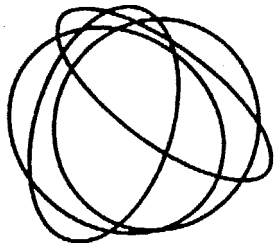

INSTITUTE FOR RESOURCES IN SOCIETY

CROSSING OVER THE LINES:

Multi-Jurisdictional, Multi-Ownership, Multi-Party, Multi-Problem Landscape Management Strategies

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August 1995

Report for the
Eastside Ecosystem Management Strategy Project
Columbia River Basin Assessment
USDA -- Forest Service
Pacific Northwest Research Station

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TABLE OF CONTENTS:

CROSSING OVER THE LINES: Multi-Jurisdictional, Multi-Ownership, Multi-Party, Multi-Problem Landscape Management Strategies

(A) TAKING AN INSTITUTIONAL PERSPECTIVE

This research on which this paper is based was done to inform management of natural resources where resource concerns cross ownership and jurisdictional boundaries, thus involving several independent actors. In our complex society, most natural resource management is done by organizations acting within institutional frameworks. We hope this reasearch contributes to resource management by contributing to understanding of the creation and change of institutional dynamics of natural resource management.

This research includes insights drawn from ten case studies of efforts to address cross-jurisdictional natural resource management issues. These cases are drawn from across North America and span most of the twentieth century. The research also draws heavily on the empirical and theoretical research from many different disciplines, and draws especially heavily from the fields of organization theory and democratic theory.

This research was conducted by coordinating efforts and funding from several sources, to produce a more comprehensive product with more depth than would have been possible under any of the projects alone. This paper was produced to contribute to the Eastside Forest Ecosystem Health Assessment, of the Forests of eastern Washington and Oregon. The assessment was conducted by the USDA Forest Service at the request of then-speaker Foley and Senator Hatfield. The Eastside Assessment was to answer seven questions about the condition of Eastside ecosystems and how to manage them sustainably. We hope this paper will inform management of Eastside ecosystems by examining institutions people have created and used to address cross-jurisdictional resource management issues in other places, but which are similar to issues presently of concern in the Eastside. In these very complex matters, we hope that people on the Eastside will be able to learn from the experiences of others.

Social institutions are consistent patterns of human activity which persist over time because they are embedded in a system of relationships. Institutional analysis focuses on the system of relationships and the patterns of human activity which both form the system and are formed by it. Thus, institutional analysis must look simultaneously at the individual actors-stakeholders. landowners. agencies: etc.-and at the system of relationships linking them together.

From a policy perspective, institutional analysis is both obvious-assessing the political feasibility of a course of action--and invisible. Institutions are typically the most invisible of social relationships for they provide the very context for action: and thus are in the background of our attention. Yet, institutional arrangements and procedural frameworks define and confine policy options.

Institutional analysis plays a highly pragmatic role in the development of strategies for landscape management. As Caldwell argues for the Great Lakes, "Any realistic plan for action must consider how that action is to be accomplished. Consideration of institutional changes for the Great Lakes is not a utopian development" (Caldwell 198826). The term 'institution' can describe any "social decision system that provides decision rules for adjusting and accommodating, over time, conflicting demands...from different interests groups" (Ciriacy-Wantrup 1969: 13 19). Institutions range from highly formalized rules, regulations, and organizational structures, to informal patterns of behavior. The purpose of institutional analysis is to define and describe policy goals and potential consequences of, and obstacles to. the goals and to increase our ability to anticipate and prepare for institutional obstacles to change (Cortner 199 1).

Unlike other assessments of landscape management which focus upon specific landscape patterns or management practices, this analysis focuses upon the human organization required to carry out landscape management. The Tribal Environmental Policy Committee of Timber/Fish/Wildlife (TFW) has argued that "The question is not whether we have the 'tools' but whether we have the 'political will' to implement a comprehensive landscape approach for wildlife protection" (Tribal Environmental Policy Committee 1993:3). The question of political will is one of many that institutional analysis seeks to investigate.

To understand the development of policy for landscape management. the institutional context is the critical link between theories of vegetative management and social capacity to put these theories into action. In addition, institutional analysis contributes to developing the political will to chart a new policy course.

Throughout North America there are numerous attempts to address resource management problems which extend across different land ownerships or administrative jurisdictions. The purpose of this document is to examine ten cases where multiple organizations have come together.in a new way to address physical resource management issues. We analyze the dynamics of these efforts to change how organizations work with each other. We hope that the experience of these ten efforts, as shown in this analysis, will be useful to others who are trying to deal with cross-jurisdictional natural resource issues. Institutional analysis provides a baseline against which to evaluate potential new approaches. Included in this baseline information is the history of the actors, the place, the land, and the current institutional arrangements.

In this document we use a typology of different kinds of institutions for cross-jurisdictional management as a framework for analyzing the institutional dynamics of landscape management. This typology is a continuum ranging from informal to formal organization. In this section of the document we describe the typology. In Section B. we discuss the sorts of problems landscape management is intended to address. In Section C. we discuss institutional analysis. Section D. our framework for doing an institutional analysis of landscape management cases. Section E. presents highlights of the literature on ecosystem management, which is a form of landscape management which enlightens our analysis. Section F. describes our research methods. Section G. presents the results of our case analysis. Section H. consists of our conclusions and recommendations for further research. Narrative descriptions of the ten cases analyzed in this study are included in the Appendix.

(B) LANDSCAPE MANAGEMENT SOLVES WHAT PROBLEM?

Landscape management tends to operate at a meso-scale somewhere between a very localized site-specific locus of management (e.g., at the stand level for trees) and the very large scale (e.g., tens of millions of acres). Landscape management addresses issues which no single landowner or jurisdiction can solve by itself. The problems require joint action by multiple organizations. For example, the Washington Forest Landscape Management Project describes its goal as *"to determine whether it is possible to integrate forest management across federal, tribal, state andprivate land ownerships and thereby increase the likelihood of sustaining viable populations of sensitive wildlife species and anadromous fish stocks, while reducing landowner costs and uncertainties"* (Carey and Elliott 1994: 1).

The history of conservation is a history of institutional arrangements aimed at achieving the conservation of natural resources at the meso-level. Theories of property ownership and contract, economic policies and mechanisms, administrative agencies and procedures, and the very body of natural resource and environmental law are all aimed toward securing management activities which collectively achieve "conservation objectives." Specifying these objectives in measurable terms and deriving criteria for evaluating success has been and continues to be an illusive task.

To what problem is "landscape management" the solution? This question is an important first step in the process of institutional analysis. One reason criteria and measurable indicators are so difficult to define is because of the lack of a clear question and at least a list of desired objectives or conditions. Indeed, definition of what constitutes a "problem" is itself a political decision (Bachrach and Baratz 1970, Schattschneider 1960, Benveniste 1989) and some actors even consider "landscape management" to be the problem. However, policy processes seldom wait for clear questions! We hope that we

will be able to contribute to understanding problems of coordination across organizations, institutional change, and collective action.

The concept of landscape management is very much an idea of the time. In most instances, the broad objective of a landscape management approach is to overcome impediments to achieving desired conservation objectives posed by conflicting jurisdictions, economic policies, and fragmented ownership patterns. Recognizing that what is desired is defined differently by different actors, the institutional challenge of landscape management is one of designing governance arrangements which simultaneously protect property owners from undesired policies from the "outside" and enhance opportunities for choosing desired management practices on the 'inside." Further, successful institutional strategies fit with the cultural context, with the history of the place, and with the political culture of the actors within the broader policy framework. Also, landscape management has been proposed as the solution to several different problems. Organizations may work together, because each needs the others to achieve it own ends, while at the same time the ends of the different organizations may be quite different. A central purpose of this paper is to explore how actors develop shared ends, considering the inclusiveness of processes for choosing ends.

Potentially the most frustrating aspect of institutional analysis for a management project is that institutions changes slowly. Even if an entirely new set of institutional rules and processes were to emerge immediately from this research, it takes time for the affected actors to develop new visions, decide whether to pursue their traditional vision, and generally to come to new accommodation with one another.

(C) WHAT IS INSTITUTIONAL ANALYSIS?

Institutional characteristics fall into several broad categories: legal, administrative, economic, jurisdiction, and capacity to act (e.g., political, financial and organizational resources). For each category, the institutional arrangements range from the more formal to the more informal. For example, legal institutions can include: statutes, executive orders, administrative rules and rule-making processes, standard operating procedures, judicial rulings, local ordinances, liability rules, management standards and guidelines, and common uses.

The purpose of institutional analysis is to appraise the policy process of the institutional characteristics of the current situation. Descriptive knowledge of the existing situation is the first stage of analysis. The second stage is the evaluation of the existing arrangements and the overall objectives in order to identify barriers and opportunities. Given that clear purpose and clear objectives may or may not precede this stage, and adequate approach to institutional analysis must include contributing to the definition of the problem.

To begin, we distinguish "institutions" from "organizations." An organization is a body with boundaries that define who and what is inside and outside the organization. Usually organizations have a purpose. For example, government agencies and private corporations are organizations. In contrast an institution is a way of acting which is understood by multiple people. Examples of institutions include generally accepted accounting principles, marriage, and the standard operating procedures of a corporation. All organizations have institutional attributes, but not all institutions are organizations. The main focus of this paper is to analyze how organizations use and develop new institutions for resource management.

