not be totally discounted, because future improvements in access as proposed by the draft EIS for Hells Canyon National Recreation Area may improve users' ability to travel to and within the Recreation Area. In addition, FC/FS may be appropriate for distribution of no-shows.

Merit rationing, although not well accepted by the users sampled, may also have its uses. Educational groups, for example, might compete for special permits by merit, as well as distribution of special "low-use" permits.

Although purchase and lottery were not as widely accepted as reservations, these systems also appear feasible, possibly in conjunction with reservations. Some of the objections to lotteries, too, may be reduced if probabilities of selection are published before users apply for permits.

Fortunately, two-thirds of the respondents felt that some sort of permit system was necessary on the Snake, even though use is still relatively low. It appears that Hells Canyon users accept the necessity of rationing. Of course, no one system will fulfill all agency goals, but workable, dynamic systems could conceivably be fashioned from the five rationing techniques outlined in this thesis. Hells Canyon managers are particularly blessed with time in which to search for viable alternatives. However, the present cushion of relatively low demand for Hells Canyon float permits may be short lived. If Hells Canyon is to avoid the serious allocation problems facing rivers such as the Grand Canyon, then workable solutions should be developed while

change is still feasible.

BIBLIOGRAPHY

Behan, R.W. 1976. "Rationing Wilderness Use: An Example from the Grand Canyon." Western Wildlands, 3:23-26.

Berkowitz, L. and E. Walster, ed. 1976. "Equity Theory: Toward A General Theory of Social Interaction." Advances in Experimental Social Psychology, 9. New York: Academic Press.

Brunner, R.E. and C.T. Clotfelder. 1975. "An Economic Appraisal of State Lotteries." National Tax Journal, 17:297-305.

Burnett, J.T. 1973. "Campground Reservation Systems... A Study." Trends, April-June: 13-19.

Clawson, M. 1959. Methods of Measuring the Demand for and Value of Outdoor Recreation. Washington, D.C.: Resources for the Future.

Deutsch, M. 1975. "Equity, Equality, and Need: What Determines Which Value Will be Used as the Basis of Distributive Justice." Journal of Social Issues, 31:108-118.

Fazio, J.R., and D.L. Gilbert. 1974. "Mandatory Wilderness Permits: Some Indications of Success." Journal of Forestry, 72:753-756.

Fienburg, S.E. 1971. "Randomization and Social Affairs: The 1970 Draft Lottery." Science, 171: 306-308.

Finney, J.M. 1972. "Indirect Effects of Path Analysis." Sociological Methods and Research, 1:175-186.

Garren, J. 1977. Letter to District Ranger, Pine Ranger District, Halfway, Oregon. March 11.

Hardin, G. 1968. "The Tragedy of the Commons." Science, 162: 1243-1248.

Hardin, G. 1969. "The Economics of Wilderness." Natural History, 76:554-556.

Heise, D.R. 1969. "Problems in Path Analysis and Casual Inference." In E.F. Borgatta, ed., Sociological Methodology 1969. Pp. 38-73. San Francisco: Jossey-Bass.

Hendee, J.C., et. al. 1968. Wilderness Users in the Pacific Northwest - Their Characteristics, Values, and Management Preferences. Department of Agriculture, Forest Service Research Paper PNW-61.

Hendee, J.C. 1974. "A Scientist's Views on Some Current Wilderness

Management Issues." Western Wildlands, Spring: 27-32.

Hollingshead, A.B. 1958. Social Class and Mental Illness. New York: John Wiley and Sons.

Holthus, D.C. 1978. "Application for Rerservation of Float Trip on Snake River." Halfway, Oregon; Pine Ranger District. (Mimeographed.)

Homans, G.C. 1961. Social Behavior: Its Elementary Forms. New York: Harcourt, Brace, and World.

Hughes, J.M. and R.D. Lloyd, ed. 1977. Outdoor Recreation: Advances in Applications of Economics. Department of Agriculture, Forest Service General Technical Report WO-2.

