

AN ABSTRACT OF THE THESIS OF

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Abstract Approved:

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The concept of large-scale natural resources planning and management is not new. The idea that resources and their human users occur as systems over large geographic areas has a long established tradition in forest, range, water, and air management sciences. Recent trends in this thinking concern the recognition of the inherently interdependent nature of many bio-social systems, where the interaction of people, culture and environment together influence regional conditions. Such thinking requires new concepts and strategies to understand and prescribe effective resource management actions. Included among these emergent concepts are those associated with regional recreation systems, which arise amidst growing evidence of declining recreation quality.

This study presents experience-based recreation and the human ecology perspective based in systems theory as a useful framework for regional recreation planning. The framework takes a distinctly structural approach as it focuses on the social organizational attributes of resource management networks conducive to regional, inter-agency cooperative planning. Empirical evidence in support of the conceptual framework is provided by a case study of regional recreation

planning in the Pacific Northwest and results of data analyses as evidence of regional recreation systems.

Two separate state surveys of 5,205 sample households in Oregon and Washington were conducted over a 12-month period during 1987. Recreation activities, travel patterns, and natural resources used for recreation within and among the states were measured using telephone and mail instruments. Principal components analysis of travel patterns within Oregon and Washington was used to delineate functional recreation regions within the two-state area. As a result, five recreation regions were identified. The spatial and temporal characteristics of one recreation functional region in Oregon were described further using Lorenz Curve, directional bias and net flow, compactness and connectivity indices, and peaking index analyses.

The final element of the study was to integrate the conceptual and empirical data in a simulation of institutional arrangements for regional recreation planning. The simulation was guided by a typology of organizational contexts relevant to recreation resource planning, both present and future. The applicability of the conceptual framework to regional resource management activities other than outdoor recreation was discussed.

A Conceptual Framework For Regional Recreation Planning:
With An Example From The Pacific Northwest

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A CONCEPTUAL FRAMEWORK FOR REGIONAL RECREATION PLANNING:
WITH AN EXAMPLE FROM THE PACIFIC NORTHWEST

CHAPTER 1

THE SOCIAL IMPETUS FOR REGIONAL RECREATION
RESOURCE MANAGEMENT PLANNING

Introduction

Much has been written about the functional importance of outdoor recreation to the well-being of society (e.g., see Driver et al. 1991 for a recent examination of the social benefits of leisure and recreation). In an age when more than 70 percent of the United States population lives in urban areas, and less than two percent of the total population reside on farms (Bureau of the Census 1992), outdoor recreation provides a critical sensory and emotional link between humans and the natural environment (Rolston 1991). In our urban society with all its ethnic and cultural diversity, the opportunity to experience and gain benefits from the natural environment is not a day-to-day function of the subsistence activities of husbanding and harvesting. Removed as we are from direct experience of the land for livelihood, we return to it in our unobligated free time to fulfill essential needs not met by our primary work and residential opportunities.

A measure of our desire for natural places can be found in the values we hold toward the natural world. Through the cognitive act of valuing, we indicate our strength of preference toward nature. When material nature-state preferences are expressed as a measure of social utility, these nature-states are commonly referred to as natural resources (Bennett 1976). Natural resources are thusly defined to the extent societal values are mobilized for utilization in a form prescribed as socially appropriate.

The definitions of natural resources vary by the culture in which values are formed, and over time. As societal values change, definitions of natural resources also change along with evaluations of the appropriateness of resource utilization strategies. Evidence of this is the recent apparent changes in public agency definitions of appropriate uses of public forest resources in the United States from one of nearly total emphasis on timber production toward a definition that tends more toward integration of multiple uses, including recreation, on the same areas of land (Clark and Brown 1990).

Changes in the societal definition of natural resources, and their concurrent influence upon resource utilization, make their influence felt to the heart of social mechanisms existing to facilitate resource access and use. Where natural resource management is concerned, public land management organizations such as the U.S. Forest Service, National Park Service, Bureau of Land Management, and state park departments exist to service social demands for natural resources. As societal emphasis on recreation resources has increased, these demands have been translated as structural change within these organizations, and in their relationships to one another as their respective individual activities collectively affect the recreation opportunities of a mutually shared clientele. As evidence, some agencies now talk in terms of adopting formal marketing strategies as a way of enhancing the fit between the resource opportunities available on public lands and the resource values demanded by the agency's clientele (Lee 1991).

With what seems to be a growing public mandate for management agencies to meet the diverse resource demands of an ever-expanding clientele, concern continues to mount regarding the adequacy with which resource management organizations, individually and as a group, contribute to the overall satisfaction of user publics (Hospodarsky 1988a). This concern has, in turn, led to consideration of the overall pattern of resource demand by populations expressed over large

geographic areas, and the roles that respective management entities play in meeting this demand (Brown, in press). One logical conclusion of this ongoing redefinition of organizational roles is that agencies sharing recreation resource management responsibilities within a given geographic area can improve the quality of their services by collaborating in their resource planning and management activities, thereby providing greater diversity of recreation opportunities to meet the desires of a changing population (Cordell et al. 1990).

These developments do not mean there has been widespread adoption of cooperation resource management strategies by recreation management agencies. Such collaboration is only just beginning. For various reasons within and outside their control, autonomous agencies usually have been reluctant to collaborate in recreation management activities. To make sense of this reticence and guarded acceptance within the social, cultural, and biophysical context that gives it meaning is requisite to formulating a framework for cooperative regional recreation resource planning and management that is more efficacious for providing recreation benefits to people. Thus, the general purpose of the remainder of this chapter is to elaborate the issues associated with regional outdoor recreation resource planning in sufficient detail to allow specification of research objectives, and the definition of the variables and processes to be studied in meeting those objectives.

The Issue of Regional Recreation Systems

Many of the issues encountered in regional resource recreation planning can be conceived in terms of the interrelationships among resource management agencies within the region. Of these, the particular genre of issues related to inter-agency cooperation, or the lack thereof, suggest special attention be paid to the configuration of relationships developed to articulate legal, financial and administrative relations among public agencies (Craine 1971). The

specific relationships of this type are constrained and shaped by the natural and social environment, which weave a web that describes the recreation management system for decision making.

It is proposed here that the interrelationships defining social relations among resource management agencies are most relevant to issues of regional recreation planning. Regional resource management entails linkages tying recreation agencies together into a public decision making system that operates responsively to the demands of its environment. If the goal of recreation management is to provide a system for improving the quality of public recreation planning decisions, a framework for regional inter-agency recreation management needs to address three conditions viz., public expectations about the content of resource management agency decisions; the capability of the management agency system to produce decisions that meet public expectations; and the process of resource management agency system design (adapted from Craine 1971).

The Nature of Public Recreation Decisions

The nature of the decisions expected from public recreation management planning may be described in terms of problems which seem to generate dissatisfaction among both the consumer public and resource managers. A current general trend in outdoor recreation has demand for a wide variety of recreation opportunities increasing while the available resource base that supplies opportunities is decreasing (Cordell et al. 1990). This trend results in an overall erosion of recreation quality, when quality is perceived as a function of the goodness of fit between desires for experiences and available opportunities (Jubenville and Becker 1983; Wagar 1966). Thus, the more diverse the desires of a population, the more diverse need be the opportunities to fulfill the population's desires. Within a large geographic area, a reduction in recreation diversity would diminish the

quality of recreation found in the region and likely lessen the capacity for land use changes in the future (Gould 1961).

As a barrier to erosion of quality, one strategy of resource managers is to stabilize recreation quality through improvements in recreation service delivery that enhance the diversity of recreation opportunities made available to a population. Since recreation managers can do less to affect quality by directly altering the desires of recreation consumers, the main avenue they have for affecting recreation quality is effectively expanding the resource base (Schreyer 1985).

This avenue in itself presents two possible routes to improving recreational diversity and consequent quality. Managers can increase diversity in recreation opportunities for a population by (1) making the resource area more accessible and enlarging its usable area (e.g., improving access roads) and (2) improving service delivery from an existing resource area through organizational efficiencies (e.g., management planning to eliminate redundancies in services and to fill gaps or deficiencies by providing new or expanded services). Clearly, during times of diminishing opportunity to add new recreation areas such as we are now experiencing, managers are in a much better position to attack the problem through increased efficiencies (Cordell et al. 1990).

Success in stabilizing and improving recreation quality through enhanced management efficiencies rests on the assumption that management actions affecting the type and level of access to recreation opportunities also determine, to a large extent, the consumer's response to the managed environment. This view is in keeping with Brown's (1981) general contention that within Western society most individual behavior is constrained by government and private institutions. Expressed in terms offered by Jubenville and Becker (1983), social norms of recreation behavior are often driven by the development norms imposed upon the recreational environment by management. Development norms, according to Jubenville and Becker (1983, p. 316) are the "messages

placed on the landscape" about what is available and appropriate in the way of resources and behaviors. "Management success, then, is measured as how well we achieve the desired social norms on the ground and the "thing" the manager can tinker with...is the development norms" (p. 317).

However, as Jubenville and Becker (1983) warn, success in resolving the problem of improving recreation quality cannot be assessed in terms of the cumulative satisfaction of users of individual recreation areas, since the people using the areas must be reasonably satisfied or they would have found their way elsewhere. Rather, recreation development that results in changes in recreation diversity for a site, or even an entire National Forest, only can be evaluated comprehensively with regard to the more inclusive regional mix of recreation opportunities, vis-a-vis the experiences desired throughout a population. As an example, for prime outdoor recreation settings near population centers, demand for recreation opportunities is often very high - often at resource capability and above - within a wide range of management options. Managers of these local areas can always beg the question of how their specific activities contribute to regional quality by pointing up the fact that their sites are heavily used and that, by inference therefore, a good job is being done in providing quality recreation services.

While this contention may be true locally or for certain user groups, such site-level management is often conducted in ignorance of consequences to other population segments who may be deprived of quality experiences by virtue of a region-wide lack of an opportunity foregone because of uncoordinated site developments. The cumulative result of such piecemeal developments is often a net reduction in the diversity of opportunities available to a population.

A counter to this form of reduction in recreation opportunities is inter-agency cooperative planning and management to insure the most

efficient delivery of recreation services of highest quality. There are good reasons why there are multiple suppliers of recreation opportunities, but to manage at any lesser scale of social and natural resource organization than is called for in cooperative planning and management, is not to adequately consider all aspects of the system relevant to recreational use and management (Machlis 1986).

Delimiting current problems of quality in recreation service delivery in terms of population demand for opportunities and the regional supply of opportunities, implies public decisions be made in direct consideration of specific populations, and the functional resource area from which they gain sustenance (Clark and Brown 1990). This regional problem underscores the importance of larger recreation social systems, as these systems act as causal determinants of recreation behavior, rather than as mere locals of human activity as they have usually been considered in recreation research (Bultena and Field 1983). More recently Brown (in press) has suggested that problems of delivering quality recreation opportunities require a new research and management paradigm which focuses on community-level demand and inter-ownership collaboration among regional suppliers in resource planning and management. Burch (1988) foretold this developing paradigm when he predicted a tertiary political economy that is to be dominant in Western society for some time to come. This phase of social and economic development, according to Burch (1988, p. 158) "...sees expectations shifting from satisfactory standard of living to a satisfactory life-style. Thus parks, wildlands, historic sites, and landscapes will reflect the coming class struggle. Managers of natural resources will be well advised to fully understand the total systems they purport to regulate." This suggests the physical-biological systems which resource managers are accustomed to managing are part of a larger social context which must be understood in order for acceptably efficient management to be carried out.

Toward a Regional Recreation Management System

The existing organizational environment relevant to the production of quality outdoor recreation largely involves government. Because a majority of outdoor recreation settings are located on public lands (Cordell et al. 1990), government has provided a lot of outdoor recreation services, especially in the West (Cordell and Stanley-Saunders 1983). There have been a variety of local, state, and federal government activities that have affected the quantity and quality of recreation outputs from public lands.

A review of the existing organizations involved in public recreation decisions reveals features that are at odds with the biophysical and human social imperatives inherent in public resource recreation. For example, existing organizations in the form of resource management agencies are characterized by: (1) a frequent incongruence between jurisdictional boundaries of governmental agencies (both geographic and institutional) and environmental problem-areas, the effect of which inhibits efforts to integrate management within a region; and (2) a highly fragmented governmental authority controlling public resource use and development, thus providing little coordination of goals and methods for management intervention in response to requirements for improved recreation service delivery, which presumably was the impetus for intervention in the first place.

Clearly there is much overlap between these two problem areas. Efforts to resolve management problems affecting large geographic areas, and which encompass resources under various jurisdictions, are often thwarted by barriers to management cooperation. Because of this extensive overlap in the definition of social organizational problems in resource management, often it is difficult to separate discussions of the two issues as they appear in the resource management literature. The distinction between the two problem areas is helpful, however, to the discussion of institutional design later in this chapter.

Therefore, a somewhat artificial separation between these organizational problem areas is maintained in this current discussion, realizing that the boundaries are indistinct and not always meaningful.

The frequent incongruence between jurisdictional boundaries of governmental units and environmental boundary-areas has been the topic of much discussion in the resource management literature, particularly as this incongruence inhibits regional planning and management efforts. Much of this literature has been couched in terms of the desirable efficiencies to be realized from a more-comprehensive, regional scope to planning and management; again suggesting, at least implicitly, the impetus for inter-jurisdictional cooperation among agencies resident to the larger area.

Regional resource planning and management has been advocated for public management of a variety of natural resource-based systems including those associated with range (Schneider 1975; Anderson and Baum 1987), river basin (Ranney 1972), lake and bay (Craine 1971), parks (Sax and Keiter 1988; Machlis 1986), outdoor recreation in a variety of settings (Gould 1961; Schreyer 1985; Cordell et al. 1990; Burch 1988; McLaughlin and Harris 1986; Brown (In Press); Hospodarsky and Eixenberger 1990; USDA-Forest Service 1986; Royer et al. 1977; Jubenville and Becker 1983; Driver and Rosenthal 1980), tourism (Murphy 1985; Gunn 1979; Gunn 1986; Mathieson and Wall 1982), as well as biological and social systems in general (Gilbert 1988; Isard 1975; Risser 1985; Joyce et al. 1986; Lassey 1973). All these authors point up the effectiveness in realizing benefits from regional-level management of natural resources.

The spatial sweep of regional planning implies inter-agency cooperation in resource management. Even though individual agencies may control substantial tracts of land, the pattern of resource demand exhibited by a population weaves itself inextricably among individual land holdings to include the resource areas of many agencies. It has

long been a maxim of recreation management that people do not really care which agency manages as long as desired opportunities are available. Without coordination among these public land holders, resource management is fragmented and potentially inefficient due either to redundancies or deficiencies in the resource supply. Inter-agency cooperative resource planning and management has been often proposed, although attempted far less often, as a remedy for such management inefficiencies.

Along with many of the writers cited previously, several other writers have commented specifically on the benefits and techniques of cooperative, interagency resource management ventures, including those associated with regional economic development (Webster 1986), fisheries (Nehlsen 1992), natural resource management in general (Clark and Stankey 1991; Clark and Brown 1990), range (Jaindl et al. 1990), tourism (Field 1986), outdoor recreation (Oregon State Parks and Recreation Division 1988; Shivers 1986; Wallace 1985; Cox and Askham 1984; Smith 1983; McDonough 1980; Wagar 1963; Burch 1964), and forestry (Robbins 1985; Stere 1984).

The problems with the organizational arrangements in public recreation management cited by these authors support the proposition that the institutional arrangements for regional outdoor recreation planning and management are underdeveloped in their capacity to improve the delivery of recreation services from public lands. The origin of this deficiency can be traced to the inadequacy of current arrangements to enact functional linkages between the agencies involved in public resource recreation management activities at the regional level of service delivery. Meanwhile, the roles of recreation management agencies within a regional system remain unclear as they each contribute to a common service function with much duplication of services or with insufficient services being offered (Driver and Rosenthal 1980). What is called for in this sort of situation is a regional "system of

interagency linkages designed to encourage the agencies to play complimentary instead of conflicting roles" (Craine 1971, p. 541).

The operational linkages between relevant government agencies within this regional system should be, according to Craine (1971), a primary focus of institutional design. To the contrary, past efforts at organizational reform have largely worked to further differentiate agency functions. These efforts have mistakenly eschewed "a concept that functions may appropriately be shared if operational linkages are prescribed to govern the interagency behavior in specified decisional processes. The nature and significance of interagency linkages in institutional design is a subject that deserves much more investigation...for many public sectors where interagency relations are a central problem" (Craine 1971, p. 546). For problems of regional recreation planning, interagency linkages in institutional design also are a salient and persistent concern.

Statement of the Problem

Given the nature of public recreation decisions confronting organizational systems, as they operate amidst the biophysical and social imperatives of these resource systems, it is not surprising that existing organizations fail to comprehend let alone resolve the current recreation management problems manifest at the regional level. Building the capability of organizations to resolve these problems will require further development of an effective delivery system through a process of institutional design and development.

The concept of institutional design as a way of improving efficiencies in outdoor recreation service delivery is not new. Brown et al. (1973) advocated alteration of the existing organizational structures shaping recreation opportunities, whenever their current form presented obstacles to achieving preferred social goals. They maintained the key to determining the appropriateness of a particular

intervention strategy and guidance in its implementation could be best found within the context of agency interactions, to include: the complementariness and competitiveness of agency activities; the suitability of specific agencies to supply certain recreation opportunities; the inherent flexibility of agencies to adapt to recreationists' changing demands; and the proportion of demand that should be supplied by each management agency. The issues raised and problems confronted in applying the social-political process of institutional design to developing recreation management systems is a central topic of this dissertation.

The pertinent question then is how can public resource management agencies operating within a region, enhance institutional arrangements in order to maintain and improve the quality of recreation services? And, how might such arrangements be useful in regional recreation planning and management? The purpose of this study is to demonstrate how information on the organizational arrangements of public recreation can be used within a social ecological structure as input to a regional planning framework for providing enhanced recreation benefits to people. Information on recreationists and their activities is used to delimit the functional recreation resource region; which, in turn, facilitates identifying the public resource management organizational structure pertinent to supplying opportunities within the region.

The following objectives have guided the study:

- 1) to develop a conceptual framework of agency arrangements conducive to regional recreation resource management planning;
- 2) to cite an example of regional recreation resource management planning and use the empirical planning data to supplement the conceptual model, with regard to its effectiveness in accommodating regional, inter-agency recreation management planning; which includes two sub-objectives viz.,
 - 2a) to delimit the functional resource area of a population of recreationists in order to spatially define a recreation region, and thereby, help;

- 2b) to identify the structure of the public recreation management system operational within the functional recreation region and the system's environment; and
- 3) to demonstrate how and why information from the conceptual framework and empirical evidence about a public regional recreation system is useful in developing regional recreation management plans to enhance the quality of recreation for a population.

The Heuristic Case Study

The problem description derives from an actual case of regional, inter-agency recreation planning in the Pacific Northwest, in which the benefits and difficulties of the cooperative approach to recreation service delivery are apparent. Details of the case provide background for defining the specific problems to be overcome in successful regional recreation planning.

The needs expressed by managers and researchers for system-wide information for regional planning continue to grow. One salient component of this information deficit pertains to a lack of knowledge about the barriers to regional recreation planning presented by the social relationships among recreation management agencies.. While a detailed analysis of the social relationships pertinent to explication of the Pacific Northwest case will be saved for a later chapter, aspects of the case that are relevant to tracing its course to the current problem definition are discussed here.

The recent planning effort in the Pacific Northwest viz., The Pacific Northwest Outdoor Recreation Study (NORS), provides a case study of a somewhat successful example of regional, inter-agency recreation planning. The details of this effort have been documented in several places (Hospodarsky et al. 1992; Hospodarsky 1991; Oregon State Parks and Recreation Department 1991; Hospodarsky and Eixenberger 1990; Johnson et al. 1989; Hospodarsky 1989a; Hospodarsky and Lee 1989a; Hospodarsky and Lee 1989b; Hospodarsky 1989b; Oregon State Parks and Recreation Division 1988; Hospodarsky 1988a; Hospodarsky 1988b;

Hospodarsky 1988c; Hospodarsky 1988d; Hospodarsky 1988e; Hospodarsky 1987; Hospodarsky 1986). Additionally, the research methods used in obtaining the data base for the NORS planning effort are presented in Chapter 4 of this dissertation, and portions of this same data base are used in Chapter 5 to describe recreation regions.

Perhaps the most pertinent aspect of the NORS is what resulted from the inter-agency cooperation, which seemingly might not have otherwise transpired without the collaboration. The unique results of cooperation among resource management agencies in regional recreation planning can be considered as they fall into two main categories viz., the quality of the information outputs available to planners and the potential for communication among recreation management agencies.

The Recreational Needs Bulletin of the Oregon State Comprehensive Outdoor Recreation Plan 1991 (Oregon State Parks and Recreation Department 1991) is an example of how information quality and the power of decision analyses were enhanced by the regional scale of planning data analysis used in NORS. Of particular interest is Chapter III of the Needs Bulletin, which is an assessment of need for certain recreation settings on USDA-Forest Service lands given estimates of future recreation opportunity supply and demand for recreation experiences on these lands. The analysis indicated that, under current forest plans, the NORS-projected consumption of semi-primitive opportunities on Forest Service lands in Oregon, as a whole, would significantly exceed supply by the year 2000; while, the supply of opportunities offering more developed kinds of recreation would be available far in excess of NORS-projected demand by the same year. That is, there would be unmet demand for an entire class of opportunity on Forest Service lands statewide, the absence of which would reduce the overall diversity of recreation opportunities and, consequently, recreation quality for the state as a whole.

The potential for enhanced communication among cooperating recreation management organizations within the region is a less tangible but no less important result of the NORS. Increased information exchange between organizations is vital to the enhanced efficacy of the planning effort overall, since the benefits of increases in the quality of information obtained through inter-agency cooperation are realized as the information affects the management decisions of the agencies involved. Information obtained as a cooperative effort as it was in the NORS, with the intention of maximizing its value to all collaborators, has the potential for producing results whose overall benefit to management decision making is greater than the sum of the individual organizations' contributions to information gathering (Hospodarsky 1988a). By way of illustration, a partial list of the applications which have been made of the NORS results is presented in Appendix A.

Dissertation Study Scope

The purpose of this study is to help managers and policy makers make judgments about the agencies and other organizational arrangements that better promote regional, cooperative recreation resource planning and management. The study clearly spans disciplines and the study products can be seen in a slightly different context from the different disciplines. For example, recreation managers likely will be interested in aspects that have implications for land management while sociologists likely will be interested in aspects that reveal the dynamics of social organizational processes. While the study finds its basis in the sociological theory of public organizations as causal variables, its distinctly applied orientation strives to produce theoretically sound management-relevant information as the end product.

The study also assumes a planning orientation in its premise that foreknowledge can be effectual in shaping the future of recreation

management activities and, thus, the quality of outdoor recreation opportunities that are consumed as a result. This planning orientation is made all the more relevant by a shift in the resource management paradigm that some have perceived as currently moving the locus of decision authority from the realm of the professional-managerial to the public decision making systems. During times of rapid change, a clear vision of the desired future and a plan for realizing that future become even more important to fulfilling the public resource management mandate.

Part of this changing management environment is the lessening of reliance on the reductionist approach to resource problem solving, commensurate with an increasing emphasis on more holistic conceptions of resource issues. With mounting evidence of failure of a technocratic paradigm in natural resource management, the intellectual path becomes clearer for more qualitative and interactive approaches to resolving resource issues. This previously less trodden path also is the one followed in this study.

The generally increasing use of qualitative models such as conceptual frameworks (Rovelstad 1987) is evidence of the aforementioned trend. Conceptual frameworks, in general, are simplified abstractions of reality; their main benefit to decision making is that they help reduce and organize available knowledge and information and therefore permit better focus on relevant facets of problems. At the same time, all conceptual frameworks are inherently limited in their usefulness by the ability of the user to correctly interpret results, limitations of the data with which the framework was constructed, and the framework's comprehensiveness in depicting real-world phenomena. With these limitations in mind, reliance upon a conceptual framework for regional recreation systems planning, as is advocated in this dissertation, should heed the caveat of Brown et al. (1973, p. 29) who maintain "... the logically consistent set of assumptions required of a rigorous

systems approach can only be formulated within the framework of a sound theoretical base."

The following three chapters describe the theoretical tenets of a conceptual framework on which these research objectives are based, and the methods and procedures used in gathering the empirical evidence used in the study. Subsequent chapters present the results of the analyses used to define the regional recreation resource system, identifying the functional recreation region of a population and the scope of public recreation management organizational arrangements operational within that region. The dissertation concludes with an attempt to integrate the theoretical and empirical findings into a conceptual framework for regional recreation planning, and a discussion of the implications of these findings for public recreation resource planning and management.

CHAPTER 2

THEORETICAL BACKGROUND AND ORIENTING CONCEPTS

In this chapter concepts of experienced-based recreation and the human ecological perspective are combined to lay the foundation for a conceptual framework for regional recreation planning. The purposes of this chapter are 1) to discuss the theory and concepts, demonstrating how they provide the basis of a conceptual framework for the study, and 2) to review the literature pertinent to this discussion. The next chapter, Chapter 3, continues to build upon this foundation by introducing elements of systems theory that provide structure to the ecological analysis and, thereby, the emerging framework. The purpose of Chapter 3 is to continue development of the conceptual framework for regional recreation planning by synthesizing the concepts introduced in Chapter 2, culminating in a demonstration in propositional form of how the concepts shape the framework.

Recreation as a Public Concern

Western society places high value on opportunities for quality outdoor recreation experiences. Recreation is defined by Driver and Tocher (1970) as a type of human experience based on intrinsically rewarding voluntary engagements during nonobligated time. This definition emphasizes the intrinsic rewards of activity participation, with recreation experiences coming as the realization of outcomes from participating in recreation activities (Brown 1983).

The social, psychological, and physical benefits of recreation experiences are so widely perceived and sought after that to say it is beneficial is mere tautology (Driver et al 1991: see also Kelly 1983a; Driver 1976; Kelly 1981). The recognition of recreation's benefits extends to those responsible for providing recreation opportunities from public lands, influencing management philosophies and activities. The

public land management paradigm has been shaped by issues of equity in access to opportunities, resource scarcity and needs for preservation, and efficiency in managing resources for public benefits that would be beyond the means of most individuals to secure on their own (Kelly 1982). And, to not some small extent, by the self-recognition that public resource stewards must perform a service or provide a product perceived as socially and politically desirable, if the social role of the resource manager is to remain viable (Gale 1985). The sensitivity of resource management agencies to this social role is perhaps at the root of apparent changes now taking place in the public land management paradigm.

With recreation institutionalized¹ by virtue of its perceived benefits to society (Kelly 1983b), the issues related to public recreation production concern ways to produce opportunities for recreation benefits in the most effective way possible. The pertinent questions of recreation planners and managers then become: What are the consequences of plans and activities? Who benefits? Who loses? And how much? (Driver et al. 1991). These types of questions are characteristic of a planning perspective to the recreation production process in which desired future conditions are the object of current decision making (Brown et al. 1973).

¹The term institution is plagued with ambiguity. The potential to add to existing ambiguity in this dissertation is great since it makes extensive use of the terms 'organization' or 'agency', which often have been used synonymously with 'institution' in the literature. For purposes here, institution is defined as vast complexes of norms established by society to deal in a regularized way with what are seen to be its fundamental needs (Cooley 1948). This definition is in keeping with Chinoy (1962) as he suggests the word institution should be used to refer only to patterns of approved or sanctioned behavior, and that other terms should be used to denote the organizational aspects of such behavior and the group of persons involved e.g., organization or agency. In this vein, institutional arrangements are defined to include both institutions and organizations as they both help define the environment of public recreation management. "However, maintaining a distinction between institutions, as rights, rules and incentives, and organizations, as formal structures, can provide valuable insights into resource management" (Gibbs 1986). It is the inclination of this dissertation to follow Gibbs' suggestion.

In the public resource decision-making environment, these questions can perhaps best be answered when the planning of recreation is viewed as a service (Zeithaml et al. 1990) which, along with relevant natural resources and the consumer population, comprise a recreation service system (Driver and Tocher 1970). Like health services or other social service systems, recreation provides vital inputs to the total social system. In the case of recreation, the inputs supplied to the total system are the recreation benefits to individuals and society, such as character formation and social integrity, respectively. It is the widespread conception of these benefits which has provided the impetus for the organization of social life to accommodate opportunities for recreation experiences as a normal part of living.

Experience-Based Recreation

A behavioral approach to recreation lends itself well to the social service model (Driver and Tocher 1970). The maturing concepts associated with experienced-based recreation are the most advanced of this genre. Briefly, the experienced-based approach to recreation planning and management represents a major departure from the activity-based approaches previously used (Manfredo et al. 1983). An experience-based approach suggests that the products of recreation planning and management are psychological experiences resulting from activity participation (Brown 1983). Experiences are the result of interaction among the particular activity, the social group in which the activity transpires, and the physical environment (Clark and Stankey 1979).

The approach draws heavily from Lawler's (1973) view of expectancy-valence theory, and concludes that the choice to participate in a recreation activity in a certain setting is done in an attempt to obtain desired experiences. The experienced-based approach has been influential in resource planning, management, and research during the past decade (see Lee 1991 for a comprehensive review).

The role of recreation planners and managers in the experienced-based approach is to provide recreationists - actual and potential - with opportunities to realize desired experiences. This role is facilitated by the definition of the desired recreation product as experiences, which allows what managers supply and recreationists demand to be measured in the same units (Driver and Brown 1978). Recreation opportunities are defined as the chance to participate in a specific activity, in a certain setting, to realize desired experiences. These opportunities are the services supplied by land managers in response to public demand for recreation experiences (Driver et al. 1987).

The experienced-based approach has developed from an applied orientation, with the aim to help address resource management problems. This orientation lends credence to the perspective that the provision of recreation opportunities on public lands is a production process. Several models of this process have been formulated (e.g., Driver and Rosenthal 1980; Brown 1984; Driver et al. 1991); the model by Brown (1984) is illustrative for purposes of this discussion.

In the production process depicted in Figure 1, the basic inputs are settings and management activities, which interact resulting in opportunities for activities and experiences, some or all of which are desired and consumed, resulting in experiences and benefits, possibly both positive and negative. Brown (1984) refers to management strategies modelled after this production process as experienced-based settings management.

True to the basic tenants of the experienced-based approach, planning and management activities can only alter the probability that specific types of experiences can be realized; they cannot provide recreation experiences per se. The creation of experiences is necessarily the function of recreationists' various personal and social resources combined with the opportunities supplied by land managers.

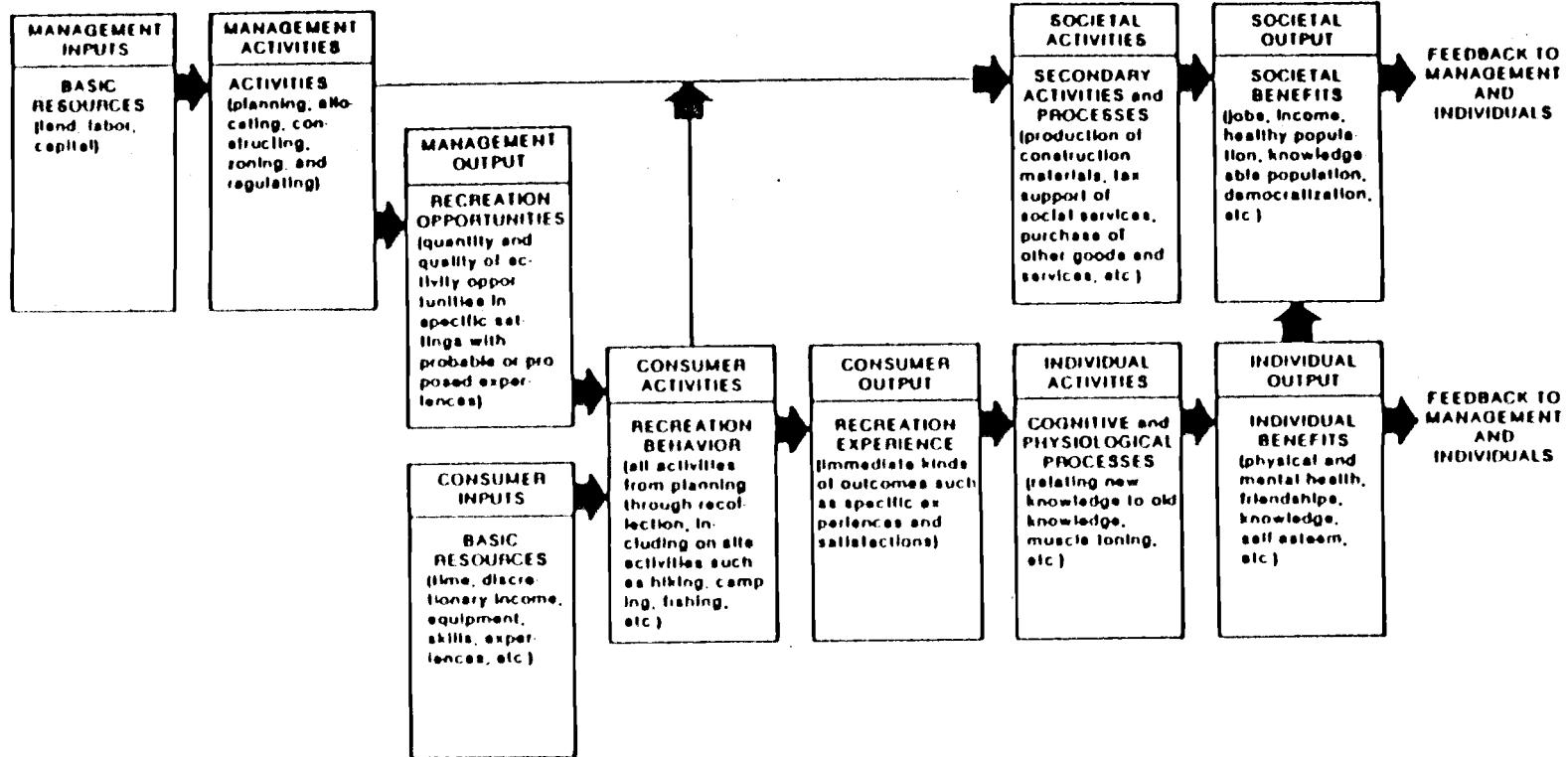


Figure 1. Overview process and subprocesses for producing outdoor recreation benefits. Reprinted with permission of the author, from Brown (1984).

These opportunities are the places supporting specific activities in specific settings having physical, social, and managerial attributes², such that there is a reasonable expectation certain experiences will be realized (Brown 1983). Klausner (1969) had made a similar observation. Burch (1988) likened this outdoor recreation system to a place or "stage" that is suited for certain activities preferred by individual actors.

Experienced-based settings management has been the conceptual impetus for the Recreation Opportunity Spectrum (ROS) recreation planning system. One of the main virtues of ROS is that it allows managers to inventory resources for the supply of opportunities available and to assess demand for the same units of opportunity (Lee 1991). The ROS system is currently used by land management agencies such as the U.S. Forest Service, Bureau of Land Management, and Oregon State Parks Department in the United States, and by public agencies in several foreign countries as well (Driver et al. 1987).

Thus, tools of the experience-based approach to recreation, such as ROS, have application to planning problems manifest at both the management and consumer (or supply and demand) levels of the recreation production process referenced in Brown's (1984) model. The management planning orientation assumed in this dissertation dictates a focus on the management planning activities affecting the supply of recreation opportunities to consumers. Because of the effect management activities have on the supply of goods and services produced, management activities also affect opportunity demand, since supply and demand are causally linked in theory and reality (Walsh 1986; Cordell et al. 1989).

Management-related variables, therefore, are appropriately considered among the independent variables of recreation demand. While

²These attributes of the physical resource, which have been called the 'tangibles' of service quality by Zeithaml et al. (1990), were found to be also the primary determinants of recreation service quality as perceived by service consumers (Hamilton et al. 1991).

the causal strength of these variables remains open to question they, nonetheless, may be assumed to have a substantial influence on recreation behavior. Brown (1981), in a book on diffusion of innovation suggests that individual behavior in general does not represent free will, but rather choices constrained by government agencies and private organizations which establish and control the constraints. A research corollary of this view, according to L. Brown (1981), is that considerable variance in many social science phenomena can be explained by looking at organizational, in addition to individual, behavior.

Achieving Experience-Based Management Goals

According to Ellis and Rademacher (1986), recreation opportunity demand is comprised of actual recreation participants (manifest or expressed demand) and those who would like to participate but do not (latent demand). A central challenge to land managers thus becomes "identifying and eliminating the barriers which preclude participation of members of the latent demand group" (Ellis and Rademacher 1986, p. Motivations-34), while servicing the demand that is currently expressed. A barrier to recreation participation is defined as "any factor which precludes or limits an individual's frequency, intensity, duration, or quality of participation in recreation activities" (p. Motivations-30, emphasis added).

While not mentioned specifically in Ellis and Rademacher's (1986) comprehensive literature review of demand barriers, a central thesis of this dissertation is that the policies and practices of public resource management present barriers, intentionally or unintentionally, to part of the recreation public. These management factors impact most directly the availability of recreation resources as they present barriers of distance, either actual or perceived, between recreationists and opportunities (Jackson 1983; Witt and Goodale 1981). These impacts affect the quality of recreation experiences despite the fact that

quality may, in many instances, be more the result of recreationists' choices and how they use the resources already available to them (Brown 1989).

It is the contention of the thesis developed here that the effects of management factors upon the quality of individuals' recreation experiences are additive within populations. When population aggregates of individuals are considered, the net effect of the barriers posed by management is to reduce the overall quality of recreation for the recreating public by not affording opportunities for individuals to shift their expression of demand from latent to manifest. The proposition being that quality in recreation depends upon how effectively a broad spectrum of desired outcomes are achieved. Under the premise of the present thesis, what Wagar (1966) said about individual perceptions of quality are equally valid for the population of individuals viz., if the recreation opportunities provided are not adequate to fulfill desires, quality must be less than optimum and perhaps declining.

The proposition linking recreation quality and diversity stems from a fundamental philosophy of recreation as a service function, in which quality implies an evaluative component associated with management activities to meet social needs. The task of the manager is to deliver quality recreation opportunities. But, little more is known about this function than quality in experience depends upon how well what is desired is reflected in what is obtained (Brown 1989). From the applied perspective of the manager, this means that while providing recreation opportunities is only one input to quality recreation experiences, they are a factor that managers control and which influence recreation experiences.

Quality is affected by management to the extent management is effective in producing information and opportunities vital to realization of desired recreation experiences (Wagar 1966). Several

researchers have concluded that the recreational needs of a diverse public are better met when managers provide a variety of recreation opportunities (J.V.K. Wagar 1951; J.A. Wagar 1966; Burch 1964; Tocher et al. 1965). Which is to say, quality in the aggregate recreation experience corresponds, positively, to diversity in recreation opportunities; while, individually it helps people get what they want.