A fundamental unit we use in this institutional analysis is the "policy community." A policy community is that set of actors which associate themselves or are associated with a particular policy problem or policy regime. If actors define themselves as affected by a policy problem and involve themselves in interactions with other actors having to do with the problem, they become a part of that policy community. By becoming involved, actors define themselves as within the "landscape management" policy problem, regardless of their physical location. The concept of policy community resembles the concept used in political science and called an "issue network" or "attentive public." Some analysts also consider actors who are affected by a policy action but who are not active or represented in formulation of a policy to be members of the policy community. Clearly, actors being affected but not being active or represented raises questions about the extent that policy communities are democratic. This complex of policy actors from a variety of other "policy communities" and associated with other "policy problems" is a defining feature of the *landscape management policy community*.

Policy communities are self-defining and self-organizing. As a result, they are *problem-posing* as well as problem-solving in their organization and orientation. For these reasons. the study of the policy community defined by landscape management will also illuminate the definition of the problem to which landscape management is the solution. Other policy communities may look at a situation which we are examining as a case of inter-organizational coordination to sustain natural resources and may interpret the situation as a case of inequitably powerful owners of land and capital, or as a case of intrusive federal government. We have chosen to examine problems defined by policy communities addressing landscape management; other policy communities could consider roughly the same human populations or geographic areas and define different problems, calling for different solutions.

(D) A FRAMEWORK FOR INSTITUTIONAL ANALYSIS

The first stage of our institutional analysis is to describe the landscape management policy community. This description will include the actors, organizations, resources (financial, political, organizational, human), jurisdictions, and relationships. Questions

like land ownership, size and type of ownership: objectives of ownership, demographics of ownership, and history of ownership are all part of such an analysis. We will pay particular attention to relationships between organizations and how those relationships and interactions are transformed by the action of those organizations. The purpose of the institutional analysis is to draw the connections between this kind of information and the institutional context within which landscape management can be realized.

VARIABLES MEASURED

Drawing on the literatures of organizational theory, institutional analysis, organizational change, program implementation, environmental policy, and democratic theory we chose attributes to measure in the case studies. As with all research, the selection of what variables to measure is crucial to determining whether we might be able to test our suppositions about the dynamics of cross-jurisdictional resource management efforts. We chose to examine the jurisdiction, membership, decision making processes, authority, resources, relationships, flexibility, role of conflict, and public involvement in each of the cases we examine. We will define each of these variables.

Jurisdiction has spatial, temporal, and topical dimensions, Typically, when people think of jurisdiction they think of the topical and spatial dimensions. In landscape management, we must also think of the temporal dimension. All organizations had a more or less clearly defined jurisdiction. The jurisdiction of agencies is typically clearly bounded by the statutory mandate of the agency. The jurisdiction of not-for-profit organizations is typically defined fairly narrowly in the charter of the organization. private corporations often have legal authority to engage in any lawful activity. Ad hoc networks of actors may have not formal jurisdiction, but usually have rough bounds which participants mostly agree to. We choose to measure the jurisdiction of the resource management efforts we are studying because, as a fundamental attribute of organizations and networks, it defines the bounds of the entity we study. Simultaneously, we must remember that jurisdiction in practice may be narrower or broader than the jurisdiction officially held by an actor or network.

Others have noted that the spatial dimensions of the jurisdiction of a landscape management effort must be relevant to the spatial dimensions of the resource stock or process being managed (Clark and Zaunbrecher 1987). Often these dimensions are greater than have previously been addressed by organizations newly attempting to address a resource management issue (Moote et. al. 1993, Francis 1988).

The **Lifespan** of resource management efforts is an aspect of the jurisdiction of the effort. We separate it from jurisdiction because different goals require efforts with different lifespans. Efforts to change the jurisdiction or mode of interaction of previously existing entities may work best with a relatively short lifespan. In

contrast, when a new organization is created to address a resource management problem, that organization's lifespan may have to be indefinite or permanent.

Membership is a fundamental attribute of institutions and organizations, like jurisdiction. Membership may be formal or informal. Either way, within an organization it specifies who has a say in the choices made by that organization. In an ad hoc group, actors exercising power over the resource or resources addressed by the group may be treated like members of the group, even if the actor does not directly participate in the group. Membership may be easily obtained by participation, or may be tightly limited. Members may all have equal roles, may have functionally distinct roles, or may have hierarchically arranged roles. There may be substantial obligations of membership.

Decision making is a fundamental activity of resource management institutions. As such, it is not possible to understand the dynamics of joint action of organizations without examining decision making. Like membership, decision making may be conducted using formal or informal processes. It can be centralized and hierarchical, where one makes a decision for many, or it may be consensual, where all participants must agree to the decision and none are compelled to assent. Decisions may be made collaboratively. They may be made in an open process or closed process.

Authority is not the same as jurisdiction. Jurisdiction has to do with the formal scope of authority. Authority may be formal and linked to formal jurisdiction. It may be informal with people granting authority to an assertion or organization with little correlation to organizational jurisdiction. Also, authority may be to decide, to implement, or to ensure compliance. A distinct entity may have authority, or authority may be quite diffuse, such as when many people regard a certain mode of discourse as authoritative. For example, claiming a scientific mode of discourse is to claim authority in this society (Latour 1987).

Resources of landscape management groups come in many forms. Resources are capacities to act that actors bring to landscape management efforts. Money, control of land, other forms of authority, staff, information and relationships with other actors are all common and important kinds of resources used in landscape management.

Relationships are fundamental to joint action, and the problems of landscape management which we are analyzing are problems of joint action of multiple actors. The kinds of relationships existing between actors structures the kinds of action those actors can do. Without some form of communication, joint action is impossible. Without a commitment of participants to long-term interdependence, it is unlikely that actors will maintain joint action through time if that action involves costs to the actors (Francis 1988). Relationships may be strong or weak, short term or lasting, involving a single narrow issue or a broad range of issues,

carried out through a single way of interacting or many different ways of interacting, equal or hierarchical, outreaching or exclusive, formal or informal, and between two or many actors.

Flexibility as an asp&t of relationships, authority, and resources. We examine flexibility as a variable separate from our other variables because we believe it is extremely important in organizations and networks successfully achieving their natural resource management goals. Especially at larger spatial and temporal scales, and when dealing with'the interactions of multiple resources, resource management has a great deal of uncertainty. Over time, the values of actors with authority or jurisdiction over resources changes (which may occur by changes of actors or within actors). Technology of resource use changes, and relative abundance of resources changes.. Flexibility, including learning, is essential in dealing with the uncertainty of all these different kinds of changes. Yet, in organizations, flexibility is highly constrained (Powell and DiMaggio 1991, Wilson

Note that we are primarily trying to analyze relationships between organizations, not relationships between individuals. While these macro-scale interactions of organizations are carried out through the micro-scale actions of individuals, there are collective phenomena which are only visible at the macro scale. For example, given that agency technical staff typically want to do their jobs well and do work which is coordinated with relevant factors outside their organization, why do agencies so often fail to coordinate with each other? This failure is an emergent property of- among other things--the kinds of jobs agencies know how to do, the processes and timelines agencies use to do these jobs, conflicting mandates of different organizations, and conflicting goals staff simultaneously attempt to meet. If we only look at the actions of an individual and the other individuals that person interacts with, we will probably fail to understand how the ways in which work is organized contribute to the frequent failure of interagency coordination.

Conflict is prominent in landscape management. Often, but not always, conflict over resources is the motivation for actors to attempt landscape management. Some actors report that they participate in landscape management to resolve or manage conflicts. Some analysts argue that change is usually precipitated by conflict (Schattschneider 1960, Sabatier and Jenkins-Smith 1993, Bachrach 1975, Bachrach and Baratz 1970, Lukes 1974). Thus, for an analysis of how organizations change how they interact, we believe one must include conflict in the set of variables analyzed.

Public involvement may be important in landscape management because many members of the general public may have to change their behavior to implement landscape management. In theories of action based on social construction of goals (Wildavsky 1987, Mansbridge 1990, Landy and Plotkin 1982) public

involvement is essential in the construction of goals in a democracy. Analysts assert that public involvement often results in alienation rather than agreement on goals or actions because resource managers often state that they want public involvement in resource management but are not willing to give up determining outcome a priori (Stankey and Clark 1992), even for the possibility of getting implementable outcomes instead of conflict and likely blocking of action.

The dynamic nature of landscape management necessitates a dynamic analysis of the institutional environment. Thus, a policy community approach places the actors into their dynamic context of action and includes an analysis of the objectives, strategies and resources of the various members. Questions like: What kinds of coordinating mechanisms between local governments, agencies, and landowners are in place? How do they work? What precipitates change in these working relationships? How do such changes evolve? Is coordination effective? What are the current forms of participation? All these questions are central to this analysis.

THEORETICAL IMPLICATIONS OF THE AD HOC/COUNCIL TYPOLOGY

Theory and experience suggest two distinctive institutional arrangements which can be posed at the outset as theoretical cases for analysis. On the one hand, mutual recognition of a shared problem can lead to voluntary associations aimed at developing collective solutions to the problem. In contrast, the problem may result from the broader context of policy and a collective body may be established to analyze and solve the problem.

We assert that a fundamental variation among efforts to address cross-jurisdictional resource management problems is the degree of formality or informality of the effort. In this analysis we use a typology to describe the continuum of more formal to more informal efforts. We label informal efforts “ad hoc” and formal efforts “council” structure.