Interagency Whitewater Committee. 1976. "Interagency Whitewater Management Guidelines." (Mimeographed.)

Jorgensen, C.G. 1976. "Administrative Appeal re John Garren." Portland, Oregon: Deputy Regional Forester, U.S. Forest Service. (Mimeographed.)

Knetsch, J.L. 1974. Outdoor Recreation and Water Resources Planning. Richmond, Virginia: William Byrd Press.

Land, K.C. 1969. "Principles of Path Analysis." In E.F. Borgatta, ed., Sociological Methodology 1969. Pp. 38-73. San Francisco: Jossey-Bass.

Lime, D.W. and R.G. Buchman. 1974. "Putting Wilderness Permit Information to Work." Journal of Forestry, 72:622-626.

Magill, A.W. 1973. "An Overview of Campground Reservation Systems." Berkeley, California: U.S. Forest Service Pacific Southwest Forest and Experiment Station. (Mimeographed.)

Magill, A.W. 1976. Campsite Reservation Systems... The Camper's Viewpoint. Department of Agriculture, Forest Service Research Paper PSW-121.

McConnell, K.E. and V.A. Duff. 1976. "Estimating Net Benefits of Recreation Under Conditions of Excess Demand." Journal of Environmental Economics and Management 2:224-230.

McGuire, J.R. 1977. Letter to Bob Packwood, U.S. Senate. March 4.

National Park Service. 1974. The Campsite Reservation System, A Pilot Program in Six National Parks. Washington, D.C.: National Park Service.

Parent, C.R.M. 1978. "Private and Commercial Use Allocations

in Hells Canyon." Corvallis, Oregon: Consulting report to allocation study of Hells Canyon directed by Bo Shelby, Oregon State University. (Mimeographed.)

Pauly, M.V. and T.D. Willett. 1972. "Two Concepts of Equity and Their Implications for Public Policy." Social Science Quarterly, 53:29-32.

Pritchard, R.D. 1969. "Equity Theory: A Review and Critique." Organized Behavior and Human Performance, 4:176-211.

Shelby, B. 1978. Letter to participants in allocation goals questionnaire. November.

Shelby, B. and M.S. Danley. 1979. "Allocating River Use." Corvallis, Oregon: final report to U.S. Forest Service regarding private and commercial use-allocations in Hells Canyon. (Mimeographed.)

Stankey, G.H. and J. Baden. 1977. Rationing Wilderness Use: Methods, Problems, and Guidelines. Department of Agriculture, Forest Service Research Paper INT-192.

Stankey, G.H., et. al. 1976. "Crowding in Parks and Wilderness." Design and Environment, 7:38-41.

U.S. Forest Service. 1979. "Snake River Float Trip Use Statistics." Halfway, Oregon: Pine Ranger District. (Mimeographed.)

Utter, J.G. 1979. "Wild River Recreation Management: A Case Study of the Use Allocation Issue." Missoula, Montana: Unpublished Ph.D. Dissertation, University of Montana.

Vars, R.C. 1975. "Consequences of Non-Clearing Public Service Prices." Proceedings, Sixty-Eighth Annual Conference on Taxation, November 2-5. (Mimeographed.)

Wagar, J.V.K. 1940. "Certified Outdoorsmen." American Forests, 46:11.

Walster, E., Berscheid, E., and G.W. Walster. 1976. "New Directions in Equity Research." In L. Berkowitz and E. Walster, eds., Advances in Experimental Social Psychology, 9. New York: Academic Press.

Wilderness and Individual Freedom. 1976. Conference Proceedings, Mount Hood, Oregon, March 4-6. (Mimeographed.)

Wilmarth, Dixie. 1979. Personal interview with Recreation Guard, Pine Ranger District, Halfway, Oregon. September.

Zimmerman, E.W. 1964. Introduction to World Resources. Harry L.

Hunker, ed. New York: Harper and Row.

APPENDIX

Sample Questionnaire. Selected Coding Categories in Parentheses. In Pocket.