Thus, recreation quality can be thought of as a composite measure of how effectively demand for diverse activities, settings, experiences, and benefits are fulfilled across a population. Recreation managers supply settings - physical, social, and managerial - for recreation opportunities and experiences. Within this system of people, places, and their interaction, ROS represents a human ecological framework for answering questions about how recreation opportunities can be provided which enable people to obtain quality recreation experiences (Brown 1989).

The ROS framework has several features that lend themselves to the effective delivery of quality recreation opportunities (Brown 1989). First, it provides a framework for identifying and defining recreation opportunities. Second, it requires specifying the conditions necessary for various opportunities to be provided. Third, it helps guide allocation and management decisions, and is a metric for evaluation of those decisions. Recreation opportunities are an output of management activities and an input to the production of recreation experiences. Clearly defining salient aspects of different opportunities in the course of providing a variety of opportunities enables delivery of the diversity of opportunities, which match the desires of different recreationists. With a suitably diverse repertoire of opportunities available, managers can feel more confident that those looking to participate have at least one necessary ingredient for producing quality recreation experiences, albeit one of only two they control (Brown 1989), along with information about opportunities.

Despite the usefulness of ROS to enhancing recreation quality, the difficulty remains how managers can know if recreation quality improvement can happen or is happening as a result of their activities? An analysis comparing the supply and demand effects of production within the same model is clearly indicated. However, the question regarding appropriate criteria with which to evaluate quality of the overall recreation product remains. Dunn (1981) provides some guidance in this regard with descriptions of criteria for policy recommendations. Among these descriptions the effectiveness criterion under conditions of adequacy seems appropriate for our specified use since it is program outcome oriented with performance evaluated on the basis of value-grounded criteria. "Effectiveness refers to whether a given alternative results in the achievement of a valued outcome (effect) of action, that is, an objective" (p. 232). While, "(A)dequacy refers to the extent to which any given level of effectiveness satisfies the needs, values, or opportunities that give rise to a problem" (p. 232). One level of adequacy is described as efficient: plans that achieve the maximum effectiveness at least cost are said to be efficient, which is the most resource managers can perhaps hope to attain.

According to Dunn's classification scheme for defining the types of adequacy relevant to efficiency problems, evaluating the quality of recreation service delivery is representative of a category of problems involving fixed costs and variable effectiveness; fixed costs are represented by maximum allowable budgetary expenditures (e.g., by the resource management agency) and the aim is to maximize recreation quality (e.g., through opportunity diversification) within available budgetary limits. The most effective recreation plan in this circumstance might be one that maximizes the attainment of the diversity-quality objective while remaining within the bounds of fixed cost constraints i.e., is the most efficient (Dunn 1981). Such a

strategy should recognize, however, that diversity is a necessary but not sufficient indicator of quality in the system.

With some criteria thusly defined with which to evaluate the effectiveness of the recreation delivery system, the immediate task is to adopt a strategy by which we come to know which aspects of the system are effective in achieving the quality-diversity objective, and which are not. This strategy should heed the reminder of Driver et al. (1987) that because there exists a diversity of preferences for recreation experiences, managers cannot rely upon a standardized set of activities or development plans. A recreation supply and demand analysis is helpful for evaluating delivery system effectiveness, when used in conjunction with the efficiency criterion for quality delivery effectiveness.

The quality of public recreation can be efficiently enhanced if some portion of recreation demand can be shifted from that which is latent to that which is expressed as participation, while not exceeding the fixed cost constraints of agency budgets, the capability of resources to produce opportunities, or abandoning the opportunity needs of the current clientele. An argument has been made here that an obstacle to that shift may be a lack of diversity of recreation opportunities available to meet the diverse desires of the population. Since public resource management agencies are in the business of supplying opportunities for consumers to benefit from recreation experiences, it follows that the planning and management activities of these agencies affect recreation quality to the extent they effectively increase or decrease opportunity diversity and, ultimately, the benefits delivered.³

³The definition of benefits used here is that offered by Driver et al. (1991, p. 4) as it refers to benefits as nonmonetary or a generally improved condition, in contrast to its economic definition as economic gain. The definition preferred in the present discussion stems from common dictionary usage in which benefit refers to change that is viewed to be advantageous—an improvement of condition or a gain to an individual, group, society, or to another entity."

Increasing Recreation Benefits

Individuals participate in recreation activities that provide them with benefits after personally relevant costs have been considered. Benefits analysis can be concerned with both total and marginal benefits (Walsh 1986), of which the latter are most pertinent to this discussion.⁴ Total benefit is a measure of the utility consumers obtain from recreation experiences; the higher the total benefit, the better off the consumer vis-a-vis the cost incurred. In order to consider which recreation consumption decisions most effectively promote total benefit, however, we must consider the concept of marginal benefit.

Marginal benefit is the additional benefit to consumers from obtaining one more unit of recreation goods or services. In a serial listing of total benefits accruing to consumers, marginal benefit is the difference between two successive total benefit figures (Walsh 1986). According to the tenets of diminishing marginal utility, marginal benefit decreases with each successive unit of recreation opportunity consumed by an individual, other things being equal (e.g., variations in site quality, sanitary conditions, insect populations, weather and crowding). The resulting economic rule of recreation behavior stipulates that consumers should seek opportunities (activities and settings) whose marginal benefits exceed costs, and avoid those whose marginal benefits are less than the costs of participation. Other things being equal, recreationists should continue to consume opportunities until cost and marginal benefits are equal, because this quantity maximizes the net benefits from participation (Walsh 1986). From the supply perspective of management, on the other hand, a

⁴While the first part of this discussion on assessing recreation benefits is couched in terms of total and marginal benefits accruing to individuals, total and marginal benefits are often calculated for entire markets on the assumption that benefits are additive across a population of individuals (Johnson, personal communication). The latter part of this discussion rests upon this assumption.

defensible course might be to increase the diversity of opportunities within the population's regional resource area to the point where the added costs of producing recreational opportunities equal the added benefits provided to consumers.

A key phrase in the preceding discussion is "other things being equal" as it has important implications for recreation quality enhancement within a planning environment. One way in which to increase the marginal utility of recreation opportunities is to increase quality through the enhancement of diversity. Under conditions of latent demand, increasing the diversity of recreation settings within the population's accessible resource area effectively increases the supply of total benefits potentially faster than the costs of obtaining them. The effect on the downward-sloping aggregate demand curve, between marginal direct cost and the quantity demanded (see Walsh 1986, p. 121), would be to shift the curve outward, resulting in consumption of a larger overall quantity of more diverse opportunities by the population. If this were achieved by agency providers within budgetary limits, it could be claimed that the effectiveness of the recreation service delivery system had been enhanced through increased efficiency of operation.

Increases in effective recreation supply through management activities that diversify opportunities, serve to fulfill both expressed and latent demand, thereby increasing the quantity and quality of recreation for a population of individuals. Effective supply is distinguished from total or absolute supply by a factor measured in terms of distance - either perceptual distance in the form of information proficiency (More 1976) or physical distance in the form of transportation capability (Cordell et al. 1990) - between the location of relevant opportunities and the location of people.

Physical distance is measured in terms of the time it takes to travel to a given destination. Travel patterns in two directions define

a geographic region that can be managed within specific segments of time (Hawley 1986). Social phenomena are necessarily manifest in spatially-based systems because social phenomena occur in a time-space universe (Hawley 1984). Distance serves to effectively reduce potential supply to some lesser level based on its practical availability to the population as a function of communication and transportation capability.

Since, as a service, outdoor recreation production can only occur simultaneously with consumption (Hawkes 1992), and consumption occurs in natural settings that are fixed in space, most recreation sites are located relatively close to users. Consequently, few outdoor recreation sites can be managed more efficiently by merely capturing the economies of scale to be had by producing for multiple geographic markets, as physical product manufacturers might do (Walsh 1986). Unlike many modern service industries, outdoor recreation is still tied to and dependent upon proximity to the natural resource base. This fact encourages and results in regional demarcations of activity patterns.

Thus, there are several reasons why discrepancies between recreation supply and demand can exist and persist. Given the complexities of the recreation service delivery system, it would be indeed noteworthy if levels of supply and demand always coincided in space and time. With regard to recreation supply - the factors of recreation production controlled by managers - it will always be separated from consumers. In general, the production of outdoor recreation opportunities is land intensive and, as a consequence, occurs on less valuable land outside metropolitan boundaries (Hawley 1950). Currently, only about three percent of public recreation lands are within a one hour drive of 70 percent of the United States population (Cordell et al. 1988). This means that travel in order to reach recreation opportunities will continue in some form into a future that may even include routine creation of virtual reality right in our own homes.

Outdoor Recreation as a Regional Phenomenon

During the course of normal periodic recreation activities, most recreationists must travel because of the separation between supply factors and the loci of recreation demand. Travel is an integral part of the recreation experience (Clawson and Knetsch 1966); although the popularity of travel as a research topic has perhaps resulted from a rather arbitrary specification of travel distances in an effort to distinguish tourism from other recreation travel (Murphy 1985).

The often made distinction between recreation travel and tourism is only meaningful to the extent it helps to delimit the geographic resource area containing a potentially adequate supply of recreation opportunities to service some population unit (O'Rourke 1974) - adequate in terms of quantity and quality. The supply within an area need only be potentially adequate (Burch 1988), recognizing that the delivery system supplied by management has the potential to enlarge effective supply through its activities (Murphy 1985). The question then becomes one of where to draw the boundaries of the recreation resource region that is adequate to the needs of the population in the form of opportunity diversity and the planning issue at hand viz., improving the quality of recreation delivery from public lands. In order to provide an acceptable answer we must go well beyond McDonough's (1980) general observation that if a large enough area is considered, adequate diversity is more likely to exist.

The modern facility and inclination to travel has led to a regionalization of human activity, as it has expanded beyond the home community (Warren 1963). This process of regionalization includes the bounding of recreational activity as well. The spatial dimension of recreation must be considered as part of any attempt to improve the effectiveness of recreation delivery (Smith 1989), including that from public lands. The conceptualization implied is that of a regional

recreation resource system. This concept has been operationalized at varying levels of planning and management specificity by Lucas (1964) and Wagar (1966) in general terms; Clark and Downing (1985) and Clark and Brown (1990) as recreation home range; by Smith (1989; 1984) as functional resource area; by Cordell et al. (1989) as an effective opportunity area; by Gunn (1979; 1972) as the community attraction complex; and by Murphy (1985) as a community ecological complex. Of these, Smith's functional resource area concept and associated analytic methods appear especially well suited for the regional recreation system analyses required for regional planning applications.

Like regional economic input-output analyses, which are complex and difficult to delineate geographically, yet are popular because they provide a comprehensive picture of a functional economic region (Miernyk 1965), regional recreation analysis offers the same kinds of benefits and difficulties.⁵ Among these difficulties is what Mayo (1964) suggests is a reticence to adopt a comprehensive area approach, despite its recognized need in resource development because of deep attachment to political and administrative boundaries. These attachments which often end up outweighing possibilities and capabilities can be traced to the various social institutions which ultimately determine how recreation is made available within society (Manion and Flowerdew 1982). The rules defining these institutions provide clues for resolving problems associated with the delineation of recreation systems. Gale (1982) suggests institutional analysis - analysis of social norms and values as expressed in policy, and the social organization that has arisen to give them expression within the natural environment - is appropriate to making decisions about spatial partitioning as it frames

⁵Isard(1975, p. 1) defines region as "an area which is meaningful because of one or more problems associated with it which we want to examine and solve." Also, according to Smith (1976, p. 4) regions are functionally defined "systems of any scale that occupy space, exploit resources, and interact with one another and the environment in patterned ways."

questions about the social milieu governing the boundaries, structure, and function of regional systems.

Considering quality recreation opportunities as a product of regional resource system processes requires expanding the concern for supplying opportunities to individuals and groups to include concern for supplying opportunities for the population of a supraregional area. This implies that recreation resources also be considered as they contribute to population demand as a whole, irrespective of ownership. All the recreation resources within a given land area are functionally related to each other through use and the management structures that support them (Hart 1966). Machlis (1986) concurs stressing the need to explicitly consider regional aspects of recreation systems in order to comprehensively consider the interactive effects of use and management activities.

Within a population's use area there are often numerous agencies with responsibility for providing recreation opportunities, but the specific ownership of resources is only relevant to consumers as it affects availability, resulting from variation in management policy. With most of the United States population living in urban areas, decision making authority over the resources used by these populations is also concentrated within cities. Thus, according to Christaller (1963), many authors view regional recreation as involving metropolitan demands being met by peripherally located supply, which leads him to suggest the core-periphery concept is useful in recreation studies.

Considering a population as the planning and management unit, therefore, requires an expanded spatial-regional approach. This perspective also requires enhancement of institutional capacities, including development of mechanisms enabling inter-agency communication and cooperation, which is at the administrative heart of regional systems planning (Gilbert 1988). Murphy (1985) proposes a human

ecological systems model as being well suited for the analysis of recreation travel on a regional scale.

The Ecological Context of Outdoor Recreation

The inherent complexity of regional recreation phenomena implies that the contextual relationships of recreation behavior and environment be considered as a whole in planning for outdoor recreation. The human ecological perspective to be discussed in this chapter is contextually holistic in its consideration of social, cultural, and biophysical environmental variables bearing upon recreation behavior. This effort to gain a more comprehensive and meaningful understanding of regional recreation is extended by defining a human ecological perspective and applying it in the next chapter within a systems framework to regional recreation resource systems for purposes of planning and management. The application of human ecological and systems thinking to recreation research is in keeping with what has been characterized by a steady increase in the number of variables and interrelationships under study (Machlis et al 1981), and the number of theoretical perspectives used to relate variables to recreation phenomena (Manning 1986).

The effort is facilitated by human ecology's innately comparative approach. This approach assumes that universal principles can be found with which to make predictions about the consequences of certain human organizational patterns of behavior (Hawley 1986), in this case recreation. The human ecological approach also takes an historical perspective, recognizing that the current status of social conditions is the cumulative result of all that has transpired before. Human ecological analysis, therefore, relies upon historiographic methods in order to explain current social phenomena.

The Human Ecological Perspective

The comprehensive theoretical approach that the human ecological perspective provides to the study of regional recreation is essential if it is to be successfully planned and managed as systems to improve recreation quality. A brief discussion of the origins and basic tenets of the human ecological perspective relative to outdoor recreation systems is presented toward this end.

Bruhn (1974) provides a comprehensive account of the origins of human ecology from within general plant and animal ecology, sociology, and anthropology; therefore, only some of the most notable historical milestones will be reviewed here as a guide to provenance. Early work in plant and animal ecology beginning around the turn of the century was soon followed by the application of ecological principles to the intricacies of human social existence. By the mid-1930s, two major treatises in human ecology had been prepared, one by McKenzie (1926) and one by Park (1936). In 1950, Hawley's influential work in the field Human Ecology: A Theory Of Community Structure was published giving structure to human ecology's basic tenets. Building upon Hawley's continuing work, Duncan (1964) refined some basic concepts including definition of human ecology's key tenets. Firey (1947) and Bennett (1976; 1974) pursued a distinctly anthropological version with their explicit reliance on culture as an explanatory variable.

It is axiomatic yet pertinent for Hawley (1986, p. 3) to remind us that "human life is lived on the ground and is all mixed up with soil, tools, food, raw materials, buildings, and other material externalities. A social system is reared upon these profane foundations and it is never dissociated from them." It shapes and in turn is shaped by the natural environment (Vayda and Rappaport 1976). These statements reverberate with the tenor of what Catton and Dunlap (1980) term a new ecological world view of the human species as ecologically interdependent with the natural world---new to Western thought at least. As such, humans may be

understood best from within the same paradigmic perspective using the human ecosystem as its basic unit of analysis (Machlis 1986). For the problems of recreation resource management to be addressed in this study, the consideration of human ecosystems at the level of resource assessment, planning, management actions and monitoring is essential for coherent, comprehensive, and responsive management regimes (Burch 1988).

The ecology of humans is perhaps most complex of all species due, in large part, to complexities of culture and social organization not observed in other species groups, and which arise in addition to basic life strategies shared with other species (Bennett 1976). Much of the complex organization of human life is the result of species-specific methods to fulfill the universal need to capture sustenance from available natural resources (Hawley 1984). Humans organize as a system of interrelated social relationships, which allow a population of individuals to act as a single unit to obtain necessary sustenance through the process of adaptation to its environment (Hawley 1986).⁶ Construed as a unitary adaptive mechanism, the entire system - a population adapting through its organization and culture to its environment - functions as a producer of sustenance for its own maintenance (Hawley 1986).

Certain parts of the system function directly to produce life-essential needs such as farms producing food and textile factories producing clothing. Other parts of the system play an indirect role in their support of direct sustenance activities, but without which the

⁶Hawley (1986, p. 18) defines population in the context of human ecology when he states the "aggregate with which human ecology deals is a population of environmentally oriented, necessarily dependent, time-bound, compulsively expansive, and very adaptive individuals." Vayda and Rappaport (1976, p. 22) describe populations as "groups of organisms living within a given area and belonging to the same species or variety, communities (all populations within a given area), and ecosystems (either individual organisms, populations, or communities, together with their non-living environments). Hawley (1986) suggests the term can be applied to residents of any territorial subdivision, but the smaller the subdivision the closer is the aggregate to being the size that is capable of acting cooperatively in an organized response to the environment; a trait he sees is crucial to population survival.

functions of system elements engaged in direct activities would eventually cease. Examples of indirect elements of sustenance production are the household, governmental, educational, health, religious, and recreational institutions (Hawley 1986).

While both direct and indirect support of system production may be indispensable to system maintenance, Levy (1952) points out that a single functional requisite may be met in numerous ways.⁷ By the mid-1950s, for example, Meyer and Brightbill (1956) had noted that recreation was declining as a major role of the family-household. For some time, it has been recognized that the family-household was being replaced by commercial recreation functionaries (Bertrand 1964), a process that is far advanced and seems to continue to this day. Poplin (1979) also describes system elements from a functionalist perspective, focusing on the consequences of the respective elements' activities on each other. These types of subsystem interrelationships are described by Homans (1950) as an "external pattern" of organization that allows the group to survive in its environment. Parsons (1951) suggests the religious system, or any other, is intimately interwoven throughout the fabric of society, influencing and being influenced by all other major institutions. There seems no reason to exclude recreation systems from this consideration.

⁷In employing the human ecological systems perspective, we follow the assumption of Rose (1976, p. 41) when he states "the social system can be analyzed as having parts, which are integrated by virtue of some relationship among the parts and the whole system. Variability in one part is a function of variability in other parts. The maintenance of the whole system is a function of the operation of the parts; the social system cannot survive unless its various vital functions are effectively performed by its various parts." Thus, by the term function is meant the contribution a unit of social organization makes to the larger system of which it is a part. Hawley (1986) describes a function as any repetitive activity that provokes other repetitive activities. As an example, it might be said the functional consequence of the operation of the recreation resource system is the extent to which the system supplies an adequate diversity of opportunities for benefits.

The Adaptive Origins of Social Organizational Forms

The central issue of human ecology concerns the social organizational forms that arise as human populations adapt to their environment in order to gain sustenance from it (Field et al. 1985). Human ecologists focus on the role of human beings operating organizationally to change or maintain their environment (Manion and Flowerdew 1982). They have avoided classical institutional analyses, however, choosing rather to focus their research on changes in the organization of these sustenance activities (Siegel 1984). A very few studies have used human ecology as a basis to identify the characteristics of organization which determine the kinds of responses that are possible. A rare example is the work by Gramann and Andereck (1988) who used ecological analysis to predict adaptation of organizations in response to exogenous policy changes.

The human ecosystem framework is conceptualized as a dynamic and open system that addresses how social organization is shaped and shapes its physical environment (Bidwell and Kasarda 1985). Hawley (1944) suggests the adjustment of humans to habitat is best conceptualized as a process of community development involving social organization for planning and action at the population aggregate or community level. Community structure consists of those mechanisms by which a population organizes itself for survival in a particular habitat. Among these mechanisms is the organizational structure of the recreation delivery system that is appropriate to the needs and characteristics of the community in question. The rationale to apply human ecological analysis to recreation service delivery is conceptually similar to that used by Hawley (1944) in his analysis of urban service institutions.

The community planning and development activities of the type described by Hawley are goal directed and, therefore, according to van Willigen (1986, p. 97) constrained by community values relevant within the existing culture. The addition of culture as an explicit adaptive

factor influencing human social organization helps to account for observed variations in the organizational forms of culturally diverse populations evolved in similar natural environments (Bennett 1976; Palinkas et al. 1985).

Conceptually, human ecology is concerned with population - its size, distribution, and demographic configuration, as it combines with essential system inputs like soil, air, and water, by assuming various social relationships. Attempting to trace theoretical developments in rural sociology, Field and Burch (1991) represent the key definitional components of human ecological systems by modelling the relationships between human populations and pertinent components of their environment, which are defined as natural resources, as a function of the social environment.⁸ Their model is useful at a general level for framing resource management problems, including those associated with outdoor recreation service delivery.

In Field and Burch's (1991) interpretation, the social environment is conceptualized as a sub-system comprised of culture, interacting with the bio-physical environment to create a distinctive community organizational form, which intervenes the population adaptation process in the population's exploitation of natural resources (Figure 2). Bonnicksen and Lee (1982) and Hawley (1986) point out that the adaptive interaction between environment and social organization is reciprocal in its effect, since social organization is altered to respond to an environment which the organization itself has created. Although outdoor recreation is not explicitly defined as a resource output within the Field and Burch (1991) model, the discussion heretofore suggests recreation qualifies as a socially defined natural resource use and a sustenance function of social organization. Later, discussion of these ecological characteristics of recreation in the context of systems

⁸Hawley (1984) also suggests the 'environment' of modern society is actually two, but inseparable segments composed of social and physical components.

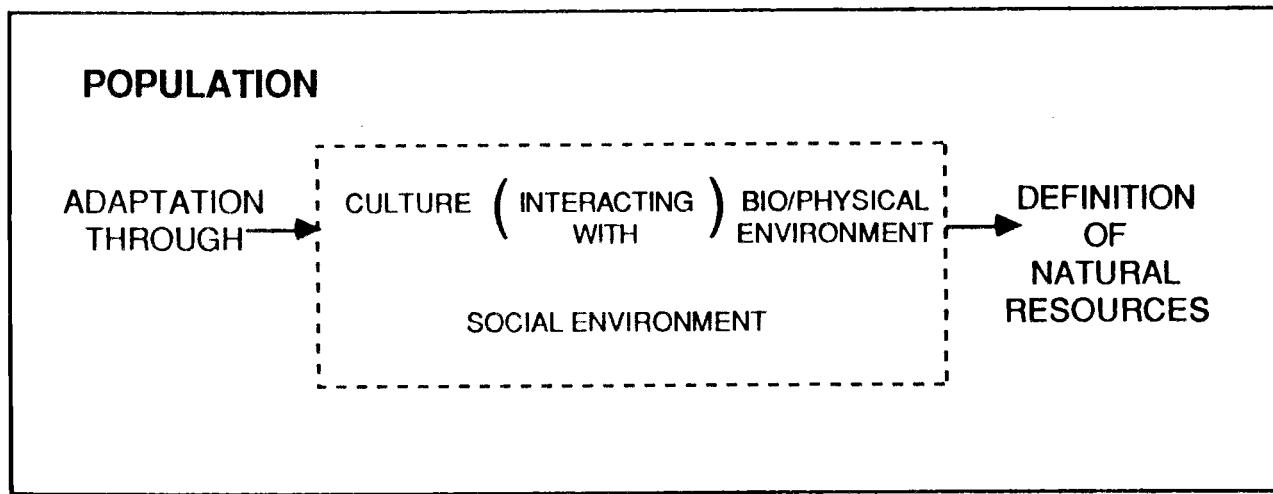


Figure 2. Definitional components of a human/natural resource system. Reprinted with permission of the authors, from Field and Burch (1991).

theory will complete the definition of recreation resource systems used in this study.

The role of cultural values in defining resources has been an important construct in the human ecological-based research by Field and Burch (e.g., see Field et al. 1985; Field et al. 1974; Burch and Cheek 1974; Cheek and Burch 1976). Field and Burch's conceptualization of the human ecological system is largely structural; information and transportation are implicit as functional links connecting system structures. Information, resulting from the perception of resources, is a principal link. Resource definitions cannot be separated from those who hold them; for example, water has value as power generation and as fish habitat only for those claiming them for either use (Bonnicksen and Lee 1982).

The Field and Burch model borrows from anthropological theory to explicitly include culture as a uniquely human and influential force shaping the adaptation process of how natural resources are defined and exploited. One genealogy of this population view of human adaptation as value-influenced choice can be traced to Bennett (1976, p. 3), who places "(T)he rational or purposive manipulation of the social and natural environments..." by humans at the heart of a human ecology "... that concerns itself with the question of what people want and how they go about getting it, and what effects this has on themselves and Nature."

The human ecological context of outdoor recreation as a specific resource use has been explored directly by several writers. A human ecology framework was utilized by Murphy (1985) in analyzing recreation at the community level. Also pre-dating the work of Field and Burch (1991), Machlis et al (1981) and Machlis (1986) wrote specifically about recreation within the context of the human ecological model. A commonality among studies using a human ecology framework in the analysis of recreation issues is their attempt to deal holistically with

the social organization that arises around the human-natural resource relationship, and which is a basis of outdoor recreation experiences. The fundamental theoretical proposition of this line of inquiry is that there is a discernable, systematic relationship between the social organization of outdoor recreation within a geographic area and the recreation behaviors that happen there; where, social organization is the result of adaptation of population to the biophysical environment. Analytically, the problem for human ecological analysis is to explain these types of adaptive variations (Micklin 1984). Such an explanation is necessary in order to answer questions regarding requisite conditions of adaptive change, the comparative adaptive ability of ecological units, and available adaptive strategies and their consequences for the unit and the larger system (Machlis et al. 1981).

This research perspective has its theoretical bases in the human ecology paradigm espoused by Amos Hawley, and in social systems theory to be discussed in Chapter 3. Hawley (1984) outlines human ecology as a paradigm in five parts. First, since human life requires the sustenance of natural resources, and these resources have location in time and space, the social system dependent upon these resources must share these dimensions. As a result, social phenomena are circumscribed within geographically based systems.

Second, adaptation by a population to its environment proceeds through the development of interdependencies among population members in the form of a social system. Bennett (1976) and Duncan and Schnore (1959) also suggest adaptation is a coping activity engaged in by a population of individuals. The adaptive form of population to its environment is not solely caused by environment in a deterministic way. Instead, behavior is the result of the interaction between organization and environment (Hawley 1984).

Third, the adaptation process moves the system irreversibly and cumulatively to the maximum size and complexity afforded by the

transportation and communication technology of the population. System development always resumes with the acquisition of information that increases capacity for the movement of materials, people, and other information, and ceases only when the enlarged capacity is exhausted. Even at this point, stability is not the normal state of organization, since organizational structure continues to respond to environmental inputs as closely interrelated parts of the human ecosystem (Bidwell and Kasarda 1985).

Fourth, it is in the relationship between social circumstances and environment that determines the organizing principle of the system. The system organizing principle has three main aspects (Hawley 1984): 1) A system begins to appear with the emergence of specialization in mediating the environmental relationship; 2) the function specialized in obtaining environmental inputs sets the main conditions under which all lesser functions operate, that is it is has a dominant position within the system by virtue of the key function it serves;⁹ and 3) other system functions are empowered in accordance with their degrees of removal from direct generation of environmental inputs, and the amount of control over system processes varies directly with position in the functional hierarchy (see also Manion and Flowerdew 1982, p.43).

Fifth, as a collective achievement of adaptation, a system cannot be explained solely in terms of the processes of its parts. Therefore,

⁹Hawley (1986, p. 332) defines key function as "that which makes a contribution to aggregate organizational productivity that is large in relation to its size." Bidwell and Kasarda (1985, p. 166) suggest the "key functional standing of a subunit is measured by a ratio of proportions: its proportional contribution (observed or assumed) to total organizational productivity divided by the proportion of the subunits total membership that belongs to the unit." Here, the term "unit" refers to the organization and "subunit" to functional organizational subdivisions e.g., a recreation department within a city's administrative structure. "Key functions of units come to center on the coordination of production activities, of exchanges with resource suppliers in the external environment, and of exchanges with consumers (Bidwell and Kasarda 1985, p. 167). Hawley (1986,) suggests the main criterion for locating key functions is the directness of a subunits contact with the external environment. Since a subunit usually acquires key function status as it mediates the environmental relationships of other subunits.

human ecology is concerned with holistic, macro-level analyses of system structures and their functional interrelationships.

Elements of Hawley's paradigm are evident in Duncan's (1964) description of the essential conditions of human ecology viz., the interaction of population, social organization, and technology in response to a set of environmental conditions. For example, improved communication and transportation technology enabling expansion of recreation ranges (resulting in); intensified exploitation of environment (resulting in); expansion of the recreating population (resulting in); development of an inter-jurisdictional resource management organization. To be more specific, ecological expansion of the human ecosystem through improved transportation to recreation places will result in development of organizational functions to facilitate access, such as interagency, regional management (Kasarda 1972). Among these variables interaction is the key concept. Hawley (1950, p. 72) also stresses the centrality of the interaction concept to human ecology which he maintains "fastens its attention upon the human interdependencies that develop in the action and reaction of a population to its habitat." This is to say, interaction is the dynamic mechanism of adaptation.

The goal-oriented system of social relationships is the only mechanism of adaptation available to human beings, since species adaptation to environment is a population rather than an individual problem (Hawley 1986). All human effort may be viewed as collectively directed toward adaptation (Hawley 1986). Adaptation involves doing something organizationally with the aim of improving a particular social unit's (e.g., an organization or association's) functional standing within the system. Adaptation, in this context, involves altering the flow of information, energy, and materials by units to improve the population-environment balance for the system as a whole. Thus, adaptation is a function of social units rather than individual actors

(Siegel 1984). Units are rewarded by the total system by receiving vital inputs to the extent that units contribute to the overall system upon which they are dependent. Thus, the units external environment is an institutional environment as institutional values affect various units' internal events and external relationships (Bidwell and Kasarda 1985).

In separate but similar frameworks proposed by Poplin (1979) and Mitchell 1979) for analyzing social structure , roles and statuses combine with other roles and statuses to form organizations and associations, organizations and associations combine with other organizations and associations to form institutions, and institutions combine with other institutions resulting in communities and societies. At the community level of social organization both of these frameworks end but they could be logically extended to consider suprcommunity or regional organization by using Warren's (1972) conceptualization of inter-community linkages between systems (viz., the organizational entities of particular institutions) within one community and those in another. Hawley (1986) refers to such social arrangements as networks that arise around essential system functions.

Organizational Networks in Recreation Management

The concept of functional networks is at the theoretical core of this dissertation whose goal is to better understand how we might more effectively plan and manage regional recreation resource systems. Evidence has already been presented to suggest that recreation is a sustenance function of the societal system. Characteristically, around such necessary functions symbiotic modes of relationship develop among organizational units in the form of organizations and associations, which are specialized in various degrees to support, say, the recreation function (Hawley 1986). While these organizations contribute instrumentally to the function of the social network, it should not be

assumed that their instrumental nature necessarily entails a unit-wide output goal (Bidwell and Kasarda 1985; Mitchell 1979). The interaction of these supporting units may be conceptualized as forming the recreation service network whose combined function is to make available opportunities for recreation benefits to society (Driver and Tocher 1970). Networks form, in general, because many of the units cannot exist in isolation from other units that have complementary goals, functions, and purposes (Poplin 1979). The interaction of organizational networks and their composite units is necessary but not sufficient cause for the social system to exist (Loomis 1960).

The identification of candidate units comprising a recreation network may be aided heuristically by citing Hawley's example of a health services network comprised of social organizations of hospitals, doctors' and dentists' offices, pharmacies, drug manufacturers, testing laboratories, medical schools, and professional associations. In a parallel elaboration the units comprising the recreation service network might include public recreation land management agencies along with their recreation lands and facilities, private recreation providers, equipment manufacturers, wholesalers, and retailers, recreation clubs and associations, university recreation programs, and professional organizations.

Laws and governmental administrative policies regulate the network units, and frequent interactions among units produce a store of understandings, agreements, and practices. These norms of network behavior, along with the organizational units themselves, may be conceptualized as similar to the recreation social environment in the Field and Burch (1991) human ecological model, the organizational principles in Murphy's (9185) community tourism system model, the structural or intervening variables in the Palinkas et al (1985) social systems model, the social organization and human population variables in

Machlis' (1986) parks ecology model, and the cultural and organizational features of the Burch (1988) human ecological systems model.

Whatever the rubric, Hawley (1986) is pertinent as he points out that network structures are loosely integrated¹⁰ by virtue of the participation of member units in more than one network. As examples, transportation and communication services and government regulatory bureaus are active in nearly all the network subsystems comprising the community system, including recreation. Units, situated as they are within network sectors, can be distinguished from one another according to the primacy of their outputs to the network in which they are located, and to other networks as well (Bidwell and Kasarda 1985). Hawley (1986) refers to this type of relationship in terms of a unit's key function. The shared allegiance of units also means a particular network is competing with other networks for shares of the total system's resources. This provides an ever present source of friction and system change.

Integration is also dependent on network size. The size of networks is positively correlated with size of the human ecosystem in question, as there is also a close relationship between system complexity and population size (Hawley 1986). The effectiveness of the networks exhibits a positive relationship to system size. The ability of a network to respond to the many relationships in which it finds itself requires special and often technical knowledge on the part of network member units. Only relatively large units have sufficient resources to support suitably qualified personnel. As markets for network services grow, larger units remain more competitive than smaller units and are, therefore, more apt to survive in some recognizable form.

¹⁰Tomovic (1979, p. 96) defines integration as "those tendencies within a system to give a common orientation, a sense of participation and identification, and a smoothing out of obstacles to the performances by each independent component of the contributions that it is expected to make to the system."

Network integration can be thought of in terms of systemic linkages. Loomis (1960, p. 32) uses system linkages to refer to "a process whereby one or more elements of at least two social systems is articulated in such a manner that the two systems in some ways and on some occasions may be viewed as a single unit." Loomis suggests the term can apply to interaction between groups (to form units), between units (to form functional networks), and between the various networks contributing to the institutions of which the community is composed. Generally, territorial and network boundaries intersect substantially in a society, while unit and network boundaries intersect much less often (Bidwell and Kasarda 1985).

Poplin (1979) laments the lack of definitive research into the specific mechanisms of systemic linkages, but suggests they are important to understanding community social structure, nonetheless. He then proceeds to describe four possible ways in which systemic linkages can develop. First, units that share some function, but that are from different networks, can merge to form a new network. This type of linkage may result from an opportunistic response to fill an unmet system need by individual units endeavoring to capture a greater share of community system resources. Current examples are the partnerships being established between private business and public resource management agencies looking to improve the quality of public recreation delivery, while reducing agency operating costs and enhancing private-sector profit potential.

Second, the leaders of various network units may interact on behalf of their respective units, but without direct prospects for personal gain. This mechanism operates on the leaders' individual beliefs that the unit's position will be enhanced in some way through the collaboration. An example is the interagency, collaborative recreation planning effort that is the basis of this dissertation.

Third, a unit may emerge having special expertise in coordinating relationships among other units. Again, the planning effort described in this dissertation provides an example. The planning process was administered in its formative stage by an inter-governmental agency with legal responsibility to coordinate the recreation planning activities of multiple agencies within a large geographic area.

Fourth, the interaction between units can transpire indirectly by way of messages through various communications media. An announcement by a national forest restricting access to a heavily impacted wilderness area, for example, may set off a series of responses and adjustments in other units such as BLM wilderness managers, hiking clubs, and local recreation equipment suppliers.

Bebout and Bacon (1963) suggest four ways in which generic social systems, presumably to include organizations, obtain needs from other systems through coercion by a dominant system over a subordinate system; bargaining with mutually beneficial tradeoffs; legal-bureaucratic mechanisms which provide member systems with inputs as their legal right; and solidarity mechanisms involving benevolent acts to those perceived as central to one's personal identity.

Warren (1972) discusses interaction at the community level in terms of the inputs that flow between the various community subsystems, to be referred to here as units of network organization. The classification of the types of these inputs contributes much to understanding the relationships that develop between systems (Poplin 1979). Every unit receives inputs of various types from other units within and outside the local network. Inputs may be classified as to whether they are part of the operating needs of the unit, are the inadvertent result of adaptive adjustments made by other local units and networks, or are inputs involving the attitudes and behavior of unit employees or unit clientele. A municipal parks and recreation department, for example, receives all these inputs. It must receive

operating funds from local government in order to deliver recreation services. The department is affected by changes and adjustments occurring in other networks, especially governmental, where a reduction in funding for recreation results in reduced programs. Finally, the parks and recreation department is influenced by the attitudes and behavior of the program leaders it hires, the recreationists it serves, and the public that supports it with their taxes.

It thus is necessary to understand the effect units within the recreation service network have on each other, and the effect the network has on the entire (community or regional) system, as both determine the effectiveness of delivery of recreation benefits to the population. The implications of interactions between the social units within a network are among the most important to understanding the workings of total system (Manion and Flowerdew 1982). A basic proposition is that the more integrated the recreation service network, the more effective it is likely to be in fulfilling the recreation function of the community or region.

Thus, we can say there exists a social organization of recreation that functions as a network within a region, and which has arisen as an adaptive mechanism to obtain recreation, a sustenance supporting function of the population. As a sustenance functionary, the recreation network is, in turn, supported by smaller units, the functions of which the recreation network may share with other networks in the community system, and from which it obtains vital inputs. Institutional functions of the network are achieved when units make a contribution to fulfilling the goal or objective of the particular network system (e.g., outdoor recreation) to which they provide support.

Bertrand (1964) suggests that in studying a given social network, one must necessarily turn to the network units - the organizations and associations - which support the institution, since it is at the unit level that the efficiency of social structures in promoting the network

function is most salient. The impetus, he maintains, is to know more about organizational structure and its functional implications for other subsystems and the larger system as a whole.

The next chapter attempts to synthesize what has been described theoretically regarding the social organization of outdoor recreation into a conceptual framework designed to guide regional recreation planning. The goal of this attempt remains unchanged as it is intended to enhance the quality of recreation service delivery by the suppliers of public outdoor recreation opportunities.