One dilemma in developing these strategies is to avoid normative lariguage in the naming of categories. While our belief in democracy and participation has a normative base, we wish to empirically examine the consequences of different institutional arrangements, and not be blinded by our initial normative choices of what is important to study. Nearly every characteristic which defines these strategies carries a connotation associated with political or philosophical viewpoints. However, for the purposes of analysis, it is critical to separate features of institutional arrangements which can work differently under different landscape management regimes. The terms chosen as analytical categories must be viewed as general characteristics of institutional arrangements which can take many forms and serve many ends. These strategies represent simplified types which in no way reflect the variability of real world examples, but which aim to illustrate two rather different approaches: the bottom-up, primarily informal structure of an ad hoc organization, in contrast to the often top-down, formalized structure of a council.

The reason to represent these multiple institutional arrangements as categories in a typology is to look closely at their characteristics: and to possibly reconstruct a hybrid of characteristics fitting to the landscape management problem. There has been little systematic research on institutional arrangements, and what there is draws from legal analysis, political theory, and the new international environmental policy literature. However, these interdisciplinary conceptual frameworks together with the variety of cases around the country can provide a rich source of inspiration and experience to develop appropriate strategies for future landscape management efforts.

To frame this analysis, before researching cases but after developing the list of attributes of cases we would examine, we hypothesized attributes of effective landscape management institutions and hypothesized institutional barriers to landscape management. A description follows of why we hypothesize each proposed attribute of effective institutions and constraints. In our analysis we attempt to go beyond the generalities and provide specific examples of barriers and a set of potential strategies for the relevant actors theoretically located within the typology of characteristics of institutional arrangements.

Origins. We hypothesize that landscape management efforts are unlikely to originate unless there is a perceived conflict over resources and either a policy entrepreneur or an active policy community. Political theory holds that conflict is a major driver of group and political action (Schattschneider 1960). Others argue that ideological conflict is the main motivation of policy action (Sabatier and Jenkins-Smith 1992, May 1992). Theories of conflict as a driver of policy may focus on changes which allow actors to get previously suppressed issues onto policy agendas (Bachrach and Baratz 1970, Lukes 1974). Alternatively, technology may change and different materials become valuable (Firey 1960) or the actors active in a policy community may change, resulting in policy change (Sabatier 1993).

Jurisdiction. We have defined the problems of interest in this study to be problems of joint action. Thus we are examining situations where no single actor has the jurisdiction to completely address the problem in question. The challenge for actors is to use or create institutions which address resources at appropriate spatial and temporal scales (K. Lee 1993). As it the case in all aspects related to what can be broadly termed ecosystem management, limited incentives and limited capacities for cross-jurisdictional coordination are major barriers to developing a landscape management approach. Solutions to these problems, however, may aggravate other elements of the "system." For example, new requirements for coordination may actually suppress the coalescence of interests among affected actors or may stymie action by making action subject to approval by agencies pursuing conflicting goals (Forest Ecosystem Management Assessment Team 1993). Also, crises can focus efforts on short term effects, resulting in undesirable longer term consequences.

Lifespan. Logically, institutions for managing resources should exist as long as the resources exist. The institutions must change as needs, knowledge, and the resources change, but without some sort of functional institution for resource management, the resources are likely to be depleted or destroyed (Firey 1960, Ostrom 1990). Institutions may be temporary and change the way organizations interact with each other to manage resources. The Timber/Fish/Wildlife negotiation process is an example of such a temporary institution.

Membership. Some analysts argue that membership, or participation, in resource management institutions should be very inclusive for normative reasons of justice (Blakely 1994). Others argue that membership should be inclusive to make use of multiple kinds of knowledge (R. Lee 1994) or because broad involvement in policy formulation is necessary for effective implementation (Majone and Wildavsky 1978). Barriers to achieving membership necessary for effective action include the lack of organization or structural exclusion of certain views (Bachrach and Baratz 1970).

Decision Making. Some theorists argue that, for instrumental reasons, decision making should be open and substantially by consensus (Susskind and Cruikshank 1987, Cormick 1989). Others argue that social actors cannot develop choices without the deliberative interaction of an open decision making process (Stanley 1990, Wildavsky 1987, Haan et. al. 1953). While decision making is not separate from implementation and should be collaborative, implementation often should be coordinated but decentralized (K. Lee 1993). Barriers include the polarization and compartmentalized decision making so common in conflicts over natural resources. "Forum jumping" where technical resource management decisions are directed or evaluated by the courts limits seeking alternative solutions, limits broad participation in decision making, and limits the natural resource expertise of the actor judging the decision. Alternatively, consensus decision making is slow, expensive and unlikely to occur in situations where all alternatives would require at least on participant to sacrifice a core value.

Authority. Within the typology of informal to formal authority, analysts have observed advantages and disadvantages to both. Formal authority, in complex societies with administrative bureaucracies, develops taken-for-granted ways of acting which are very difficult to change (Powell and DiMaggio 1991). Thus, organizational learning is difficult (Lindblom 1959, May 1992). In contrast, while institutions with informal authority are more easily changed to incorporate new knowledge, values or resource conditions, the authority of informal institutions is usually less stable through time. In many natural resource management institutions, policy making authority is separated from the authority to implement policy choices. Extreme separation may result in failure of implementation or development of policies which do not produce desired results (May and Handmer 1992, May 1993, K. Lee 1993, Majone and Wildavsky 1975).

Resources. Adaptive and effective resource management requires substantial information about the resources in question, and their changes through time (K. Lee 1993). Obtaining this knowledge requires a substantial expenditure of time and or money, which may not be readily available to a resource management organization or network.

Relationships. Theorists assert that participants must be committed to long term interdependence to sustainably manage natural resources (Moote et. al. 1993, Korten 198 l, Landy and Plotkin 1982). While interdependence requires recognition of strong relationships between organizations, legalistic mandates and an ideological emphasis on individual economic rights and command and control regulation often make joint decision making difficult or impossible (Social Science Research Group 1994, Korten 198 l, Landy and Plotkin 1982).

Flexibility. Natural resources are dynamic, our information about them is uncertain, our knowledge of interactions between resources is uncertain, people's relative value of different resources changes: and external social structures change. To adapt to all this change and uncertainty, institutions for natural resource management must be flexible (K. Lee 1993, Moote et. al. 1993, Social Science Research Group 1994). However, institutional inertia limits flexibility (Powell and DiMaggio 199 1), resource managers are often reluctant to allocate resources to assessment and monitoring and both experts and the public may resist experimental management of threatened resources (K. Lee 1993). Having an unclear or inappropriately focused mandate may also limit an organization's capacity to change.

Role of Conflict. If conflict over resources is one of the main precipitators of action to change natural resource management, then the role of conflict in resource management institutions is important. If conflict is suppressed, change is suppressed (Bachrach and Baratz 1970, Blakely 1994). Conflict, when used to stimulate dialog, can promote learning (Cormick 1993). However, extreme conflict can prevent learning and choice, demonstrated when social institutions collapse.

Public Involvement. Public involvement in significant public actions affecting the environment is required by the implementing regulations of the National Environmental Policy Act, passed in 1969. We hypothesize that public involvement could be a mechanism for public deliberation and learning, facilitating policy development and choice and we wish to test this hypothesis in our empirical examination of cases of cross-jurisdictional management. However, members of the public often criticize agency public involvement activities as empty procedural side-shows where agency representatives present agency positions, without meaningful dialog, and without contributing to option development, learning or policy choices. We hypothesize that, if structures to fit

with local culture: public involvement processes could facilitate social learning and choice.

While this theory serves as the primary guide for the design of this study, we also draw upon data from the literature, from cases other than the ten analyzed here. However, as Caldwell notes in the case of the Great Lakes, at this point many of the problems involved in ecosystem management are far easier to identify than are the solutions (Caldwell 1988).

(E) USING ECOSYSTEM MANAGEMENT CONCEPTS TO INFORM ANALYSIS OF LANDSCAPE MANAGEMENT

Landscape management shares many attributes with what many commentators call ecosystem management. Both attempt to sustain multiple ecological functions and multiple resources through time, usually over spatial scales of thousands of millions of acres and temporal scales of decades to centuries. Because of these commonalties of landscape and ecosystem management, we can draw on the literature and practice of ecosystem management to inform our analysis of landscape management.

Ecosystem management means many things to many people, and this lack of a clear definition poses difficulties to both planning and implementation. Whether referred to as watershed, landscape, ecosystem, or 'ecologically integrated' management (Jennifer Belcher, ONRC Coastal Resources Conference, Aberdeen, WA, 1 l/16/93), attempts to manage a wide range of resources over a multi-ownership landscape are becoming increasingly common.

Despite the different names of these multi-jurisdictional efforts, a number of principles of ecosystem management are beginning to emerge from the expanding body of literature on the subject and from case studies. This literature addresses attempts to manage a variety of resources across a landscape, noting problems faced and potential solutions to these problems.

Here we use the literature on ecosystem management to inform our analysis of landscape management. Donahue cautions that "...the uniqueness of...hydrology, geography, and political jurisdictional status tends to discourage the application if institutional forms in place in other regions" (Donahue 1988: 135) but we can nonetheless learn from the experiences of others on the path to ecosystem management. In their often experimental steps towards a new approach to resource management, these cases provide valuable lessons.

Many discussions of ecosystem management focus on its definition, and how it could be implemented.

> [Although] an ecosystem approach will require that the Forest Service view and manage the forest landscape as an integrated whole, with the trees, soils, water, wildlife, air, and humans functioning in a dynamic, interdependent process, *an operational framework for accomplishing this has yet to* be *defined.*(Cheng et. al 1993: 1, emphasis added).

Caldwell's description of the Great Lakes Basin is equally applicable to the Pacific Northwest:

> . . . we have the commitment to a basinwide ecosystem approach, but . . . the approach has yet to be undertaken. There has been a giant step in concept and principle, but implementation is as yet in the exploratory state . . . (Caldwell 1988: 6).