HELLS CANYON USER SURVEY

Everyone wants Hells Canyon to remain a high quality recreation area. But this requires careful planning. To help protect the river environment from overuse and to insure visitors an unspoiled recreation experience, we need to learn more about you -- what you do and what you prefer.

Please try to answer every question, since a single missing answer decreases the value of all of your answers. Try to answer what you believe to be true for you. There are no right or wrong answers; the best response is the one which most closely reflects your own personal feelings and beliefs.

Your name will not be used. Our data will be reported for large groups, like this, "Of the river runners in our survey, 60% were male and 40% were female." We never say "John Doe believes such and such." You can be assured that your personal views will not be revealed.

The questionnaire is divided into sections to make it easier to answer.

A number of different ideas have been suggested for distributing float-boating permits for Hells Canyon. In this section, we would like to know your reactions to these alternatives. Please consider each idea carefully, since your reactions are important in evaluating each alternative. Assume each individual user, including yourself, would be required to obtain a permit by the suggested alternative.

Alternative 1

PURCHASE PERMITS

All individual users would be required to purchase permits from the Forest Service during the May 21 - September 9 river season. A nominal fee would be charged for permits during "low-use" days (such as mid-week). For the high-use days (weekends and holidays), the permit would cost more.

This would mean:

1. Individuals could purchase permits from the Forest Service for as many launch dates as they wished.
2. Permits could be transferred to individuals other than the original purchaser.
3. Individuals could choose between the "low-use" permit and the "high-use" permit (depending on which day they wished to launch).
4. Permits could be purchased at any time prior to launch, including the day of the launch, until all launches for the day were taken.

1. Do you think that this is a fair method of distributing permits?

8 % Definitely yes

37 % Probably yes

8 % Don't know

19 % Probably no

27 % Definitely no

n = 287

2. How would this system affect your chances of obtaining a Hells Canyon float permit?

16% It wouldn't affect my chances at all; I could purchase a permit whenever I wished to float the Snake.

20% It would limit my chances of obtaining a permit only occasionally; most of the time I would be able to purchase a permit.

18% My chances of obtaining a permit would be greatly restricted; most of the time I would be unable to purchase a permit.

2% I could never obtain a permit under this system.

20% I don't know how this would affect my chances.

n = 284

3. Would you try to obtain a float permit by purchase?

19% Definitely yes

43% Probably yes

14% Don't know

13% Probably no

10% Definitely no

n = 284

4. In outlining this permit system, we stated that permits during "low-use" days would cost a nominal amount. How much would you be willing to pay for such a permit? (PUT YOUR BUYING PRICE IN THE BLANK BELOW.)

$\bar{X}$ = $11.00 is the highest amount I would pay for a Hells Canyon float-boating permit for a "low-use" day (probably Monday through Friday). I would buy a permit if you offered to sell me one at this price.

n = 244

5. Now suppose you wanted to purchase a permit for a "high-use" day such as the Fourth of July weekend. How much would you be willing to pay for such a permit? (PUT YOUR BUYING PRICE IN THE BLANK BELOW.)

$\bar{X}$ = $15.50 is the highest amount I would pay for a Hells Canyon float-boating permit for a "high-use" day. I would buy a permit if you offered to sell me one at this price.

n = 242

6. If you would not be willing to purchase a permit, would you explain why:

Shouldn't charge for public resource n = 45

Discriminates against poor n = 9

Possibility of "scalping" n = 8

Should be provided by outfitter n = 8

All others n = 35

Alternative 2

ADVANCE RESERVATIONS

All permits for trips during the summer season would be reserved before the desired launch date. Priority would be given to those persons who "reserved" a particular date the earliest.

This would mean:

1. Persons planning the furthest in advance would have the best chance at receiving a particular launch date.
2. Once a date was "filled," no more permits would be issued for that day.
3. Persons would be allowed to reserve more than one launch date per season.
4. Priority would be given to those whose reservations were made the earliest.