CHAPTER 3

SYNTHESIS--TOWARD A CONCEPTUAL FRAMEWORK
FOR REGIONAL RECREATION PLANNING

Chapter two illustrated aspects of regional outdoor recreation behavior and its social organization that are appropriate to analyses using human ecological theory. The theory provides insight into various phenomena of regional recreation but, while there is a recognizable thread running through, a whole fabric in the form of an integrated framework does not necessarily result. The purpose of the present chapter is to weave together into a conceptual framework for regional recreation planning the parts of what is now held together by a tangled thread: the integrating structure of this framework is provided by systems theory; while, human ecology illuminates the pattern. The intent of this chapter is to explain how various concepts contribute to a framework for regional recreation planning. In so doing, theoretical assertions from human ecology and systems theory, will be liberally interpreted as if they apply to recreation phenomena as readily as to the different, but similar human behaviors about which the conclusions were perhaps originally made.¹

As was discussed in Chapter 2, the tenets of experience based recreation, with its emphasis on behavioral adaptation to prevailing social, physical, and managerial environments, lend themselves to study using human ecological theory. Human ecology allows explicit consideration of these interactions among the components of recreational

¹This of course increases the risk of Type II error viz., not rejecting the null hypothesis when it is wrong that there is no difference between theoretical assertions applied to recreation phenomena and other kinds of social phenomena, either specified or unspecified. The cost of Type II error is presumed to be more acceptable than the alternative cost of rejecting relationships that are indeed true, given the purpose in this research is exploratory as it seeks to identify interrelationships among variables set in a rather novel analytic context (Nagel and Neef 1977).

experiences as these interactions are played out over regional geographic areas large enough to include the resources of several management agencies. When the tenets of the behavioral approach to recreation are applied as a planning and management framework such as ROS, human ecology can be useful to guiding planning strategies such as those involved with increasing the quality of recreation for a population which draws its sustenance from a regional resource area.

While human ecology has much to offer that is relevant to regional recreation planning, the theoretical basis of human ecology does not provide a coherent framework to guide regional planning initiatives, in and of itself. Only when considered within the context of social systems theory and given an organizational bearing, is the potential of the human ecological paradigm sufficiently realized for the purposes of regional recreation planning intended in this dissertation.

Social Systems Theory as Integrative

The operationalization of the human ecology paradigm in regional recreation studies is facilitated by the recognition that systems thinking is at the core of the human ecological perspective (evidence the common reliance on systems terminology by several authors throughout the preceding chapter). Systems theory is an essential compliment to human ecology as it accounts for the ways in which populations structurally organize themselves for various functions (Poplin 1979) presumably to include recreation. It is the conception of social systems structure developed in human ecology that defines a framework useful for analyzing many aspects of society relations (Hawley 1984), such as recreation. In this capacity human ecology supplies independent variables in studies of regional outdoor recreation behavior.

Systems thinking is at the conceptual heart of Duncan and Schnore's (1959) elucidation of four main human ecological variables. Primary theoretical interest is not in the variables per se, but in the

functional interrelationships between them that results from adaptive interaction by the system. Many human ecological relationships, including those associated with outdoor recreation, can be identified and effectively analyzed with the aid of a systems framework (Burch 1988). The framework-building task of the present chapter is facilitated by adopting the systems paradigm. The knowledge of systems and our ability to model them is a key intellectual tool in operationalizing the human ecological perspective for the study of recreation resource and other systems (Machlis 1986). Modelling is largely an intuitive process involving the specification of system boundaries and sources of input, key components, and principal relationships (Odum 1983). The conceptual framework for regional recreation planning developed here is also intuitive as it guides delimitation of recreation system boundaries and defines inputs to system structure and function.

Some elements of systems theory are salient as they incorporate human ecological principles relevant to identifying general parameters of a regional recreation planning framework. For example, the definition of human ecology proposed by Rambo and Sajise (1984, as cited in Burch 1988) takes a systems perspective of human society and nature; describes the internal behavior of social systems and ecosystems , and their interactions; is interested in understanding the organization of systems as networks and hierarchical relationships; and addresses the dynamics of system change resulting from feedback and adaptation. All these elements of systems theory will be incorporated in the framework for regional recreation planning to be developed in the remainder of this chapter.

The human ecological system - to include regional recreation systems as a component part - is a special adaptive case of more general systems. The term social system is broadly synonymous with much of the subject matter of sociology so research has tended to focus on the

organizational aspects of social systems. With this focus, the term social system has often been used in place of social organization by influential writers such as Homans (1950) and Parsons (1960).

In general, a system is a set of components interacting with one another within a boundary which regulates the flow of inputs and outputs to and from the system (Berrien 1968). The boundary mechanism filters both the type and amount of exchange between the system and its environment. The system functions by processing inputs and expelling products which are in some way different from the inputs by virtue of system processes. Systems theory, as it can be applied to systems of any size, structure, or function, provides a set of rules with which to associate system structure with system function and by which system outputs can be correlated with inputs (Palinkas et al. 1985). Under this generic definition of systems and the conceptually broad cast of systems theory, it seems reasonable that population-level recreation phenomena be a legitimate topic for a systems analysis of regional ecological processes.

A conceptual framework for regional recreation planning must be comprehensive as it includes characteristics relevant to system function, without burdening the framework with superfluous detail. The more useful framework will direct the focus of analysis to system properties salient to regional recreation planning while maintaining a grasp of system properties as a whole. The structure of the regional recreation system determines its function; together, structure and function describe system organization. The accuracy and comprehensiveness of system analysis increases to the extent that a system's structure may be known and its action understood (Monane 1967). A general theory of resource systems is made difficult, however, by variation in institutional constraints on the system as they vary through time and space (Flowerdew 1982). Therefore, an institutional-oriented approach to regional recreation resource systems analysis is

useful to framework specification and application as it focuses on these factors and attempts to develop theory concerning the impact of organizational controls on the largely region-bound recreation behaviors of populations.

A systems framework for regional recreation planning requires thinking in terms of wholes -- integrated sets of facts and events with their own properties and relationships. Key among these relationships are those between recreation resource management agencies - their resource bases and management planning activities, and their effect upon regional recreation behavior; together, the regional recreation system. General systems theory seeks to discern common features in terms of shared aspects of organization (Laszlo 1972). By organization, Laszlo refers to how sets of events are structured in space and time and function relative to their environment of other sets of things similarly structured. System adaptation is made on the basis of cybernetic feedback, which is anything that influences the system's current action (Monane 1967) e.g., information, matter and energy (Bonnicksen 1982). Positive feedback keeps the system going on its present course; an alteration of course in terms of trajectory or velocity results from negative feedback to the system. Thus, a comprehensive framework must reflect the condition that the impetus and course for regional recreation planning may derive from feedback in the form of social redefinition of desired planning outcomes, resulting from dissatisfaction with the performance of the current recreation service delivery system.

A regional recreation planning framework must provide guidance for delimiting regional recreation systems. That guidance finds a source in social systems theory, of which many basic concepts are applicable to regional recreation planning. A social system in its most basic form, consists of two or more individuals interacting, directly or indirectly, in a bounded situation that may include territorial limits (Mitchell

1968). Parsons (1960) defines social systems in terms of their units, patterns, and boundaries. For the system definition to pertain, actors within the social system must have a common focus and shared communication among most of the actors within the system (Mitchell 1968). If these conditions are met, a system is as big as the actions and things it includes; the interaction of system parts set its boundaries based on functional criteria (Bonnicksen 1991; Isard 1975). Thus, social systems - including regional recreation systems as is contended here - are repetitive patterns of action of people and culture (Monane 1967), which are bounded in space and time, and culturally defined as right or wrong (Parsons 1960).

The social collectivities that are the subject of social system analysis can range from small groups to whole societies, the range encompassing populations of recreating individuals. Social systems are open systems that exchange information with other systems (Berrien 1968). All social systems send and receive energy and information as part of normal functioning (Monane 1967). A framework for regional recreation planning must focus on the exchanges between population demand and supply elements of the recreation system, particularly as supply factors affecting opportunity diversity and availability affect demand for recreation experiences.

It is an axiom of the social systems theory that humans cannot be studied without regard to the natural environment (Laszlo 1972): in the case of outdoor recreationists, not without regard to the physical setting. It is, therefore, what the sociologist borrows from systems thinking about human activity as being embedded within the natural environment, which makes the human ecological perspective a unique and particularly rich vein of sociological inquiry in outdoor recreation. Humans at once are biological by origin and physiological existence, are social in work and leisure, and psychological in linking and coordinating the biological and social aspects of existence. All social

systems occupy space and use material of various sorts obtained from its environment (Parsons 1951). Natural resources including those used for outdoor recreation, therefore, are attributes of a physical and social-cultural order. The term regional recreation resource system implies both orders have been linked into a single conceptual construct with either the physical or social variables taken as independent (Firey 1978).

The size of the recreation planning system eventually delimited in a regional-level analysis has consequent implications for system structure and function. The number of components within a social system strongly determines its action (Monane 1967). The larger its size the greater the heterogeneity in its components there is likely to be. For example, the city is more diverse ethnically, occupationally, and recreationally than the town. Additionally, the larger the diversity the more highly developed the functional interrelationships between subsystems (Monane 1967) e.g., the economic, political, and governmental sub-systems function to also supply recreation inputs to the system to a greater extent in the larger system. Kasarda (1972) in his study of 157 SMSAs found empirical support for the theory that increases in the size of peripheral areas of territorial based systems will be matched with development of organizational functions within the system - presumably to include recreation - to insure integration of activities throughout the expanded system. Thus, a framework for regional recreation planning should anticipate the need for well developed agencies integrated in their combined function to provide recreation services to a consumer population.

A key attribute of a regional recreation planning framework is its ability to demarcate the areal boundaries circumscribing the totality of system phenomena contributing to the planning problem. Delineating system boundaries is precedent to system definition. The areal extent of a regional recreation system's domain is the result of the necessary

interaction of people with resources, which are always removed by some distance from one another. In a planning context, distance factors dictate that system boundaries be placed coincident with the area of major planning problems, that it have flexible boundaries, and include the organizations with interests within the boundaries that are relevant to the problem (Odum and Moore 1966; Isard 1975). The aim in regional recreation planning is to integrate the concerns of the various resource management agencies so a comprehensive view of their joint operations can be encouraged at the designated planning center. This requires delineating the inclusive geographic boundaries of the system and realizing that within that area a certain balance of natural resources and management agencies is possible at a given time for the most effective development of land and people (Mumford 1927) as a regional recreation system.

The notion of unit character, which is at the basis of the systems conceptualization of regional recreation resource planning problems, implies the existence of a boundary that marks off an entity and makes it recognizable for observation. However, as Hawley (1986) points out, human ecosystems are usually frayed at their edges and difficult to delineate. The operationalization of the boundary concept depends upon how the particular social system, such as that of regional recreation, is defined. "Since a system embraces all interactions that recur with a prescribed periodicity, the boundary falls where that periodicity no longer obtains. The periodicity may be hourly, daily, weekly, or seasonally" (Hawley 1986, p. 27). The concept of periodicity is especially relevant to defining regional system boundaries, and a concept that has been well developed in the empirical literature of recreation behavior (Manning 1986).

The regional recreation planning framework, therefore, must explicitly account for periodicity in recreation system interactions as it delineates system boundaries based on a population's recreational

travel patterns. Systemness, according to Hawley (1986), tapers off on an interaction frequency gradient, the steepness of which positively corresponds with the complexity of the system i.e., the more complex communal core has a higher level of interaction than its less-dense hinterland. The concept of interaction density gradient leads Hawley (1986) to propose that the territory of a human ecosystem includes three scales which he refers to as local, regional, and interregional.

The spatial and temporal dimensions Hawley uses to describe the territory of human ecosystems also clearly pertain to the regional recreation planning problem at hand, given what is known empirically of the spatial-temporal characteristics of recreation systems. At the local scale, myriad interactions occur with daily periodicity over distances requiring one hour or less of travel time; the regional scope encompasses fewer interactions with a given center area, occurring weekly or fortnightly; and the interregional territory has few interactions with the particular center, occurring infrequently, perhaps a few times each year. The dimensions of these three areas are temporal as well as spatial. Within the context of a regional recreation planning framework, interest is in daily and weekly recreation behaviors of a population as these behaviors, when mapped spatially, describe the target population's recreation resource space. The more infrequent recreation behaviors of the population are perhaps better conceived as tourism and, therefore, beyond the purview of outdoor recreation research as it has been traditionally defined.

Considering the dimensionality of human ecosystems, Smith (1976) suggests that a conceptualization of nested, overlapping systems is a helpful analysis framework as it directs attention to level-specific organizations, functions, and processes meaningful to social integration at the most inclusive level of a particular planning endeavor. For example, the aggregation into regions where it is appropriate to the particular problem, is descriptively useful because

it means fewer separate facts need to be perceived as significant statements can be made about the area as a whole (Hoover and Giarratani 1984). A framework for planning recreation for a population requires consideration of a region as the minimum inclusive area containing all the resources required for quality recreation experiences, but no more.

The size and shape of a regional recreation system is the result of historic and ongoing adaptive interactions between human social organizations and their environments. The density of these interactions effectively defines the system (Hoover and Giarratoni 1984). System configuration and expansion is predicated on the reduction of time and cost involved in obtaining natural resources (Kasarda 1972), including those used in outdoor recreation. Many of the recreation resources required by a population are often located in the area removed from the communal core. Without efficient transportation and communication networks controlled through the auspices of the core area, people are restricted to a smaller regional area than that which contains and is necessary to fulfill sustenance requirements for outdoor recreation.

In the general economic sense of production and consumption relationships, the growth of a recreation region and the kinds of opportunities it provides for its residents depends largely on the region's mix of recreation opportunities. Regions, in general, can be categorized by degree of specialization in a limited range of activities, or by their diversification and well roundedness (Hoover and Giarratani 1984). In their conception of resource space as any possible set of resources that directly sustain populations, Bidwell and Kasarda (1985) posit that as resource spaces gain in internal diversity and quantity of exploitation opportunities, they represent more diverse possibilities for population sustenance. When a resource set is that which is necessary to sustain a recreating population, the internal diversity and quantity of recreation opportunities found within a regional area represent more diverse possibilities for population

sustenance and a higher quality of recreation services delivered. This potential for gains in recreation diversity and quality attainable through regional systems planning is an operational premise of the regional systems framework for recreation planning being developed here.

Hawley (1986) suggests the boundaries of regional systems can be represented as an isoline plotted spatially at points where the value of goods and services produced for exchange with or through the dominant core area approximate the cost of getting them to the center from outlying locations. In the case of outdoor recreation where experiences are the goods brought back from the somewhat distant natural environments in which they often are obtained, it is the costs associated with travel to the production area that determines the location of this boundary. Production and other costs can cause this boundary to change, as can the expansion and contraction of the territorially and functionally overlapping components of adjacent recreation systems. The boundary is usually irregular as it reflects the influence of core area expansion along transportation corridors at a faster rate than elsewhere along the system boundary (Hawley 1950). Empirical studies often use the movements of goods and services, people and money flows, and frequency of phone calls to delimit regions (Hoover and Giarratani 1984). A framework for regional recreation planning should also incorporate the movements of recreationists along transportation routes to regional points of experience production as part of its boundary specifying objective.

Regions delimited on the basis of functional integration criteria - such as those delineating a regional recreation system - can be seldom delineated with boundaries that are coincident with political or administrative jurisdictions (Hoover and Giarratani 1984). The population of a city proper excluding its suburban area, for example, has little utility for purposes of delimiting a regional recreation resource system. Since the density of metropolitan interrelationships

effectively merge the several populations into a regional population, a new system boundary encompassing extended resource requirements is needed (Hawley 1986). The dynamics of changing functional relationships usually keep a system's scope well beyond any single political or administrative boundary (Hawley 1950). Since these boundaries seldom coincide with the geographic distribution of use of public recreation goods, special regions must be created for purposes of defining a population's recreation system.

Unlike political boundaries that are explicitly defined and fairly static, regional recreation system boundaries are implicit in functional relations, variable, and difficult to define spatially. Often, some of the regional area in a recreation system's domain also falls within the domains of other political and administrative jurisdictions. In which case, systems overlap and no one jurisdiction can claim sovereignty over ecosystem functions (Hawley 1986). The regional recreation planning framework must be able to delimit system boundaries as they occur outside the purview of established jurisdictions and their analytically convenient statistics, while accounting for overlapping domains that affect recreation system functions.

Concepts of the physical environment must be included in any regional recreation planning framework. The physical environment sets only broad limits as to the range of social systems phenomena that might be found in a given geographic area (Michelson 1970), including recreation (Brown 1983). Accordingly, certain recreation system forms may be more prevalent in certain settings than others; which is to say, the states of variables in one recreation system are congruent and coexist better with states of variables in the surrounding system, than with other alternative states. A useful framework for regional recreation planning must be able to describe the correspondence between the regional recreation system and its environment in order to predict the effects of system intervention as part of planning.

Human ecology deals with the spatial aspects of the symbiotic relations of human beings and human institutions (Odum and Moore 1966). Because of the conceptual constructs human ecology shares in common with systems theory, a systems-based model provides an effective framework for analyzing the ecological relationships of human phenomena on a regional spatial scale (C. Smith 1976), presumably to include outdoor recreation. The model has seldom been applied to recreation, however, at the regional or any other scale for that matter (see Bultena and Field 1980 for an exceptional example of its use in a community recreational analysis). Instead, because of the difficulties involved in operationalizing system-level variables (Machlis 1986), the importance of larger social systems for understanding recreation behavior has received little attention (Bultena and Field 1978). This is the situation a conceptual framework for regional recreation planning is meant to redress.

In proposing a forecast model to be applied to problems of system structure in social impact assessment (SIA) pursuant to recreation policy implementation, Palinkas et al (1985) provide a structure applicable to a regional recreation planning framework. According to Finsterbusch (1983) an important goal of SIA is to improve the design and administration of policies in order to reduce costs and increase benefits. The model Palinkas et al. (1985) propose has several advantages for purposes of understanding regional recreation resource systems in the context of policy design and planning initiatives. It is nomothetic and so the interpretive breadth of results from its application are robust. The model also has the ideographic capacity to describe and analyze change in particular historical and socioenvironmental contexts. The model has the advantage of explicitly handling information on the relationships between the community value structure and social behavior including recreation. Finally, the model

allows integration of quantitative and qualitative data on all aspects of community structure and organization related to recreation.

Palinkas et al.'s model interrelates three system component parts - input, structure, and output - that are useful in a regional recreation planning environment. Input to the system consists of recreation-relevant variables originating outside the system defining the system environment under analysis. For the purposes of analysis, these would be considered exogenous or independent variables as they affect recreation behavior. Inputs may be considered as variables which are ecological (e.g., natural resources); extrasocietal (e.g., federal recreation resource management agencies); and intrasocietal - social system components directly influencing the recreation resource system (e.g., work/nonwork cycles).

While the latter type of variables is an integral part of community structure, these variables may be analyzed as independent variables to demonstrate their effect on the organization of recreation. Also, any of these exogenous variables (e.g., public recreation management agencies) can operate within the system as they represent demands to which the community must respond or as they serve as resources in support of community structure. The system concept of feedback further blurs the relationships between variables. Since causal relationships are not linear, the systems model allows variables which are independent in one context to be considered dependent in another context. Thus, a framework for regional recreation planning that treats recreation system inputs as independent variables may be difficult to interpret for causality but, importantly, it does not violate the theoretical tenets of system function.

Structure is the second major component of the regional recreation social system, according to Palinkas et al. (1985). Structure provides the rules of transformation between input and output to the recreation system, defining the relationship between independent and dependent

regional recreation variables. Structure consists of the values and norms that provide guidelines and constraints for recreation behavior (Brewer 1964), allowing for behavioral predictability in the form of social organization, the second category of structural elements. Thus, a framework for regional recreation planning must reflect the fact that observed patterns of recreation organization or behavior are the result of the structure of the rules constraining recreation behavior and the function or purpose recreation behavior is designed to accommodate within a population.

Within the regional recreation system, these patterns, as they are influenced by inputs such as management agency policy and activities, may be viewed as a recreation subsystem in parallel with other economic, political, religious, education, health care, and social services, which are organized through similar processes to accomplish their specific social tasks. While the behavior of each subsystem is relatively task-specific, the behavior of one subsystem can have considerable significance for others. As an example, recreation focuses on leisure-oriented behavior, which may have economic and educational significance as well. Gale (1982) stresses the need for the explicit and operational treatment of organizational variables affecting individual and social behavior. A framework for regional recreation planning should make similar efforts to consider organizational variables.

Finally, within the Palinkas et al. framework, output represents the adaptive response of the community population to perceived environmental influence. As a population-level phenomenon, output is measured by social indices such as income levels, population size, mortality rates, recreation participation rates, and social benefits of recreation depending upon the subsystem being addressed. The particular output that results from population response depends upon its social structure, the interaction of social values, and organized behavior. Values color the interpretation given the environment such that

resulting social behaviors can only be understood within a specific value hierarchy. Thus, similar sets of recreation resources may produce different responses from regions, communities, or groups within a community population, by virtue of their different structures.

Change in the recreation system can also result from the feedback of output onto the system structure, resulting in adaptive alteration of population values toward recreation and the social organization of recreation life. What a population does recreationally is an historical artifact of the operating resource system. Therefore, the impetus for change comes from both the environment and the system structure itself. For example, if the community's sustenance needs are not met within the structure of the recreation system, its social organization for recreation must change or the community will not survive in its original form. The locus of this change is the public recreation management agencies with jurisdiction within the population's regional resource area. An effective framework for regional recreation planning must also adopt this functional perspective for accomplishing desired change.

Burch (1988) provides ideas useful in operationalizing the three classes of variables comprising Palinkas et al's. (1985) social systems model by conceptually working through an application of regional recreation resource systems planning. In combination, Palinkas et al's systems model for identifying candidate independent and dependent variables of social system impact, and Burch's human ecological definitions of regional recreation resource system components, provide the basis of a planning framework for regional recreation systems. The explication of the resulting framework is a start at identifying the impact of any given public recreation regional management agency policy, plan, or action.

Burch (1988) suggests an inventory of the types of information needed to define systemic conditions affecting the ability of recreation systems to deliver opportunities to populations. Burch classifies this

information in four main categories he calls biophysical features, cultural features, organizational features, and actual behavior, and lists some of the principal forms of analysis for each. Some examples of the categories of information Burch believes pertinent at each level of analysis are the following: biophysical features of landform, ecosystem, and climate; cultural features of values, traditions, beliefs, and tastes affecting leisure; organizational features of ownership patterns and policies, budget devoted to recreation management, typical nonwork patterns, and predominant institutions affecting recreation resources; and actual participation patterns and the sociodemographics of recreationists. These kinds of information also may be assumed as vital to casting a conceptual framework for regional recreation planning.

Burch (1988) presents a process for applying the resource inventory information in the form of map overlays. His method has promise, too, for the application of the framework to be developed in this chapter. The resulting map, Burch suggests, defines the existing, or what can be presumed of the future, regional recreation system in terms of current status, alternatives for action, and their possible consequences to the system. The importance of this methodology, according to Burch, is that it demonstrates "that a marriage between perceived problems, available methods of measurement, techniques of analysis, and social ecology theory need not wait for heavenly intervention, but can begin whenever we find the will" (p. 157).

Organizational Analysis as a Conceptual Synthesis

It is the intention in this dissertation to focus on the independent variables of regional recreation systems function viz., the organizational features that effect actual recreation behavior within the region, the dependent variable. This focus attends from a programmatic perspective of recreation where planned intervention to the

structures of system organization is seen as an effective way to improve the quality of service delivery, and which is one of the few ways available to the resource manager. The remainder of this chapter attempts to bring this organizational aspect of regional recreation resource systems into finer focus within the conceptual framework under development. In providing structure to the conceptual framework, a number of functional propositions will be developed about how relationships between public resource management agencies², and between agencies and their bio-social environment, can affect their responses to regional recreation planning initiatives and, as a result, the effectiveness of the regional recreation system as a whole.

In Chapter 2 the behavioral approach to recreation was interpreted to suggest there is a conceptual basis for using a recreation quality criterion to evaluate the effectiveness of recreation service delivery by public agencies. This criterion derives from recreationists', managers', and researchers' images of some preferred condition, and from their assumptions this condition can be achieved in practice. When the organizational requisites to deliver recreation are considered, however, several confounding factors become apparent, some of which stem from individual agencies internal system states and some from their relationship to other organizations in their environment. It is the confounding factors posed by these organizational relationships that must be minimally addressed in a conceptual framework in order to accomplish the public resource management goal of regional recreation quality enhancement.

The relationships of concern can be expressed at two levels of organizational conditions: 1) the effectiveness criteria relating to the internal state of individual organizations; and 2) the organization's

²In this section the terms (the) agency and (the) organization are used interchangably to refer to formally organized social groups publicly charged with the management of resources held in common ownership.

ability to obtain resources from and otherwise adapt to its environment (Harrison 1987). While these two levels are always interrelated to some degree, the focus in developing a regional recreation planning framework primarily is on the later condition. The rationale for focusing on the adaptive response of organizations to external change, rather than on their internal adjustment processes, stems directly from human ecology which considers adaptation to be the central problem of human organization (Micklin and Choldin 1984), and from a regional perspective which spatially juxtaposes the activities of several management agencies with regional jurisdictions. As such, the human ecological perspective expressed within a regional systems context has considerable potential for increasing understanding of how public resource management agencies adjust to initiatives originating outside their organization (Gramann and Andereck 1987). Presumably, this could be interpreted to include initiatives to enact regional recreation planning as well.

A framework for regional recreation planning must recognize some management agencies are more effective than others at operating within the interagency cooperative environment required for regional recreation planning. A useful framework must describe the system conditions and further causal explanations for differences in the effectiveness of public agencies to contribute in collaborative efforts, to enhance the quality of recreation service delivery to populations.

Recreation resource management agency environments include resource supplies, resource suppliers, and all other external actors and relationships among these components (Bidwell and Kasarda 1985).

Salient among these relationships are those served by other organizations in the system as they control the inflow of resources (Aldrich 1979); in the case here, to recreation resource management agencies. Environments affect recreation resource management organizations by making available or withholding resources. In this context Yuchtman and Seashore (1967, p. 900) define organizational

resources as "the generalized means, or facilities, that are potentially controllable by social organizations and that are potentially usable - however indirectly - in relationships between the organization and its environment." Organizations can be ranked hierarchically based on their success in obtaining resources from an environment that is instrumentally comprised of other organizations (Aldrich 1979).

From a search of the literature, Aldrich (1979) identifies six functional dimensions of the organization-environment relationship affecting the efficacy of resource procurement by resource management agencies and their characteristic interactions with similar organizations. The six dimensions can be conceptualized as contributing to the organizational basis of a regional recreation planning framework. First, is the capacity of the environment in terms of relative resource abundance for the organization. Lean or poor environments reward efficient resource use, which can be accomplished by improving management practices and merging with other organizations. An abundance of resources in rich environments provide no incentives for interorganizational relations aimed at sharing scarce resources. A second dimension relates to environmental similarity and differentiation. A homogeneous environment allows organizations to develop standardized ways of interaction, which may lead to homogeneity in products or services (Thompson 1967), because only a small repertoire of rule-bound activity patterns that specify how inputs are to be transferred into outputs may serve a population adequately (Bidwell and Kasarda 1985).

Third, environmental stability also affects organizational routine. A stable environment in which there is little turnover in the elements allows routines to become fixed. Organizations established within stable environments may have more trouble adapting to change than those that are newly formed and have less entrenched response mechanisms. Fourth, environmental concentration-dispersion affects the

ability of organizations to adapt. If resources, including the client population and other organizations are concentrated in space, then exploitation strategies are much easier to develop, as compared to a more random resource distribution whose patterns are more inscrutable.

Fifth, organizational adaptation is affected by the degree to which an organization can make undisputed claim to a specific domain. In the social service sector domain conflict often arises over perceived duplication of services by public agency providers. Sixth, and finally, Aldrich (1979) describes environmental turbulence as affecting the adaptive response of organizations to their environment in the process of securing resources. Increasing amounts or rates of interconnection between the organization and its environment leads to externally induced changes in the organization for which it is difficult for administrators to anticipate and deal.

Given the problem of social organization for public recreation planning stated in Chapter 1, Aldrich's functional dimensions of the organization-environment relationship can be applied to structuring the problem framework in the following way: Public outdoor recreation planning and management agencies currently operate in an environment of growing resource scarcity; the regional environment is heterogeneous requiring a broad repertoire of agency structures and operating routines; the regional environment is unstable requiring adaptive flexibility on the part of agencies; agency resources and client population are somewhat dispersed making exploitation strategies difficult to conceive and orchestrate; there is potential for much domain overlap between management agencies within a region and a resultant duplication or omission of services; and there are a great number of interconnections between an agency and its regional environment, making predictions about future conditions very difficult within the spatially broad planning scope implied by the problem regional context.

Contained within this problem assessment are the tenets of a prescriptive framework for the social organization of regional recreation resource systems. While economic theory provides direction as to whether free market or government action ought to provide recreation services, it provides little help in deciding the scope of social organization i.e., the public agencies and their interactions, which should provide the service - be it local, county, regional, state, or national; and by what authority - ad hoc or formal organizational mandate (Olson 1969).

Public sector decisions about organizational scope or domain are often argued on the basis of the conditions necessary for the effective provision of collective goods such as outdoor recreation. In fact, this is the basis of the argument for the regional planning framework being developed here. Olson (1969) maintains that allocative inefficiency is common since there is often a large discrepancy between the boundaries of a collective good and those of jurisdictions that provide them. Olson (1969, p. 480) cites "(T)he labyrinthine network of state, local, and functional governments" as being widely criticized as "a waste of resources and an obstacle to intelligent planning and coherent public policy" as present patterns of management are often duplicative and wasteful of resources. To address this criticism Olson (1969) argues for public resource management domains with rational boundaries. Ideally, he advocates a separate government organization for every collective good having a unique boundary. This organizational structure would help insure a fit between those who receive benefits from a resource base and those who pay for it. Warren (1968) also cites the possibility of positive and negative spillover benefits associated with resource delivery by functionally overlapping jurisdictions. The promise to rationalize public recreation planning with a regional framework of resource consumption and management is a key impetus for this dissertation.

The traditional way of meeting the collective needs of a population for a specific resource has been to provide services from a single jurisdiction of regional scope (Warren 1968). A familiar example is the metropolitan transit districts providing mass transit to major urban and their outlying suburban areas. This organizational strategy presumes that a single regional organization is more effective for the particular service delivery application. Theoretically, it also assumes that a negative causal relationship exists between organizational structure, in terms of the number of units exercising autonomous control over the supply of resources, and the effectiveness of the system in meeting population needs (Warren 1968).

While there is considerable empirical evidence to support this proposition, Warren maintains the absence of a centralized authority does not necessarily mean that regional issues go unresolved. Issues extending beyond the domain of individual jurisdictions are sometimes addressed through interorganizational bargaining, informal understandings, formal agreements, and the creation of new agencies within a region. The basic organizational impetus for these collaborations is the mutual understanding that the resolution of problems that extend beyond the domain of any one unit require cooperation among the other units that are in direct competition over resources (Warren 1968). Warren describes cooperation at this level to be that of units seeking mechanisms to achieve regional needs while protecting the autonomy of existing units.

The frequent need for recreation management agencies to work together to accomplish a social goal, such as regional enhancement of recreation quality, creates something of a paradox for the participant agencies. Research shows that because of different internal and environmental conditions, the managerial practices and organizational structures that promote effectiveness for one agency may not be effective for another (Harrison 1987). It seems important, therefore,

that any conceptual planning framework hoping to account for the effectiveness of an agency within its system environment, explicitly consider all its relevant environmental relationships. Ostensibly this implies describing the myriad of environmental conditions affecting agencies, including the interaction of all agencies and the transactions involved; a task, the success of which has largely eluded the comprehension of researchers (Aldrich 1979).

Since the scope of inter-agency analysis theoretically can be expanded outward to encompass global systems, some guide is needed for setting limits on the range of inquiry. The framework under development here has been defined as having regional scope. Within this general definition, however, the framework still must address the fundamental problem, according to Brown (1979), of trading increasing comprehensiveness for decreasing conceptual tractability.

Aldrich (1979) offers two concepts for drawing interactional boundaries that are helpful to the applied organizational analysis indicated for the purposes of this framework. These concepts derive from what Aldrich terms a population ecology model of organizations. This approach focuses on the nature and distribution of resources in agencies' environments as the primary impetus of organizational change; examines agencies in their interactions with other agencies; and considers the historical context of agency development, particularly as the agency contributed to various social institutions. All of these model components are presumed applicable in this case to problems of regional outdoor recreation planning.

The two concepts Aldrich (1979) proposes, which are instrumental to an organizationally-based regional recreation planning framework, are the interorganizational network and the action set. In the ranking of dominance hierarchies that characterize all social systems (Hawley 1986; Micklin 1984), action sets, when they occur, are subordinate to the networks of which they are always a part. "An

interorganizational network consists of all organizations linked by a specified type of relation, and is [empirically] constructed by finding the ties between all organizations in a population" (Aldrich 1979).

Thus, in the context of the regional recreation resource system the public outdoor recreation interorganizational network consists of all the public resource management agencies linked by virtue of their shared recreation management functions. Regional recreation networks are usually loosely linked by virtue of few communication ties between some agencies. For purposes of analysis, networks are mapped to illustrate organizational interaction under the assumption that networks help or hinder the activities of agencies in a systematic way, which can be known at the aggregate level (Aldrich 1979).

Regional recreation networks do not, of themselves, maintain any system boundaries. Their operation, however, may create conditions favorable for the establishment of other organizations or action sets. Often the dominant agency in a public recreation network can use their position to mobilize other agencies around specific issues. When influences toward mobilization are combined with shared adaptive strategies and the perception of possible reward on the part of subordinate agencies, a cohesive action set is formed (Aldrich 1979).

An action set, as defined by Aldrich (1979, p. 271), "is a group of organizations formed into a temporary alliance for a limited purpose", such as regional recreation planning by a collaborating group of public resource management agencies having recreation management responsibilities. A regional recreation planning action set may not necessarily contain all the agencies in a network, since it is a voluntary association in which some functionally related agencies may choose not to participate. Action sets are consortia of organizations that pool their resources for providing a collective service to members, which no individual organization could manage alone e.g., fire districts and recreation planning regions. Since action sets are usually formed

to accomplish a specific task such as regional recreation planning, membership is drawn from recreation-functional subunits within the various network agencies represented within the action set, which have responsibility for similar types of task accomplishment viz., recreation resource planning and management.

Action sets may have a very formal social structure complete with written agreements, internal division of labor, inter-organizational behavior norms, and recruitment rules for new members (Aldrich 1979). Since the agencies in a regional recreation planning action set usually draw inputs from and produce outputs for the same system of resource management agencies, they have an inherent conflict of interest. As a result, reciprocity between agency action set members is always undertaken with reluctance in fear that others are receiving more from the relationship than they are contributing.

In order to resolve the problem of poor compliance with collective agreements, action sets frequently focus on two strategies: member agencies follow the dictates of a single dominant agency; or the action set attempts to bring about uniformity in the outlook of members through product standardization (Aldrich 1979). The later strategy is often achieved with the assistance of government agencies who remove some source of competitive pressures. In the case of recreation an example might be the adoption of ROS by the action set for purposes of regional resource inventory and demand assessment. Aldrich maintains that because of inherent similarities, the genesis of action sets can be studied with the same analytic methods that are used to study the preconditions and generation of individual agencies. Aldrich goes on to then describe these methods in general terms.

Concepts of an Organizationally-Based Framework

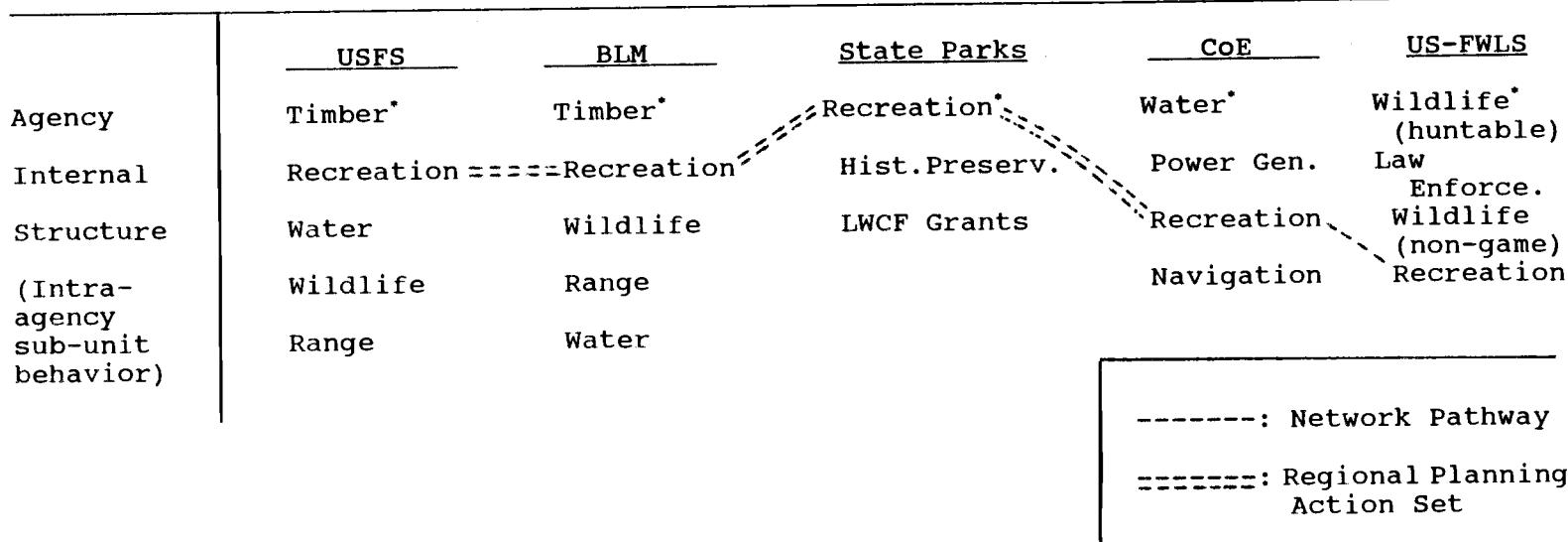
A framework for regional recreation planning and policy making requires anticipation of consequences. The work of Aldrich (1979) and

Gramann and Andereck (1987) reviewed here provide evidence for Hawley's (1986) contention that concepts of human ecology provide the general precepts for a framework, which can be refined in its various aspects to allow full consideration of the structural factors affecting the success of policy and plans. An operational thrust of this dissertation is that prediction of the responses of organizations to regional recreation policy and planning initiatives can be improved by applying human ecological concepts relating to the structure of public resource management organizational networks. Among the ecological concepts salient to framework specification are those that include dominance hierarchy and integration, key function, organizational subunit, and action set.

The relationships among these concepts can be illustrated with an example of a hypothetical regional outdoor recreation organizational network functioning in the public sector. The development of this example is an attempt to integrate into a conceptual framework many of the ecological concepts that have been discussed to this point. The crux of this conceptualization remains unchanged from the earlier assertion that resource management agencies and their environments, including other organizations with which they interact, are important independent variables affecting the quality of public recreation services and consequent experiences by consumers. Conceived as a recreation resource system, these relationships represent the interaction of public recreation network constituent agencies and their activities, and recreationists' demands.

Some of the key structural relationships of organizational networks are illustrated in Figure 3. The regional recreation network membership is arrayed across the top of the figure where interrelationships are typified by inter-organizational, cooperative behavior. The internal structure of individual organizations within the regional network is arrayed along the side of the figure where

**Organizational Network Structure
(Inter-agency behavior)**



*Key function: Intra-agency dominance is assumed as an aggregate measure of the hierarchical positions of all functionally similar subunits within an agency in the regional system e.g., timber management is the dominant function of the USFS as an average measure of dominance for all forests within the region.