Not only is it unclear how to carry out ecosystem management, but the criteria which define it, and which will be used to monitor and evaluate its success, remain the subject of debate.

Because of this lack of both definitional and operational clarity, Cortner and Moote conclude that ecosystem management is a still developing pre-paradigm (Cortner and Moote 1993). By "pre-paradigmatic" we mean that there is no single, generally accepted definition or set of internally consistent actions or principles which people agree constitute is ecosystem management. In the language of Kuhn (1970), this agreed upon view would constitute a scientific paradigm. Instead of this single, accepted set of actions, different people make fundamentally different assertions about actions constituting ecosystem management. and some of these versions contradict other versions. We may never agree that the practice of ecosystem management is a single thing, but it may be that—depending on unique bio-physical conditions of different places, and things that people value in these different places-we will always have contradictory examples of ecosystem management. Perhaps, given the variation of the world, this contradictory range of applications of ecosystem management will forever remain pre-paradigmatic in a Kuhnian sense. The concept of ecosystem management may be, to use the language of philosophers, essentially contestable.

At the same time, we hold would-be ecosystem managers at least somewhat accountable for their management. As a society, we hold managers of resources on private lands less accountable that managers of resources on public lands. We specify regulatory limits on certain environmental conditions and activities, but leave it to land owners to enforce many types of accountability on private lands. On public lands, we often attempt—through legislation, legislative oversight and court rulings-to hold resource managers accountable. Due to limits of information (Wilson 1989) and the demands of having to pay attention to other things (March and Olsen 1979) accountability often is minimal.

However, despite contradictions, some common principles of ecosystem management do exist. Researchers at the University of Arizona's Water Resources Research Center have carried out an extensive review of recent literature on ecosystem management (Moote et. al 1993). While they agree that the concept remains less than clearly defined, they do provide the following working definition:

> Ecosystem management is a management philosophy which focuses on desired states, rather than system outputs, and which recognizes ecosystem functions and structures as being critical to achieving and sustaining these desired states . . . Underlying all ecosystem management is the need to protect or restore critical ecological components, functions, and structures, in order to sustain renewable resources in perpetuity (Moote et al.: 1).

In their review of the literature, they have identified five principles common to most conceptions of ecosystem management:

> 1) Socially defined goals and management objectives;
>
> 3) a Systems approach, which " . . . focuses on the dynamic interrelations of systems components -including social, political, economic, biological, and physical features";
>
> 3) Collaborative decision building, "Participants should strive for joint organizational and community learning which acknowledges the values and expertise that each participant brings to the planning process";
>
> 4) Adaptable institutions, which " . . . need to be flexible, in order that they may adapt to changes in social values. political pressures, available data, and knowledge"; and
>
> 5) Management over " . . . longer spatial and longer temporal time scales than has been the norm in resource management" (Moote et. al. 1993: 1).

Observing that assertions about what is sustainable activity are central to most debates about ecosystem management, the Social Sciences Research Group recently prepared an international review of principles of sustainable resource management. This review did not attempt to evaluate the effectiveness of any of these principles but instead is a survey of what published works assert are the attributes of sustainable resource management. The review presents strong similarities to the concepts presented in the review of literature on ecosystem management prepared by Moote et. al. The Social Sciences Research Group identified six principles implicit in most discussions of sustainable resource management:

1) Maintain ecological functions, conditions, and/or biodiversity;

2) Evaluate and adapt social processes and governance structures;

3) Adapt to change;

4) Integrate ecological, cultural and economic systems;

5) Ensure intergenerational equity; and

6) Accept ambiguity of the concept of sustainability.

These principles of sustainability and the principles of ecosystem management identified by Moote et. al. emphasize integration of multiple values-especially social and bio-physical values-and adaptation to changing conditions and new information. We apply these integrated values of sustainability and ecosystem management in our analysis of landscape management.

(F) METHODS: A COMPARATIVE CASE STUDY APPROACH

A comparative case study approach was used to establish a typology of strategies appropriate for landscape management. Case studies are a commonly used research strategy when examining linkages between system variables, when the phenomenon under study is difficult to separate from its context, and when examining contemporary phenomena where one has access to a variety of data sources, including documents, interview data, and direct observations (Yin, 1989). A previous review of the literature on landscape management efforts (Shannon and Robinson, 1994) indicated that one element common to all of these efforts was the existence of a network of stakeholders interested in and willing to participate in developing mechanisms for shaping resource use behavior within a specified geographic area. The case study approach allowed us to examine the intricacies of these networks, including linkages among those directly concerned with resource management and linkages between key stakeholders and external policy actors. It also permitted us to gain a better understanding of how external factors, such as demographic shifts, regional and national economic changes, and political events, affect the effectiveness of various land management strategies.

Single case studies are useful in helping to identify key relationships among stakeholders operating in a particular socio-economic context. However, multiple case studies contribute to understanding the range of variation occurring in institutional attributes that contribute to effective landscape management. In addition, multiple case studies allow one to get a better sense for the circumstances under which various strategies (i.e. reliance on formal versus informal authority in management institutions, incentives for specific management behaviors, etc.) are likely to be effective. Given that we were interested in

both exploring how large-scale resource management efforts work in specific contexts and in identifying a range of workable strategies, we opted for a comparative case study approach.

Unit of Analysis: Resource Management Network. The unit of analysis consisted of the resource management network, defined as those groups involved in the use and management of a set of resources located within specified geographic boundaries. In some cases, the resource management network corresponds to a relatively small number of groups or organizations, with relatively simple and fixed relationships with each other. For example, the Western Oregon Special Forest Products Council, which is developing rules concerning the harvesting of a number of non-timber forest products (mushrooms, berries, floral greens, etc.) on federal lands in the Pacific Northwest, consists primarily of Bureau of Land Management and U.S. Forest Service employees, with limited participation by university scientists, mycological societies, and (rarely) special forest product processors. Other resource management networks, such as that which manages the Great Lakes ecosystem, are composed of many players with complex linkages to each other.

Selection of Cases. Ten cases were included in this exploratory study of landscape management strategies (Table 1). The cases were selected to include as wide a range of variation as possible in terms of the following factors: 1) geographic scale of management effort, 2) jurisdictional complexity, 3) degree of formal authority of key management institution(s), 4) length of duration of management effort and 5) degree to which the effort was considered "successful" by key stakeholders. Cases were restricted to North American contexts to minimize confounding effects of cultural and political differences. An important goal of this study is to obtain information useful in helping resource management agencies in Washington state develop strategies appropriate for managing forest landscapes. Thus, a significant proportion of the cases selected are concerned with forest management in the Pacific Northwest. Three of the ten studies are directly connected to the Timber/Fish/Wildlife agreement (TFW) which plays a key role in shaping the rules governing forest management in Washington State. The high percentage of TFW-related cases is justified given that any forest management landscape strategy in Washington is likely to be influenced by the TFW process.

Attributes Examined. Deciding what attributes of the resource management networks to examine was no easy task. We began with a list of approximately seventy specific variables to measure, addressing the resource management context and management institutions. These variables included such things as degree and source of formal authority, types of resources managed, number of participants, type of participation, membership criteria, resources available to participants, etc. We tested this list of variables by doing first drafts of three cases. We found many of the specific variables to be redundant in actual case descriptions because of the interactions between those variables. Many other variables were not applicable to one case or another. To streamline the data collection effort, and capture interactions between aspects of cases, we collapsed the initial set of variables into a set of nine topic areas. The topic areas list

allowed for greater flexibility than the long list of specific variables. While providing a better structure for revealing interactions of the variables, the topic areas impose a common structure on all of the cases: all case studies contain data about the same kinds of things (nature of the resources managed, internal structure of the institution, etc.).

The names of topic areas and the divisions of types of information between different topic areas are slightly different from the variables we used to hypothesize the attributes of effective institutions for landscape management. The aggregate content of the variables and topic areas is essentially the same. For example, the variables of "relationships" and "public involvement" are important parts of the category "internal/external interactions."

There are two main reasons for the differences. One, the hypothesized attributes of effective institutions for landscape management focused on understanding the dynamics within institutions. In contrast, when we did the cases we wanted more information about the interactions between efforts to do cross-jurisdictional management and the contexts in which these efforts occurred. The second reason for the difference between the variables used to develop hypotheses and the categories used for writing case studies is that we were learned from our research. After hypothesizing about what we expected to be important in cross-jurisdictional management, we did some pilot studies and further theoretical research. From this work, we refined the hypothesized attributes of effective organizations into the categories covered in cases; we present the original hypotheses in this paper (rather than the modified set of hypotheses we would have written after having completing the study) because we believe that a description of the process of research and changes in understanding is important evidence readers can use to judge the quality of our research (following methods of Glaser and Strauss 1967 and Yin 1989).

Data Sources. In developing the case studies, we relied primarily upon secondary data drawn from published material, including journal articles, books, and project documents. Where possible, we also examined internal staff memos, in-house reports, and meeting minutes. In a number of cases, published information was scanty or included only a limited number of stakeholder perspectives. To obtain more detailed information we conducted phone or face-to-face interviews with various stakeholder representatives. For all cases, we stopped gathering data after generating a cohesive picture of the network and when data collection efforts yielded no contradictory or anomalous information to the picture already developed. We also drew from the literature some references to other joint action efforts for which we did not prepare case analyses.