1. Do you think that this is a fair method of distributing permits?

   34% Definitely yes

   43% Probably yes

   6% Don't know

   12% Probably no

   5% Definitely no

   n=285

2. How would this system affect your chances of obtaining a Hells Canyon float permit?

   21% It wouldn't affect my chances at all; I could reserve a permit whenever I wished to float the Snake.

   43% It would limit my chances of obtaining a permit only occasionally; most of the time I would be able to reserve a permit.

   15% My chances of obtaining a permit would be greatly restricted; most of the time I would be unable to reserve a permit.

   1% I could never obtain a permit under this system.

   20% I don't know how this would affect my chances.

   n=282

3. Would you try to obtain a float permit by reservation?

50 % Definitely yes

34 % Probably yes

10 % Don't know

5 % Probably no

2 % Definitely no

n = 286

4. There are several ways in which the Forest Service could administer a reservation system. Mark the method which you think would be the best for you.

65 % Reserve launch dates by mail; those applications which were postmarked the earliest would be given priority.

17 % Reserve launch dates by telephone; those persons calling earliest would be given priority.

7 % Reserve launch dates through a ticket agency; the reservation could be made in travel agencies, motels, and department stores in the West; to pay costs, a reservation fee of $3.00 would be charged.

12 % Reserve launch dates in person at any U.S. Forest Service office in the Northwest.

n = 255

5. If you would not be willing to use a reservation system, would you explain why:

Would increase "no-shows"	n = 11
Not enough advanced notice	n = 8
Gives Outfitters unfair atvantage	n = 4
Too much hassle, "red-tape"	n = 4
All others	n = 9

Alternative 3

LOTTERY

In this variation of a reservation system, users would apply for a launch date of their choice, and applicants would be selected at random for those days when applications exceeded the launch limit.

This would mean:

1. A user's chance of obtaining a permit on any given launch day would depend on how many other persons applied for that particular day. On popular days you would have a lower chance of getting a permit.

2. Users would have to apply for a launch date 4 - 8 weeks in advance; successful and unsuccessful applicants would be notified at least 4 weeks in advance.

3. Persons would be allowed to apply for more than one launch date per season.

4. Applicants for a given launch date would be allowed alternate choices in the event they did not obtain their first choice date.

5. Dates not filled by the lottery would be available by telephone reservation or on a first-come-first-served basis.

1. Do you think that this is a fair method of distributing permits?

12% Definitely yes

27% Probably yes

9% Don't know

30% Probably no

23% Definitely ~~yes~~ no

n = 284

2. How would this sytem affect your chances of obtaining a Hells Canyon float permit?

3% It wouldn't affect my chances at all; I could get a permit whenever I wished to float the Snake.

29% It would limit my chances of obtaining a permit only occasionally; most of the time I would be able to obtain a permit.

36% My chances of obtaining a permit would be greatly restricted; most of the time I would be unable to get a permit.

6% I could never obtain a permit under this system.

27% I don't know how this would affect my chances.

n = 277

3. Would you try to obtain a float permit by reservation/lottery?

19% Definitely yes

32% Probably yes

18% Don't know

19% Probably no

18% Definitely no

n = 282

4. Assuming a lottery/reservation system was adopted, what would be the minimum lead time you would need between the notification of a successful or denied application and your intended launch date?

I would need _____ months _____ weeks _____ days of lead time.

Median = 59 days; $\bar{X}$ = 69 days n = 248

5. If you would not be willing to use a lottery, would you explain why:

Need more "lead-time;" difficult to plan n = 43

Too risky n = 34

Too restrictive; limits freedom n = 14

Too complicated n = 3

All others n = 10

Alternative 4

FIRST-COME/FIRST-SERVED

Permits would be issued at the launch site until the daily capacity was reached.

This would mean:

1. Priority would be given to those who arrived at the launch site the earliest.
2. Users could not reserve permits in advance.
3. Users arriving at the launch site after the daily permit quota was filled would not receive a permit.