Figure 3. Structure of a hypothetical regional recreation organizational network and action set.

interrelationships are in the form of intra-organizational (functional subunit) behavior. Subunit interrelationships assume a hierarchical arrangement with dominant subunits within an organization appearing nearest the top of the figure. The dominant subunit within an organization fulfills the key function of that organization. Other subunits are integrated within the organizational hierarchy to the degree they support the key function. By this definition, a recreation subunit is that part of the resource management agency that functions in support of the regional recreation network, either as the primary or some lesser level function of the particular agency.

Dominance relationships among organizations within the network also exist, but these relationships are difficult to describe because of the complexity of system interrelationships. At first glance it seems feasible to think of organizational dominance in terms of the relationship between an organization's key function subunit and the location of the route the recreation network pathway takes through the subunit field. If the network pathway coincides with the organization's dominant subunit, then that organization would seem a contender for dominant status within the network.

However, if a subunit controls a larger proportionate share of resources of the recreation network than are controlled by any other recreation subunit within the network, despite its hierarchical status, then the parent organization of that subunit may still express dominance within the network. Knowledge of this contingency may be helpful for purposes of delimiting network dominance in cases where two or more network organizations have recreation as a key function. State recreation agencies provide an example of dominance associated with key social function. By controlling the allocation of Land and Water Conservation Fund capital improvement monies to county and municipal governments, state park and recreation agencies exercise considerable

power over more local jurisdictions within the system hierarchy, despite the fact they may not be generally network dominant.

The organizational network concept provides a structure with which to identify all groups, agencies and their subunits, that should be considered in order to successfully implement public recreation policies and plans (Aldrich 1979). The premise is that any organization that shares, even peripherally, a function with an organization targeted by an action, also may be impacted by that action and should, therefore, be considered in the decision making process. Whether or not all eligible organizations are represented in the network action set depends upon the status of the various system states relating to the structure of organizational networks.³

The remainder of this chapter develops a number of propositions addressing how differences in public recreation management agencies affect their response to recreation planning initiatives; which, in turn, determines the diversity and quality of recreation opportunities they produce. These propositions incorporate the following major concepts central to human ecology and closely related theoretical literature: key function, hierarchical integration, resource competition, and organizational capacity. The propositions and their research corollaries can be stated more specifically as follows:

Proposition I: Agencies will be more likely to adapt to environmental change if the change affects the agencies' key function.

Corollary A: Agencies having recreation as their key function will be more likely than other agencies to adopt initiatives aimed at integration of the regional recreation network. Where network integration is defined as action set development through an increase in horizontal linkages between agencies e.g., a fully integrated network consists

³For example, land trusts and nature conservancies exist on the periphery of the recreation network hierarchy. Although they have recreation functions and may be part of other networks (e.g., resource preservation), they usually are not integrated formally into the public recreation system. Because of this, they lack the institutional means to influence policy within the system; for them, adaptation tends to be the result of reaction rather than proactive response to the environment.

of an action set composed of all the pertinent agencies in the network.

Corollary B: If recreation is not the key function of an agency, then the likelihood of the agency to adopt initiatives aimed at regional network integration is determined by the extent to which internal organizational structure allows for participation, inter-personal relations, work and information flows, and consensus.

Sub-corollary: Agencies evolved in stable environments will have more trouble adapting to change than agencies that are newly formed and have less entrenched response mechanisms.

Corollary C: The closer is recreation to being the key function of an agency, all else being equal (see Corollary D below), the more prominent is the role of the agency in the regional recreation network.

Sub-corollary: The closer is recreation to the key function of an agency, the denser are its ties with other agencies in the regional recreation network.

Sub-corollary: Dominance of the recreation function within an agency corresponds positively with the dominance of recreation professionals within the agency. Where dominance refers to the proportion of recreation to other professionals within the agency.

Sub-corollary: The greater the excess capacity of an agency in the form of a high proportion of recreation professionals within the agency work force, the more likely the agency will embrace initiatives aimed at network integration. Where excess capacity refers to resources held in reserve that allow the agency to respond to environmental change beyond its normal capabilities (Bingham et al. 1984).

Corollary D: The agency that controls the larger proportion of recreation resources within a network is likely to be network-dominant, whether or not recreation its key function.

Sub-corollary: The dominant network agency will be more active than subordinate network agencies in achieving network integration. As a means to integration, the dominant agency may advocate the network-wide adoption of internally accepted product standards, such as the USDA-FS and ROS, for example.

Sub-corollary: Subordinate network agencies will accept the dominant agency and its product standards to the extent they are perceived to enhance the subordinate agency's individual adaptive advantage.

Sub-corollary: If no one agency expresses dominance within the network, a network unit may emerge having special expertise in coordinating relationships among the other units.

Proposition II: Agencies that are integrated into a horizontal network of relationships will be more likely than non-integrated agencies to adapt to changes affecting other network units: Where horizontal integration is defined as the relationship of organizations within a locality (Warren 1972).

Corollary: Agencies that are closely integrated within the recreation network are more likely to respond positively to initiatives aimed at furthering network integration than are less integrated agencies.

Sub-corollary: The more dominance in total that is delineated by the recreation network pathway, the more likely are member agencies to embrace initiatives aimed at furthering network integration.

Sub-corollary: The more dominance in total delineated by the recreation network pathway, the closer the articulation between output goals of member agencies and output goals of the overall network. Close articulation between the two facilitates agreement among members about how output quantity and quality goals are to be set and achieved.

Proposition III: Agencies that are closely integrated into a vertical hierarchy of authority will be less likely than non-integrated agencies to adapt to change affecting other local units: Where vertical integration is defined as the formal ties between an organization's parts and the outside world (Warren 1978).

Corollary: Agencies that receive fewer locally originating inputs (e.g., the National Park Service whose clientele is national and international and whose funding originates from federal budget allocations) will be less likely than more locally-tied agencies (e.g., the U.S. Forest Service) to respond to initiatives aimed at local network integration.

Sub-corollary: Agencies that receive a larger proportion of inputs non-locally will be less likely than more locally-tied agencies to effectively respond to network integration initiatives, since their dynamic operational environment obfuscates the advantages of integration.

Proposition IV: The greater the density of agencies managing similar resources, the more likely the competing agencies will adapt to external changes affecting their management of those resources.

Corollary: The lesser the diversity of regional recreation resources relative to population demand, the more likely management agencies will adapt to declining administrative resource inputs by further integrating network structures to achieve opportunity diversity. Where, resource diversity refers to the number of opportunity types available to the regional population.

Sub-corollary: The more integrated the recreation network, the more the diversity of recreation opportunities made available will reflect the diversity required by the population for enhanced recreation quality.

The next chapter describes the methods used in collecting the data used as a basis for defining a functional recreation region, about which these various aspects of the propositional framework pertain.

CHAPTER 4

RESEARCH METHODS FOR REGIONAL RECREATION PLANNING

The preceding chapters reviewed the literature suggesting linkages between previous knowledge about experience-based recreation and human ecology as they contribute to a conceptual framework for recreation resource planning and management from a regional systems perspective. This literature suggests a regional scale of analysis is appropriate for examining the recreation behavior of discrete populations, since it is at the regional scale that a population's day-to-day demands for recreation opportunities are addressed. The previous chapters also established the imperative for cooperative, inter-agency approaches to supplying quality recreation opportunities demanded by these populations.

This present chapter describes the methods used to gather information to examine regional systemic relationships. The methods are described in the context of a larger research undertaking in support of Statewide Comprehensive Outdoor Recreation Plans (SCORPs) in the Pacific Northwest. The emphasis is placed on SCORP processes since, at the present, they represent the predominant recreation planning activity having potential to build cooperative regional planning as an institutionalized endeavor. The description of methods includes a comparison of the cooperative research methods followed in producing recent region-based SCORPs for individual states in the Pacific Northwest region, with research methods that have historically been used to support state only oriented SCORPs within the Pacific Northwest and elsewhere.

The chapter concludes with discussions of the study area, study design, variable operationalization, sampling, survey methods, data preparation, response rates, and non-response bias.

A Brief History of SCORP Research Methods

The periodic and comprehensive process of outdoor recreation planning that characterize SCORPs is a logical context for cooperatively organized, regional recreation resource planning. Although the SCORP process as it was originally mandated did not explicitly consider planning of this scope, the enabling legislation is flexible enough to have enabled some states in recent years to adopt planning frameworks conducive to formulating plans aimed at addressing the issues of regional recreation systems; issues that affect an individual state's ability to provide recreation opportunities to its citizens, but that sometimes originate or are influenced by system forces outside state boundaries. Additionally, the case will later be made that because of massive reductions in the federal funds available for comprehensive recreation planning, a cooperative, multi-agency regional approach remains as perhaps the only viable avenue to system-wide recreation planning still available to the states.

In 1958, President Eisenhower established the Outdoor Recreation Resources Review Commission (ORRRC) setting in motion a series of events that were to become landmarks in the modern history of recreation in the United States. Four years later, in 1962, the ORRRC issued its report, which today continues to serve as a model for planning support research and outdoor recreation plans being formulated today (Bradley, personal communication).

History has shown the ORRRC report's most important recommendation was to establish a fund to finance conservation and outdoor recreation projects at the federal, state, and local levels. This recommendation resulted in the establishment of the Land and Water Conservation Fund (LWCF) in 1964, and amended as PL 88-578 in 1965. The LWCF has provided the single largest source of funds for the development of outdoor

recreation systems at all levels of government (Wellman 1987), with over \$3 billion in grants issued between 1965 and 1989 (Smith 1989).

The Bureau of Outdoor Recreation (BOR), established in 1963, came into being also as a result of the ORRRC recommendations. For 17 years, until it was dismantled in 1980, the BOR managed the LWCF and oversaw individual SCORP efforts nationwide. The original BOR and in its later form as the Heritage Conservation and Recreation Service, brought coherence to the national outdoor recreation delivery system that had not been prevalent before, or since, the BOR's existence (Wellman 1987).

The LWCF Act served to implement as policy broadly defined prescriptions of purposes and methods to be followed in recreation planning. Implicitly, the LWCF legislation conceived of individual states as recreation systems, through the law's requirement that each participating state produce a SCORP to qualify for federal grants for recreation land acquisition, development, and planning. As legally intended, this conception of how recreation planning at the state level should proceed stemmed from the idea the states should play a pivotal role in a national effort to improve outdoor recreation opportunities. To implement this policy, individual states' SCORP efforts were construed as mechanisms to improve the national recreation condition. The planning policy, with its funding provisions and concomitant methods, as broadly prescribed by the LWCF legislation, served to create a new institutional structure for providing recreation services and implementing outdoor recreation policies (Smith 1989).

The guidelines for the SCORP process developed by the U.S. Department of Interior emphasize, among other things, the states' opportunity to fashion planning processes and final plans to meet their own unique situations. The methods used to accommodate unique statewide conditions are similarly loosely prescribed. Only the periodicity of the planning cycle and the few essential elements of the SCORP

Assessment and Policy Plan are prescribed by the LWCF Act. (Arbeit and Gangaware 1982 provide a detailed discussion of these requirements).

The latitude allowed states in the process and product guidelines for SCORPs has resulted in considerable variation in SCORP practices over the years. During the early history of SCORPs, states adopted rules requiring huge amounts of data on recreation resource supply and opportunity demand. During the heyday of state planning in the 1970's, comprehensive plans built on huge data bases were financed by commensurately large congressional appropriations for LWCF grants to the states (Smith 1989).

Planning methods and products during this zenith reflected the cornucopia of federal funding and other social and political circumstances favorable to recreation research and planning. Under the BOR during this time of plenty, statewide planning was characterized by a willingness on the part of local, state, and federal recreation resource management agencies to cooperate in recreation planning more fully than at any other time in the history of SCORPs (Bradley, personal communication).

As available money was the primary impetus for this cooperation, the independence of the BOR as the governing agency for state planning helped to perpetuate cooperative alliances from its non-threatening position as a program administrator with no lands of its own to manage. Cooperation and coordination in SCORP planning was further strengthened during this period by the guidance provided by up-to-date National Outdoor Recreation Plans -- which are still legally required but which, to the contrary, have not been produced by the National Park Service for nearly a decade; a strong and active public national park and recreation ethic; and a viable nationwide outdoor recreation research program (Bradley, personal communication).

While interagency cooperation in SCORPs was never greater than during the 1970's, informed sources involved with federal SCORP

administration from its inception personally recall no instances of recreation resource agencies forming other than temporary, ad hoc committees to address pressing, localized planning issues within state jurisdictions (Bradley, personal communication; Atkins, personal communication). Also, none of these previous cooperative planning efforts are known to have persisted through more than one five-year SCORP cycle. Additionally, no interagency cooperative efforts are known to have been undertaken for large geographic areas of multi-state scale. While a complete written record might refute these personal recollections, the SCORP archive is incomplete, scattered, and otherwise impossible to fully reconstruct, making it impossible to disprove the assertion (Bradley, personal communication).

As LWCF yearly appropriations have decreased steadily from \$370 million to \$20 million during the decade 1979 to 1989 (Smith, 1989), and continued to decline to a low of about \$17 million in 1992 (Coffin 1991), data-intensive and costly plans have been largely abandoned for economic reasons. This is in spite of continuing LWCF legal requirements that states assess current and future recreation supply and demand for state resources emanating from inside and outside state borders, and set forth a comprehensive plan for meeting recreation needs revealed by the analysis. In response to these difficult circumstances an American Planning Association (APA) review of SCORP processes, stressed the need for planning innovations in attempting to fulfill the legal requirements for plans under limited budgets (Smith 1989).

Obvious in its omission among the APA's suggestions for SCORP innovations is an alternative that includes cooperative, regional approach to SCORPs as a way to overcome current planning obstacles. This approach promises economies of scale in data gathering and analysis, and offers states the wider range of expertise assembled within multiple agencies compared with that available within state planning agencies (Frost, personal communication; Eixenberger, personal

communication). In an era when meager LWCF appropriations are chronic and worsening, this approach offers promise as a means to continue the recreation institution building that was the ORRRC's original aim for SCORPs, but that has since been largely subverted by changing institutional priorities and diminished funding.

Recent SCORP Research in the Pacific Northwest

Lack of adequate LWCF appropriations have thrown the SCORP process, as it has been pursued in the past, into crisis. At jeopardy is the recreation institution-building role of SCORPs originally envisioned by the ORRRC framers. Without the financial incentives of adequate LWCF appropriations for states' planning, or other demonstrations of institutional support for recreation, cooperative ventures and geographically comprehensive approaches to SCORPs have not generally developed or survived.

The Pacific Northwest Outdoor Recreation Study (NORS) is the recent exception. While not an expressed goal, the NORS effort has sought to effectively revive the institution-building role of SCORPs during this time of diminishing federal aid to state recreation planning. The Study represents a cooperative regional research effort in gathering recreation planning support data by state parks and recreation agencies in Oregon, Washington, and Idaho, and seven federal resource management agencies with lands in the region. NORS was undertaken to provide information to evaluate and plan for changes in recreation systems that transcend state lines and agency administrative boundaries in the Pacific northwest. To accomplish this goal, NORS incorporated an ecological concept of regional recreation systems as a precept for designing research methods and applying research results.

Cooperative agreements between NORS participating agencies were based on recognition that regional patterns of recreational use characterize population demand for diverse and geographically widespread

resources. Thus, the resources in individual agencies' charge are considered as components in a regional supply system, which functions to deliver a diversity of quality recreation opportunities while increasing the efficiency of delivery to recreating populations. Research in support of planning at the scale of the Pacific Northwest recreation system enabled recreation suppliers to assess comprehensively the needs of clientele populations whose recreation demands transcend administrative and political boundaries, while contributing to efficiency of the larger system to deliver a diversity of recreation opportunities (Hospodarsky 1988).

The NORS research proceeded on the premise that regional recreation use data have enhanced potential for public resource management and planning functions. The greatest potential uses of regional recreation data involved the identification of recreation activity travel patterns and trends. These data had application for:

- 1) determining the interrelatedness of recreation locales as these settings, in aggregate, represent the pattern of destinations for a population's recreation activity. Gaps or redundancies in this pattern may become evident when the overall visitor experience is considered within the context of the regional recreation system;
- 2) determining the complementariness of settings as part of a regional recreation system allows for the selective promotion of lesser-used settings, thereby directing use away from more popular areas in the same region;
- 3) determining if differences exist in recreation patterns among locales as a guide to tailoring planning and management activities; and
- 4) increasing the efficiency of the individual states' SCORP data procurement and analysis by incorporating the economies of regional scale in research design and implementation.

The hallmark of NORS was the cooperative effort by participating state and federal recreation resource management agencies. The project goal was to obtain representative recreation use data of practical significance to private, local, state, and federal recreation resource suppliers within a region; that is, to describe in its entirety the

Pacific Northwest recreation system and its functional regional sub-systems of lesser geographic scale.

Planning toward this goal began in 1985 with the formation of the Pacific Northwest Regional Recreation Committee (NWRRC). The NWRRC was formed to bring together public agency managers with jurisdiction over recreation resources throughout the Pacific Northwest. Three state and seven federal agencies are active members of NWRRC: Oregon State Parks Department, Washington Interagency Committee for Outdoor Recreation, Idaho Department of Parks and Recreation, National Park Service, USDA Forest Service, Army Corps of Engineers, Bureau of Land Management, U.S. Fish and Wildlife Service, and Soil Conservation Service. The NWRRC was chaired by a veteran employee of the Washington Interagency Committee For Outdoor Recreation, an official state agency mandated to coordinate public sector recreation planning within the state, but without any lands of its own to manage. All of these agencies along with technical consultants from Oregon State University, Western Washington University, and the University of Idaho worked together closely throughout the project to translate the needs of each participant into the research final product.

A technical sub-committee undertook the tasks of study design and implementation. This sub-committee was composed of agency planners and university consultants. Working closely with the entire NWRRC membership, the sub-committee lead by Oregon State University, designed the survey sampling plan and recreation demand questionnaires used by all three participating states. The sampling plan and questionnaires underwent extensive review and revision in an attempt to accommodate the requirements of each member agency, yet preserve the comparability of data among the states. Agencies added survey questions to meet individual management and planning needs. These questions asked about use of specific sites, use and preference for areas described in terms

of the Recreation Opportunity Spectrum (ROS), and the potential of resources as tourist attractions.

Final decisions about the form of study components were arrived at through negotiation by the entire NWRCC membership. The considerable give-and-take of these negotiations was characterized by a spirit of compromise and the quest for creative solutions to enhance the value of the study for each party involved. To this end, maintaining the viability of the system-focused cooperative effort became an important element of NORS for many of the participants. The process - and its potential for producing results beyond the capability of any one agency to achieve individually - was perceived as a valuable benefit of the study. As a successful demonstration of interagency cooperation in recreation resource systems planning, the cooperation engendered by the study continued as a positive benefit even after the original study was completed (Hospodarsky 1988).

While the NORS effort to accomplish recreation planning and management on a regional scale was by no means a complete success, the attempt was no less important for its lack of total accomplishment. The importance of NORS lies in the example it represents as unique in the history of public recreation resource stewardship. No other known attempt has been made, by such a diverse group of recreation management agencies over such a broad geographic area, to integrate data collection efforts with the prospect to evaluate the delivery of recreation services on a system-wide basis. Certainly the concept of systems planning is not new to natural resources, but the scale of NORS, the cooperative intensity of the effort, and the far-reaching practical applications that its results have enjoyed have set a timely precedent not only for outdoor recreation management but for natural resource management in general. The NORS process demonstrates that under appropriate conditions of social organizational structure and resource relationships, regional recreation planning and management can be

achieved to the benefit of people and the resources upon which they depend.

Study Area

A clear distinction must be drawn between the tri-state Pacific Northwest geographic area, which was the object of the NORS analysis, and a sub-unit of this area that is the functional recreation region empirically described in the next chapter and the topic of the conceptual framework for regional recreation planning developed in this dissertation. The analysis of functional recreation regions described in the next chapter was undertaken after completion of NORS and its state-wide planning applications. As such, the tri-state geographic area of the NORS analysis (see Appendix B) was found subsequently to include the functional recreation regions of several discrete recreating populations, only one of which is described by way of example in the next chapter. Consequently, the research objectives and methods for regional recreation planning described in this present chapter are those used in the NORS and SCORP applications, as they come to provide the data base for the secondary analysis of a discrete recreation region in Chapter 5. Since data from the Oregon survey portions of NORS were used as the basis for much of the secondary analysis to be reported later, only the methods specific to the NORS Oregon survey, which resulted in data useful to describing functional recreation regions, will be discussed in the remainder of this chapter.

Research Context of the Oregon Study

Data allowing subsequent description of the functional recreation regions of populations residing within Oregon were gathered as part of NORS research in support of SCORP efforts in Oregon, Washington, and Idaho. The results of the NORS study that were relevant to individual

SCORPs have been reported elsewhere (Hospodarsky 1988; Hospodarsky and Lee 1988; Hospodarsky and Lee 1989; Hospodarsky 1990).

The inclusive NORS study represents a coordinated regional approach to gathering outdoor recreation participation data. Methods and instruments used to gather the data were designed under the premise that patterns of recreation behavior and activity participation are the measurable result of interaction between the social, economic, physical, and behavioral characteristics of the tri-state area and its natural and man-made resources (Machlis et al. 1981).

Study Design

The majority of visitors to recreation areas in the Northwest are from regionally contiguous points-of-origin. Thus, regional recreation use data has enhanced potential for state and federal resource management and planning functions beyond that provided by simple description of client population home ranges. The greatest potential management uses of regional outdoor recreation data involve the identification of recreation activity and regional travel patterns and trends.

Fundamental to Oregon's participation in NORS was the survey of Oregon and adjoining states' residents to determine current outdoor recreation travel patterns and trends. The current demand for recreation activities, activity settings, and recreation facilities in Oregon continues to change. The relative level of demand for these aspects of the outdoor recreation experience varies with characteristics of the population, geographic region of residence within the state, season, individual and social characteristics of participants, and other factors. Knowledge of these elements of demand is a necessary information base from which to develop recreation management plans (Cordell et al. 1990) and for description of functional recreation regions useful in recreation policy and management decisions (Smith

1989). These types of data were also, therefore, the objective of the Oregon SCORP survey methods.

Based on the needs of the region-based SCORP, the objectives of the Oregon portion of the NORS research were twofold:

- 1) To estimate the current rates of participation by Oregonians in outdoor recreation activities by time of the year, physical resource or settings type, and geographic location with a specified level of precision. The observation and measurement of these patterns, studied in relation to socioeconomic and demographic attributes of an existing population base and the corresponding stock of recreation resources, provides the foundation for estimating future recreation use levels; and
- 2) to determine the socioeconomic and demographic characteristics of resident recreationists. Correlated with current activity participation estimates, these data allow description of the leisure lifestyle of Oregonians. In projecting recreation activity estimates, these data provide a baseline from which to estimate future activity trends as they are affected by changing socio-economic and demographic characteristics of the population.

In order to meet these objectives for the Oregon survey portion of NORS, data were gathered on the following classes of variables.

Independent Variables

- 1) Socio-economic and demographic characteristics of recreationists and non-recreationists in the sample.
- 2) Geographic locals within which recreationists reside and to which they travel for outdoor recreation opportunities.
- 3) Time of the year in which recreation takes place.
- 4) Settings used for recreation as described by ROS classes.

Dependent Variable

Rates of participation in outdoor recreation activities.

Sampling

The two-phase telephone and mail survey method used in the Oregon and other cooperating states' studies required a complex correlational design and sampling plan. Sampling considerations cited by Kalton (1983), such as target population, questionnaire complexity, sample size, and sampling frame availability influenced selection of the

telephone/mail survey samples in the study. Because of these considerations, the mail survey was designed as a sub-sample of the telephone survey, as the mail survey was subsequently administered only to respondents of the telephone survey.

Specification of the telephone survey sample size was based on the expected returns in both the telephone and mail surveys. The mail questionnaire was the primary data-gathering instrument and was, therefore, designed to elicit detailed responses about various behaviors and attitudes. The mail survey sample size was set to ensure adequate numbers of observations at desired levels of data disaggregation. Since telephone survey respondents also served as the mail survey sample, the telephone survey sample size was set at a level to ensure an adequate size sample for the mail survey.

Telephone Survey. The target population for the telephone survey was defined to consist of all adult residents of Oregon who live in households with telephones. This target population was estimated to be about 96% of Oregon's population of 2,119,018, who were 18 and older, or about 2,034,257 people. Using a standard formula to select the sample size to estimate population proportions (Scheaffer et al. 1979), a 0.23 percent sample, about 4,750 people, was determined to be large enough to obtain estimates of adequate precision for the surveys. Expecting a response rate of approximately 70% from the target population, the ratio of participating to non-participating adults in recreation activities could be estimated within plus/minus 100,000 with 95% confidence. It was recognized that adjustments for non-response bias would increase the standard errors somewhat, and that percentages of population subgroups could not be estimated so precisely.

The sample design was a stratified, two-stage cluster. The sample was stratified by in-state region and by month of the year. The sample was clustered by household and then by adults within the sample household. Regional stratification began by the Oregon State Parks

Division designating in-state regions based on homogeneity of physiographic, economic, socio-cultural, and leisure lifestyle characteristics within the region (Eixenberger, personal communication). In general, regions were aggregates of whole contiguous counties except for Oregon Regions 5 and 8, and 6 and 9, (see map in Appendix B). In these four regions, the county boundaries did not conform to regional criteria as Lane County (in Regions 5 and 8) and Douglas county (in regions 6 and 9) assume a quite different character on the west and east sides of the Coast Range. As a result, both counties were divided on regional boundaries formed along a straight line connecting the southeast corner of Lincoln County with the northeast corner of Coos County. This boundary roughly coincides with the Coast Range ridge.

Samples of equal size were drawn from 7 of the 8 designated state regions (Appendix C) in order to simplify later aggregation of regional data (Berg 1987, personal communication). The other region, Region 5, comprised of Clatsop, Tillamook, Lincoln and coastal Lane Counties, was over sampled to allow for a more complete statistical analysis of particular sub-populations within the region. Region 5 data were weighted appropriately in applications where the data were combined with that for other regions to produce population estimates for the entire state.

With the exception of Region 7, the counties actually sampled within each region were selected with a probability proportionate to the population in the county. This is an accepted method for obtaining representative samples of counties or other entities where size is related to the dependent variable (Kalton 1983). Using this method three counties from each region were selected for the sample. The number of counties was determined arbitrarily in consideration of Region 6 which included only three counties -- Coos, Curry, and part of Douglas County. For Region 7, composed of four counties in the Portland metropolitan area, all counties were included for the regional sample. This sampling

strategy was necessary because within the Portland Metropolitan area the telephone directory-based sampling frame made it difficult to determine the respondent's county-of-residence.

The sample was also stratified by month for 12 consecutive months beginning with June, 1987. Although seasonal recreation use data were the objective of the survey, monthly data could be aggregated into any period configuration desired because of the independence of the periodic samples (Scheaffer et al. 1979). Monthly sampling was undertaken to avoid the biasing effects of peak recreation periods such as holiday weekends, which might fall near the end of a three- or four-month-long, seasonal sample period, since recall required over a longer period might be disproportionately weighted toward recent activities.

The monthly samples were drawn as a two-stage cluster of 265 households and adults within households for each of the 12 sampling periods. The monthly sample was divided among the probability sample of counties comprising the eight in-state regions, in two ways. In each sampled county in Regions 5-6 and in 8-12, an equal size sample of households was drawn from each county (excepting Region 5 as already noted). In the Portland Metropolitan region - Region 7- the sample of households was drawn from throughout the region without regard to county-of-residence. Thus, all households in a region had the same probability of being in the sample as the households in any other region (Berg, personal communication). Respondents within households were randomized by interviewing the adult with the most recent birthday.

Monthly quota samples of 265 households were obtained by substituting households which could not be contacted after repeated calls or which refused to participate in the survey. Attempts to reach respondents which resulted in no answer continued twice a week on various days of the week and at various times of the day throughout the sample month and for two consecutive months, thereafter. After this time, another number (household) was substituted in the sample.

Attempts to reach respondents in which busy signals resulted, continued half-hourly the day of the original call and then daily thereafter until the household was contacted.

The quota sample distribution by region, county and month for the telephone survey is shown in Appendix C. The sample months were June, 1987 to May, 1988, inclusively. Samples of equal size were drawn each month from each region of the state, with the exception of Region 5 which was over sampled. The Portland metropolitan region was sampled at the same intensity as the other regions, excluding Region 5.

The sampling frame for selecting respondents was all the listed residential telephone numbers in the state. This frame was altered to include unlisted numbers by adding one to the listed number, as the numbers were systematically selected from the directories. Using this procedure the survey research firm of Bardsley and Hoslacher, Inc., Portland, Oregon obtained approximately 6,500 primary telephone numbers. The quantity of primary numbers for each region was roughly twice the anticipated sample size in order to accommodate refusals, disconnected numbers, businesses, and empty exchanges. The primary numbers generated by the consultant as well as the county-of-residence were recorded directly on a questionnaire call record. This record allowed the interviewer to keep track of the calling status to a particular number.

Records of calls included notes by the interviewer regarding the alteration of primary numbers. When interviewers encountered a number to which a call status code of refused, out-of-service, or nonresidential applied, they were instructed to change the primary number by adding one to the original number, and dial again. This sampling procedure was necessary due to the large quantity of "empty" numbers encountered in some exchanges, especially in sparsely populated eastern Oregon. Calling continued each month until the designated 265 questionnaires had been completed for that month.

Mail Survey. The sampling frame for the mail survey was obtained from completed telephone questionnaires. Consequently, the sample size, sampling units, and other sampling characteristics of the mail survey represent a sub-sample of the telephone survey sample. As a sub-sample, the statistical quality of the mail survey sample was initially dependent upon the representativeness of the sample drawn for the telephone survey.

The sample size of the mail survey was the same as the telephone quota sample; that is, the number of calls received by respondents minus the number of refusals. Each month of the 12 monthly sample periods, 265 questionnaires were mailed to those people who had completed the telephone survey.

Survey Methods

A sequential combination of the telephone and mail survey methods were used in the regional study by the three operating states. This design, which Dillman (1978) refers to as a data collection system, was chosen to balance among sampling considerations of survey costs, and the complexity of questions. Specifically, the combination of telephone and mail survey methods allowed use of a readily accessible and inexpensive sampling frame in the form of telephone directories. Telephone contact with sampled respondents also served the important functions of building credibility and commitment with respondents who were asked to subsequently complete a mail questionnaire. The mail survey method was considered the most efficient way to obtain answers to the complex questions that were necessary to obtain information about activity participation.

The survey system method and the content of the telephone and mail questionnaires were developed by faculty members at the Forest Recreation Resources Department, Oregon State University (OSU), with substantial inputs from Oregon State Parks, the Interagency Committee

for Outdoor Recreation, and other state and federal agencies and educational institutions.

Final content of the questionnaire and the choice of survey methods were determined by consensus of the technical sub-committee for survey development of the Pacific Northwest Regional Recreation Committee (PNRRC). Four alternative combinations of telephone and mail questionnaires were drafted by OSU as decision aids to facilitate the committee's selection process. From the four alternatives, a preferred alternative was selected after a lengthy process in which survey methods and individual questionnaires were evaluated in detail. The preferred alternative telephone and mail questionnaires were then revised to reflect the specific concerns of committee members before pre-testing of the instruments began.

Questionnaire Pre-test. Pre-testing of the telephone and mail questionnaires was conducted in the spring of 1987. To assess the reliability and validity of the survey instruments (Babbie 1973), the following pre-test procedures were followed.

- Following selection of a draft telephone and mail instruments by the technical committee of the PNRCC, review comments were solicited from the full PNRRC membership.
- The telephone and mail instruments were field tested with a random sample of fifty households in Corvallis, Oregon according to actual questionnaire administration procedures. These households were not part of the sample for the state-wide survey. Respondents indicating difficulty with the mail questionnaire were recontacted by telephone for follow-up interviews.
- The mail questionnaire was administered to twenty faculty, staff, and students at Oregon State University. Follow-up interviews were conducted with each respondent.
- Results of the pre-tests were incorporated in the questionnaires and reviewed by Oregon State Parks staff and the full PNRRC membership. Further revisions were incorporated into the survey instruments.

Part of pre-testing the telephone questionnaire included evaluation of the survey introduction given by the interviewer to the respondent. Several alternative phrasings of the introduction were

tested and it was concluded that a rendition including mention of Oregon State Parks as the sponsoring agency was most effective in engaging the potential respondent in an interview.

The pre-test indicated the need to clarify several questions and to change the order of some questions in order to enhance readability to reduce the perceived tediousness of the questionnaire completion task. The final versions of the telephone and mail questionnaires along with related survey materials are presented in Appendices D and E, respectively.

Telephoning. Telephoning procedures began with developing the sampling frame, sampling plan, questionnaire, telephone introduction, and call record, all of which except the sampling frame and plan are shown in Appendix D. Necessary quantities of documents were determined based on an anticipated response rate of 80 percent and a 100 percent increase in needed primary telephone numbers beyond the sample size. Printing of material was done by the OSU Printing Department.

The telephone survey was conducted from the Offices of the Forest Recreation Resources Department, Oregon State University. Four touch-tone phones were available after 5 p.m. weekdays and on weekends. Calls were made from five p.m. to nine p.m. on weekday evenings and on Saturdays from 9 a.m. to 5 p.m. Calls for the monthly sample were begun the first working day following the last day of the sample month. Calling for each month was usually completed by the third consecutive week of effort depending on the number of interviewers available.

Interviews were conducted by college students who worked from 10 to 20 hours a week on the project. Employees worked an average of three months before quitting. The number of interviewers employed at one time varied from two to as many as seven, although four was the usual number. Interviewers completed, on average, 2.5 interviews per hour. This low figure was largely the result of the randomized dialing method in which

considerable telephone time was consumed by non-interview transactions (e.g., disconnects, empty exchanges).

Because of the transiency of student employees, considerable administrative effort was expended training replacement interviewers. Prospective employees were hired based on their interview experience, fluency with English, speech clarity and speaking voice, and warmth of expression. This latter quality, while difficult to evaluate, proved vital to obtaining reasonable response rates over the telephone. New employees were given three hours training before they were allowed to begin interviewing. This training consisted of a thorough review of the interview materials and procedures as well as mock telephone interviews with other project employees. Employees who successfully completed pre-interview training were monitored closely by the shift supervisor for 4-8 hours of interviewing. During this period, interviewers were given periodic feedback regarding delivery style, interview content, and methods of completing the interview materials. Employees who were unable to adequately conduct interviews were sometimes assigned tasks associated with the mail survey or were terminated.

Following each interview session, the project director checked the completed questionnaires for recording errors and tallied the number completed for each county in the sample. A record was also kept of the number of interviews by county completed by each interviewer. Daily work assignments were rotated by county to spread any interviewer-induced response bias over the sample. Once the monthly sample was drawn, a master list of respondent's names and addresses, and three sets of mailing labels were produced to be used for the mail survey.

Mailing. Mailing procedures were modeled after Dillman's (1978) total design method. Mailing procedures began with developing the sampling frame, drawing the sample (both of which were accomplished by the telephone survey that preceded the mail survey each month), producing three sets of mailing labels, and developing and pre-testing

the questionnaire including map, cover letters and reminder postcard. Final versions of the last three products are shown in Appendix E. Necessary quantities of documents were determined based on an anticipated response rate of 65 percent. Printing of questionnaires, maps, and postcards was done by the OSU Printing Department. Cover letters were individually addressed, typed and signed by the project staff. Cover letters were produced in 12 batches, one for each monthly sample.

Mailings for the monthly samples began the first day of the month following the end of the sample month in which the monthly telephone survey was completed. First-mailing questionnaire packets included a sequentially numbered questionnaire with the number corresponding to the respondent's name on the master list, a regional map, stamped first-class return envelope, and a personalized cover letter. Packets were sent by bulk mail. Returns from the first mailing were checked off the master list as they came in to avoid sending repeat questionnaires to respondents. One week after the first-mailing reminder, postcards were sent by bulk mail to everyone on the master list. Two weeks following the postcard mailing, a second complete questionnaire packet was sent to those who had not yet responded. This second packet was identical to the first-mailing except for the content of the cover letter, and the questionnaire numbers which were continued sequentially from the first-mailing. Returns from the second mailing were again noted on the master list.

Mail questionnaire packets and postcards were addressed and stuffed by student workers. Each month's mailing required approximately 40 person-hours of labor and administrative effort. Administrative effort involved general quality control, periodic summarization of response rate, resolution of undeliverables and responding to respondent's questions and requests.

The general procedures followed in the Oregon survey were outlined in a project work schedule. The project time-line showed the sequence of project tasks, including data analysis and reporting of results.

Data Preparation

Coding. Most of the telephone questionnaire data were coded for computer entry by operators as they entered the data from each questionnaire. Operators referred to a Code Book for instructions for coding each variable. The correct response was then typed directly into a microcomputer. Responses to Question 10 about occupation in the mail questionnaire, were pre-coded according to the Classified Index of Industries and Occupations prepared by the Bureau of Census, 1982. There were few open-ended questions in the telephone instrument so data field widths and the number of key strokes required for data entry were minimized.

Some of the mail questionnaire data were coded before data entry began and the remainder were coded by operators as they entered the data from the individual questionnaires. Responses to Questions 1a and 33, tourist activity and spouse's occupation, were pre-coded and the open-ended responses to Question 1b were paraphrased before data entry began. All other responses were coded by operators at the computer with the aid of a Code Book.

The mail questionnaire contained several open-ended questions designed to gather exploratory data about attitudes toward natural resources development. To preserve the diversity of these data, no pre-coding was done for Questions 15, 17, 18, 20, and 21. Large data fields were also reserved for these variables to accommodate the entirety of responses.

Data Entry. Data were entered by student workers on IBM Personal computers at the College of Forestry, OSU. Operators were given three

hours of individual training prior to beginning data entry and were closely supervised during the data entry process.

Because non-professional operators were employed to enter data, an interactive data entry program was developed in an effort to minimize data entry errors. The program was designed by a private consultant using dBase III software. With the program, operators were able to enter on the average of 20 telephone questionnaires each hour.

Operators were provided with forms on which to note the data base record number and the nature of any problem they encountered in entering data. This procedure was necessitated by the general lack of operators' ability to edit computer entries. By leaving such troubleshooting to a few supervisory personnel, consistency of responses to problems was ensured.

Data Cleaning. The task of data cleaning was made easier by the generally high quality of data entry attained with the interactive data entry program. However, errors were inevitable as a result of incorrect coding, incorrect reading of responses, or incorrect entry of codes. One experienced employee, the data entry supervisor, performed all the data cleaning for both the telephone and mail questionnaire data.

Two types of cleaning were performed on the data. First, responses were checked against the set of legitimate responses to a question. This check was done by examining the distribution of responses for each question using a dBase command function and SAS frequency output to identify and locate any inappropriate entries in the data base.