Limitations of the Case Studies. As with any data-gathering strategy, case studies yield only partial insights about the phenomenon under study. Two limitations of the case studies should be noted. First, since we relied primarily on readily accessible secondary data in developing the case studies. the results are likely to be skewed toward the viewpoint of stakeholders who had the means to produce such data. Often the parties producing written information on the cases are government agencies. Literature from a variety of perspectives was available for only four of the cases: the Great Lakes, Chesapeake Bay, Tennessee Valley Authority and the Northwest Power Planning

Council. To overcome the lack of published information from and about non-governmental stakeholders in the six other cases, representatives of the key stakeholders were interviewed. In one case (WOSFPC), participant observation was used to gather information about stakeholder concerns and interactions.

A second limitation of the case studies is that they are relatively weak from the standpoint of presenting the perspective of those who either chose not to be involved, or who were purposively excluded from these management efforts. Not only is it difficult to identify these "voiceless" interests, it is also difficult to identify specific individuals to interview once the general category had been identified. However, sometimes we were able to identify and get information from affected non-participants. The case where we think we were most successful at representing views of non-participants is the Yakima Resource Management Cooperative case, because preparation of this case included conducting several interviews and several non-participating interests were visible because they were organized.

(G) RESULTS OF CASE ANALYSIS

In this report we present conclusions we draw from the analysis of cases after the results of the case analysis. In this section we separately present the results of analysis of each variable. In the discussion of each variable, we present results from all ten cases. A brief version of these results is displayed in Table 3. Because of interactions between variables, within the text focusing on a specific variable there is some discussion of other variables.

Origins. The origins of the cases we examined are quite varied. Four, the Tennessee Valley Authority (TVA), Northwest Power Planning Council (NWPPC), the International Joint Commission (IJC) addressing Great Lakes issues, and the Northern Forest Lands Council (NFLC) were all formally established by Congress. All four were established to address specific problems: navigation, flood control, power generation and economic development in the Tennessee River valley, balancing power generation and fish in the Columbia River basin of the Pacific Northwest, coordinating issues which span the international boundary on the Great Lakes, and recommending governmental actions to maintain existing lifestyles in the rural, forested areas extending from New York state to Maine. Two of these entities were established more than 60 years ago.

In contrast, the Western Oregon Special Forest Products Council (WOSFPC) has very informal origins. Federat land management agency staff observed increasing use of special forest products and increasing conflict between users. These staff decided to meet. without any additional authorization or direction, to examine the issues they face and try to develop common policies to recommend to their respective agencies.

The entities or processes examined by the other five cases were initiated by a pre-existing authority. Each was initiated to address a specific problem or perform a specific function. The Chesapeake Bay Program (CBP) was initiated by the US Environmental Protection Agency to reduce water pollution in the Chesapeake Bay. The Timber/Fish/Wildlife process (TFW) was established to develop and alternative to litigation about impacts of logging on fish and wildlife. The Yakima Resource Management Cooperative (YRMC) and Nisqually Resource Management Plan (NRMP) were both designated as pilot watersheds to develop and test basin planning to mitigate cumulative effect of logging on fish and wildlife, under the TFW agreement. The Salmon Summit (SS) was initiated by a senator and governors to develop a plan to save salmon in the Snake River, to propose to the federal agency responsible for saving the salmon. The hope was that if local interests developed a plan, that plan would better serve local needs than a plan developed under the federal process.

Each of the entities or processes examined in the cases was established to address a conflict over natural resources. Formal, pre-existing governmental entities played a strong role in initiating each one.

Jurisdiction. The spatial bounds of seven of the cases are defined by river basins. The other three cases, the NFLC, TFW, and WOSFPC and defined by state boundaries or a combination of state boundaries and vegetation type boundaries. The sizes of the areas addressed range from 100,000 acres in the Nisqually to more than 150 million acres each in the Great Lakes and Columbia River basins.

Jurisdiction may be bounded in time. Seven of the ten cases are about efforts with no specified termination date. The three cases with limited temporal jurisdiction are the NFLC, TFW, and Salmon Summit processes. The NFLC and Salmon Summit cases were to develop recommendations to present to decision makers. The initial TFW negotiation had a lifespan of only a few months, but resulted in a process for further development of information and proposed policies. That process was scheduled for review after 3, 5, and 7 years to see if it should be continued.

Each of the entities or processes examined had topical jurisdiction nested within some jurisdictions and crossing other jurisdictions. Arguably, the TVA has the most heterogeneous jurisdiction, with a mandate to address navigation, flood control, power generation, fertilizer manufacturing, and building local economic capacity. Several cases were initiated to integrate the management of two or three natural resources: The NWPPC, TFW, and the TFW progeny YRMC and NRMP all are intended to integrate the maintenance of fish and wildlife with the revenue producing activities of logging or power generation. Efforts with narrow topical jurisdiction coordinate or integrate the activities of several previously existing jurisdictions: The Great Lakes Water Quality Agreement (GLWQA), established under the IJC, coordinates water pollution prevention and clean up programs across eleven states, three provinces, and the federal governments of the U.S. and Canada; the CBP coordinates programs across parts of six states, the

District of Columbia, and federal agencies. Both the GLWQA and CBP also coordinate the activities of many local governments.

Jurisdiction may be limited, to avoid issues which participants believe would result in a failure to agree to a separate joint action desired by the participants. For example, the TFW agreement negotiators agreed not to address rate of logging and conversion of forest lands to non-forest uses because all participants wanted an agreement addressing fish and wildlife management, and all believed that rate of harvest and conversion would be "deal breakers" (Halbert and Lee 1990). The issues of rate of harvest and forest conversion were passed on to the Sustainable Forestry Roundtable, and the issue of old-growth conservation was passed to the Old Growth Commission, but several of these issues remain substantially unresolved. At a certain point, these "agreement breakers" may encompass most of what is left to be discussed, posing a substantial challenge to attempts at consensus building.

Lifespan. Two of the case entities no longer exist. Both, the NFLC and SS had finite lifespans and terminated at the planned time or slightly there after. All of the other case activities are ongoing and officially have indefinite lifespans. However, some participants are asserting that the TFW process is moribund and the state Department of Natural Resources has reduced its funding for TFW activities and threatened to eliminate its support. The TVA and IJC have both operated for more than 60 years and show no signs of terminating.

Membership. The TVA, NWPPC and IJC have a formal council to which members are nominated and appointed. Each of these entities has a formal, legal structure, identifying them as primarily within the "council" model of organization. The lead policy group within the CBP is the policy commission. Most members hold seats on the commission as a function of holding another elective or appointed office. Each of these organizations has subordinate committees and other mechanisms involving representatives of other organizations. While the NFLC had an appointed council, much of its activity was public involvement or research conducted by contractors.

The TFW, YRMC, NRMP, SS and WOSFPC all have somewhat less distinct membership. Some committees of TFW have very distinct membership, and all four organizations have or had a fairly clearly defined roster of individuals who constituted the organization's decision making body. Each of these organizations has somewhat permeable membership. If the participants believe a non-participant is a significant power within the jurisdiction of the group, a representative of that organization or interest is likely to be admitted. Others usually can participate to a limited degree. However, these groups do have boundaries: For example, the WOSFPC only admits agency representatives as full members, and the YRMC has denied membership to some forest recreation groups. All groups, from the most formal to the most informal, have some degree of hierarchical ranking of different participants.

Decision making. Through the years, the decision making of the TVA has turned inward. While the organization started with ideals of transforming the social capacity and organization of the residents of the Tennessee Valley (Selznick 1980), through the years it has abandoned these activities and focused on power generation and river flow management. Decision making has been largely internal and technical and decisions to develop nuclear power have generated public controversy. This degree of internal focus during decision making appears to be unique among the cases we examined.

The other more formal entities, the NWPPC, GLWQA, CBP, and NFLC all have multiple mechanisms for involvement of other organizations and the public. These mechanisms include public meetings, circulation of draft plans for comment, involvement of other groups in data collection, analysis and modeling, participation on technical committees, and agreements for joint action to implement programs.

The four TFW-related cases, TFW, YRMC, NRMP and SS, all use consensus decision making. All have mechanisms for members to designate issues for consideration and all have accepted means for gathering information about resource conditions and dynamics, to inform decisions. The WOSFPC also uses consensus decision making. All five of these less-formal entities make little effort to involve actors which are not already participants in the process. It is the more formal entities which make conscious efforts to involve non-participants.

We observed the use of several justifications for excluding groups from decision making. People may be excluded because they are not politically organized and their goals do not support the goals of organized groups. This occurred in the Yakima basin. At public meetings, firewood cutters objected to restrictions on snag cutting to preserve wildlife trees. Cooperative participants were quite aware of these conflicting interests but apparently did not act to accommodate them. Groups can be excluded from decision making because cooperators view the outsiders' goals as incompatible with those of the cooperative group. This occurred in the Yakima when an off-road vehicle riding group asked to join the cooperative but was denied with the argument that the vehicles caused erosion and this was incompatible with the cooperative's goal of reducing erosion. Membership in consensus building organizations may exclude individuals or organizations which occupy extreme positions in a debate, for whom compromise and negotiation are inconceivable. Drawing from outside the ten cases prepared for this report, in an extreme case of such restricted membership the Greater Yellowstone Coordinating Committee---composed exclusively of representatives from the National Park Service and the USDA Forest Service--carried out a planning process for the greater Yellowstone ecosystem without including representatives from other agencies, private landowners, or the local public. Intense public opposition resulted (Goldstein 1992).

Authority. We observed a broad range of types of authority exercised in the cases analyzed. Types of authority observed include authority over internal functions (which

may be called autonomy), formal authority to decide disputes or choose policy, formal authority to compel others to comply with policy, and informal authority where actors change their behavior in response to other actors who have informal authority.