1. Do you think that this is a fair method of distributing permits?

   4% Definitely yes

   8% Probably yes

   5% Don't know

   21% Probably no

   63% Definitely no

   n=287

2. How would this system affect your chances of obtaining a Hells Canyon float permit?

   3% It wouldn't affect my chances at all; I could get a permit whenever I wished to float the Snake.

   11% It would limit my chances of obtaining a permit only occasionally; most of the time I would be able to get a permit.

   37% My chances of obtaining a permit would be greatly restricted; most of the time I would be unable to get a permit.

   29% I could never obtain a permit under this system.

   20% I don't know how this would affect my chances.

   n=285

3. Would you try to obtain a float permit by first-come/first-served?

   6% Definitely yes

   11% Probably yes

   10% Don't know

   31% Probably no

   41% Definitely no

   n=285

7. Would you be willing to do any of the following to get a Snake River permit? (Circle one answer for each item.)

Wait a month longer to go on the trip. no 36% yes 64% n=267

Take the trip in May or September. no 49% yes 51% n=262

8. Do you feel that a permit system is necessary on the Snake River?

48% Yes, a permit system is needed now.

14% Probably yes, but not for a few years.

17% Probably no, only if the number of floaters increases dramatically.

1% Definitely no, permits will never be needed on the Snake River.

20% I don't know whether permits are needed.

n=279

In this section, we would like to ask some questions about the river trip you just finished.

1. When you made plans to run the Snake, how far in advance did you decide to go? Please fill in the appropriate numbers.

____ months ____ weeks ____ days

Median = 120 days; $\bar{X}$ = 136 days n=270

2. How many weeks of vacation do you have each year? ____ weeks

Median = 3.3 ; $\bar{X}$ = 5.8 n=263

3. How far in advance does your job permit you to plan your vacation?

____ months ____ weeks ____ days

Median = 93 days; $\bar{X}$ = 151 days n=206

4. Before this trip on the Snake, what was your river-running experience?

$\bar{X}$ = 0.8 total number of float trips on the Snake n=244

$\bar{X}$ = 1.1 total number of jet boat trips on the Snake n=271

$\bar{X}$ = 6.2 total number of other whitewater river trips n=276

5. How many years ago did you start going on whitewater river trips?

____ years ago n= 108 this was my first trip

$\bar{X}$ = 3.3; Median = 1.7 n=277

6. If it was not possible to go on a Snake River trip, what would you do instead?

Would you take a river trip on a different river? no 10% yes 90% n=269

What other river(s) would be reasonable substitutes for the Snake?

Main Salmon n=107

Rogue n=100

15% for me, there is no substitute

85% there is a substitute

n=292

Colorado n=81

Mid Fork Salmon n=70

All others n=165

7. If it was not possible to run the Snake, would you become involved in some other activity? no yes
20% 80% n = 276

What other activities would be reasonable substitutes for river running on the Snake?

Non-water oriented outdoor n = 187

Water-oriented outdoor n = 97

General travel n = 38

All others n = 8

n=65 for me, there is no substitute

8. For some people, running rivers is one of the most important things in their lives. To others, it may be just one of a number of interests -- something they enjoy but to which they are not strongly committed. Check one statement below that best describes your own position.

(1) 34% If I couldn't go river-running, I would soon find something else I enjoyed just as much.

(2) 35% If I had to give up running rivers, I would miss it, but not as much as many other interests I have.

(3) 18% If I couldn't go river-running, I would miss it more than almost any other interest I have.

(4) 13% Running rivers is one of the biggest things in my life; if I had to give it up, a great deal of the total enjoyment I now get out of life would be gone.

n=278

9. Where did you first hear about rafting on the Snake River?

63% from a friend or acquaintance

<1% from the U.S. Forest Service

7% from a brochure published by a river outfitter

4% from a book

4% from a magazine or newspaper

3% from the radio or TV

18% other (please explain) _____

_____

n=276

10. Is the trip you just completed a commercial or a private river trip?

57% commercial

43% private

n=295

In this section, we would like to ask some questions about your background which will help us compare your answers to those of other people. All of your answers are strictly confidential.