Second, a contingency cleaning of data was conducted. The logical structure of the questionnaire placed limits on the responses of certain respondents. For example, an unmarried respondent could not indicate a spouse's occupation. Such illogical responses were identified by comparing logically related entries from data files by way of the count-sort commands in dBase.

Survey Returns and Response Rates

Telephone Survey. A summary of telephone survey returns is provided in Table 1. The large number of calls necessary to obtain the monthly samples is broken down by call status categories taken from monthly call records. On the average, about seven calls were attempted for each questionnaire completed. Most attempts resulted in disconnected, nonresidential, and call-backs (i.e., no answer, line busy, or correct respondent not at home). Overall, only about 20 percent of calls actually reached respondents, resulting in refused, partially completed, or completed questionnaires.

Table 1. Telephone survey returns.

Sample Month	Number Attempted	Number of Non-resid	Disconnect/ Call-backs	Calls Reaching Respondents		
				No. of Questionaires Refused	No. of Partial Complete	No. of Questionnaires Complete
June	1,908	1,382	154	103	4	265
July	1,802	1,311	114	109	3	265
Aug.	1,836	1,296	160	112	3	265
Sept.	1,889	1,385	137	96	6	265
Oct.	1,818	1,310	160	109	4	265
Nov.	1,858	1,352	118	121	2	265
Dec.	1,820	1,286	151	113	5	265
Jan.	1,797	1,262	133	114	5	265
Feb.	1,866	1,356	133	108	4	265
March	1,874	1,326	169	107	7	265
April	1,899	1,393	130	106	5	265
May	1,808	1,303	133	103	4	265

If response rate is defined to be the ratio of the number of questionnaires completed to the number of calls reaching respondents, the final response rate for the telephone survey was 70.3 percent. If the response rate is defined to be the ratio of questionnaires completed and partially completed to the number of calls reaching respondents, the response rate was 71.3 percent.

Mail Survey. A summary of mail survey returns is given in Table 2. Very few of the mail questionnaires were undeliverable due to short elapsed time between obtaining respondent addresses by telephone and the mailing of questionnaires a few weeks later. A fairly substantial number of mail questionnaires were returned unattempted, often a reflection of the length and perceived difficulty of the questionnaire (Dillman 1978).

The final response rate, defined as the ratio of the number of questionnaires returned and completed to the number received by respondents, was 68.5 percent. Alternatively, the response rate defined to be the ratio of questionnaires returned and completed to the number mailed, was 68.2 percent. Finally, a response rate defined to be the ratio of all questionnaires returned (completed and unattempted) to the number mailed, was 72.9 percent. This latter definition of response rate was in keeping with the sampling strategy of the combined surveys in that non-response to portions of either questionnaire were treated as missing data in a respondent's combined telephone and mail survey data record. The first and second mailings of the questionnaire contributed to 58.1 percent and 14.1 percent of the response rate, respectively.

Non-response Bias. Implicit in the research methods described in this chapter is the attempt to control unattributable bias and to enhance measurement precision. This over arching goal of research design is suggested by Dooley (1984) as the methodological paradigm for sample design and questionnaire development. Several areas of each

Table 2. Mail survey questionnaire returns.

Sample Month	Number Mailed	Number Undeliverable	Number Received by Respondents	Number Returned	Number Returned Not Attempted	Number Returned Completed
June	265	0	265	205	9	196
July	265	1	264	199	11	188
August	265	0	265	198	13	185
September	265	2	263	184	14	170
October	265	1	264	188	10	178
November	265	1	264	198	12	186
December	265	2	263	196	13	183
January	265	1	264	191	15	176
February	265	0	265	190	13	177
March	265	0	265	189	14	175
April	265	1	264	188	11	177
May	265	1	264	191	12	179

phase of survey development were necessarily compromised in this regard in order to complete the research within time and budget constraints. Where compromises became too great a threat to statistical reliability, methods to specifically assess bias were introduced into the analysis.

Despite concerted efforts to control bias in the respective surveys, several potential sources of bias could not be completely eliminated within project budgetary constraints. The primary source of bias to the surveys is the substitution of sampled households in the telephone survey as a result of refusals and unreachable households (Dillman 1978). This bias could, in turn, also bias the mail survey sample. The households substituted may not be similar to the original household, regardless of whether systematic or random digit dialing sampling methods were used. And, since little is known about the households that refused to respond or were unreachable it becomes difficult to obtain sufficient data to compare the representativeness of this sample component with the population.

This potential source of bias was minimized by permitting substitution only after attempts to reach the household over a considerable period of time and at diverse times of the day. Still, most calling was done in the evening hours when it is more likely that multiple-member households and older people, especially older women, were more apt to be reached by telephone. The biasing consequences of this form of substitution, however, may not be too serious since the primary interests of the two surveys was in household characteristics and recreation behavior which were likely to be known to all adults in the household.

The substitution of households in the telephone sample seemed the most obvious threat to precision. To determine whether those who refused to respond to the telephone questionnaire were different from those who responded, call-backs were attempted to a small sub-sample of refusers. Calls were made by the most experienced interviewers in an

attempt to persuade respondents to divulge as much socio-economic and demographic information about themselves as possible. These data were considered the minimum necessary to assess the representativeness of the non-respondent group. The response rate from call backs was only about 12 percent for the three months during which they were tried, so call-backs were discontinued for the remainder of the sample months.

Potential for bias in the mail survey stemmed from sampling difficulties inherited from the telephone survey and from the length and complexity of mail survey instrument. The relatively large number of returned-unattempted mail questionnaires (Table 2) reinforced these later suspicions. It was possible that the questionnaire content disproportionately affected the responses of lesser and better educated individuals in the sample.

To determine if there were any important differences between those who returned questionnaires and those who did not, comparisons were made between mail questionnaire respondents and non-respondents based on information obtained during the telephone interview. This information includes gender, age, survey month, residence, and outdoor recreation activities.

Table 3 shows men were less apt to respond to the mail questionnaire than women. The relationship is not significant ($p < .05$), however, indicating there is probably little gender bias in responses.

People over 45 were more likely to complete the questionnaire than people 44 and younger (Table 4). This might, in part, be attributed to the greater mobility of younger persons, but differences are not significant at the ($p < .05$) level.

Table 3. Gender distribution of respondents and nonrespondents to the mail survey (N=3,169).

Gender	Respondents (%)	Nonrespondents (%)
Male	40.6	44.9
Female	<u>59.4</u>	<u>55.1</u>
Total	100.0	100.0

Table 4. Age distribution of respondents and nonrespondents to the mail survey (N=3,134).

Age (yrs)	Respondents (%)	Nonrespondents (%)
18-29	16.0	18.4
30-44	32.1	35.5
45-60	28.6	25.4
61 +	<u>23.3</u>	<u>20.7</u>
Total	100.0	100.0

People who acted on the questionnaires sent them during September, December, April, and May were slightly, but not significantly ($p < .05$) less apt to return them (Table 5). These statistics indicate that monthly or seasonal bias in the samples is probably slight.

People who lived in the urban areas along the Interstate Highway 5 corridor, Regions 7, 8, and 9 were less likely to respond than those living in the remainder of the state (Table 6). Again, the relationships are not significantly different ($p < .05$).

Table 5. Months during which respondents and nonrespondents acted on mail questionnaires (N=3,180).

Month	Respondents (%)	Nonrespondents (%)
June	8.9	7.8
July	8.6	7.9
August	8.5	8.0
September	7.9	9.3
October	8.1	8.2
November	8.5	8.1
December	8.5	8.8
January	8.2	8.1
February	8.2	8.0
March	8.2	7.9
April	8.1	9.1
May	<u>8.3</u>	<u>8.8</u>
Total	100.0	100.0

Table 6. Place of residence of respondents and nonrespondents to mail questionnaire (N=3,180).

Region	Respondents (%)	Nonrespondents (%)
5	12.9	12.1
6	12.3	11.1
7	11.4	14.7
8	12.4	13.5
9	12.2	13.9
10	12.8	12.9
11	12.6	11.2
12	<u>13.4</u>	<u>10.6</u>
Total	100.0	100.0

Table 7 indicates some trends were evident in comparisons of recreation activities by respondents and nonrespondents. Nonrespondents were more active in water activities, riding or driving motorized

vehicles off road, and hunting and shooting. No significant differences ($p < .05$) were found in these relationships, however.

Table 7. Outdoor recreation activities during the last 12 months by respondents and nonrespondents to the mail questionnaire (N=3,180).

Activity	Respondents (%)	Nonrespondents (%)
Fishing	51.7	48.6
Water Activities	43.2	46.1
Gardening/Nature Study/ Food Gathering	46.5	43.2
Hiking/Walking/Climbing	65.9	64.7
Camping	32.0	30.8
Snow Activities	19.8	18.9
Riding or Driving Motor- ized Vehicles On-road	29.4	32.6
Nonmotorized Riding	28.4	25.5
Sightseeing/Picnicing/ Driving on the Road	66.6	64.3
Hunting/Shooting	32.5	36.2
Sports/Games/Cultural Events	47.2	44.5

In summary, there is little evidence to suggest the data obtained from the mail questionnaire is biased on the variables examined in this study.

The next chapter uses the results of the NORS research as empirical evidence for regional recreation systems. The evidence that ensues is the result of further analysis of the NORS data using functional regionalization and other related procedures. Since the NORS research was originally undertaken in support of much broader SCORP planning goals than those attempted in this thesis, comparatively little of the available data are actually used in the procedure delineating a regional system presented in the following chapter.

CHAPTER 5

EMPIRICAL EVIDENCE FOR REGIONAL RECREATION SYSTEMS

The previous chapter discussed methods used to gather information about outdoor recreation in the Pacific Northwest. While the information was originally intended as a direct input to various resource planning processes, it is used here as a source case for empirically evaluating what is a largely conceptual framework for planning regional recreation resource systems. As such, results of analysis of the case data are relevant to describing regional recreation systems, but are insufficient as the sole basis for compelling conclusions about regional systems without heavy reliance on the premises of the theoretical framework. A fundamental premise underlying the conceptual framework is that there is an interdependent relationship between the structure of recreation resource systems and recreation behaviors, both of which are manifest at a regional scale such that as regional resource systems vary in structure, recreation behaviors will change.

This chapter defines the boundaries of a regional recreation system based on the spatial patterns of activity consumption exhibited by a recreating population. The establishment of regional boundaries, in turn, sets the geographic and suggests temporal parameters of the recreation system operational within the region, and facilitates identification of internally relevant recreation phenomena that are the functional result of the operation of the regional system. Since description must precede explanation, the information about the recreation patterns that functionally define a recreation region is prelude to examining the region with its indigenous recreation behaviors. Description is aided by the results of applying some analytic methods which, while perhaps novel to the recreation research,

are helpful to understanding the fledgling concept of regional recreation systems.

The Supporting Role of Empirical Data in
this Dissertation -- a Digression

The stated aim of this dissertation is to build a conceptual framework for regional recreation planning. This aim finds its impetus in needs clearly defined in terms of regional systems, evident in the natural resource management planning literature and a recent applied case of regional recreation planning in the Pacific Northwest. As recounted in Chapter 1, the Pacific Northwest case enjoyed some success as a regional planning effort, but it should also raise pertinent questions about the transferability and relevance of methods and results to other planning circumstances and locations. Thus, the focus in this chapter is to explicate the basic structure of what might be commonly conceived as a regional recreation system, guided by relevant social theory and based on available case study data.

Much of the evidence for developing this conceptualization of regional recreation systems is drawn from the theoretical literature, since what is taken here as a heuristic case study in support of the conceptual framework was initially intended as research solely in support of on-going planning efforts. This adaptation of what was intended as a problem-specific input to planning, to its present use as information from which to induce support for a general conceptual framework, loses much relevancy in the translation. Only a relatively small amount of the information from the Pacific Northwest case study is applicable as direct evidence for regional recreation resource systems.

The Pacific Northwest case also is limited by important omissions in the data base, which limit the variety of explanatory variables available for analyzing regional recreation systems. Again, any omissions can be traced to the original purpose of the data as a narrowly defined input to specific resource planning needs. An

important class of explanatory variables clearly lacking in the case data are those describing the institutional arrangements i.e., the socially-sanctioned organizations embodying institutional relationships of regional recreation systems. Without empirical measures of these variables, elements of the conceptual framework are left to stand on assumptions of construct validity, without the buttressing of empirical validity measurement. While the existence of key aspects of regional recreation systems can be empirically verified and partially described within the existing case data, detailed description of system structure and function must await data more comprehensive than is available at this time.

Therefore, expectations regarding the robustness of results of data analyses in support of conceptual framework development must be less than what might be expected from more conventional, analytically oriented studies where research was designed around anticipated data analysis requirements. Accordingly, the results of the data analysis reported in this chapter provide only general construct support of some of the concepts comprising the framework; they have neither the potential, nor do they actually serve as a basis for formal internal validity tests of key components of the framework.

In addition, since the approach to this dissertation is largely theoretical and exploratory, the particular analytic methods chosen for delineating and describing regional systems are those that have not been commonly used in recreation studies. In this regard the data analysis relinquishes any attempt at comprehensive description or inference, choosing instead to suggest some of the more novel analytic approaches available for understanding the qualities unique to regional recreation systems; thereby, providing some empirical evidence for regional recreation systems.

Functional Recreation Regions

Unlike many regionalization procedures that are largely intuitive in their methods, the purposes of regional recreation planning require an objective basis for regionalization procedures. Functional regionalization defines recreation regions on the basis of the pattern of origin-destination flows resulting from travel for which outdoor recreation was a primary purpose. A functional recreation region is the result of compromises a population makes between the desire for access to a diversity of recreation opportunities and the desire to contain travel costs (Smith 1984). As such, functional regions are often internally heterogeneous in their recreation opportunities and travel patterns: adjacent regions are distinguishable from one another based on prevailing patterns of internal travel. According to Smith (1989, p. 184) "... a functional region is defined by a portion of the landscape that contains a set of common origin-destination pairs and transportation routes between them."¹

A functional regionalization procedure using principal components analysis in the Factor Procedure of Statistical Analysis Software (SAS 1988) and eigenvalue cutoff criterion = 1.00, identified five regions within Oregon and Washington as being internally homogeneous as destinations for outdoor recreation activities. Data inputs to the principal components analysis consisted of an asymmetrical square matrix

¹The concept of a functional region was first discussed in Philbrick's (1957) article on "Areal Functional Organization." Basic to the concept is the idea that regions are a type of social system, evolved from a relatively stable set of interactions among geographically proximate people. Smith (1984, p. 14)) operationalized this concept in the context of recreation travel stating "... a functional region may be described as the result of a common set of recreational and tourism interests, similar social perceptions and values, friendship and kinship ties, historical migration and travel patterns, similar responses to the economic problem of minimizing travel and distance costs while seeking an acceptable ... experience." (emphasis added) "Because the ultimate focus is on the result of the interactions of the variables described above, it can be argued ... that patterns of origins and destinations are acceptable surrogates for a more detailed analysis in a regionalization project."

with cells containing the number of recreation trips made between each of 12 sub-state regions in Oregon and Washington, as these areas were designated in the original NORS survey sample configuration (see map in Appendix B). This raw data matrix is shown in Appendix F. In the matrix, rows represent origins and the columns represent destinations. The matrix is asymmetrical because the number of trips made to a sub-state region is not necessarily the same as the number originating within the same region. The matrix also includes trips taken by people recreating within their home sub-state region. The cell values in the matrix represent the sum of trips taken for 50 outdoor recreation activities. The list of these 50 activities is presented in Appendix G.

For purposes of data analysis the raw data contained in the original matrix were standardized to adjust for population variations among origins by converting the raw data to percentages (Smith 1989). The results of the standardization procedure are shown in Appendix H. This matrix of ratio cell values is what was input as data to the SAS principal components program.

Table 8 presents the eigenvalues of the principal components correlation matrix generated from the principal components analysis. Together the five components retained under the 1.0 eigenvalue cutoff criterion recommended by Smith (1984) explain 56 percent of the original variance. Each of components 1 - 5 explain approximately 16, 11, 11, 9, and 9 percent of the variance, respectively.

The scree plot of these eigenvalues, shown in Figure 4, indicates that the eigenvalue cutoff of 1.00 coincides with an obvious leveling off of the eigenvalues. Cattell (1965) suggests it is appropriate to stop factoring at this point. The identification of this leveling-out point lends some credence to the a priori specification of the eigenvalue cutoff criterion at this particular level.

Table 8. Eigenvalues of the correlation matrix resulting from the initial factor method in principal components analysis.

	Eigenvalues of the Correlation Matrix: Total = 12 Average = 1					
	1	2	3	4	5	6
Eigenvalue	1.874741	1.368340	1.285272	1.122178	1.089759	0.970601
Difference	0.506401	0.083068	0.163094	0.032419	0.119158	0.028221
Proportion	0.1562	0.1140	0.1071	0.0935	0.0908	0.0809
Cumulative	0.1562	0.2703	0.3774	0.4709	0.5617	0.6426
	7	8	9	10	11	12
Eigenvalue	0.942380	0.897557	0.867831	0.855458	0.725882	0.000000
Difference	0.044823	0.029726	0.012373	0.129576	0.725882	
Proportion	0.0785	0.0748	0.0723	0.0713	0.0605	0.0000
Cumulative	0.7211	0.7959	0.8682	0.9395	1.0000	1.0000

5 factors will be retained by the MINEIGEN criterion.

Table 9 shows the Varimax rotated component patterns for the five components retained by the principal components analysis. Destination sub-state regions (DEST1-DEST12) with loadings larger than 0.5, for any one component, were considered to represent a group of common destinations (Smith 1984). Thus, Component 1 describes the functional recreation region comprised of sub-state regions 1 and 2; Component 2 is comprised of sub-state regions 5, 7, and 8; Component 3 is comprised of sub-state regions 3 and 4; Component 4 is comprised of 6 and 9; and Component 5 is comprised of one sub-state region, Region 10, from the original NORS survey.

A map of the five functional regions identified from the principal components analysis is shown in Figure 5. The five functional recreation regions (FRRs) are comprised of the following sub-state regions (SSRs): FRR A = SSRs 1 and 2 in Washington; FRR B = SSRs 5, 7, and 8 in Oregon; FRR C = SSRs 3 and 4 in Washington; FRR D = SSRs 6 and 9 in Oregon; and FRR E = SSR 10 in Oregon. It should be noted that NORS sub-state regions 11 and 12 are excluded from mapping as a result of

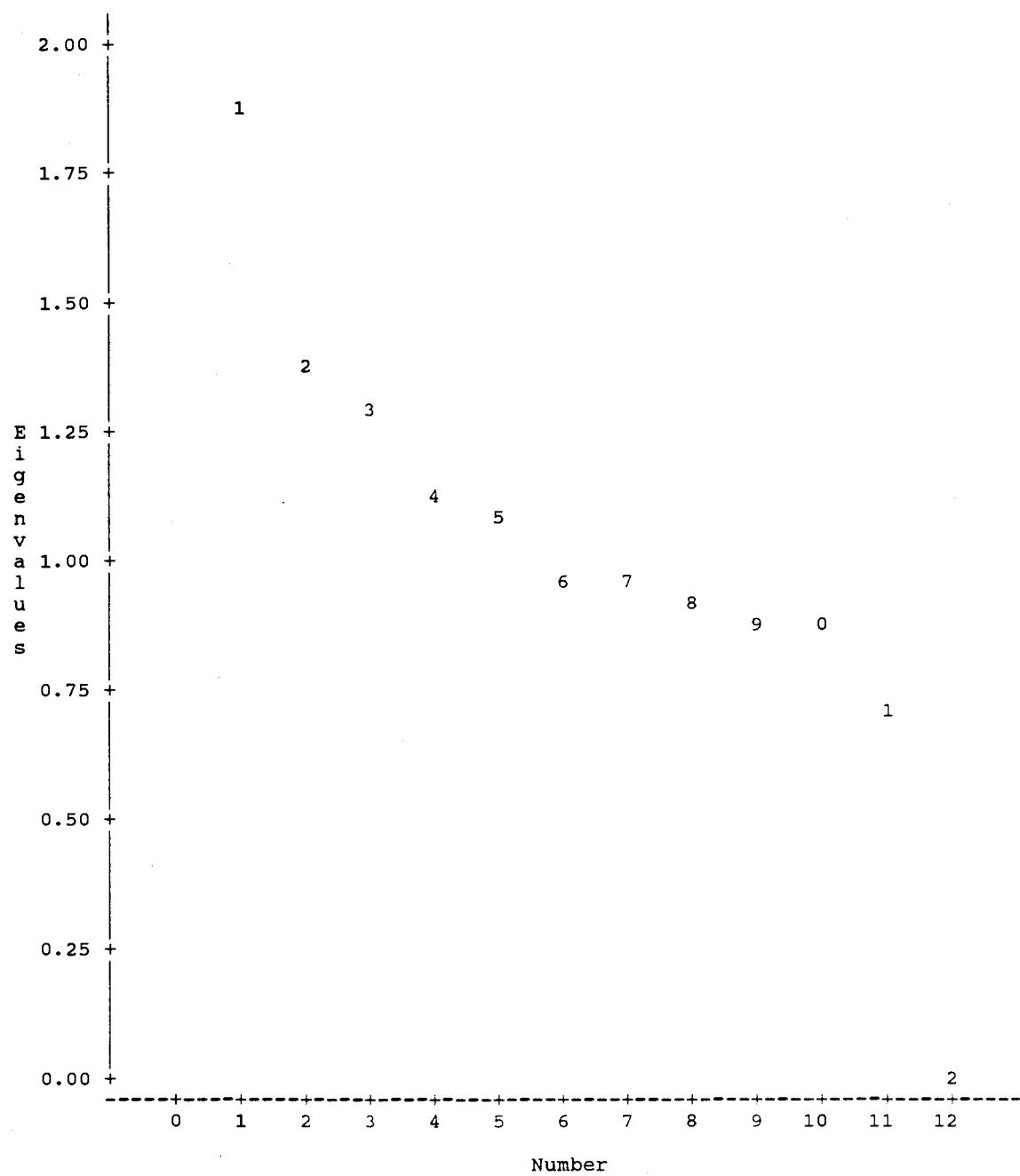


Figure 4. Scree plot of eigenvalues resulting from initial factor method in principal components analysis.

Table 9. Rotated factor pattern resulting from the varimax rotation method in principal components analysis.

	Rotated Factor Pattern				
	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
DEST1	0.75282	-0.14544	-0.03180	-0.11969	-0.03416
DEST2	0.73000	-0.15025	0.04116	-0.11536	0.00134
DEST3	0.22747	-0.17091	0.61079	-0.07701	-0.01342
DEST4	-0.22168	-0.13847	0.79702	-0.13128	-0.02246
DEST5	-0.14633	0.69644	-0.10786	-0.06286	-0.13012
DEST6	-0.12691	0.00688	-0.07374	0.70311	-0.07622
DEST7	-0.02106	0.55637	-0.12449	-0.26733	0.16025
DEST8	-0.14913	0.56643	-0.10153	0.08213	0.02748
DEST9	-0.07729	-0.10355	-0.10192	0.70239	0.06641
DEST10	-0.24889	-0.17626	-0.27454	-0.18352	0.77449
DEST11	-0.24923	-0.27255	-0.31179	-0.20329	-0.67592
DEST12	-0.36669	-0.41120	-0.27458	-0.31926	-0.01775

Variance explained by each factor					
FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5	
1.525222	1.492750	1.312252	1.297609	1.112458	

limiting the number of significant components with the eigenvalue cutoff criterion. Note should also be made that the functional regions denoted by the factor patterns do not overlap. This is very desirable as it avoids an important possible source of ambiguity when analyzing functional regions (Smith 1984).

The origins of recreation visitors to the respective functional regions are indicated by the standardized scoring coefficients for each of the five components (Smith 1989). As is similar to the case of component loadings, score values larger than 0.5 on a component were considered to be high, and similar high scores on any one component indicated a group of common origins. Table 10 shows the scores for each sub-state (origin) region within the five components. When scores on components are compared with loadings on the same components, it is clear that the functional recreation regions delimited on the basis of shared recreation destinations are geographically the same as those

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Outdoor Recreation Study
1986-87

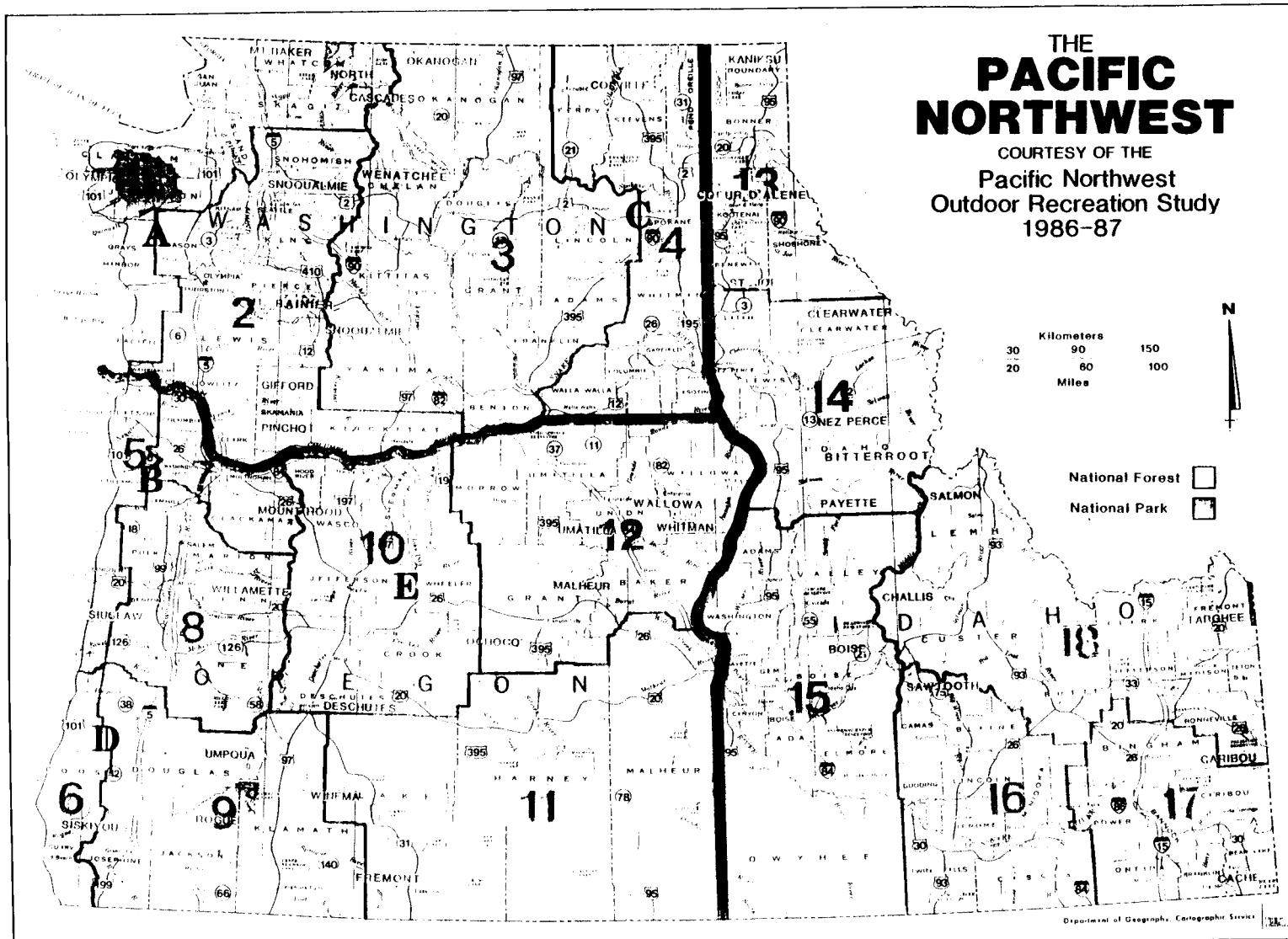


Figure 5. The five functional recreation regions identified from the principal components analysis.

Table 10. Standardized scoring coefficients resulting from the varimax rotation method in principal components analysis.

	Standardized Scoring Coefficients				
	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
DEST1	0.77175	0.27092	0.07885	0.20702	-0.00655
DEST2	0.66955	0.17446	0.07736	0.13368	0.02239
DEST3	0.29607	0.22928	0.63389	0.19728	0.01792
DEST4	-0.03543	0.24445	0.84414	0.13995	0.00607
DEST5	0.20770	0.79098	0.19155	0.17934	-0.13666
DEST6	0.19281	0.27213	0.16414	0.78145	-0.04039
DEST7	0.19972	0.59260	0.08615	-0.04618	0.12256
DEST8	0.12170	0.58752	0.12413	0.21596	0.01005
DEST9	0.21132	0.17320	0.11774	0.77511	0.09221
DEST10	0.11067	0.13545	0.01921	0.12636	0.71012
DEST11	0.09577	0.12763	-0.04080	0.07737	-0.59658
DEST12	0.00000	0.00000	0.00000	0.00000	0.00000

containing the origins of recreation activities. This is to say, the population of a functional recreation area shares a recreation home range that is functionally delineated by the area, to use the vernacular of Clark (1987).

Thus, the principal components analysis identified five functional recreation regions within Oregon and Washington on the basis of origin-destination travel patterns associated with outdoor recreation activities. The five identified regions are assumed to be the result of the function of complex bio-social systems that include population-level recreation behavior and the organizational context affecting that behavior, among other variables. Because the focus of regionalization is on the result of the interactions among these manifold variables, it may be assumed, as was argued in Chapter 4, that origin-destination travel patterns are appropriate surrogates for a more detailed analysis of regional descriptors (Smith 1984).

For purposes of describing the internal characteristics of a region, the functional recreation region described by Principal Component 2 (viz., FRR B in Oregon) was chosen for further analysis. FRR B, hereafter referred to as Region B, was chosen because of its considerable internal complexity for demonstrating recreation flows

among three sub-state regions, and the author's firsthand knowledge of regional system structure and recreational behavior patterns. The region described by Principal Component 1 might just as well have been chosen since it is arguably more important to recreation in the Pacific Northwest (it explains more of the variance), but it lacks similar familiarity. Therefore, while either functional recreation region promised to be useful for the descriptive purposes of further regional analyses, the topic of the remainder of this chapter is Region B in northwest Oregon.

The additional analyses of conditions internal to Region B were undertaken in order to describe some of the system-level phenomena evident within the region. The internal analysis of Region B recreational behaviors sought to determine the general manner in which behaviors are distributed in space and time. The premise being that knowing something about these distributions could serve as a basis to possibly orient spatial and temporal overlays depicting resource system structure; thereby, allowing inferences to be made about the resulting interrelationships.

Spatial Description of the Regional System

Five descriptive methods identified by Smith (1989) - Lorenz Curves, directional bias, net flow, compactness index, and connectivity index - yield results that are useful for describing various spatial characteristics of regional recreation systems. The results of these descriptive methods as they were applied to Region B, are discussed in this chapter.

Lorenz Curves

Lorenz Curves, and an associated index of dissimilarity, are useful for illustrating the similarities and differences in recreation activity structure, and use of ROS settings within individual NORS Sub-regions 5, 7 and 8 that comprise functional Region B. Basically, these

methods result in measures of how specialized is each sub-region relative to each other and to Region B as a whole, on the basis of recreation activity patterns, and the population's reliance on five ROS settings as supply of opportunities for recreation activities.

The tables in Appendix I show the results of the Lorenz Curve and dissimilarity indices calculations for sub-state regions 5, 7, and 8, for 10 categories of outdoor recreation activities. Figure 6 shows the four Lorenz Curves plotted from the information contained in the Ranked Cumulative SSR and Region B columns in the Appendix I tables. From the data in each of the tables, dissimilarity indices were also calculated for each sub-state region. These indices are summarized in Table 11 to facilitate comparisons. The indices, in conjunction with the Lorenz Curves, suggest the relative degree to which recreation is specialized within the three individual sub-state regions and give clues about internal heterogeneity that may have significance for recreation planning in Region B.

The Lorenz Curves (Figure 6) show that recreation activities are least specialized for Region B as a whole (compared with the perfectly even distribution represented by the diagonal line); while, Sub-state Region 7 exhibits the highest degree of specialization among the group, and with SRR 5 and SRR 8 falling between the two extremes on the basis of observed specialization.

Indices of dissimilarity (Table 11) quantify these observed relationships by showing that, with recreation specialization for Region B as a reference, SSR 7 is nearly twice as specialized as SSR 5, and 15 times more specialized than SSR 8. SSR 8 is very similar to Region B with regard to its lack of recreation activity specialization. When the indices in Table 11 are considered with the diagonal as the reference, the magnitude of these numerical relationships vary, but the observed trend among the sub-state regions remains unchanged.

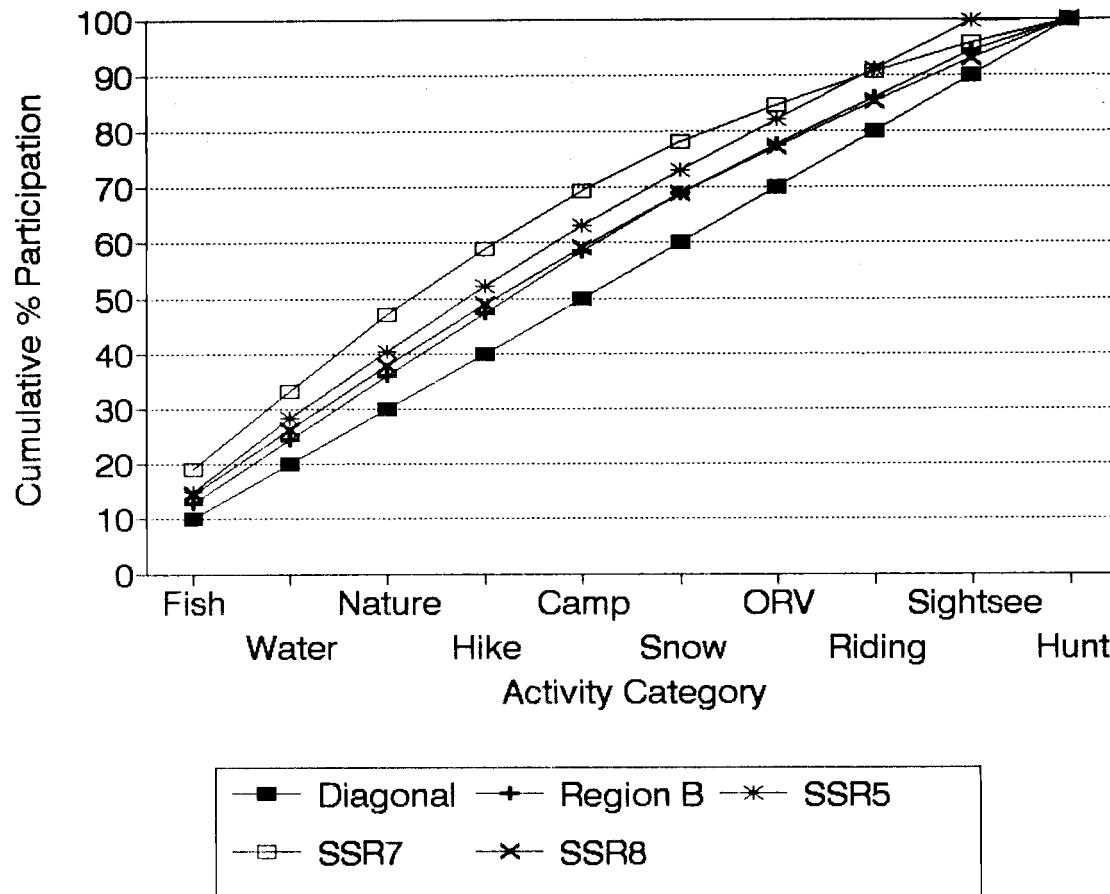


Figure 6. Lorenz Curves of specialization in outdoor recreation activities for geographic areas within the functional recreation region.

Table 11. Indices of dissimilarity in outdoor recreation activities for geographic areas within the functional recreation region.

	SSR		
	5	7	8
Diagonal as Reference	.21261	.28133	.13511
Region B as Reference	.10008	.17856	.01143

Lorenz Curve analyses also were conducted using five ROS settings classes as the categorical variable and the number of trips made for recreation within each of these classes as the interval-level variable. The ensuing procedure was similar to that used to assess recreation activity specialization, and the results of that procedure are reported here in a likewise similar format.

The tables in Appendix J show the results of the Lorenz Curve calculations for Sub-state Regions 5, 7, and 8, for five ROS settings classes where outdoor recreation activities occur. Figure 7 shows the Lorenz Curves plotted from the information contained in the Ranked Cummulative SSR and Region B columns in the Appendix J tables. From the data in each of the tables, dissimilarity indices were also calculated for each sub-state region. These indices are summarized in Table 12 to aid comparisons. The indices in conjunction with the Lorenz Curves, suggest the relative degree to which the use of ROS settings classes for recreation is specialized within the three sub-state regions and indicate aspects of internal heterogeneity that may be significant for recreation planning in Region B.

The Lorenz Curves (Figure 7) show the distribution of use of ROS classes is least specialized in SRR 8, with the distribution of use

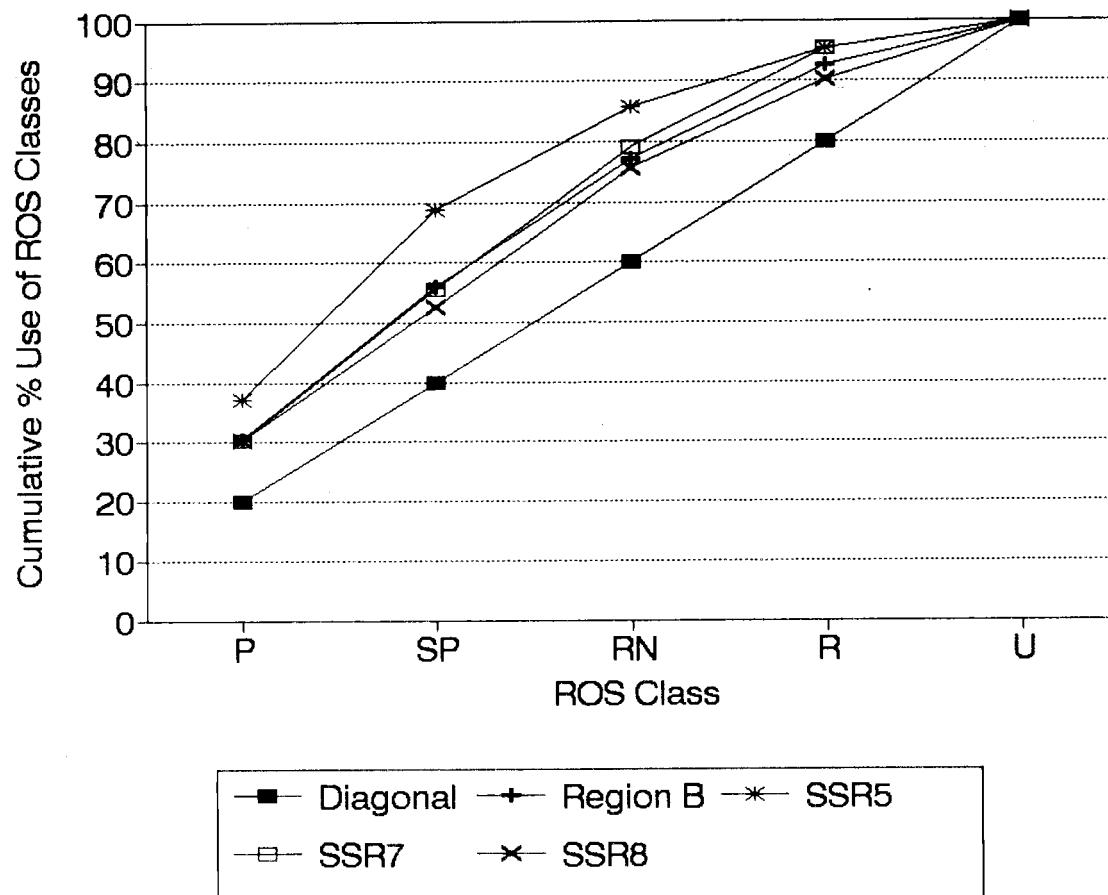


Figure 7. Lorenz Curves for specialization in use of ROS classes for geographic areas within the functional recreation region.