The TVA is an example of an organization exercising substantial authority over its internal functions. Owning thousands of acres and billions of dollars of capital assets (dams, power plants and transmission lines, navigational facilities, etc.), it exercises very broad and relatively uncontested authority over these resources. The NWPPC cites its congressional mandate that other agencies should follow council plans "to the fullest extent possible" as a formal authority to get other agencies to comply with its plans. The GLWQA and CBP have commissions which are largely composed of governors and agency heads. These individuals wield substantial power by occupying offices outside the commissions. This external status both gives informal power to the actions of the joint-action groups, and is power to direct home organizations to implement policies of the joint-action groups.

The NFLC, TFW and SS policy groups were composed of individuals who were prominent actors within the topical and geographic areas addressed by these respective groups. The actors included representatives of government, industry, communities, environmental organizations, and Indian tribes. Like the GLWQA and CBP commission members, these individuals could exercise the power they hold from their actions and status outside the joint action group.

While the NRMP, YRMC, and WOSFPC do not hold formal authority to compel action by any actor, participants are representatives of organizations controlling land within the geographic jurisdiction of the consensus group. Thus it is the participants who may hold the authority to implement the decisions of the group. In the-NRMP process landowners could submit an annual master forest practice plan complying with the Nisqually Plan. If approved by the state, the annual plans substitute under law for individual forest practice applications and permits. The YRMC provides an unusual variation of informal authority. While the cooperators explicitly state that their agreements are strictly by consensus and strictly voluntary and without any recourse to legal enforcement, the industry participants also state that their word is their bond to adhere to the agreements. this appears to be relevant because the corporations and their contractors are not always consistent in their execution of forest practices. With the consensus agreement, other parties, particularly Indian tribes, monitor forest practices on private lands and when they find actions inconsistent with cooperative agreements, ask the land owner to change the situation to conform to the agreement. Presumably the agreement also commits actors to continue abiding by agreements, unless there is a new consensus agreement to abolish the old.

All the cases include actors which have engaged in conflict. Thus, when those actors jointly support a position, that position gains substantial informal authority, because it is relatively safe for other actors to support it. With the exception of the Salmon Summit,

which failed to reach a consensus on how to protect salmon, all of the groups studied wielded significant informal authority stemming from the agreement of diverse actors.

Conflict extends to participants holding conflicting views about what authority a joint-action organization should have. One situation in which the expressed positions of different parties appear to leave little common ground can be found in recent documents prepared by stakeholder organizations in Washington state. *Wildlife Protection through Landscape Management,* a discussion paper prepared by the Trustees of the Washington Forest Protection Association, takes the position that "Private landowners . . .should be *provided with incentives to voluntarily participate* in landscape management" (WFPA 1993:2, emphasis added). In contrast, a document prepared by the Tribal Environmental Policy Committee of TFW discusses their 1991 proposal which "Ensures that areas within landscapes that are of high importance to wildlife can be adequately protected *regardless of the level of cooperation from landowners"* (Tribal Environmental Policy Committee 1993a:2; emphasis added). It appears that, while virtually all sides of the debate are buying into the "buzzword" of ecosystem management, there exists not the slightest actual meeting of the minds over what it means, and what should be done about it (Rowland, pers. comm.).

Resources. For the purposes of this section, we use the word "resources" to mean the capacities to act which actors may posses. These capacities include money, social influence, people's time (especially staff), and information. This use of the word "resources" is different from the way we usually use it in this report, which is to refer to natural resources like water, fish and trees.

Large literatures examine how organizations create, use, and fail to use resources. Shafritz and Ott (1992) provide an excellent overview of approaches to organization theory in general, and in so doing provide a range of perspectives on how organizations deal with resources. Burrell and Morgan (1979) provide an in-depth analysis of how organizations operate. Others provide views of how organizations operate with political contexts. For example, Kingdon (1984) examines how opportunities for organizational action arise through external occurrences. Wilson (1989) provides an empirically rich analysis of how bureaucratic structure directs actions of organizations. Allison (197 1) and Morgan (1986) both provide excellent examples of how a given organization can be examined using different perspectives, revealing different insights with each perspective.

Huge variation exists in the amount and type of resources controlled by the entities studied in these cases. On the high-resource end of the scale, the TVA receives hundreds of millions of dollars of power revenues each year, and manages $13 billion in assets, and the NWPPC has a significant technical staff having sophisticated water modeling capabilities and allocating a "water budget" which spills water over dams to benefit fish forgoing $160 million per year in power revenues. On the modest end of the continuum, the Salmon Summit and WOSFPC have few resources other than a portion of the time of participants, and whatever staff, information or funding those participants can convince their home organizations to contribute to the efforts. For these efforts the informal

authority they can derive from being a coalition may be their most influential resource. In addition, the WOSFPC has a "resource" held by no other entity we studied: There are currently very few rules controlling the use of special forest products; the group does not have to go against existing institutions to implement new management institutions. Given the endurance of institutions and the tendency for organizations to become like one another (Powell and DiMaggio 199 l), this lack of pre-existing institutions is a significant resource.

Another form of resources used by the groups we studied is social influence, where the group convinces other actors to use resources toward group ends. The Great Lakes provides an example. Here non-governmental environmental groups use the fact that the GLWQA has stated that certain water quality standards and management practices are desirable to pressure local governments to undertake water pollution mitigation actions.

Perhaps more important that the absolute level of resources available to a joint-action group, is the evenness of the distribution of resources within that group. From the perspective of democratic theory, one of the most attractive aspects of consensus decision making is that it provides an opportunity for the affected parties to come to the table as equals. However, achieving a truly level playing field, even just in the context of the negotiation, is easier said than done. If certain parties have consistently disproportionate resources at their disposal-information, the financial capacity to expend staff time and effort in negotiations, communications skills-ther parties will remain at a disadvantage. The most obviously disadvantaged parties in consensus decision making are disorganized, less than clearly defined interests, whose invisibility may keep them from the table (Amy 1957). As expressed in the TFW, YRMC and NRMP cases, once at the table, environmental interests--while increasingly well organized, well funded, and at least until recently, effective in the courts-continue to feel at a disadvantage to industry and governmental representatives (Hoberg 1993, Rowland, pers. comm.). A regional director of the National Parks and Conservation Association voiced his concerns: "Environmental negotiations only work when you have two people of equal power, and often the environmental group has the least power, money, information, and legal muscle" (Goldstein 1992: 3 13). Local citizen organizations and individuals find themselves at a disadvantage if they must take time off from work to engage in negotiations, while agency and industry staff perform these duties as part of their jobs (Carpenter and Kennedy 1988). At the same time, many small land owners and resource extraction workers feel wronged by federal governmental regulations, disadvantaged in political areas, and hurt by the loss of resource extraction jobs. The election of republican majorities in both houses of the U.S. Congress is interpreted by many as an indication of this resentment and fear of material loss. Some negotiations have attempted to correct imbalances in ability to participate by compensating individuals for whom participation is not part of their regular employment (Alberta - Pacific Forest Management Task Force 1992). The Northwest Power Planning Council attempted to increase the legitimacy of it computer models of water flow by making copies of the software available to anyone who wished it, and providing technical support on the use of

the software. This action had the additional effect of equalizing interactions by allowing people from outside the agency to examine the assumptions within the model and experiment by changing those assumptions. Finally, it has been argued that consensus decision making favors those for whom the status quo is less offensive, by providing each person at the table with what is essentially veto power (Hoberg 1993).

Another important attribute of resources is their stability through time. The natural resources the studied groups are attempting to manage all have the characteristic that present actions have a lasting impact on future resource conditions. To continue to exist and be productive, resources must be continuously maintained. Having excellent conditions for salmon this year does nothing for the salmon population if we drove them extinct last year. Thus, temporal continuity of management capacity is as important and the average level of that capacity. While the TVA, NFLC and CBP appear to have relatively stable resources, the TFW has quite unstable access to resources. A substantial portion of TFW funding, information, and staffing comes from the Washington State Department of Natural Resources and the Department has terminated funding for partially completed wildlife research and threatened to terminate operational funding for continuing TFW activities. Arguably, the WOSFPC, with its low absolute level of resources, has a more stable level of resources because it is relatively independent of other powers to maintain its resources.

Relationships. Trust is a fundamental attribute of relationships through time where social agreement on goals and means is required for action toward chosen goals. Without trust, both individuals and organizations are unlikely to put themselves in positions where they are vulnerable to others, or take actions where the positive results will not occur until some time in the future. It is not clear whether the relationships and resulting actions in the GLWQA and CBP relatively strong because participants are acting because they trust other participants, or because their actions unilaterally benefit themselves, even if other participants fail to act in coordination. Participants in the TFW process report that the creation of trust was essential to the parties choosing to act within TFW instead of pursuing their separate interests in court or the state legislature.

The dynamics of relationships have inertia through time. While the TFW negotiations have been generally viewed as successful, the subsequent attempt to do state-wide negotiation on forestry issues, the Sustainable Forestry Roundtable, was not ultimately successful at reaching consensus (Hoberg 1993). Issues of mistrust stemming from the inability to ratify the negotiated agreement of the Sustainable Forestry Roundtable may negatively affect the credibility of the consensus process among certain stakeholder groups in the future (Rowland, pers. comm.).