1. How old are you? $\bar{X}$=33 years old. n = 291

2. Are you 60% male; 40% female? n=292

3. How many years of school have you completed?

(1-12) 1 2 3 4 5 6 7 8 9 10 11 12

Some college? (13) B.A. or equivalent? (14) M.A. or equivalent? (15)
Advanced degree (M.D. or Ph.D., etc.)? (16)
$\bar{X}$=13.3 n=289

4. What is your primary occupation? Please be as specific as possible; if you are a homemaker or student, please indicate the occupation of your spouse or parent. If retired, give former occupation.

(coded 1-7 after Hollingshead, 195). $\bar{X}$=5.1 n=279

5. Please check the space that comes closest to your total family income before taxes:

(1) 3% $0 - 3,999
(2) 5% $4,000 - 7,999
(3) 13% $8,000 - 11,999
(4) 12% $12,000 - 15,999
(5) 12% $16,000 - 19,999
(6) 8% $20,000 - 23,999
(7) 11% $24,000 - 27,999
(8) 7% $28,000 - 31,999
(9) 6% $32,000 - 35,999
(10) 4% $36,000 - 39,999
(11) 3% $40,000 - 43,999
(12) 2% $44,000 - 47,999
(13) 16% More than $48,000

$\bar{X}$=6.9

n=269

6. Are you:

(1) 39% Single
(2) 54% Married
(3) 7% Separated, divorced, or widowed

n=287

7. How many children do you have? $\bar{X}$=1.2

Median = 0.4

n=268

We hope you found this questionnaire interesting.

Thank you for your help and cooperation.

4. If you would not be willing to use a first-come/first-served permit system, would you explain why:

Live too far away; favors local users n = 139

Can't plan; not enough notice n = 80

Too much confusion at launch site n = 24

Would cause bad feelings among users n = 6

All others n = 10

Alternative 5

MERIT SYSTEM

Preference would be given to users who demonstrate skill in environmental practices, river running, and/or safety. This would be similar to requiring a safety test for hunters or a "rules of the road" test for drivers. On days when applications for permits exceeded launch capacity, those users who demonstrated "merit" would be given priority.

This would mean:

1. Persons who did not meet the "merit" criteria might not be able to launch on the Snake River on more popular days such as weekends or holidays.
2. Persons wishing to receive "merit" priority would have to take some kind of Forest Service test.
3. Merit criteria would be subject to interpretation and evaluation by the Forest Service.

1. Do you think that this is a fair method of distributing permits?

8% Definitely yes

15% Probably yes

13% Don't know

26% Probably no

39% Definitely no

n = 285

2. How would this system affect your chances of obtaining a Hells Canyon float permit?

(1) 17% It wouldn't affect my chances at all; I could get a permit whenever I wanted to float the Snake.

(2) 20% It would limit my chances of obtaining a permit only occasionally; most of the time I would be able to get a permit.

(3) 26% My chances of obtaining a permit would be greatly restricted.

(4) 11% I could never obtain a permit under this system.

26% I don't know how this would affect my chances.

n=281

3. Would you try to obtain a float permit by demonstrating merit?

11% Definitely yes

25% Probably yes

20% Don't know

26% Probably no

18% Definitely no

n=284

4. If you do not feel that a "merit" system is warranted, would you please explain why:

Criteria too hard to judge/administer	n=63
Limits beginners	n=57
Discrimination (not specified)	n=14
Too much "red-tape"	n=12
All others	n=36

5. If you believe a "merit" system is a fair method of issuing float-boating permits, would you indicate some of the factors you think should be considered in judging merit.

Environmental manners/knowledge	n=55
Boating skill and experience	n=50
Safety	n=26
Equipment Standard	n=9
All others	n=10

Some statements in this next section refer to the alternatives just outlined, while other questions apply to other aspects of permit systems.