Table 12. Indices of dissimilarity in use of ROS classes for geographic areas within the functional recreation region.

	SSR		
	5	7	8
Diagonal as Reference	.43550	.30150	.23350
Region B as Reference	.21434	.02784	-.06681

there being even less specialized than in Region B as a whole. In contrast, SRR 5 exhibits the highest degree of specialization among the group. Finally, the ROS classes within SRR 7 receive a slightly more specialized distribution of use than does Region B.

The indices of dissimilarity for ROS setting classes shown in Table 12, quantify the relationships graphed as the ROS Lorenz Curves. The indices show that with recreation specialization for Region B as the reference, the distribution of use of ROS classes in SRR 5 is seven times more specialized than that in SRR 7, and that SRR 8 is even less specialized than is Region B as a whole. When the indices in Table 12 are considered with the diagonal as the reference i.e., an equal distribution of use across ROS classes, the magnitude of the these numerical relationships vary but the observed hierarchical trend among the sub-state regions remains unchanged.

In summary, the Lorenz Curve analyses indicate that within functional recreation Region B, SSR 7 exhibits a greater specialization of recreation activities than do the other geographic entities comprising the functional region. When recreational use of ROS settings classes is the unit of analysis, however, SSR 5 exhibits the greater degree of specialization than the other geographic areas comprising

Region B. When the degree of specialization on both activity and ROS variables is compared within individual sub-state regions, relatively high degrees of specialization in ROS settings are associated with diminished specialization in activities (e.g., SSR 5) and relatively high degrees of specialization in activities is associated with lesser ROS settings specialization (e.g., SSR 7). This suggests that in this case setting diversity is somewhat negatively associated with activity opportunity diversity. This seemingly counter-intuitive result can be perhaps attributed to the grossness of the activity categories used in the calculations, which combine activities common to a range of classes, and the perceived lack of settings diversity by visitors to SSR5.

Directional Bias and Net Flow

Measures of directional bias and net flow summarize population travel patterns between origins (places of residence) and various destinations. Within Region B, travel for outdoor recreation is not likely to be evenly distributed since, as the Lorenz Curve analysis has shown, the opportunities for recreation also are not evenly distributed in space. By calculating directional bias and net flow for the sub-state regions within Region B, the measures contribute to the systematic description of the recreation travel patterns of the regional population, and provide independent variables for the conceptual development of the regional planning framework.

Directional Bias is an index of the proportion of trips from one origin to each available destination (Wolfe 1966). The index is not a measure of net travel between geographic areas, however. For this, net flows are measured and these measures are combined with directional bias to provide a more complete picture of travel flows within a region (Smith 1989).

The results of the directional bias index and net flow calculations for Region B are shown in Tables 13 and 14. The work

tables and calculations from which these results were obtained are contained in Appendix K. Directional bias indices for SSRs 5, 7, and 8 of Region B are shown in Table 13. The downward sloping diagonal, represented by cells with coordinates 5-5, 7-7, and 8-8, contains the standardized measures of the propensity of sub-regional residents to stay within their home areas to obtain recreation experiences. These indices show that SSR 5 residents are far more apt (roughly twice as likely) to stay within their home area for outdoor recreation than are the residents of either SSR 7 or 8. When it comes to travel outside the home area for outdoor recreation, by far the greater propensity is for people to travel to SRR 5; travel by the Region B population to either SSRs 7 or 8 represents a distant second in destination popularity.

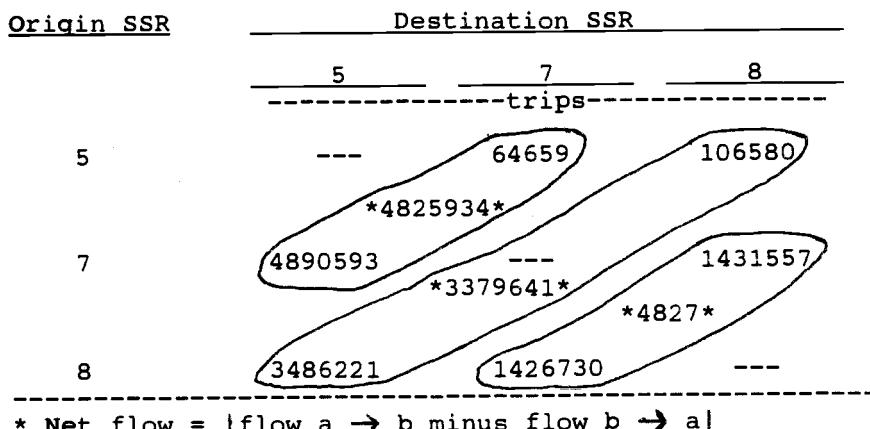
Table 13. Directional bias indices for geographic areas within the functional recreation region.

<u>Origin SSR</u>	<u>Destination SSR</u>		
	<u>5</u>	<u>7</u>	<u>8</u>
5	87	1	3
7	20	40	5
8	20	5	55

Net Flow quantifies the actual number of trips between origins and destinations, which are the basis for the indices of directional bias. These quantities are shown in Table 14. Here the magnitude of travel between the SSRs is readily apparent. Of the nearly five million recreational trips (4,955,252) taken between SSRs 5 and 7, about 98 percent of them (4,890,593) originated within SSR 7 and had their

destination in SSR 5, for a net flow to SSR 5 of 4,825,934 trips. Only 64,659 recreation trips originating in SSR 5 had SSR 7 as their destination. A similarly large discrepancy in net flow is evident between SSRs 5 and 8. In this instance, of the 3,592,801 recreation trips taken between the two sub-state regions, 97 percent (3,486,221) originated within SSR 8, for a net flow of 3,379,641 trips to SSR 5. The net flow of recreational trips between SSRs 7 and 8 was slightly weighted in favor of SSR 8, but by only 4,827 trips out of the total of 2,858,287 trips taken between the two sub-state regions.

Table 14. Net flow* of recreation trips among geographic areas within the functional recreation region.



Measures of recreational travel patterns within Region B indicate an overwhelming bias toward SSR 5 as a destination area within the larger region. Not only is this coastal area popular with inland residents, but it remains the destination of choice for those who already live in SSR 5 as well. The magnitude of the bias toward SSR 5 as a recreation destination becomes clearer when the actual numbers of

trips are considered. The aggregate net flow of trips to SSR 5 is 8,205,575, or nearly 72 percent of all recreation trips taken within Region B. In other terms, SSR 5 is a huge net exporter of recreation experiences to other geographic areas within Region B. Clearly north coastal Oregon - perhaps in part due to its appeal as a recreation resource setting, and in part due to its accessibility to the large urban areas of the region, is the predominant destination for the recreating population of Region B.

Compactness and Connectivity Indices

While anyone who has visited the north Oregon coast would probably not dispute the appeal of SSR 5 as an outdoor recreation destination, two measures are available to help quantify the physical accessibility that contributes to the propensity to travel to this and other potential recreation areas within Region B. The compactness or shape of a recreation region is a measure of the general internal accessibility of the region. The more compact the region, measured as a ratio of boundary length to internal area, the easier it is for recreationists to reach all the region under the assumption that transportation opportunities are evenly distributed about the region as well. The compactness index of a region, therefore, is useful for understanding the relative internal accessibility of a region if certain strong assumptions about accessibility are also met.

In place of the rather strong assumptions required in order for compactness indices to be useful, a direct measure of accessibility in the form of a connectivity index is available as a complement to the compactness index. The connectivity index is based on empirical evidence that travel within a particular region follows established routes within a transportation network composed of nodes and corridors. The connectivity index is a summary measure of the overall accessibility of a region in terms of the amount of connectivity among transportation

nodes (Smith 1989). In general, the greater the connectivity the more accessible is the region for recreation. The connectivity index does not, however, indicate anything about ease of travel, travel times, or corridor lengths. Thus, in comparisons between regions of different sizes, for example, conclusions about accessibility must be carefully interpreted since equal connectivity is not the same as equal travel time or cost.

The calculation of the compactness index for region B is shown in Appendix L. The map area of Region B was measured as $A = 6.2$ units; the map length of the longest diagonal of region B was $D' = 4.1$ units. The diameter of a circle with the same area as Region B was calculated to be $D = 2.8096$. Using the formula for compactness index (C) was calculated as the ratio of D/D' to be 0.68. Since the index ascribes a value of zero if the region is the shape of a line, and a value of one if it is a circle, the calculated index of 0.68 indicates Region B tends toward a moderately circular shape and is, therefore, a reasonably compact system.

The calculation of the connectivity index for Region B is shown in Appendix M. Twenty-one major transportation nodes or points (P) were counted within region B. These nodes were directly linked by 24 road segments (L). Using these data and the formula for Gamma, the connectivity index was calculated as 0.42. Since the index ascribes a value of zero if nodes are completely unconnected, and a value of one if all possible connections exist between nodes, the calculated index of 0.42 indicates Region B is a system having only a moderate degree of connectivity.

The overall results of the spatial analyses of the functional recreation region suggest it is the strong appeal of the recreation resources of the north Oregon coast that serves to overcome any constraints to travel presented by lack of inherent compactness of the region or undeveloped transportation linkages. By knowing something of

the temporal distribution of recreation use within Region B, an even more complete picture of the regional recreation system can be drawn.

Temporal Description of the Regional System

The temporal pattern of regional recreation phenomena can be conceived as overlaying the spatial pattern of the same phenomena, to add a time dimension to the description of the regional system. Two related measures of regional time dimensions are provided by calculation of peaking indices and exceedance curves for Region B. The results of these descriptive methods are the topic of this section.

Peaking Indices

A peaking index summarizes into a single value large amounts of data on temporal patterns of recreation use (Stynes 1983). A characteristic of regional systems, as well as recreation systems of any other spatial scale, is that the number of people recreating in a geographic area varies dramatically over time. It would conceivably be of considerable use to the planner to be able to measure quantitatively the tendency for people to use various areas within their recreation home region in one time period versus other periods. The peaking index helps fulfill this need by providing a measure having a minimum value of zero, and which assumes greater values as the degree of temporal concentration or peak use increases. This would seem especially true for areas receiving very heavy use such as the north coast of Oregon.

The peaking index is derived from a graph (Figure 8) of the recreation use within a particular region. The curve that is graphed reflects the number of times a particular use level was reached or exceeded, hence its common name of exceedance curve. Taken together, the main use of the exceedance curve and its derivative peaking index is for describing trends in peak use over time within a region.

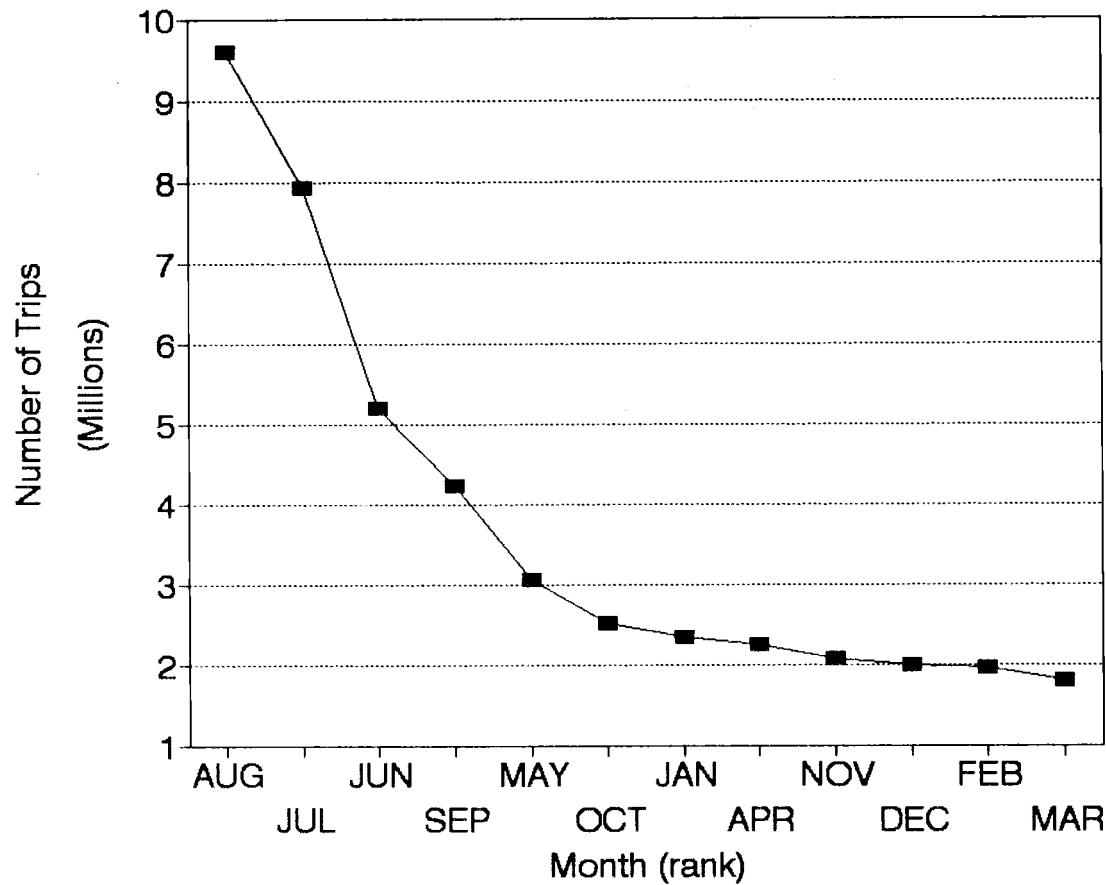


Figure 8. Exceedance curve of the number of recreational trips taken within the functional recreation region during a 12-month period.

Reflecting Smith's (1989) suggestion that the appropriate length of the time period within which to assess peaking should, in the absence of objective guidelines, depend upon factors such as data availability, study objectives, and educated judgment, two different time periods were chosen for the sake of comparisons. Since functional recreation Region B was delineated using the principal components analysis, on the basis of year-long recreation activity data, a peaking index was calculated for a 12 month period. Additionally, there is considerable ulterior evidence to suspect recreational use experiences seasonal peaks, suggesting that a peaking index be calculated on the basis of three-month seasonal periods throughout the year.

The number of outdoor recreation trips originating and having destinations within Region B, by month, is shown in Appendix N. Months are arranged in descending order of the number of trips taken during each monthly period. The table shows that most trips within Region B were taken during the summer months of August, July, and June, and the least trips were taken during the winter months of December, February, and March.

The graph of the monthly recreational trip data in Appendix N yields the exceedance curve shown in Figure 8. The vertical axis shows the number of recreational trips taken and the horizontal axis shows the number of months a particular number of trips was equalled or exceeded. The curve demonstrates the preponderance of recreational travel that occurs during the summer season, relative to the considerably lesser and more stable level of use at other times of the year.

The peaking indices that are calculated from the exceedance curve data increase as recreation activity levels concentrate in certain periods. Appendix N shows the peaking index calculations for the 12-month period and by 3-month period (i.e., seasonally). The 3-month index of 22.9 is about three times larger than the value of the 12-month index of 7.4. Thus, the 3-month index provides a summary measure of the

seasonal concentration of recreation activity in Region B, particularly in summer, which was graphed by the exceedance curve.

In summary, the temporal distribution of recreation activity within Region B exhibits a strong seasonal orientation. Just over one-half (22,715,892 trips) of the total recreation activity of the region (44,906,587 trips) takes place during August, July, and June. When the summer shoulder months of September, May, and October are also included, account is given for nearly three-fourths of the total regional recreation activity for the year (32,512,372 trips). The strong orientation toward outdoor recreational travel during the warmer months, coupled with the marked propensity for Region B residents to recreate along the north Oregon coast, as described by the spatial analyses, creates a picture of regional recreation that is highly concentrated in both time and space. This result is significant in the context of even a limited case study as it empirically supports the proposition of intra-regional heterogeneity - both in demand and supply of recreation opportunities, which must be addressed at the conceptual heart of a framework for regional recreation planning.

The next chapter draws conclusions from the discussion of theoretical concepts of regional recreation planning presented in previous chapters and empirical results from the case study analysis presented in this chapter. The chapter attempts to bring these contributing elements together into a logically coherent framework for undertaking and evaluating regional recreation planning efforts. To this end, the framework that results is largely normative as its primary use is to suggest the likely results of various recreation systems interventions. The validity of the prescriptive framework and the applications which it may find, depend largely on the precision with which the framework was conceptualized and, to a lesser degree, the empirical verification of regional recreation system properties.

CHAPTER 6

APPLYING THE FRAMEWORK FOR REGIONAL
RECREATION PLANNINGIntegration and Application

The theoretical concepts and empirical results presented in previous chapters of this dissertation together provide the essence of a framework for regional outdoor recreation planning, which systematically accounts for the role of public resource management organizations in affecting the quality of recreation experiences of recreating populations. With the basis for this framework being primarily of a conceptual nature, the resulting framework is largely normative as it aids prediction of regional systems interventions at the managerial level of recreation service delivery. The lack of a prominent empirical contribution to the framework, except in the vital capacity of delineating the regional system, leaves the causal relationship between the organizational structure of regional recreation management and recreation quality empirically unverified.

The recognized need to present an integrated framework and a generalized strategy for its application require, however, that certain causal assumptions be furthered within the context of the study parameters. Meeting these requirements is the task of the first part of this chapter. Once this integrative task is complete, the present chapter concludes with a discussion of the study's implications and recommendations for regional recreation planning.

The tenets of regional recreation planning espoused in this present study are a sub-set of service delivery system processes belonging to the management and consumer functions in Brown's (1984) model mentioned previously in Chapter 2 (Figure 1). Specifically, the conceptual framework may be conceived as explicating the organizational structure that intercedes Management Inputs and Management Outputs, by

way of Management Activities. This processual area concerns the structure of the regional outdoor recreation management social organization. The structural analysis of this area lends itself to the Palinkas et al. (1985) input-structure-output approach, and the operationalization of structural variables is aided by the organizational features of regional systems suggested by Burch (1988), both of which also were described in Chapter 3.¹

The structural locus of an integrated regional planning framework is defined through analysis of recreation behavior at the level of Consumer Activities in Brown's model (see Figure 1). The principal components analysis of actual recreation behavior performed in this dissertation defined the regional scope of the resource management-consumer system by conceptualizing an intermediate feedback loop directly connecting Consumer Activities and Management Activities in Figure 1. The information content of this analytic feedback loop was conceptualized as expressed activity demand, which was subsequently used to define the geographic boundaries of the regional recreation system and, by inclusion, delimit the recreation organizational network relevant to regional planning. Note should be taken that at this stage of the analysis the structural configuration of consumer transformation processes connecting Consumer Inputs with Consumer Outputs within Brown's model remain implied, since the functional regionalization procedure was conducted on the assumption that Consumer (recreation) Activities are empirical evidence of relevant structural processes, but that knowing the intricacies of these processes is not necessary in order to delineate functional recreation regions (Smith 1984).

¹ Recall in the Palinkas et al. (1985) model of social change assessment, social structure provides the normative rules by which management inputs are translated into activities and eventual management outputs such as the diversity or quality of recreation opportunities. Recall also that Burch (1988) suggests this structural variable be operationalized using organizational features such as land ownership patterns and policy, proportion of budget allocated for recreation management, and agencies affecting recreation resources.

Thus, within the overall outdoor recreation service delivery system, the scope of management processes relevant to regional planning is defined empirically as those management organizations and their activities that fall within the geographic area used by a population for its routine recreation activities. With the boundaries of the functional recreation region so defined, the parameters of the planning framework can be further refined to consider only those aspects of the managerial subsystem relevant to regional system functions. Within this context, the concepts of organizational network and action set are salient as they suggest characteristics with which to describe current conditions and focus efforts to achieve future desired conditions for the management of regional recreation systems. In this way the concepts are rendered amenable to a process for regional recreation planning.²

The description of existing recreation management organizational arrangements and the visualization of desired future arrangements is facilitated by comparisons of resource management models in Table 15. The information in Table 15 is a typology emphasizing the descriptive, and avoiding the predictive features of management arrangements. The typology is meant as an analytic tool that may be applied as an instrument to stimulate thinking on alternative directions in which decision makers can move their organizations to accomplish regional recreation planning. The results might lead them to make adjustments they would otherwise not attempt. Decision makers, of course, do this anyhow, but a good tool can facilitate the process. The logical next step in developing this tool would be to formulate predictive statements which, if empirically supported, could make the typology and the planning framework to which it contributes, even more powerful.

²Where planning is defined by Banfield (1973, p. 139) as "... the process by which he [the actor] selects a course of action (a set of means) for the attainment of his ends."

Table 15. A typology of the organizational contexts of recreation resource management.

Resource System Component	Recreation Resource Management Model				
	Multiple-Use	Coordinated	Integrated	Cooperative	Social
Land Management Administrative Unit (e.g., Forest, Park, Water Projects)	-----Primary Functional Linkages (information and energy exchanges)-----				
	Within (A Unit)	Among (Like Units)	Among (Some Units of a Recreation Network)	Among (All Units of a Recreation Network)	Among (All Units of All (Various Resource Management Networks)
Resource Management Discipline (e.g., timber, recreation, wildlife)	Within	Within	Among	Among	Among
Resource Management Agency (e.g., USDA-FS, NPS, COE)	Within	Within	Within	Among	Among
Functional Recreation Region (Viz., population demand area)	Within (A Small Portion Thereof)	Within (An Intermediate Portion Thereof)	Within (An Intermediate Portion Thereof)	Within (To the Fullest Extent Thereof)	Among (Two or More)
Analysis Variables: Demand/Supply	Individuals & Groups/ Individuals and Groups Within a Discipline	Types of Groups/ Functional Discipline Areas	Large Sub-populations/ Resource Management Agencies	Populations/Resource Management Networks	Society/Primary Institutions
Areal Descriptors	Site	Landscape	Ecosystem	Region	Multi-region

A main contribution of the typology in Table 15 to a regional planning framework lies in its facility to locate and characterize the starting point for organizational change, and describe the direction in which change should be pointed to successfully manage for regional recreation systems. Ultimately, according to the planning framework espoused in this study, success in managing regional systems is better assured under the cooperative management model. Adopting the cooperative model requires implementation of organizational change strategies that effectively move the operational management model from its current location in multiple-use and coordinated management types on the left side of Table 15, toward the cooperative model on the right side. The conceptual framework helps to define, as will be demonstrated subsequently, conditions under which this necessary shift is more likely to occur.

The typology in Table 15 suggests five distinct recreation resource management models accounting for the range of both existing and potential model configurations. There are of course a whole range of gradations of these idealized models that are not represented and are left largely to be inferred.³ The potential of some of the models in the typology is still to be realized, since they have yet to enjoy significant practical applications in recreation or other areas of resources management (e.g., the cooperative and certainly the societal models). Generally, the multiple-use and coordinated models can be found in widespread use by public resource management agencies; the integrated model enjoys scattered use within localized areas of management agencies; and the cooperative and social models are awaiting future development and application to address emerging and, as yet, unidentified issues in natural resource management.

³See Poplin (1979, p. 121) for an overview of the configuration and uses of typologies in social research, including the use of ideal types such as those presented in Table 15.

The typology is based on the ecological concepts of structural hierarchy, the concomitant changes in functional complexity associated with structural development, and environmental adaptation. In Table 15, some structural attributes of recreation management systems are listed in the left hand column. Functional linkages, defined in relation to the integration space of like structural attributes, are designated for each of the five recreation management models in the Table. For example, the multiple-use, sustained yield management model is characterized by a inward system focus in which primary information and energy exchanges take place wholly within a particular land management unit (e.g., a forest), a management specialty discipline (e.g., outdoor recreation), a management agency (e.g., USDA-FS), and a small fractional part of the functional recreation region (e.g., a site or stand). The strong inward system focus of the multiple-use management model belies the management agency's autonomy and orientation toward processes of minor internal adjustment in adapting to a system of comparatively lesser complexity with few environmental linkages.

Near the opposite extreme in the recreation management typology is the cooperative model. The cooperative model is appropriate for recreation systems having a decidedly outward focus in which management structures are complexly linked throughout much of the system, with the one exception being the lack of functional linkages among recreation regions, which is achieved under the social typological model at the next higher level of system integration. The key survival processes for management agencies to master within this system are those promoting adaptation to a complex and fluid environment, rather than merely internal system adjustment. The management model indicated by this complex, environmentally dependent system is one that functions under relatively less individual agency autonomy and control over resource inputs and outputs.

Table 15 indicates the cooperative model possesses many of the qualities necessary to successfully manage large, complexly-linked systems such as recreation regions. The cooperative model is characterized by an outward system focus in which the integration of recreation management functions takes place among land management units, management specialty disciplines, and management agencies rather than solely within them. The cooperative model is also the minimally proficient model for fully addressing the requirements for managing functional recreation regions in their entirety, rather than some lesser portion of the regional whole. The bottom of Table 15 also suggests some variables to be considered in describing the systems amenable to analysis under each model, and the areal dimensions of historic or theoretically appropriate applications for each model.

The proposition has been made in this dissertation that current recreation planning usually is conducted within the multiple-use or coordinated management model; while, the hypothetically appropriate model for regional recreation planning is a cooperative management model. The applied goal for the planning framework developed here is to provide conceptual guidelines for facilitating the functional shift from the current inward-looking, internal adjustment-oriented management models, to a model whose outward focus better enables agency adaptation to external change and enhances the ability of agencies to cooperate, thereby enhancing the quality of outputs available from the regional recreation delivery system. In practical terms, the regional planning framework is intended to help move the recreation resource system from its present state, to where we want it to be in the future with regard to management agencies' ability to deliver quality recreation opportunities for regional populations. What remains to be attempted heuristically in order to accomplish this transition is an application of the regional planning framework, demonstrating how the relationships

among the framework's basic ideas are relevant to planning regional recreation delivery systems.

Short of its use in an actual planning process, an application of the regional planning framework can be made using simulation techniques that rely on informed judgment about the behavior of human ecosystems. Simulations of this type, according to Bonnicksen (1991), are particularly useful for predicting complex system behavior in situations with short time frames and limited available information. In simulating the response of the recreation system to organizationally-induced change, the regional planning framework provides the generic structure needed to conduct the simulation. The framework also suggests the interrelatedness of system elements so that the simulation can anticipate these chains of effects.

The simulation method called scenario simulation (Bonnicksen 1991) is particularly applicable to the demonstration undertaken here.

Scenario simulation relies on scenario writing to forecast outcomes under specified circumstances. Often, the scenarios are written without specification of the rules connecting system properties. In the application of the planning framework that follows, a single scenario is written predicting the conditions of regional planning structure that are conducive to cooperative-regional recreation planning. Much of the scenario content is based on the propositions in Chapter 3. The scenario, lending itself to tabular form, is presented in Table 16.

By associating the concepts comprising a planning framework structure (left column) with conditions conducive to cooperative regional recreation planning (right column), a scenario emerges suggesting the likelihood that regional planning will be achieved as a viable means of improving recreation quality for a population. The respective conditions comprising the scenario will occur, of course, within a range of values more or less conducive to the regional planning process. Because it is the aggregate effect of all the various

Table 16. Scenario of organizational conditions conducive to regional recreation planning.

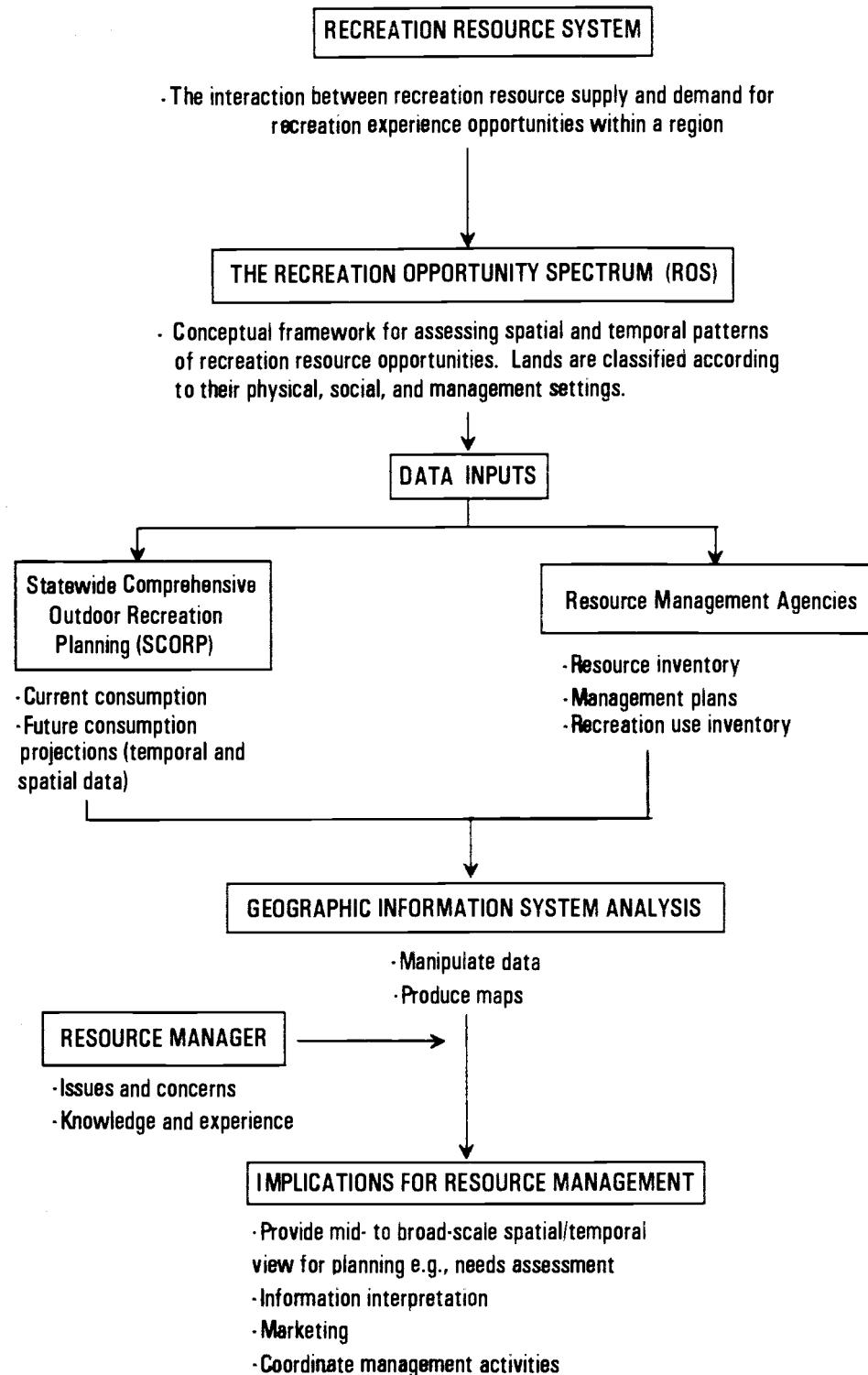
Regional Planning Concept	Condition Conducive To Regional Recreation Planning
Functional recreation region	The outdoor recreation region can be functionally defined as a population resource area, with indigenous recreation resources and public management agencies
Natural history of the recreation management agency	Agency evolved in an unstable environment; or, the agency is newly formed and its response repertoire is not yet entrenched
Effect of environmental change on the agency	The environmental change affects the agency's key function
Agency key function agency's key	<p>Recreation is or is close to the function as it increases the agencies:</p> <ul style="list-style-type: none"> -proclivity toward regional regional cooperative planning -prominence within the regional network -density of ties within the regional network
Agency internal structure	Agency has an internal structure that allows maximum personal participation, inter-personal relations, information flows, and consensus-building
Agency dominance within the recreation network	<p>Agency dominance based on the extent to which:</p> <ul style="list-style-type: none"> -the agency controls a majority of network resources -recreation professionals are dominant within the agency -the agency has excess capacity of recreation professionals in its work force -the agency is active in promoting network-wide adoption of internally acceptable product standards -subordinate agencies perceive the activities of the dominant agency to be in their own self interest

Table 16. Continued.

Regional Planning Concept	Condition Conducive To Regional Recreation Planning
	-an agency actually expresses dominance. If no agency expresses dominance, then the emergence of a network unit having special expertise in coordinating relationships among other agencies
Horizontal integration	Closely integrated agencies having a higher likelihood to embrace and promote regional cooperative planning
Vertical integration	Loosely integrated agencies that are relatively more dependent on local inputs and are, therefore, more likely to aspire to regional cooperative planning goals
Resource competition	Agencies in close competition over finite resources seeking to protect resource allotments through adaptations that clearly align the agency with distinct clienteles, by virtue of the diverse and unique resource opportunities they offer

conditions that ultimately determines the success of cooperative planning efforts, the interaction effects among factors must also be considered in order to arrive at a comprehensive evaluation of planning outcome.

The scenario is built solely upon the application of the social organization tenets of the planning framework which posit that region-wide, interagency cooperation is the most efficacious way of providing a population with opportunities for quality recreation experiences. Together, the recreation resource management agencies, the resources they manage, and the recreation consumers that are functionally interrelated within a geographic region, comprise a regional recreation resource system. A planning model that incorporates all these system components as part of a regional planning process, is shown in Figure 9.



The planning model in Figure 9 was developed based on empirical evidence of the NORS case study and on the theoretical framework. Thus, the model reflects both the empirical and conceptual contributions to this study. It is an implicit assumption of the model that the desire for regional planning is the impetus for interagency cooperation, which is sufficiently well developed to accomplish system management goals. The model explicitly identifies ROS as a standardized measure with which to equate agencies' recreation resources and management outputs. The ROS framework is not regularly used by all management network agencies, so an assumption is made regarding the influence of a dominant agency, such as the USDA-Forest Service, to persuade other agencies on the merits of the standard measure. Geographic information system analysis is recommended as lending itself to the analysis of ROS data inputs, while being currently in widespread use by recreation management agencies.

The explication of the planning framework through scenario simulation and the development of a general planning model conclude the applications for regional recreation planning forthcoming from this research. The remainder of this chapter discusses the implications of this research, and makes recommendations for future research and applications of regional recreation planning.

Discussion and Implications

Outdoor recreation is a conceptually complex but omnipresent phenomenon. Though the intellectual history of research in the area over the past forty years or so has emphasized explanatory questions such as 'Why do people recreate?', it is now becoming increasingly clear that such enquiries can be strengthened by other forms of analysis. From the pragmatic perspective of resource planning, what also is interesting about the study of outdoor recreation is how it helps to set the stage for effective public action. What surfaces is that outdoor

recreation is almost sure to be influenced by the rules and regulations of social and governmental relations. It is at once a cause, an effect, and an intermediary; localized and spatially extended; a consequence of public policies and a policy instrument; endogenous and exogenous; and so on. Indeed, the focus and contexts of outdoor recreation are clearly heterogeneous and as much dependent on exogenous social structure as on individual behavior and choice.

Recreation resource management agencies are functionally the most potent organizational form within this social structure, with regard to their affect on outdoor recreation. Management agencies are not without their own internal limitations and external constraints on how they affect and are affected by change in the recreation environment, however. As has been discussed previously, change affecting management agencies can originate within, or come from outside the agency structure within the larger recreation resource management system.

The structural characteristics of the agency and its functional role within the system, together determine the agency's adaptive response to change. Generally, the more change required of the agency the more likely it must change outside structures and personal habits, as against a limited internal change in practice; although, it is far more likely to first exhaust the latter solution, since organizations perceive of structural change as radical alteration of what is right and good about themselves (Katz and Kahn 1966). Thus, public recreation management agencies function to manage change within their environments. One important function from the standpoint of agency survival is effectively ameliorating the effects of changes that threaten the agency constituency's access to resources within its charge.

Historically the focus of land management activities has been the physical features and biological processes that are instrumental in fulfilling social commodity needs; rather, than on broader cultural and social processes that give expression to human desires beyond basic

requirements for physical comfort. This past operational focus on commodity production has shaped the current culture and structure of resource management agencies by promulgating the ascendancy of commodity values within the agency's cultural milieu, and by filling occupational roles with specialists acculturated in the primacy of commodity production values. The USDA-Forest Service provides an example.

Until recently, the core Forest Service organizational structure was dominated by specialists whose professional role has been defined in the context of a traditional forest management paradigm viz., to arrest natural ecosystem development at pre-determined stages which maximize yields of a few socially valued products. In American culture the socially valued serial stages in forest ecosystem development have often coincided with the acceleration of mean annual increment (MAI) for water production, culmination of MAI for wood fiber production, or diminution of MAI for many forms of experience opportunity production. These stages of forest ecological development are described silviculturally as immature, mature, and over-mature or decadent, respectively, stated in the fiber production-oriented vernacular of the organizational culture.

Within the Forest Service organization, the full array of forest values have not received equal management emphasis. As a central function of the agency, the Forest Service is experienced at managing the bio-physical resources required for certain production processes centered within biological systems. The agency, however, is much less experienced for managing changes originating within the agency's social environment. Until fairly recently socially-induced perturbations to the agency's organizational environment have remained largely peripheral to primary agency functions. As a result the occupational structure of the agency has not acquired adequate expertise to allow consideration of the exigencies of exogenous social change, as a core function of the agency.

Clearly while the Forest Service has recently become more adept in responding to some types of exogenous social change - such as public demands for greater access to the resource management decision process, other types of change persist as problematic within the context of customary management procedures and current organizational structure. An important example of the type of social change which remains largely outside the agency's management purview is cooperative regional management for outdoor recreation. Given the ubiquitous nature of region-based population demand for recreation opportunities, it becomes important to know the characteristics of agencies that lend themselves to providing for regional resource demands.

The example cited of the Forest Service is the situation in which many of the would-be participants in cooperative regional planning find themselves today: The values of society are in rapid transition that imposes effectiveness criteria standards upon resource management agencies of a kind, or at a rate, which their organizational structure is not suited to meet. While the situation is difficult for management agencies trying to cope with their changing roles, it nonetheless contains the seeds of its own solution. It is clear from the evidence on agency amenability toward planning initiatives that without the discomfort of various adaptive stimuli, agencies are less likely to pursue cooperative efforts aimed at improving recreation quality beyond the boundaries of their individual jurisdictions. Such stimuli, therefore, provide a vital incentive for individual jurisdictions to think in terms of regional use patterns and the combined capability of regional resources to provide for this use; which, in turn, leads to a new cooperative organizational structure for managing regional recreation resources.