Other dimensions of relationships are strength and number. The NFLC made ongoing efforts to involve people who had not previously been involved in forest policy. While the council appeared to involve hundreds of people through public meetings, making suggestions for policies, and commenting on draft proposals for policy, those relationships appear to be relatively weak. The NWPPC cultivates relationships with

other actors involve in Columbia Basin water issues and attempts to build the strength of those relationships by jointly using science to understand the dynamic of Columbia River resources and attempting to reflect the interests of other actors in Council plans. In contrast, relationships can be relatively exclusive, such as in the YRMC and NRMP, where participants rarely seek to involve parties not presently involved, and have discouraged participation by actors who participants perceive as possible disrupters of current relationships.

Relationships may be formal or informal. While the NWPPC appears to be building positive relationships with some other actors, it is not clear whether these relationships gain strength from the formal process of jointly monitoring resource conditions and modeling future conditions, or from the informal, personal working relationships of individual council staff members and representatives of other organizations. Similarly, while the participants in the Yakima and Nisqually processes are signatories to formal memorandums of understanding where they commit to sharing information and undertaking joint planning, at the macro scale the cooperation exists through the informal, day-to-day activities of staff of the different organizations.

Frequently relationships are differentiated. Agency participants in the WOSFPC encourage participation of special forest product users, but explicitly exclude non-agency participants from choosing policies which the group proposes to the agencies for implementation. All of the efforts studied, with the possible exception of the Salmon Summit, had technical groups, public meetings, or other mechanisms for actors to be involved in ways which are hierarchically subordinate to the main decision making body of the joint-action effort.

Flexibility. The Salmon Summit and TVA appear to be the least flexible entities we examined. The participants in the Salmon Summit were unable to find salmon management prescriptions they could agree to. The TVA appears to have substantially narrowed its scope to producing and distributing electric power, and using its dams to promote navigation and flood control. While one could argue that the TVA demonstrated flexibility by substantially abandoning its economic development activities when faced with substantial political opposition to them (Selznick 1980), this in not the active problem solving we are thinking of. However, we acknowledge that strategic retreat may allow an actor to survive to address some issues, rather than being annihilated.

All other organizations examined showed flexibility by substantially changing their activities to address changed circumstances. The IJC was created early in this century, primarily to address international navigation and water diversion issues on the Great Lakes. About 1970, when water pollution became an issue for political action, the Commission used a clause in its charter mentioning pollution to fundamentally refocus its activities to address water pollution.

The flexibility we have observed can be described as incremental. As state agencies get data on water pollution in the Great Lakes and results of pollution mitigation efforts, the

GLWQA groups have increased emphasis on using public education to decrease non-point source pollution, and work with municipalities to implement local pollution control measures. A similar shift occurred in the Chesapeake program. TFW participants used a learning process to identify high priority information needs to be addressed by scarce research dollars. TFW participants have also obtained funding from diverse sources to backstop lost state funding for multi-year research projects. Reacting to land owner fears of increased regulation, the YRMC has backed away from its goal of preparing annual plans for approval by state forest practices regulators in favor of information sharing, resource monitoring and mapping,and developing consensus agreements about quantifiable standards for resource conditions in the basin.

While the NWPPC explicitly embraced adaptive management as a means to flexibly respond to the changes and uncertainty of the world, the Council has been reluctant to fund experimental management activities which proponents of adaptive management believe are necessary (K. Lee 1993). Also, some critics argue that some salmon stocks are too much at risk of extinction for experimentation, and that we should undertake what we think will be the most strongly conservative actions possible (Blumm and Simrin 1991).

However, we have somewhat limited data on flexibility. Five of the ten case we examined focus on institutions which have existed less than five years, and one other case has existed for less than ten years. Watching the TFW, YRMC and NRMP process evolve may provide more data on the adaptation and survival of institutions.

Flexibility of these institutions also appears be limited by participants in the institutions. Two examples will suffice. While participants in TFW recognize that rate of logging is an issue with the public, timber companies have been reluctant to agree to annual logging area controls which would result in either relatively constant rates of logging or long rotations. Industry argues that other rules and company policies effectively achieve the same end, over time, and that companies are not willing to lose this much rate of harvest flexibility on a year-to-year basis. A second example is the YRMC. Rejecting request for membership by forest recreation organizations, the cooperators are attempting to preserve their agreement to limit forest activity to minimize erosion caused by horseback riding and off-road vehicle riding. If these recreation interests had been admitted to the cooperative, it may have been possible to guide this recreational use to low-erosion areas, and gain an ally in external political struggles.

Role of Conflict. The TVA again stands out as different from the other institutions we examined. It appears to use its corporate-style of organization to make internal conflict nearly invisible. Conflict with external actors appears to be limited mainly to other actors criticizing some TVA actions in external forums.

Several institutions we examined have formal processes which function to channel and limit conflict. For example, the federal governments of the U.S. and Canada may refer issues to the IJC for study and recommendation. Technical groups within many of the

joint-management efforts may initiate study of emerging issues, or recommend action to policy bodies.

Several of the institutions studied use the procedures of doing scientific research to mediate conflict. The NWPPC, TFW and YRMC all use jointly selected or performed research to develop agreed upon statements about the state and dynamics of resources of interest. This agreed upon knowledge then serves as a basis for dialogs intended to develop agreements on particular policies or actions.

The NFLC and WOSFPC appear willing than other organizations studied to explore and articulate conflicts over resources within their jurisdictions. This willingness may correlate to the organizations' limited responsibility for action. Still, for all groups conflict remains somewhat problematic. Each was shaped to address a conflict or problem resulting from uncoordinated action of different actors, thus each has dealing with conflict as its purpose. However, to the extent that these efforts have been addressed through an organization, as with any organization, the organizations examined here try to limit expression of conflict to avoid damage.

In all of the institutions studied, informal communication and consultation are important mechanisms for addressing conflicts. Sometimes perceived differences turn out not to exist, and the conflict is resolved [example]. Sometimes the actors are able to address disputes by framing them in different, shared terms. For example, TFW participants have had some success in developing agreement about particular rules for doing forestry in riparian areas by framing the discussion in terms of sustaining both fish and commercial forestry. All these institutions are based on the premise that all participants have the right to continue existing. By definition, this gives participants a point of common agreement and legitimates the values of each participant, providing the possibility for social construction of additional agreements. Actors which do not grant other actors the right to exist are out of the debate.

Public Involvement. While public involvement is one type of relationship in an institution, how an institution deals with public involvement may have minimal correlation to how it goes about other types of relationships. For example, while the YRMC discourages public involvement, it continues to develop stronger and more complex working relationships between participants. The institutions studied tend to have weak public involvement activities and those activities tend to follow the traditional model of educating the public rather than providing a dialog which transforms both the institution an the public. To some degree, the GLWQA, CBP and NFLC are exceptions to this tendency. The Great Lakes and Chesapeake institutions both use public involvement to develop and implement non-point source pollution control programs. The NFLC explicitly attempted to organize previously unorganized rural residents of the northern forest, to engage them in developing policies for the forest.

While the NFLC used extensive and strongly interactive public involvement to develop its proposals for maintaining traditional lifestyles in the northern forest, it was developing

recommendations to governments, not implementing actions. This role as a recommender rather than implementer may have made it possible for the Council to gloss over some difficulties of implementation or avoid generating significant opposition from some parties which might strenuously oppose the implementation of the council's recommendation.

(H) CONCLUSIONS

When drawing conclusions from these cases, one must recall their commonalties. These commonalties arise from the cases being selected for analysis because they had particular attributes. These attributes include:

- Occurring primarily within the United States,
- Occurring within the 20th century,
- Being created to perform a coordinating or learning function,
- Being created to address a perceived natural resource problem, and
- Being created as an institution facilitating joint action by multiple organizations.

PATTERNS OF VARIATION ACROSS VARIABLES

We observe some correlation across variables. In the institutions for landscape management we examined, we observed that institutions addressing larger geographic areas tended to coordinate actions of other organizations, not command action. We attribute this correlation to the likelihood that large geographic areas tend to include lands under the jurisdiction of several strong resource management organizations. These strong, pre-existing organizations almost never choose to give up control of lands within their jurisdiction. When pre-existing strong organizations retain control over resources, the institutions for cross-jurisdictional management tend to coordinate those existing organizations. The GLWQA and CBP are excellent examples of where several state governments (and in the case of the GLWQA, two nations) coordinated to address cross-boundary water quality problems. The institution studied which least exhibited this characteristic is the TVA. Unlike the GLWQA and CBP, the federal government granted TVA relative control over rivers in its area, and authorized it to undertake fertilizer manufacturing which functionally became a business. With relative control over its activities, the TVA had little incentive to coordinate with other organizations. While it started out with strong coordination and interaction, over the years it became more and more independent, to the point that in the 1960s the Authority decided to build nuclear power plants, causing a storm of public protest. In contrast, several other organizations studies, including the NFLC and TFW involved hundreds, if not thousands, of actors and provided much more of an information sharing and coordination function.

We also observe correlations between authority and decision making. Formal authority to act is strongly associated with formal decision making processes. Anything different would be quite surprising in a society with due process and administrative procedure law.

However, lack of formal authority to control resources or establish policy does not necessarily correlate to an institution having lack of formal decision making processes. While the NFLC had almost no authority to control resources, it followed a formal public involvement process and parliamentary procedure in developing its recommendations. It is worth noting that the council was in part a creature of the U.S. Forest Service, a federal agency. This federal 'link, combined with creation by congress, may explain the formality of its processes. Alternatively, the formality of the process may be explained by the role of the Council being to provide input to Congress and the Forest Service: Often people judge the legitimacy of input by the process by which the input was gathered, and often formal processes are viewed as more legitimate than informal processes (Meyer and Rowan 199 1). Perhaps the best indicators of informal processes of decision making are self-origination (like the WOSFPC), having been in existence for a short time (like the Salmon Summit and Nisqually Resource Management Plan) and having little direct control over resources (like the YRMC).