1. Several methods of issuing permits to float-boaters were outlined in this questionnaire: purchase, reservation, lottery, first-come/first-served, and merit. Each of these "systems" could be used to issue all of the boating permits, or a combination of two or more systems could be used. Below you will find a list of the five permit system alternatives. Please indicate which system(s) you think are acceptable for issuing permits on the Snake River (you may think several systems are acceptable). Then rank these alternatives from most acceptable (#1) to least acceptable (#5).

	Unacceptable	Acceptable	Alternative	Rankings
n = 253	34%	66%	Purchase	$\bar{x}$ = 2.7 n = 262
n = 261	5%	95%	Reservation	$\bar{x}$ = 1.4 n = 272
n = 253	50%	50%	Lottery	$\bar{x}$ = 3.1 n = 246
n = 289	76%	25%	First-Come/First-Served	$\bar{x}$ = 3.9 n = 234
n = 248	63%	37%	Merit	$\bar{x}$ = 3.6 n = 242

2. Listed below are several different ways of giving preference to certain users. Please indicate which ones you favor, then rank them from the one you consider most desirable (#1) to the one you consider least desirable (#5).

	oppose	favor	ranking	
n = 245	32%	68%	$\bar{x}$ = 2.1	Give preference to private river runners. n = 236
n = 249	58%	42%	$\bar{x}$ = 3.0	Give preference to passengers of commercial outfitters. n = 232
n = 240	85%	15%	$\bar{x}$ = 4.1	Give preference to users who have floated Hells Canyon the most (either overall, or most recently). n = 213
n = 242	31%	69%	$\bar{x}$ = 2.5	Give preference to users who have been unsuccessful at getting permits in the past. n = 229
n = 246	44%	57%	$\bar{x}$ = 2.8	Give preference to users who demonstrate the most skill in environmental practices, river running, and/or safety. n = 236

3. Do you think the Forest Service should avoid encouraging use by limiting advertising and promotion of Hells Canyon river running?

33% No 67% Yes

n = 283

4. Do you think some periods should be reserved for "high-use," other periods for "low-use?"?

44% No 56% Yes

n = 265

5. If a permit system were adopted whereby each individual had to have a permit, where would you prefer to obtain your Hells Canyon permit? Several alternatives are listed below. Please indicate which one(s) you favor and then rank the alternative from the most desirable (#1) to the least desirable (#6).

	oppose	favor	ranking		
n = 258	6%	94%	$\bar{x}$ = 1.5	Obtain the permit by mail.	n = 265
n = 249	57%	43%	$\bar{x}$ = 3.5	Obtain the permit at the launch site.	n = 221
n = 240	75%	26%	$\bar{x}$ = 4.2	Obtain the permit at the Pine Ranger District Office in Halfway.	n = 221
n = 243	29%	71%	$\bar{x}$ = 2.7	Obtain the permit at any Forest Service office.	n = 247
n = 248	70%	30%	$\bar{x}$ = 4.3	Obtain the permit from ticket agencies located in department stores and travel agencies throughout the West.	n = 233
n = 247	66%	34%	$\bar{x}$ = 4.3	Obtain the permit from a licensed river outfitter.	n = 235

6. Permit systems often face the problem of "no-shows" - people who obtain permits but who do not use them. The Forest Service could reduce no-shows by several methods. Please indicate which methods you favor and then rank the alternatives from the most desirable (#1) to the least desirable (#5).

	oppose	favor	ranking		
n = 259	20%	80%	$\bar{x}$ = 2.3	First-come, first-served; give unclaimed permits to those who claim them first.	n = 257
n = 252	33%	68%	$\bar{x}$ = 2.7	Reservation fee; require a $3.00 non-refundable fee for making a reservation.	n = 254
n = 256	25%	75%	$\bar{x}$ = 2.1	Deposit; require a $10.00 deposit, refundable when the user claims his permit.	n = 256
n = 251	56%	44%	$\bar{x}$ = 3.2	Penalize no-shows; restrict or reduce future permits for individuals who fail to use their permits.	n = 234
n = 252	87%	13%	$\bar{x}$ = 4.4	Over-schedule; issue permits beyond capacity based on the previous "no-show" rate.	n = 221