The problem of adjustment in large systems is institutional as it is mainly a matter of changing rules. In a free society it is through modification of the rules which guide conduct in the exploitation of

opportunities that recreation resource use is influenced by public agencies. A pertinent question of recreation planning and management is how interagency relationships appropriate to regional recreation development are created or improved. It seems clear that problems with the institutional arrangement of regional recreation delivery system development need to be considered as an integral part of a comprehensive system development process, since the roles of different agencies comprising the system are often unclear with much duplication and omission in the services offered.

In addition, regional recreation planning in practice can only advance if it incorporates design-specific technical, workable ways of doing things set in schedules prioritizing temporal and spatial relationships. Practical applications also require that practitioners concentrate on organizational features over which agencies have considerable control or interventions that are most likely to lead to organizational improvement in cooperative regional planning. The result might be envisioned as a combination and correlation of the functions now performed by agencies through supervision on a regional scale. The rationale for managing recreation regions as human ecosystems in this way is simply that the increased ecological understanding of people, which may be gained, can lead to better management of both people and recreation resources.

Conceptions of a regional approach to resolving social issues are not new. Nearly sixty years ago, Chapin (1935, p. 8) observed: "There seems little doubt but that the remedy for chaotic social relationships is primarily that men learn to think in terms of larger units of area and in terms of more complicated systems of relationship." Indeed, many of our present recreation management problems appear to result from basing decisions on narrow definitions of resources and users. A pragmatic guideline for ameliorating this problem is to design as large a conceptual framework of human relationships to the environment as we

know how and then submit it to empirical test. At our present level of understanding of recreation resource systems and negative cultural views toward large-scale social intervention, a framework of regional dimensions is probably at the outer limit of current comprehension and will to act.

To be successful in the face of evolving challenges, outdoor recreation planning and management must be conducted on a regional scale so that management is distributed efficiently to meet the demands of an increasingly diverse population -- culturally, spatially, and temporally. Success also may require management on an extended temporal scale as well. Not only must recreation managers be cognizant of the particular rhythms of human users, resource managers, management agencies, and bio-physical systems affecting, and being affected by their immediate plans, but they should also plan beyond the human life span in order to achieve cultural sustainability of recreation resources that comes from adoption of an inter-generational time horizon for planning and management. The important question remains, however: How can outdoor recreation be efficiently managed to sustain opportunity diversity, as regional systems with diverse public land use goals? This may well be the most important question facing recreation resource management since the public lands were first established.

The pertinence of this question to resource management today is highlighted by tracing the historic course of recreation diversity in the Pacific Northwest. From the earlier discussion of the relationship between diversity and quality, a similar argument may be made for the course of recreation quality as well. This depiction of history, while speculative, is illustrative in the pedagogic sense of clarifying the circumstances of modern recreation resource management, and as it provides an introduction to newly emerging concepts in the resource management field.

The hypothetical time-line for recreation opportunity diversity development in the Pacific Northwest is presented in Figure 10. Total regional diversity is operationalized in this figure as resource potential for recreation diversity combined with the diversity existing in the region at a particular time. According to modern concepts of recreation diversity, undeveloped or primitive lands are potentially the sources of greatest diversity, since no diversity development options have as yet been spent in developing these lands. Both potential and existing diversity are represented by curves in Figure 10, which together trace the status of regional diversity from the past, through the present, and into the future.

During distant past episodes of resource development, there was comparatively little existing recreation opportunity diversity within the region as judged by modern standards. The diversity that did exist was largely the result of natural variation in landscapes. The potential for diversity was great, however, as nearly all land was undeveloped. This period of resource development is represented in Figure 10 as line segment A. Over time the potential for opportunity diversity was converted to existing diversity, through resource development activities other than outdoor recreation e.g., clearing forests for farm land. These commodity-based activities converted potential to existing diversity for a net gain in overall recreation opportunity diversity for the region (line segment B).

At some time in more recent history, ever increasing demand for more existing opportunities matched the capability of potential opportunities to supply them. The result was no net gain or net loss in overall diversity for this brief period of time (line segment C). Until, at the present time, evidence is mounting that conversions of potential to existing opportunities may be transpiring at a net loss in region-wide opportunity diversity e.g., the widespread loss of the semi-primitive nonmotorized ROS class on USDA-Forest Service lands in Oregon

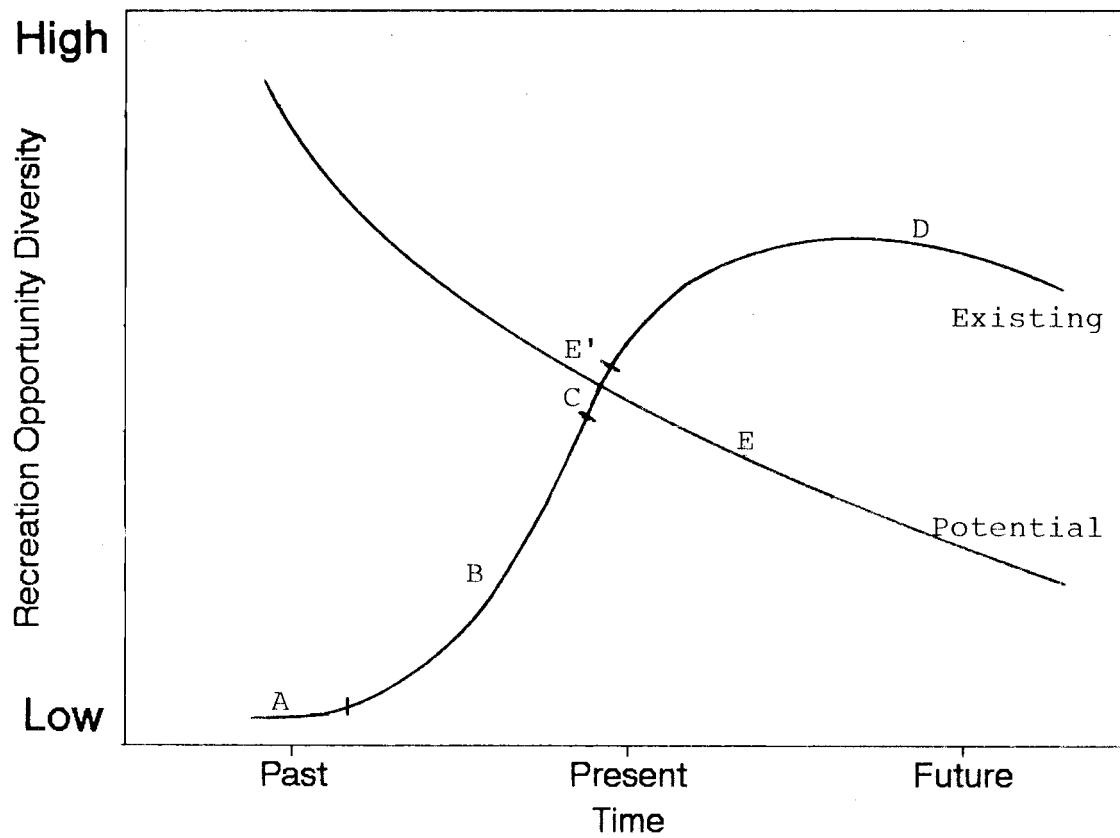


Figure 10. Hypothetical time-line of recreation opportunity diversity development in the Pacific Northwest. 160

cited earlier (line segment D). In the future, management can reverse or stabilize this trend toward diminished overall diversity by enhancing resource diversity potential within the region (line segment E to E'). This may be accomplished, such as in the Oregon case, through activities aimed at restoring some of the primitiveness of settings like removing roads and stemming the further loss of opportunities resulting from management for resource values other than recreation.

Despite its speculative origins, Figure 10 helps draw into focus several issues of resource management including resource integrity and the sustainability that are relevant today. Sustainable recreation management has as its objective function to sustain the regional ecosystem. If the regional system is losing net diversity of recreation opportunities it is not being sustained, assuming the system has been properly described. The dramatic reduction in the semi-primitive class of opportunities revealed in the Oregon case study represents a loss of integrity that threatens to reduce the diversity of opportunities and the sustainability of the region.

The range of diversity to be achieved for ensuring quality recreation experiences is problematic beyond axiomatic admonitions to strive for the maximum possible under prevailing conditions. It is defining the conditions which are to prevail that require judgment. Problems of judgment can be addressed by setting a goal for an acceptable diversity range and managing to maintain diversity within this range (Stankey et al. 1985). The practitioner should be aware, however, that the desirable range varies according to time frame and spatial scale at which management is executed.

Generally, the longer the management time horizon and larger the management area, the more diversity must be expanded to accommodate unforeseen or unforeseeable circumstances. Resource management on expansive scales involves managing for social as well as biological sustainability (Kennedy 1985). In practical terms this means managing

in the present to maximize recreation resources toward the primitive end of the spectrum, since it is these that have the greatest innate potential to meet diverse and changing demands for recreation opportunities, however they might be defined in the future. It also implies the shortsightedness of decisions that permanently reduce the sustainability of the regional recreation system without adequate consideration of the consequences of irrevocable resource conversions.

In recent years in areas of natural resource management other than recreation, concerns over biological diversity, sustainable resource systems, resource integrity, and community stability have emerged as guiding management concepts. The impetus for this emergence is a heightened concern over resource capacities and capabilities by resource professionals and the public, culminating in a perceived mandate for change in the goals and methods of resource management on the part of public resources management agencies. For the agencies involved in this societal re-conceptualization of resources, the change has required a shift from thinking in terms of 'the management of ecological systems' to one of thinking in terms of 'ecosystem management.' The distinction may be semantically subtle, but the practical implications to the ends and means of management of the latter form imply a management paradigm for resource stewardship unknown in the history of resource management.

What has evolved as a result of this paradigm shift that is significant to recreation resource planning, is that recreation is an integral part of the natural resource capacities and capabilities that together must be explicitly considered on a regional basis under the new management paradigm. Whether we couch this new conceptualization in terms of new perspectives, ecosystem or eco-region management, landscape design, restoration ecology, endangered species preservation, community development, eco-tourism, urban-rural interface issues, regional recreation management, or some combination of these terms, what emerges is a fundamental realization that to succeed in practice each must

proceed as inter-disciplinary, multi-agency undertakings within broadened theoretical, spatial, and temporal domains. Recreation, and the planning and management strategies that contribute to the comprehensive management of resource systems, have value for resource management in general. Maintaining recreation diversity is currently an overlooked part of efforts at system-wide resource management. The conceptual tenets of regional recreation planning not only can help ameliorate this immediate oversight, but more generally, they offer vital insights into overcoming the formidable social barriers to the management of regional systems, under whatever label they may happen to occur.

The conceptual robustness eluded to here can be furthered by offering an axiomatic conclusion: The comprehensive analysis of large, complex systems must start with a consideration of system boundaries and processes, rather than some phenomenon found within the system. Because, when analyses are phenomenon driven, rather than system properties driven, we are apt to fail to grasp the full complexity of problems. Instead, we must adopt a view for system-wide management as if we are looking down upon the system from above. This perspective makes obvious the necessity of integrated measures of systems e.g., population recreation behavior as the aggregate of population expressed demand and agency response. This comprehensive view also encourages consideration of resource capacity and capability as influenced by management policy and action, and the conceptualization of regions as areas that are relevant to the planning or management problem and yet include all pertinent system processes necessary for sustainability. Currently there exists much information useful for analyzing resource systems, but it has not been often analyzed at the system level using integrated measures. The analysis of the functional recreation region undertaken in this dissertation is one attempt to define a resource

system in practice, for which appropriate methods of analysis can then be subsequently identified and developed.

Practical Implications and Recommendations

The practical implications of this research stem from its largely conceptual nature and absence of substantial empirical content. From an applied perspective this leaves much about the concepts of regional recreation planning to be examined through further conceptual research and actual planning applications. Because of the early, formative stages in which this research area finds itself, much of what can be said about the practical implications of regional recreation planning are perhaps better stated in the form of recommendations for future empirical research and applications within the planning environment.

The marked absence of provisions within existing public recreation management regimes to adequately prevent further degradation of regional recreation quality starkly illustrates the need for further advances in regional resource planning technology. The absence of regionally articulated goals for a comprehensive recreation-quality sustainability plan can only be understood as a failure of public land management programs to perceive the rate and scale of degradation and find the collective means to stop it. Until the structure of research and management organizations approach the level of integration and scale of the recreation systems with which they now deal piecemeal, attempts at preservation of recreation quality will remain fragmented and ineffective. Only at the spatial and temporal scales of regional systems do the recreational behavior, bio-physical, and social organizational patterns become meaningful in the discussion of restoration and management of recreation quality.

The scale of threat to regional recreation quality exceeds the ability of individual public agencies to respond. Therefore, based upon the conceptual framework that has been developed, it is proposed the

following practical approaches be taken to managing regional recreation quality: 1) unprecedented cooperation between resource management agencies, 2) increasing recreation resource protection particularly at the more primitive end of the experience opportunity spectrum, 3) information management and demonstration projects with continuity over many years, 4) move beyond conceptual solutions to resource management to more empirically-grounded, data-driven planning such as NORS, and 5) integration of resource management activities including recreation as key to maintaining resource system vitality.

Organizational barriers that must be overcome to change existing recreation management regimes include the lack of inter-agency infrastructure necessary for regional management and the lack of personnel trained to formulate and implement regional management plans. The lack of infrastructure cannot be underestimated in its implications for institutional resistance to cooperative regional planning methods. This is especially true when high demand for management efficiency is connected to the necessity for a new institutional delineation of regions or definition of management agencies.

There are, however, some practical recommendations which can help overcome some of the barriers to regional recreation planning. In terminology developed previously, the action set for regional recreation planning must emulate the recreation network as closely as possible with regard to membership and dominance. In lieu of such an action set there is need for mechanism for member recruitment and retention. Along these lines there must also be an internal rewards structure to overcome inclinations toward self-interest and protectionism. Finally, the action set must be semi-permanent to enjoy planning continuity, yet responsive to new issues and evolving network membership in order to bring relevant agencies into the set over time. To be viable in the long term, the action set must have cooperative regional planning as its

operational goal, rather than a more spatially or temporally localized orientation such as a particular planning cycle or project.

The ultimate problem in developing action set structure is the achievement of a system which is stable, just, and efficient. The structure must be stable so change can proceed on a predictable basis, just so there is social support for change, and efficient so resources are well spent to achieve recreation quality. A regional recreation management action set with these characteristics can be created in at least three ways: 1) existing agencies may be modified by selectively strengthening practices deemed beneficial to social development e.g., outdoor recreation management planning, 2) borrowing organizational forms from different functional contexts and superimposing them upon the existing system, and 3) conceptualizing and superimposing normative forms of organization for which there is no empirical counterpart. Some combination of these methods is perhaps most feasible to contemplate.

A considerable contribution to the development of practical knowledge would accrue if there were a body of case studies of regional organizational structure, all built on a common conceptual theme to allow for analytical comparisons. Particularly helpful would be a full account of the workings of an action set-dominant organization, thus placed to encourage the fullest development of cooperative regional planning. Ideally, this organization would have only a few clearly defined purposes, be relatively free of political conflict, and be headed by persons who make a concerted attempt to be rational. The accumulated weight of such empirical evidence would go far in confirming the construct validity of a conceptual framework for regional recreation planning.

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APPENDICES

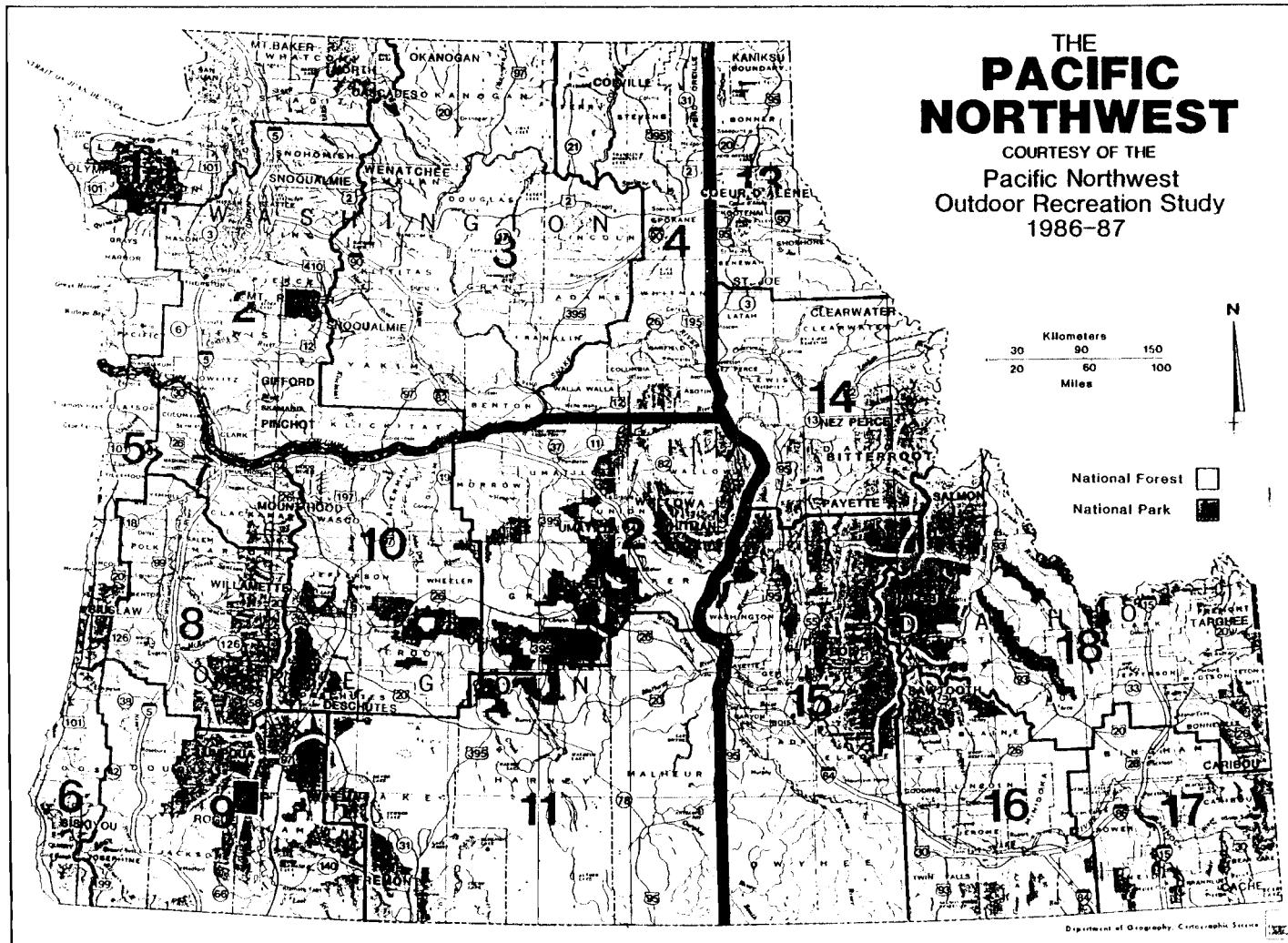
APPENDIX A
SOME PLANNING AND MANAGEMENT APPLICATIONS
OF THE NORS DATA

SOME USES OF THE PNW RECREATION SYSTEM DATA

- * STATEWIDE COMPREHENSIVE OUTDOOR RECEATEION PLANS (SCORP's) - OREGON, WASHINGTON, IDAHO
- * MARKET SEGMENTATION ANALYSES - SIUSLAW, GIFFORD PINCHOT, DESCUTES NATIONAL FORESTS AND THE CITY OF ASTORIA, OR
- * OREGON COAST PROMOTIONAL CAMPAIGN - OREGON COAST ASSOCIATION
- * COLUMBIA RIVER GORGE NATIONAL SCENIC AREA PLANNING - COLUMBIA RIVER GORGE COMMISSION
- * HANFORD REACH OF THE COLUMBIA RIVER USE STUDY - U.S. DEPT. OF ENERGY, NPS
- * RECREATION PROJECT AND PROGRAM PLANNING - USFS AREAS IN OR, WA, ID
- * REVISION OF GENERAL LAND AND RESOURCE MANAGEMENT PLANS - BLM, OR
- * REVISION OF PROJECT OPERATIONS PLANS AND REVIEW OF DAM RE-LICENSING APPLICATIONS - CoE
- * REVISION OF PARK MANAGEMENT PLANS - NPS
- * DEMONSTRATION PROJECT Mt. RAINIER NP: SOCIAL SCIENCE USE IN NATIONAL PARK MANAGEMENT - NPS
- * REVIEW OF NATIONAL FOREST MANAGEMENT PLANS - OREGON STATE PARKS
- * ASSESSMENT OF ECONOMIC IMPACTS OF FUTURE RECREATION ON THE MT. HOOD NF, OR - USFS/OSU
- * RECREATION AND ECONOMIC DEVELOPMENT PLANNING - PRIVATE CONSULTANTS IN OR, WA, CA
- * NATIONAL WILD AND SCENIC RIVERS REVIEW AND PLANNING - USFS, NPS, BLM
- * Mt. HOOD MEADOWS SKI AREA EXPANSION EIA - PRIVATE DEVELOPER
- * INTER-AGENCY RECREATION SYSTEMS PLANNING AND MANAGEMENT - USFS, NPS, OR STATE PARKS, WA IAC

APPENDIX B

NORS MAP OF THE PACIFIC NORTHWEST



APPENDIX C

**TELEPHONE SURVEY RESPONSE AND MAIL SURVEY
SAMPLING DISTRIBUTION**

Table 17. Telephone survey response and mail survey sampling distribution.

Region	County Name	County Number	Month													Total
			J	J	A	S	O	N	D	J	F	M	A	M		
5	Clatsop	1	16	16	16	16	16	16	16	16	16	16	16	16	16	192
	Tilamook	2	16	16	16	16	16	16	16	16	16	16	16	16	16	192
	Lincoln	3	16	16	16	16	16	16	16	16	16	16	16	16	16	192
6	Douglas	4	4	4	4	4	4	4	4	4	4	4	4	4	4	48
	Coos	5	14	13	14	13	14	13	14	13	14	13	14	13	13	162
	Curry	6	13	14	13	14	13	14	13	14	13	13	13	13	14	162
7	Columbia															
	Washington															
	Multnomah	7	31	31	31	31	31	31	31	31	31	31	31	31	31	372
	Clackamas															
8	Yamhill	8	10	11	10	10	11	10	10	10	11	10	10	11	10	124
	Marion	9	10	10	11	10	10	11	10	10	10	11	10	10	11	124
	Lane	10	11	10	10	11	10	10	11	10	10	11	10	10	10	124
9	Douglas	11	10	11	10	10	11	10	10	10	11	10	10	11	10	124
	Josephine	12	10	10	11	10	10	11	10	10	10	11	10	10	11	124
	Klamath	13	11	10	10	11	10	10	11	10	10	11	10	10	10	124
10	Wasco	14	10	11	10	10	11	10	10	10	11	10	10	11	10	124
	Wheeler	15	10	10	11	10	10	11	10	10	10	11	10	10	11	124
	Deschutes	16	11	10	10	11	10	10	11	10	10	11	10	10	10	124
11	Lake	17	10	10	11	10	10	11	10	10	10	11	10	10	11	124
	Harney	18	11	10	10	11	10	10	11	10	10	11	10	10	10	124
	Malheur	19	10	11	10	10	11	10	10	10	11	10	10	11	10	124
12	Morrow	20	10	11	10	10	11	10	10	11	10	10	11	10	10	124
	Union	21	10	10	11	10	10	11	10	10	10	11	10	10	11	124
	Wallowa	22	11	10	10	11	10	10	11	10	10	10	11	10	10	124

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3,180

APPENDIX D
TELEPHONE SURVEY INSTRUMENTS

TELEPHONE QUESTIONNAIRE

1. I'm going to read you some types of outdoor recreation activities. Please tell me if you or any member of your household have participated in any of these activities during the past 12 months.

CIRCLE ALL THAT APPLY. YOU MAY PROMPT RESPONDENT BY READING THE ACTIVITY LISTS.

During the past 12 months, did you or any member of your household participate in . . .

- A. Fishing
- B. Water Activities (such as swimming or boating)
- C. Gardening, Nature Study, Food Gathering (such as outdoor photography or berry picking)
- D. Hiking, Walking, Climbing
- E. Camping
- F. Snow Activities (such as skiing or snowmobiling)
- G. Riding or Driving Motorized Vehicles Off Road for Recreation (such as motorcycling or all-terrain vehicles)
- H. Nonmotorized Riding for Recreation (such as horseback riding or bicycling)
- I. Sightseeing, Picnicing, Operating Motorized Vehicle On Road for Pleasure
- J. Hunting and Shooting
- K. Sports, Games, & Cultural Events (such as jogging, concerts, or fairs)

IF ANY OF THE ABOVE ACTIVITIES WERE CIRCLED, SKIP TO Q2.

- 1a. Are there some activities in which you have participated that I have not mentioned?

Yes (LIST BELOW)

No _____

IF THE RESPONDENT PARTICIPATED IN NO ACTIVITIES, GO TO QUESTION 8.

2. I'm going to read a list of recreation facilities often found close to where people live. Please tell me if any of these places are within a 15 minute walk from your residence?

<u>Recreation Resources</u>	<u>No</u>	<u>Yes</u>	<u>(IF YES)</u> <u>How Many?</u>	<u>(IF YES)</u> <u>Have You or</u> <u>Any Members of</u> <u>Your Household</u> <u>Used It in the</u> <u>Past 12</u> <u>Months?</u>
A park	—	—	—	—
A museum	—	—	—	—
A zoo	—	—	—	—
A designated nature trail	—	—	—	—
A public playground	—	—	—	—
A public swimming pool	—	—	—	—
A school	—	—	—	—
A health/fitness center (such as YMCA, private fitness club)	—	—	—	—
A designated bike path	—	—	—	—
A ball field	—	—	—	—
An unimproved open space (such as a vacant lot)	—	—	—	—
A senior center	—	—	—	—
A community center	—	—	—	—
A public beach, river, or lake	—	—	—	—

- 2a. Are there other recreation facilities within a 15 minute walk from your residence that I have not mentioned?

Yes (LIST) _____ No _____

3. There are several national parks, monuments, and historical areas in Oregon, Washington, and Idaho. I'm going to read a list of places and please tell me if you or any member of your household visited any of them during the past twelve months.

In Oregon

- Crater Lake National Park
- Fort Clatsop National Memorial
- John Day Fossil Beds National Monument
- McLoughlin House National Historic Site
- Oregon Caves National Monument

Did you or any member of your household visit WASHINGTON during the past twelve months for recreation? (IF "NO" CHECK HERE , SKIP TO IDAHO.)

In Washington

- Coulee Dam National Recreation Area
- Ebey's Landing National Historical Reserve
- Fort Vancouver Natural Historic Site
- Klondike Gold Rush National Historic Park
- Mount Rainier National Park
- North Cascades National Park Service Complex
- Lake Chelan National Recreation Area
- Ross Lake National Recreation Area
- Olympic National Park
- San Juan Islands National Historical Park
- Whitman Mission Natural Historic Site

Did you or any member of your household visit IDAHO during the past twelve months for recreation? (IF NO CHECK HERE , SKIP TO QUESTION 3a.)

In Idaho

- Craters of the Moon National Monument
- Nez Perce National Historical Park

SKIP THE STATE(S) FOR WHICH "NO" VISITATION WAS CHECKED IN Q3.

3a. There are several wilderness, wild and scenic rivers, reservoirs, and national recreation areas in Oregon, Washington, and Idaho. I'm going to read a list of places and please tell me if you or any member of your household visited them during the past twelve months.

In Oregon

- Oregon Cascades Recreation Area
- Rogue and Illinois Wild and Scenic Rivers
- Oregon Dunes National Recreation Area
- Columbia Gorge
- Hells Canyon National Recreation Area (Oregon side)
- Mt. Hood Wilderness
- Jefferson Wilderness
- Three Sisters Wilderness
- Eagle Cap Wilderness

IF "NO" VISITATION WAS CHECKED FOR WASHINGTON IN QUESTION 3, SKIP TO IDAHO.

In Washington

- Alpine Lakes Wilderness (includes Management Area)
- Pasayten Wilderness
- Glacier Peak Wilderness
- Mount St. Helens National Volcanic Monument

IF "NO" VISITATION WAS CHECKED FOR IDAHO IN QUESTION 3, SKIP TO QUESTION 4.

In Idaho

- Sun Valley Winter Sports
- Hells Canyon NRA (Idaho side)
- Snake Wild and Scenic River (outside NRA)
- Sawtooth NRA
- Middle Fork of the Salmon Wild and Scenic River
- Salmon Wild and Scenic River
- Selway Bitterroot Wilderness
- River of No Return (Frank Church) Wilderness
- Sawtooth Wilderness
- Snake River Birds of Prey Natural Area
- Seven Devils Wilderness Area
- Cascade Lake Recreation Area
- Lucky Peak Recreation Area
- Dworshak Reservoir

4. How many people including yourself reside in your household? (Number) _____.
5. What is the age and gender of each household member?
Let's start with yourself.

	Age	Sex
Household Adult 1 (Respondent)	____	____
Household Adult 2	____	____
Children 1	____	____
Children 2	____	____
Children 3	____	____
Children 4	____	____
Children 5	____	____
Other Household Members (describe)	____	____
	____	____
	____	____

6. What is your occupation?

- _____

6a. IF RESPONDENT SAYS--
 RETIRED
 SELF-EMPLOYED
 UNEMPLOYED
 HOMEMAKER
 STUDENT
 OTHER (Specify) _____
 CHECK ONE, GO TO 7a.

7. How many vacation days does
your job provide this year?
 Calendar Year (Jan.-Dec.)

7a. How many days do you plan
 to travel for recreation this year?
 Calendar Year (Jan.-Dec.)

END INTERVIEW IF NO ACTIVITIES WERE INDICATED IN QUESTION 1.

Now we are almost finished. In order to obtain more detailed information on your outdoor recreation activities, we would like to send you the questionnaire and free map I told you about earlier. So that we can send you a questionnaire, I need to know:

12. Your name? _____

13. Your complete mailing address?

_____ ZIP CODE

Thank you very much. You can expect your questionnaire and free map in the mail in about two weeks.

CALL RECORD
Oregon SCORP Survey

TELEPHONE NUMBER (503) _____

COUNTY CODE:

(Circle - see attached list) 1 2 3 4 5 6 7 8 9 10 11
 12 13 14 15 16 17 18 19 20 21 22

▼ FOR OREGON STATE UNIVERSITY USE ONLY ▼

REGION: 1 2 3 4 5 6 7 8 SURVEY PERIOD: 1 2 3 4 5 6 7 8 9 10 11 12
 (Circle) (Circle)

CALL STATUS				
Call Number (Circle)	Day/Date/Time	AM/PM	Code/Comments (See list below)	Interviewer
1	/ /			
2	/ /			
3	/ /			
4	/ /			
5	/ /			
6	/ /			

CALL STATUS CODES	
<u>Call Status</u>	<u>Code/Comments</u>
Completed	A
Partially Completed	B
Refused	C
Out of service	D
Nonresidential	E
No Answer	F
Line Busy	G
Correct "R" Not At Home	H
Call Back	I (Day/Date/Time)
Other	J (Specify)

Final Call Status _____ Questionnaire # _____
 Code/Comments _____

TELEPHONE QUESTIONNAIRE
OREGON OUTDOOR RECREATION DEMAND SURVEY

Introduction

"Hello. I'm _____ and I'm calling from Oregon State University in Corvallis. We have been asked by Oregon State Parks to find out about Oregonians' outdoor recreation activities. The information we are collecting will be used by state and local organizations in planning how recreation tax dollars will be spent in the next five to ten years. . . And I would like to talk to the adult in your household who has had the most recent birthday. Is that person at home now?" (IF NOT AT HOME, ASK): "When would that person be home?" (RECORD ON CALL RECORD AND CALL BACK.)

(IF SPEAKING TO CORRECT RESPONDENT, SKIP TO LAST PARAGRAPH):
(WHEN YOU HAVE THE CORRECT RESPONDENT, CONTINUE WITH):

As I said, I'm calling from Oregon State University. We have been asked by Oregon State Parks to find out about Oregonians' outdoor recreation activities and I would like to ask you some interesting questions. The information you give us will be used by state and local organizations in planning how your recreation tax dollars will be spent in the next five to ten years.

You were selected at random and all the information you give us is strictly confidential. If we should come to a question you don't care to answer, just let me know and we'll go to the next question. The interview is voluntary and will take only about eight minutes. Then, in a few weeks, I would like to mail you a recreation questionnaire with a self-addressed, stamped envelope to return to us and along with that will be a nice map of the Pacific Northwest that is yours to keep for helping with the survey. Okay?"

DIALING SEQUENCE: 8-9532-7-1-#

APPENDIX E
MAIL SURVEY INSTRUMENTS

Pacific Northwest Outdoor Recreation Study

Oregon Washington Idaho



THE FOLLOWING QUESTIONS CONCERN YOUR PERSONAL TRAVEL AND VISITS THAT ARE MORE THAN 50 MILES AWAY FROM HOME FOR BUSINESS, PLEASURE, PERSONAL AFFAIRS OR OTHER REASONS, NOT FOR REGULAR WORK.

THINK ABOUT THE MOST ENJOYABLE PLACE YOU VISITED ON YOUR MOST RECENT TRIP

Q1. What was the name and location of that place?

Name of Place/Location (include the STATE)

1.a. What activities did you most enjoy doing at that place?
(Please explain below)

1.b. To what extent were each of the following VISIT CHARACTERISTICS a problem on your visit to that place?

Circle the number that best describes how serious a problem you had with EACH visit characteristic listed below.

VISIT CHARACTERISTICS

	Not a Problem	Slight Problem	Moderate Problem	Serious Problem	Very Serious Problem
Variety of visitor services and facilities	1	2	3	4	5
Quality of visitor services and facilities	1	2	3	4	5
Travel facilities and services (e.g., roads, service stations)	1	2	3	4	5
Availability of information before I left on my trip	1	2	3	4	5
Availability of information after I arrived at that place	1	2	3	4	5
General friendliness of residents toward visitors	1	2	3	4	5
Variety of man-made things to see and do	1	2	3	4	5
Quality of man-made things to see and do	1	2	3	4	5
Variety of natural things to see and do	1	2	3	4	5
Quality of natural things to see and do	1	2	3	4	5
The weather	1	2	3	4	5
Cost of travel and visit	1	2	3	4	5
Distance from home	1	2	3	4	5
Time required for travel and visit	1	2	3	4	5
Other (please explain below)	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5

THE FOLLOWING QUESTIONS ASK ABOUT YOUR ENTIRE HOUSEHOLD'S PARTICIPATION IN RECREATION ACTIVITIES FOR THE PERIOD _____, 19____ THROUGH _____, 19____.

YOU MIGHT CONSIDER ANSWERING THESE QUESTIONS AT A HOUSEHOLD GATHERING, SUCH AS DINNER, SINCE WE ARE INTERESTED IN EVERYONE'S RECREATIONAL EXPERIENCES.

FOR EACH OF THE RECREATION ACTIVITIES LISTED IN QUESTIONS 2-12, INDICATE THE TOTAL NUMBER OF TIMES YOU OR OTHER HOUSEHOLD MEMBERS PARTICIPATED IN EACH ACTIVITY WITHIN ANY OF THE STATES OF OREGON, WASHINGTON, OR IDAHO.

EXAMPLE Question 2: You went Fishing From a Boat (Freshwater) three times and other members of your household went nine times (during the four-month period). Write "12" in the blank for the total number of times "Fishing From a Boat (Freshwater)" took place. If several members of your household fished as a group, count this as one time. If you did not participate in the activity, put a zero (0) in the blank.

WRITE IN the total number of times you or other members of your household participated in each activity during the past FOUR MONTHS.

Q2. FISHING

- | | |
|---|-------|
| Ocean Charter Fishing for Salmon | _____ |
| Ocean Charter Fishing for Bottom Fish | _____ |
| Fishing from a Boat (salt-water—
not a charter trip) | _____ |
| Fishing from a Boat (Freshwater) | _____ |
| Fishing from a Bank or Dock (Freshwater) | _____ |
| Fishing from a Bank, Dock, or Jetty (Saltwater) | _____ |
| Crabbing, Clamming, Oyster Gathering, etc. | _____ |
| Other (please specify) | _____ |

- 2.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.

WRITE IN the total number of times you or other members of your household participated in each activity during the past FOUR MONTHS.

Q3. WATER ACTIVITIES

- | | |
|--|-------|
| Swimming or Wading in an Outdoor Pool | _____ |
| Swimming or Wading at a Beach | _____ |
| Scuba/Skin Diving | _____ |
| Water Skiing | _____ |
| Sailing | _____ |
| Wind Surfing/Sailboarding | _____ |
| Lake Power Boating for Pleasure
(includes charter boats and ferries;
excludes pulling skiers) | _____ |
| River Power Boating for Pleasure
(includes charter boats and ferries;
excludes pulling skiers) | _____ |
| Ocean Power Boating for Pleasure
(excludes pulling skiers) | _____ |
| Lake Non-motorized Boating (canoe,
kayak, raft, etc.) | _____ |
| River Non-motorized Boating (rowboat,
paddle boat, canoe, etc.) | _____ |
| Ocean Nonmotorized Boating (kayak,
rowboat, etc.) | _____ |
| Visiting the Beach/Beach-combing
(not swimming or wading) | _____ |
| Other (please specify) | _____ |

- 3.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.

Q4. NATURE STUDY, FOOD GATHERING

- | | |
|---|-------|
| Visiting Interpretive Centers & Displays | _____ |
| Nature Study & Wildlife Observation | _____ |
| Outdoor Photography | _____ |
| Mushrooming, Berry Picking & Other
Food Gathering | _____ |
| Collecting Objects & Materials Found
in Natural Setting (rocks, agates,
seashells, driftwood, etc.) | _____ |
| Outdoor Flower & Vegetable Gardening
for Pleasure | _____ |
| Christmas Tree Cutting | _____ |
| Firewood Cutting for Recreation | _____ |
| Other (please specify) | _____ |

- 4.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.

<p>Q5. HIKING, WALKING, CLIMBING</p> <hr/> <table border="0"> <tr> <td>Walking Along Neighborhood Streets and Roads</td> <td>_____</td> </tr> <tr> <td>Walking in Neighborhood Park</td> <td>_____</td> </tr> <tr> <td>Day Hiking on Trails</td> <td>_____</td> </tr> <tr> <td>Overnight Hiking/Backpacking Along Trails</td> <td>_____</td> </tr> <tr> <td>Overnight Hiking/Backpacking Where There Are No Trails</td> <td>_____</td> </tr> <tr> <td>Climbing and Mountaineering</td> <td>_____</td> </tr> <tr> <td>Other (please specify)</td> <td>_____</td> </tr> </table> <hr/> <p>5.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.</p>	Walking Along Neighborhood Streets and Roads	_____	Walking in Neighborhood Park	_____	Day Hiking on Trails	_____	Overnight Hiking/Backpacking Along Trails	_____	Overnight Hiking/Backpacking Where There Are No Trails	_____	Climbing and Mountaineering	_____	Other (please specify)	_____	<p>WRITE IN the total number of times you or other members of your household participated in each activity during the past FOUR MONTHS.</p>	<p>Q7. SNOW ACTIVITIES</p> <hr/> <table border="0"> <tr> <td>Downhill Skiing</td> <td>_____</td> </tr> <tr> <td>Cross-Country Skiing & Snowshoeing</td> <td>_____</td> </tr> <tr> <td>Sledding, Snowboarding, and General Snow Play</td> <td>_____</td> </tr> <tr> <td>Ice Skating</td> <td>_____</td> </tr> <tr> <td>Snowmobiling</td> <td>_____</td> </tr> <tr> <td>All Terrain Vehicle (ATV) Riding</td> <td>_____</td> </tr> <tr> <td>Other (please specify)</td> <td>_____</td> </tr> </table> <hr/> <p>7.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.</p>	Downhill Skiing	_____	Cross-Country Skiing & Snowshoeing	_____	Sledding, Snowboarding, and General Snow Play	_____	Ice Skating	_____	Snowmobiling	_____	All Terrain Vehicle (ATV) Riding	_____	Other (please specify)	_____	<p>WRITE IN the total number of times you or other members of your household participated in each activity during the past FOUR MONTHS.</p>
Walking Along Neighborhood Streets and Roads	_____																														
Walking in Neighborhood Park	_____																														
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Other (please specify)	_____																														
<p>Q6. CAMPING</p> <hr/> <table border="0"> <tr> <td>Organized Group Camping (Scouts, Mazamas, YMCA)</td> <td>_____</td> </tr> <tr> <td>Tent Camping with Motorized Vehicles (excludes sleeping in a trailer, pick-up, camper, etc.)</td> <td>_____</td> </tr> <tr> <td>Recreation Vehicle Camping (camper trailer, motor home, van, pick-up, etc.)</td> <td>_____</td> </tr> <tr> <td>Camping by Boat</td> <td>_____</td> </tr> <tr> <td>Horse Camping (with pack stock)</td> <td>_____</td> </tr> <tr> <td>Horse Camping (without pack stock)</td> <td>_____</td> </tr> <tr> <td>Other (please specify)</td> <td>_____</td> </tr> </table> <hr/> <p>6.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.</p>	Organized Group Camping (Scouts, Mazamas, YMCA)	_____	Tent Camping with Motorized Vehicles (excludes sleeping in a trailer, pick-up, camper, etc.)	_____	Recreation Vehicle Camping (camper trailer, motor home, van, pick-up, etc.)	_____	Camping by Boat	_____	Horse Camping (with pack stock)	_____	Horse Camping (without pack stock)	_____	Other (please specify)	_____		<p>Q8. RIDING OR DRIVING MOTORIZED VEHICLE OFF ROAD FOR RECREATION</p> <hr/> <table border="0"> <tr> <td>Motorcycling Off the Road</td> <td>_____</td> </tr> <tr> <td>All Terrain Vehicle (ATV) Driving (3 & 4 wheel)</td> <td>_____</td> </tr> <tr> <td>4-Wheel Drive Vehicles Off the Road</td> <td>_____</td> </tr> <tr> <td>Dune Buggy Driving</td> <td>_____</td> </tr> <tr> <td>Flying Aircraft for Pleasure</td> <td>_____</td> </tr> <tr> <td>Aerial Trams or Lifts for Pleasure</td> <td>_____</td> </tr> <tr> <td>Other (please specify)</td> <td>_____</td> </tr> </table> <hr/> <p>8.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.</p>	Motorcycling Off the Road	_____	All Terrain Vehicle (ATV) Driving (3 & 4 wheel)	_____	4-Wheel Drive Vehicles Off the Road	_____	Dune Buggy Driving	_____	Flying Aircraft for Pleasure	_____	Aerial Trams or Lifts for Pleasure	_____	Other (please specify)	_____	
Organized Group Camping (Scouts, Mazamas, YMCA)	_____																														
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Other (please specify)	_____																														

<p>Q9. NONMOTORIZED RIDING FOR RECREATION</p> <hr/> <table border="0"> <tr> <td>Bicycle Riding for Pleasure on the road (day trip/or shorter)</td> <td>_____</td> </tr> <tr> <td>Bicycling Off the Road</td> <td>_____</td> </tr> <tr> <td>Bicycling Touring On the Road (overnight trip)</td> <td>_____</td> </tr> <tr> <td>Horseback Riding</td> <td>_____</td> </tr> <tr> <td>Other (please specify)</td> <td>_____</td> </tr> </table> <p>9.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.</p> <hr/> <p>Q10. SIGHTSEEING, PICNICKING, OPERATING MOTORIZED VEHICLE ON ROAD FOR PLEASURE</p> <hr/> <table border="0"> <tr> <td>Sightseeing and Exploring</td> <td>_____</td> </tr> <tr> <td>Train or Bus Touring</td> <td>_____</td> </tr> <tr> <td>Picnicing</td> <td>_____</td> </tr> <tr> <td>Operating Car/Truck/Motorcycle On the Road for Pleasure</td> <td>_____</td> </tr> </table> <p>10.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.</p>	Bicycle Riding for Pleasure on the road (day trip/or shorter)	_____	Bicycling Off the Road	_____	Bicycling Touring On the Road (overnight trip)	_____	Horseback Riding	_____	Other (please specify)	_____	Sightseeing and Exploring	_____	Train or Bus Touring	_____	Picnicing	_____	Operating Car/Truck/Motorcycle On the Road for Pleasure	_____	<p>WRITE IN the total number of times you or other members of your household participated in each activity during the past FOUR MONTHS.</p> <p>Q11. HUNTING & SHOOTING</p> <hr/> <table border="0"> <tr> <td>Hunting—Big Game</td> <td>_____</td> </tr> <tr> <td>Hunting—Upland Birds & Small Game</td> <td>_____</td> </tr> <tr> <td>Hunting—Waterfowl</td> <td>_____</td> </tr> <tr> <td>Blackpowder Shooting</td> <td>_____</td> </tr> <tr> <td>Skeet/Trap Shooting</td> <td>_____</td> </tr> <tr> <td>Rifle/Pistol Target Shooting</td> <td>_____</td> </tr> <tr> <td>Archery (target shooting)</td> <td>_____</td> </tr> <tr> <td>Bow Hunting</td> <td>_____</td> </tr> <tr> <td>Other (please specify)</td> <td>_____</td> </tr> </table> <p>11.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.</p>	Hunting—Big Game	_____	Hunting—Upland Birds & Small Game	_____	Hunting—Waterfowl	_____	Blackpowder Shooting	_____	Skeet/Trap Shooting	_____	Rifle/Pistol Target Shooting	_____	Archery (target shooting)	_____	Bow Hunting	_____	Other (please specify)	_____
Bicycle Riding for Pleasure on the road (day trip/or shorter)	_____																																				
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Archery (target shooting)	_____																																				
Bow Hunting	_____																																				
Other (please specify)	_____																																				
<p>Q12. SPORTS, GAMES, OTHER</p> <hr/> <table border="0"> <tr> <td>Football, Rugby</td> <td>_____</td> </tr> <tr> <td>Soccer</td> <td>_____</td> </tr> <tr> <td>Baseball</td> <td>_____</td> </tr> <tr> <td>Softball</td> <td>_____</td> </tr> <tr> <td>Outdoor Basketball</td> <td>_____</td> </tr> <tr> <td>Outdoor Tennis</td> <td>_____</td> </tr> <tr> <td>Other Outdoor Court Games (badminton, shuffleboard, volleyball, etc.)</td> <td>_____</td> </tr> <tr> <td>Using Park Playground Equipment</td> <td>_____</td> </tr> <tr> <td>Jogging/Running</td> <td>_____</td> </tr> <tr> <td>Roller Skating Outdoors</td> <td>_____</td> </tr> <tr> <td>Golf</td> <td>_____</td> </tr> <tr> <td>Attending Outdoor Sporting Events (spectator)</td> <td>_____</td> </tr> <tr> <td>Attending Outdoor Cultural Events (concerts, plays, etc.)</td> <td>_____</td> </tr> <tr> <td>Visiting Amusement Parks/Fairs/ Rodeos/Zoos, etc.</td> <td>_____</td> </tr> <tr> <td>Other (please specify)</td> <td>_____</td> </tr> </table> <p>12.a. Of the activities on the above list, please CIRCLE the activity you or other members of your household participated in MOST RECENTLY during the past four months.</p>		Football, Rugby	_____	Soccer	_____	Baseball	_____	Softball	_____	Outdoor Basketball	_____	Outdoor Tennis	_____	Other Outdoor Court Games (badminton, shuffleboard, volleyball, etc.)	_____	Using Park Playground Equipment	_____	Jogging/Running	_____	Roller Skating Outdoors	_____	Golf	_____	Attending Outdoor Sporting Events (spectator)	_____	Attending Outdoor Cultural Events (concerts, plays, etc.)	_____	Visiting Amusement Parks/Fairs/ Rodeos/Zoos, etc.	_____	Other (please specify)	_____						
Football, Rugby	_____																																				
Soccer	_____																																				
Baseball	_____																																				
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Visiting Amusement Parks/Fairs/ Rodeos/Zoos, etc.	_____																																				
Other (please specify)	_____																																				

TO ANSWER THE FOLLOWING QUESTION YOU NEED TO USE THE ENCLOSED MAP.
THIS MAP IS YOURS TO KEEP ONCE YOU HAVE COMPLETED THE QUESTIONNAIRE.

This question concerns the outdoor recreation activities of you or any member of your household during the month of _____. If no one in your household participated in any outdoor recreation during the month, please skip to Question 15.

Each of the activities you circled in Questions 2-12 was listed under an ACTIVITY CATEGORY (e.g., Fishing From a Boat (freshwater) under FISHING). Refer back to these circled activities and their activity categories in answering Questions 13 and 14.

Q13.

FOR EACH ACTIVITY YOU CIRCLED IN QUESTIONS 2-12,

- (1) Think about whether you or any member of your household participated in the circled activity during the MONTH indicated above.

If the circled activity occurred during that month, check (✓) "YES" corresponding to its activity category listed below.

(2) If you checked "YES", use the map and indicate the ZONE NUMBER (1-18) where the circled activity took place. If the activity was outside Oregon, Washington, or Idaho, write in the name of the state. _____

ACTIVITY CATEGORY	DID ANYONE PARTICIPATE?		Map Zone Number
	NO	Yes	
FISHING			
WATER ACTIVITIES			
NATURE STUDY, FOOD GATHERING			
HIKING, WALKING, CLIMBING			
CAMPING			
SNOW ACTIVITIES			
RIDING OR DRIVING MOTORIZED VEHICLE OFF ROAD FOR RECREATION			
NONMOTORIZED RIDING FOR RECREATION			
SIGHTSEEING, PICNICKING, OPERATING MOTORIZED VEHICLE ON ROAD FOR PLEASURE			
HUNTING AND SHOOTING			
SPORTS, GAMES, OTHER			

Q14.

Below are general descriptions of PLACES where recreation takes place. Please read these descriptions carefully and use them to answer PART a. of this question.

RECREATION PLACES

- Place 1. An unmodified, natural setting where you will meet few, if any, other people. Access is by cross-country travel to moderately difficult trails. Motorized use is prohibited. Recreation facilities are generally not provided.
- Place 2. A predominantly natural environment where you will occasionally meet other people. Access is generally by trails. Some primitive roads may exist, but generally are closed to motorized use. Few recreation facilities are provided and those that exist are minimal and rustic.
- Place 3. Settings where nature has obviously been altered through such activities as timber harvesting, mining, farming, or grazing. Road access is prevalent. Developed campgrounds may be available in some locations. Expect to meet other people in trucks, cars, and motorbikes. You may be able to get away from others in remote camp spots.
- Place 4. Forest, range, and coastal settings which generally appear natural or slightly altered. Access is by trail, road, and highway. Expect to meet moderate amounts of other people. Recreation facilities such as developed campgrounds may exist. There may also be some opportunities to camp away from others with no facilities.
- Place 5. Cities, towns, large resorts, and major ski areas with buildings and roadways on site or nearby. Expect to meet large numbers of people. Recreation facilities are often highly developed and motor vehicle access is common.

- 14.a. This question also concerns the outdoor recreation activities of you or any member of your household for the month of _____.

For EACH ACTIVITY CATEGORY you checked "YES" in Question 13 please provide the following information.

- 1) Write in the number (1-5) of the description that best describes the place you USED when you or any member of your household participated in that activity category during the month indicated above.
If the activity took place in more than one type of place, indicate the ONE type where the MOST time was spent.
- 2) Write in the number (1-5) of the description that best describes the place you or other members of your household most PREFER for the activity category. (It might be the same place as that used or it might be different.) _____

Activity Category	Place USED (Write in Number)	Place PREFERRED (Write in Number)
FISHING .		
WATER ACTIVITIES		
NATURE STUDY, FOOD GATHERING		
HIKING, WALKING, CLIMBING		
CAMPING		
SNOW ACTIVITIES		
RIDING OR DRIVING MOTORIZED VEHICLES OFF ROAD FOR PLEASURE		
NONMOTORIZED RIDING		
SIGHTSEEING, PICNICKING, OPERATING A MOTORIZED VEHICLE ON ROAD		
HUNTING AND SHOOTING		
SPORTS, GAMES, OTHER		

THE FOLLOWING QUESTIONS ASK ABOUT TOURISM DEVELOPMENT IN YOUR OWN COMMUNITY.

- Q15. What place do you feel is the main tourist attraction within ten miles from your residence?

NAME OF ATTRACTION/DESCRIPTION OF ATTRACTION

- Q16. Overall, how do you feel tourism affects the community where you live? (circle number)

1 Large Positive Effect	2 Small Positive Effect	3 No Effect	4 Small Negative Effect	5 Large Negative Effect
----------------------------------	----------------------------------	-------------------	----------------------------------	----------------------------------

IF YOU FEEL TOURISM HAS A:

POSITIVE EFFECT...SKIP TO Q18

NEGATIVE EFFECT...CONTINUE TO Q17

- Q17. What do you feel are the main NEGATIVE EFFECTS of tourism on your community? (Please explain below)
-

SKIP TO Q19.

- Q18. What do you feel are the main POSITIVE EFFECTS of tourism on your community? (Please explain below)
-

- Q19. What do you feel should be done with regard to tourism development in your community? (circle number)

1 Very Actively Discouraged	2 Actively Discouraged	3 Do Nothing	4 Actively Encouraged	5 Very Actively Encouraged
--------------------------------------	------------------------------	--------------------	-----------------------------	-------------------------------------

IF YOU FEEL TOURISM SHOULD BE:

DISCOURAGED...SKIP TO Q22

ENCOURAGED...CONTINUE TO Q20

- Q20. What do you feel are the main things your community would have to change in order to get more tourists to visit? (Please explain below)
-

- Q21. What do you feel are the main things your community has right now that would help it in developing tourism? (Please explain below)
-

THE FOLLOWING QUESTIONS ASK ABOUT OREGON'S NATURAL RESOURCES.

- Q22. How important do you feel each of the natural resources listed below is to tourism development in your community?

Circle the number that best describes the importance of EACH resource to tourism development.

	Very Important	Somewhat Important	Neither Important Nor Unimportant	Somewhat Unimportant	Very Unimportant
FORESTS	1	2	3	4	5
AGRICULTURAL LAND	1	2	3	4	5
FISHERIES	1	2	3	4	5
WILDLIFE	1	2	3	4	5
MINERALS	1	2	3	4	5
WATER	1	2	3	4	5
ENERGY SOURCES (Such as sun, wind, oil, gas, hydroelectricity)	1	2	3	4	5

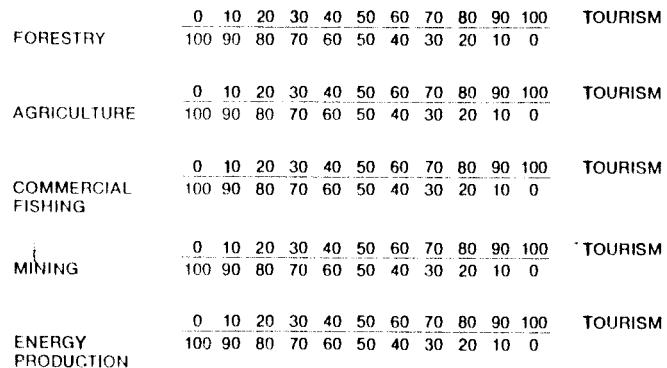
- Q23. To what degree do you feel tourism is compatible with other uses of natural resources listed below?

Circle the number that best describes the compatibility of EACH pair of resources uses.

	Very Compatible	Somewhat Compatible	Neither Compatible Nor Incompatible	Somewhat Incompatible	Very Incompatible
FORESTRY with TOURISM	1	2	3	4	5
AGRICULTURE with TOURISM	1	2	3	4	5
COMMERCIAL FISHING with TOURISM	1	2	3	4	5
MINING with TOURISM	1	2	3	4	5
ENERGY PRODUCTION with TOURISM	1	2	3	4	5

- Q24.** Tourism is one of several uses of Oregon's natural resources managers consider when making decisions about resources. On the lines below, indicate how much emphasis you feel should be placed on managing natural resources for tourism compared with managing those SAME resources for other uses.

Put an "X" on EACH line to indicate the management emphasis that should be placed on each pair of natural resource uses. EXAMPLE: An "X" in the center of the line (50/50) indicates equal emphasis on both resource uses; an "X" at either end indicates all emphasis on one use.



- Q25.** Which natural resource do you feel offers the best prospect for the long-term well-being of your community (check one)

FORESTRY MINING
 AGRICULTURE ENERGY PRODUCTION
 TOURISM OTHER (Please explain
 below)
 COMMERCIAL
 FISHING

THESE LAST QUESTIONS ASK ABOUT YOU AND THE MEMBERS OF YOUR HOUSEHOLD. THE ANSWERS WILL HELP US TO LEARN ABOUT THE PEOPLE WHO PARTICIPATED IN THIS SURVEY. ALL ANSWERS ARE CONFIDENTIAL AND WILL BE USED FOR STATISTICAL PURPOSES ONLY.

- Q26.** What was your total household income before taxes in 1985? Your best estimate is fine. (circle number)

1. Less than \$10,000
2. \$10,000 to \$19,999
3. \$20,000 to 29,999
4. \$30,000 to 39,999
5. \$40,000 to \$49,999
6. \$50,000 to \$59,999
7. \$60,000 to \$69,999
8. \$70,000 or above

- Q27.** How many years have YOU personally lived in Oregon? (write number)
- _____

- Q28.** How many years of formal education have YOU completed? (circle last year completed)

GRADE SCHOOL	1 2 3 4 5 6 7 8
HIGH SCHOOL/VOCATIONAL SCHOOL	9 10 11 12
COLLEGE OR TECHNICAL SCHOOL	13 14 15 16
GRADUATE SCHOOL	17 18 19 20 +

Q29. Which of the following best describes your racial or ethnic identification? (circle number)

1. Black
2. Hispanic
3. Native American (American Indian)
4. White (Caucasian)
5. Asian/Oriental
6. Other—Specify _____

Q30. Are you presently married? (check one)

No _____ END OF SURVEY.

Yes _____ CONTINUE TO Q31.

→ Q31. Is your spouse employed? (check one)

Yes _____ SKIP TO Q33.

No _____ IF YOUR SPOUSE IS RETIRED, A HOMEMAKER, A STUDENT, SELF-EMPLOYED, OR UNEMPLOYED, CONTINUE TO Q32.

→ Q32. If your spouse is retired, a homemaker, a student, self-employed, or unemployed, how many days does he/she plan to travel for recreation this year? (write number)

_____ END OF SURVEY.

→ Q33. What is your spouse's occupation? _____

Q34. How many vacation days does your spouse's employer provide this year? (write number)

END OF SURVEY. PLEASE KEEP THE MAP WITH OUR THANKS
FOR YOUR HELP!

Department of Resource
Recreation Management



Corvallis, Oregon 97331-5704

(503) 754-2043

January 8, 1987

Dear :

A few weeks ago, an interviewer from Oregon State University telephoned you in regard to your outdoor recreation activities. We appreciate the help you have given us with our recreation survey. To learn more in-depth information, we need your help again.

Would you please take the time to complete the enclosed questionnaire? It is designed to find out more about people's outdoor recreation activities. The information will be used by state and local organizations in planning recreation programs for the next five to ten years.

A relatively small group of people has been selected for this questionnaire, so your response is very important to us. Please be assured that all the information is confidential. Your questionnaire is numbered only so that we will not bother you again once you have responded.

After completing this questionnaire, please MAIL IT TO US IN THE SELF-ADDRESSED, POSTAGE-PAID ENVELOPE PROVIDED. Thank you in advance for your help.

Sincerely,

Denver Hospodarsky
Project Director

P.S. Please keep the enclosed map along with our appreciation for your help.

Enclosures

DH:dk

Dear Oregon Recreationist:

Last week a questionnaire about your household's outdoor recreation activities was mailed to you. Your name was selected in a sample of Oregon residents interviewed by telephone a few weeks ago.

If you have already returned the questionnaire, please accept our thanks. If not, please do so today. You are one of few Oregonians contacted to participate in this study, and your response is important to us.

Oregon
State
University

Sincerely,
Denver Hospodarsky
Denver Hospodarsky
Project Director

Department of Resource
Recreation Management



APPENDIX F
RAW DATA MATRIX FOR PRINCIPAL
COMPONENTS PROCEDURE

Table 18. Raw data matrix for principal components procedure.

NORS Origin Region		WA				OR								Total Trips from Origin
		1	2	3	4	5	6	7	8	9	10	11	12	
WA	1	4,487,278	329,120	345,523	52,235	0	0	7,640	0	0	0	0	0	5,214,156
	2	15,661,404	41,984,757	6,612,321	870,681	1,075,759	300,643	435,241	273,292	80,360	663,257	54,900	46,495	68,059,110
	3	483,102	772,486	6,635,719	512,027	51,647	23,824	11,891	24,476	0	50,911	21,573	73,523	8,661,179
	4	550,901	264,189	726,149	5,685,950	25,415	0	0	0	14,976	52,877	9,656	140,393	7,470,506
OR	5	19,184	17,053	710	0	2,312,800	51,158	64,659	106,580	9,237	56,132	20,606	20,606	2,678,725
	6	3,486	10,653	83,008	0	235,781	2,597,034	1,654	155,713	102,506	24,327	3,379	40,457	3,257,998
	7	1,102,373	554,154	138,310	60,343	4,890,593	754,170	16,428,148	1,431,557	253,957	2,214,130	364,382	279,683	28,471,800
	8	189,447	94,607	118,465	0	3,486,221	813,106	1,426,730	11,004,742	266,499	987,994	101,519	305,948	18,795,278
	9	38,480	46,351	17,644	11,387	507,894	973,656	0	408,473	6,501,290	161,377	71,193	35,780	8,773,525
	10	7,673	34,246	12,974	0	155,947	90,397	91,817	94,376	51,563	3,296,488	9,012	46,230	3,890,723
	11	0	3,885	0	2,091	24,783	32,088	0	9,062	8,188	21,905	890,558	81,401	1,073,961
	12	9,835	23,507	12,192	4,621	100,122	5,502	3,313	60,269	0	342,128	69,191	2,949,268	3,579,948
Total trips to a destination		22,553,163	44,135,008	14,703,015	7,199,335	12,866,962	5,641,578	18,471,093	13,568,540	7,288,576	7,871,526	1,615,969	4,019,784	

APPENDIX G
RECREATION ACTIVITIES LIST

Activity Summary

Fishing

Fishing from a boat (Freshwater)
Fishing from a bank or dock (Freshwater)
Fishing from a boat (Saltwater--not a charter)
Fishing from a bank, dock, or jetty (Saltwater)
Ocean Charter fishing for salmon
Ocean Charter fishing for bottom fish

Water Activities

Swimming or wading in an outdoor pool
Swimming or wading at a beach
Waterskiing
Windsurfing/sailboarding
Ocean nonmotorized boating (kayak, rowboat, etc)
River nonmotorized boating (rowboat, canoe, raft, etc.)
Lake nonmotorized boating (rowboat, canoe, raft, etc.)
Lake power boating for pleasure
River power boating for pleasure
Ocean power boating for pleasure
Visiting the beach/beachcombing

Nature Study, Food Gathering

Nature study and wildlife observation
Outdoor photography
Visiting interpretive centers and displays

Hiking, Walking, Climbing

Day hiking on trails
Walking in neighborhood park
Overnight hiking/backpacking along trails
Overnight hiking/backpacking where there are no trails
Climbing and mountaineering

Activity Summary Continued

Camping

Recreation vehicle camping
Tent camping with motorized vehicles
Camping by boat
Organized group camping
Horse camping (with pack stock)
Horse camping (without pack stock)

Snow Activities

Snowmobiling
ATV riding
Downhill skiing
Cross-country skiing
Sledding, snowboarding, general snow play

Riding or Driving Motorized Vehicle Off Road

Motorcycling off the road
ATV driving (3 and 4 wheel)
4-wheel drive vehicles off the road
Dune buggy driving

Nonmotorized Riding

Bicycle riding on the road (day trip or shorter)
Bicycling off the road
Horseback riding

Sightseeing, Picnicking, Operating Motor Vehicle

Picnicking
Sightseeing and exploring
Train or bus touring

Activity Summary Continued

Hunting and Shooting

Hunting big game

Bow hunting

Hunting small game, birds, waterfowl

APPENDIX H

STANDARDIZED DATA MATRIX FOR PRINCIPAL COMPONENTS
PROCEDURE

Table 19. Standardized data matrix for principal components procedure.

NORS Origin Region		WA				OR							
		1	2	3	4	5	6	7	8	9	10	11	12
WA	1	.85934	.06303	.06617	.01000	0	0	.00146	0	0	0	0	0
	2	.23011	.61689	.09716	.01279	.01581	.00442	.00640	.00402	.00118	.00975	.00081	.00068
	3	.05578	.08919	.76615	.05912	.00596	.00275	.00137	.00283	0	.00588	.00249	.00849
	4	.07374	.03536	.09720	.76112	.00340	0	0	0	.00200	.00708	.00129	.01879
OR	5	.00716	.00637	.00027	0	.86340	.01910	.02414	.03979	.00345	.02095	.00769	.00769
	6	.00107	.00327	.02548	0	.07237	.79713	.00051	.04779	.03146	.00747	.00104	.01242
	7	.03872	.01946	.00486	.00212	.17177	.02649	.57700	.05028	.00892	.07777	.01280	.00982
	8	.01008	.00503	.00630	0	.18548	.04326	.07591	.58551	.01418	.05257	.00540	.01628
	9	.00439	.00528	.00201	.00130	.05789	.11098	0	.04656	.74101	.01839	.00811	.00408
	10	.00197	.00880	.00333	0	.04008	.02323	.02360	.02426	.01325	.84727	.00232	.01188
	11	0	.00362	0	.00195	.02308	.02988	0	.00844	.00762	.02040	.82923	.07580
	12	.00275	.00657	.00341	.00129	.02797	.00154	.00093	.01684	0	.09557	.01933	.82383

APPENDIX I
LORENZ CURVE CALCULATIONS
FOR RECREATION ACTIVITIES

Table 20. Lorenz Curve calculations for recreation activities -- SSR5.

Activity Category	SSR 5							
	Raw %		Ranked					
% in SSR 5	% in Region B	% in SSR 5	Cumu% SSR 5	% in Region B	Cumu% Region B	Cumu% Region B	Cumulative% For Diagonal	
Fishing	13.4	10.4	14.9	14.9	12.8	12.8	10	
Water Activit.	14.9	12.8	13.4	28.3	11.7	24.5	20	
Nature Study	11.9	11.7	12.1	40.4	11.6	36.1	30	
Hiking, Walking	10.8	11.6	11.9	52.3	11.3	47.4	40	
Camping	9.0	8.8	10.8	63.1	11.1	58.5	50	
Snow Activit.	0.3	5.7	9.9	73.0	10.4	68.9	60	
Off-road Driving	9.9	8.4	9.1	82.1	8.8	77.7	70	
Nonmotor. Riding	8.6	11.1	9.0	91.1	8.4	86.1	80	
Sightsee, Picnic	12.1	11.3	8.6	99.7	8.2	94.3	90	
Hunting	9.1	8.2	0.3	100.0	5.7	100.0	100	
Total	100.0	100.0	100.0	645.7	100.0	606.3	550	

Generally, the index of dissimilarity is calculated as

$$I = \frac{A - R}{M - R} \quad \text{where, } A \text{ is the Total Cumu. \% SSR}(n); R \text{ is Total Cumu. \% Region B; and } M \text{ is the hypothetical Total of } A \text{ under condition of complete specialization e.g., } 100\% \times 10 \text{ categories} = 1000.$$

$$I \text{ (diagonal as reference)} = \frac{645.7 - 550}{1000 - 550} = .21261$$

$$I \text{ (Region B as reference)} = \frac{645.7 - 606.3}{1000 - 606.3} = .10008$$

Table 21. Lorenz Curve calculations for recreation activities -- SSR7.

Activity Category	Raw %		Ranked				
	% in SSR 7	% in Region B	% in SSR 7	Cumu% SSR 7	% in Region B	Cumu% Region B	Cumulative% For Diagonal
Fishing	6.0	10.4	19.0	19.0	12.8	12.8	10
Water Activit.	10.6	12.8	14.3	33.3	11.7	24.5	30
Nature Study	11.8	11.7	13.7	47.0	11.6	36.1	30
Hiking, Walking	13.7	11.6	11.8	58.8	11.3	47.4	40
Camping	6.4	8.8	10.6	69.4	11.1	58.5	50
Snow Activit.	19.0	5.7	8.8	78.2	10.4	68.9	60
Off-road Driving	4.3	8.4	6.4	84.6	8.8	77.7	70
Nonmotor. Riding	14.3	11.1	6.0	90.6	8.4	86.1	80
Sightsee, Picnic	8.8	11.3	5.1	95.7	8.2	94.3	90
Hunting	5.1	8.2	4.3	100.0	5.7	100.0	100
Total	100.0	100.0	100.0	676.6	100.0	606.3	550

Where, the indices of dissimilarity are calculated as

$$I \text{ (diagonal as reference)} = \frac{676.6 - 550}{1000 - 550} = .28133$$

$$I \text{ (Region B as reference)} = \frac{676.6 - 606.3}{1000 - 606.3} = .17856$$

Table 22. Lorenz Curve calculations for recreation activities -- SSR8.

Activity Category	SSR 8							
	Raw %		Ranked					
	% in SSR 8	% in Region B	% in SSR 8	Cumu% SSR 8	% in Region B	Cumu% Region B	Cumulative% For Diagonal	
Fishing	7.6	10.4	14.5	14.5	12.8	12.8	10	
Water Activit.	9.6	12.8	11.8	26.3	11.7	24.5	20	
Nature Study	11.1	11.7	11.5	37.8	11.6	36.1	30	
Hiking, Walking	11.8	11.6	11.1	48.9	11.3	47.4	40	
Camping	10.3	8.8	10.3	59.2	11.1	58.5	50	
Snow Activit.	7.1	5.7	9.6	68.8	10.4	68.9	60	
Off-road Driving	8.3	8.4	8.3	77.1	8.8	77.7	70	
Nonmotor. Riding	14.5	11.1	8.2	85.3	8.4	86.1	80	
Sightsee, Picnic	11.5	11.3	7.6	92.9	8.2	94.3	90	
Hunting	8.2	8.2	7.1	100.0	5.7	100.0	100	
Total	100.0	100.0	100.0	610.8	100.0	606.3	550	

Where, the indices of dissimilarity are calculated as

$$I \text{ (diagonal as reference)} = \frac{610.8 - 550}{1000 - 550} = .13511$$

$$I \text{ (Region B as reference)} = \frac{610.8 - 606.3}{1000 - 606.3} = .01143$$

APPENDIX J
LORENZ CURVE CALCULATIONS
FOR ROS CLASSES

Table 23. Lorenz Curve calculations for ROS classes -- SSR5.

ROS Class	SSR 5						
	Raw %		Ranked				
	% in SSR 5	% in Region B	% in SSR 5	Cumu% SSR 5	% in Region B	Cumu% Region B	Cumulative% For Diagonal
Primitive	9.7	7.3	37.2	37.2	30.6	30.6	20
Semi-Primitive	16.9	15.6	31.6	68.8	25.3	55.9	40
Roaded Natural	31.6	25.3	16.9	85.7	21.2	77.1	60
Rural	37.2	30.6	9.7	95.4	15.6	92.7	80
Urban	4.6	21.2	4.6	100.0	7.3	100.0	100
Total	100.0	100.0	100.0	387.1	100.0	356.3	300

Generally, the index of dissimilarity is calculated as

$$I = \frac{A - R}{M - R} \quad \text{where, } A \text{ is the Total Cumu. \% SSR (n); } R \text{ is Total Cumu. \% Region B; and } M \text{ is the hypothetical Total of A under condition of complete specialization e.g., } 100\% \times 5 \text{ categories = 500.}$$

$$I \text{ (diagonal as reference)} = \frac{387.1 - 300}{500 - 300} = .43550$$

$$I \text{ (Region B as reference)} = \frac{387.1 - 356.3}{500 - 356.3} = .21434$$

Table 24. Lorenz Curve calculations for ROS classes -- SSR7.

ROS Class	Raw %		Ranked					
	% in SSR 7	% in Region B	% in SSR 7	Cumu% SSR 7	% in Region B	Cumu% Region B	Cumulative% For Diagonal	
Primitive	4.7	7.3	30.4	30.4	30.6	30.6	20	
Semi-Primitive	16.2	15.6	25.1	55.5	25.3	55.9	40	
Roaded Natural	25.1	25.3	23.6	79.1	21.2	77.1	60	
Rural	30.4	30.6	16.2	95.3	15.6	92.7	80	
Urban	23.6	21.2	4.7	100.0	7.3	100.0	100	
Total	100.0	100.0	100.0	360.3	100.0	356.3	300	

Where, the indices of dissimilarity are calculated as

$$I \text{ (diagonal as reference)} = \frac{360.3 - 300}{500 - 300} = .30150$$

$$I \text{ (Region B as reference)} = \frac{360.3 - 356.3}{500 - 356.3} = .02784$$

Table 25. Lorenz Curve calculations for ROS classes -- SSR8.

ROS Class	Raw %		Ranked				Cumulative% For Diagonal
	% in SSR 8	% in Region B	% in SSR 8	Cumu% SSR 8	% in Region B	Cumu% Region B	
Primitive	9.7	7.3	28.3	30.4	30.6	30.6	20
Semi-Primitive	14.7	15.6	24.2	52.5	25.3	55.9	40
Roaded Natural	23.1	25.3	23.1	75.6	21.2	77.1	60
Rural	28.3	30.6	14.7	90.3	15.6	92.7	80
Urban	24.2	21.2	9.7	100.0	7.3	100.0	100
Total	100.0	100.0	100.0	346.7	100.0	356.3	300

Where, the indices of dissimilarity are calculated as

$$I \text{ (diagonal as reference)} = \frac{346.7 - 300}{500 - 300} = .23350$$

$$I \text{ (Region B as reference)} = \frac{346.7 - 356.3}{500 - 356.3} = -.06681$$

APPENDIX K
DIRECTIONAL BIAS INDICES
CALCULATIONS

Directional bias calculations

Raw
Recreational Trips From Origin SSR's to Destination SSR's

Origin SSR	Destination SSR			Total
	5	7	8	
5	2312800	64659	2484039	2484039
7	4890593	16428148	1431557	22750298
8	3486221	1426730	11004742	15917693
Total	10689614	17919537	12542879	

Generally, the directional bias index is calculated as

$D = \frac{10^7 (T_{od})}{\sum T_o \sum T_d}$ where, 10^7 is a scaling factor of any appropriate size; T_{od} is an Origin and Destination cell value; and $\sum T_o$ and $\sum T_d$ are row and column totals.

$$D_{5,5} = \frac{10^7 (2312800)}{(2484039)(10689614)} = 87.10 \quad D_{5,7} = \frac{10^7 (64659)}{(2484039)(17919537)} = 1.45$$

$$D_{5,8} = \frac{10^7 (106580)}{(12542879)(2484039)} = 3.42 \quad D_{7,5} = \frac{10^7 (4890593)}{(10689614)(22750298)} = 20.11$$

$$D_{7,7} = \frac{10^7 (16428148)}{(17919537)(22750298)} = 40.3 \quad D_{7,8} = \frac{10^7 (1431557)}{(12542879)(22750298)} = 5.0$$

$$D_{8,5} = \frac{10^7 (3486221)}{(10689614)(15917693)} = 20.49 \quad D_{8,7} = \frac{10^7 (3486221)}{(10689614)(15917693)} = 5.0$$

$$D_{8,8} = \frac{10^7 (11004742)}{(12542879)(15917693)} = 55.10$$

APPENDIX L
COMPACTNESS INDEX CALCULATIONS
FOR THE FUNCTIONAL RECREATION REGION

Calculation of the compactness index for Region B

Generally, the compactness index is calculated as

$C = \frac{D}{D'}$ where, $D = 2\sqrt{[A/\pi]}$ and A is the map area of the region;
and D' is the length of the greatest map diagonal
of the region.

$$C = 2\sqrt{[6.2 \text{ sq. in.}/\pi]} / 4.1 \text{ in.} = 0.68$$

APPENDIX M
CONNECTIVITY INDEX CALCULATIONS
FOR THE FUNCTIONAL RECREATION REGION

Calculation of the connectivity index for Region B

Generally, the connectivity index is calculated as

$$\text{Gamma } (\gamma) = \frac{L}{3(P-2)} \quad \text{where, Gamma is the connectivity index;}$$

L is the number of direct links
between pairs of points; and P is
the number of points.

$$\text{Gamma} = \frac{24}{3(21-2)} = 0.42$$

APPENDIX N
PEAKING INDEX RAW DATA AND CALCULATIONS

Peaking index calculations for Region B.

Raw Data

<u>Month</u>	<u>Number of Recreation Trips (ranked)</u>
August	9592048
July	7921523
June	5200183
September	4230201
May	3053648
October	2514769
January	2335142
April	2245329
November	2065702
December	1985769
February	1966010
March	1796263

Generally, the peaking index is calculated as

$$Pn = \frac{V1 - Vn}{(n-1)V1} \times 100 \quad \text{where, } Pn \text{ is the peaking index; } V1 \text{ is number of visitors during busiest period; } Vn \text{ is number of visitors during nth period; and } n \text{ is the reference period (1 = busiest period).}$$

$$P12 = \frac{9592048 - 1796263}{11(9592048)} (100) = 7.388$$

$$P3 = \frac{9592048 - 5200183}{2(9592048)} (100) = 22.890$$