As might be expected, organizations exhibiting greater degrees of flexibility also tended to exhibited relationships with a wider range of other actors involved in the institution. 'We conclude that these relationships facilitated learning, providing a mechanism for flexibility and change. Also, variations in membership correlated to variations in relationships: Not surprisingly, institutions with more open membership tended to have more actors participating. However, we were not able to measure a correlation between degrees of openness or hierarchy in membership and strength of relationships. Our hypothesis that more open, non-hierarchical membership would lead to stronger relationships between actors is not clearly supported by our data. We still suspect that relationships involving more interaction between actors tend to be stronger, but our data do not have enough resolution to support or disprove this hypothesis. Also, the alternative hypothesis is robust, that difficulty of exiting a relationship correlates with the strength of that relationship.

We hypothesized that institutions encouraging conflict as a source of dialog leading to learning would be more flexible. However, we do not see a clear correlation of attitudes toward conflict and flexibility: The two of the organizations which appear to deal with conflict in the least ways also appear to be the most and least flexible institutions we examined. These institutions are the WOSFPC and the TVA, respectively. Perhaps if we could statistically control for differences in the degree of control of resources exercised by institutions, we might be able to show a correlation between over addressing of conflict and flexibility. But perhaps not: Of legitimate forums, courts are one of the most arenas for overt conflict, and courts are quite inflexible in their procedure and (theoretically) inflexible in their decision making.

TYPES OF INSTITUTIONS, BY FUNCTION

The typology upon which we based this research, the typology of ad hoc to council institutional structure, focuses on the structure institutions. Before we draw conclusions

about correlations between different institutional structures and their functioning, a typology of institutions analyzed, by function, may be enlightening.

For the ten cases we analyzed, we find it useful to categorize the landscape management institutions into five categories. We expect that if many more cases were analyzed, several more functional categories might be necessary to describe the wider range of cases. The functional categories we find informative are:

- Closed operators (TVA)
- Open coordinators (NWPPC, GLWQA, CBP)
- Civic forums (NFLC, SS)
- Policy learners (TFW, YRMC, NRMP)
- Jurisdiction creators (WOSFPC).

These categories are heuristic. All institutions embody elements of all categories and some could arguable classed in a different category. But that is not the point. The point here is to illuminate the different functions we have observed landscape management institutions performing.

Closed operators. Organizations which have a relatively unchanging mission and which attempt to perform a relatively unchanging set of tasks with minimal learning and minimal negotiation with external actors are what we categorize as closed operators. The model of corporation with a mature product line operating in a mature market is analogous. The idea of a bureaucracy tenaciously following its standard operating procedures also fits this concept. We categorize the TVA as a closed cooperator because of its focus on managing facilities and resources under its direct authority, its relative focus on implementing technological solutions to power, navigation and flood problems, and its relative lack of focus on engaging with external actors to develop policy.

Open coordinators. Organizations which are open coordinators are inclusive in interacting with other organizations, and attempt to determine joint actions which serve the interests of multiple participants. Typically this coordination does not involve significant change in the goals, jurisdiction, or authority of participants. The NWPPC, GLWQA, and CBP all involve multiple actors having formal legal jurisdiction over specified land areas or for specified regulatory functions. The main function of these institutions is to coordinate the action of these multiple legal actors, not change their jurisdictions. We note that coordinating action might result in some actors changing their behavior and perhaps emphasizing different goals or changing paradigms for conceptualizing what action to take. In this way coordination tends to involve some policy learning or some of the change in goals which may occur as a result of participating in a civic forum. To some degree, TFW also has characteristics of an open coordinator organization. Through TFW industry, tribes, regulatory agencies, and environmentalists develop standards and management practices to implement their shared goal of doing forestry in a way which maintains fish and wildlife.

Civic forums. Actors in civic forums may be individual members of the public, or public or private organizations. Forums may be physical places, events, or networks of actor interaction. What we define as a civic forum is a dialog about the means or ends of social action. These forums are locations for the development of understandings about how the world works, and development of preferences about how actors want the world to work or be. We designate the NFLC and SS as civic forums because their primary function was to bring together actors to interact, with the hope of developing agreements about how people should live in the northern forest or what we should do to perpetuate salmon in the Snake River. While both processes drew upon science, both explicitly focused on social interaction of actors, where science provided data and models which were input into the dialog. Both the NFLC and SS had finite lifespans. We do not conclude that having a finite lifespan is a necessary condition of civic forums. However, the limited lifespans of the institutions we examined may be related to the minimal authority and responsibility for implementing policies.

Policy learners. We draw upon the concepts of policy learning elaborated by Sabatier (1988; 1993) and May (1992). These concepts of policy learning assume a set of actors are involved in a policy issue through time, and that they learn by integrating information about the world developed using policy analysis. This view of learning implies that learning is largely based on data and models of the functioning of the world. This focus on data differentiates policy learning from the social process of developing preferences and understandings of the world which occurs in civic forums. We designated TFW, YRMC and NRMP as policy learning institutions because of their focus on using resource monitoring and research to develop understanding of the condition of resources and what action to take to maintain those resources. The NWPPC could also be classified as a policy learning organization because of its strong use of data driven computer modeling of river flows, power supply and demand, and fish production/mortality. Also, the NWPPC seeks least-cost mechanisms to implement trade-offs between resources.

Jurisdiction creators. Jurisdiction creators are relatively rare. They occur only in those situations when actors are creating new rules for use of and authority over something where previously there had been few rules for use. Creation of new jurisdiction tends to occur when preferences or technology changes to make something newly valuable. The WOSFPC deals with one of these rare situations. Prior to this decade, demand for boughs, mushrooms, salal, moss, and other special forest products has been low relative to supply, and these resources were largely uncontrolled open access. Technically land owners had property rights to these materials, but the materials were perceived as ubiquitous and worth less that the cost of paying attention to them. Functionally, there was no market for these materials. With cash value of special forest products increasing and use increasing to the point where some violent confrontations occurred between users contesting appropriation of materials, agencies and land owners decided to establish and control rights to use these resources. It is this process of establishing control over resources that is the purpose of the WOSFPC.

More generally, from a public policy perspective we find it useful to characterize institutions for landscape management by their function, with respect to how they change interactions between actors involved in the issue. We could collapse the five categories discussed above into three categories: Not changing, changing, and creating new institutions. First, some institutions perform administrative of coordinating functions without significantly altering the actors involved in the process or their interactions. Currently, TVA, GLWQA and CBP could be characterized and not substantially changing the actors they interact with, or they dynamics of their interactions. Second, other institutions attempt to change participating actors or how those actors interact. NWPPC, NFLC, TFW, YRMC, NRMP, and the Salmon Summit all fall into this category. Third, the WOSFPC is creating relationships between actors where none existed before. Typically, product buyers did not interact with agencies, and usually harvesters had few interactions or little coordination with other harvesters. Land owners are developing mechanisms for controlling and selling access to special forest products.

CONSTRAINTS TO LANDSCAPE MANAGEMENT

Having examined interactions between the variables we examined and drawn conclusions about the different major functions performed by institutions for landscape management, we return to our hypotheses about constraints to ecosystem management.

We divide our discussion into three areas which appear to present particularly strong difficulties to implementing landscape management: 1) difficulties doing collaborative social decision making, 2) the difficulties of structuring institutions to learn, and 3) the difficulty of working at large spatial and temporal scales. To the extent possible, both constraints and potential solutions -derived from the case studies, literature review, and site specific information-are presented.

DOING COLLABORATIVE SOCIAL DECISION MAKING

> Increased stakeholder knowledge and empowerment via legislation has shifted National Forest management into a "shared-power" world, where the maximum level of satisfaction for all stakeholders can only be attained through the cooperative consideration, mediation and negotiation of these interests. (Cheng et. al. 1993: 11).

The lack of institutional arrangements to arrive at consensus has been highlighted as one of the most fundamental impediments to ecosystem management in both the Great Lakes Basin (Donahue 1988) and the Greater Yellowstone Ecosystem (Clark and Harvey 1990). While collaborative decision making does not require decision by consensus, consensus based collaborative decision making is currently popular (e.g. Wondolleck 1988, MacDonnell 1988, Bacow and Wheeler 1984, Amy 1987, Landre and Knuth 1993). The advantages of consensus based decision making include avoiding the highly polarized,

time and resource intensive arena of the courts, focusing on problem solving instead of strategic tactics for defeating one's opponents, and reduced opposition to the implementation of management decisions. Typically, "Institutions . . . or at least the formal rules, are 'created to serve the interests of those with the bargaining power to devise new rules" (North 1990: 16). In such situations, actors with a normative support for inclusive social processes who wish to more equitably distribute bargaining power, may support collaborative, consensus based decision making.

While the above advantages and a growing number of success stories are witness to the potential of collaborative decision making, difficulties involved in the establishment and operation of such a decision making body are numerous, and include the following:

1) Like ecosystem management, collaborative decision making remains-and perhaps must remain-undefined and pre-paradigmatic (Cortner & Moote 1993), and it is unclear whether it has the full commitment of all practitioners of ecosystem management.

2) Ensuring a level and representative playing field'while maintaining a logistically'workable number of participants is a difficult task.

3) Past relationships and attempts at negotiated settlements play an important role in the legitimization of consensus building approaches among stakeholder groups.

4) There must be some room for negotiation among stakeholder groups; not all issues are amenable to consensus-based decision making.

Each of these potential constraints is briefly discussed below.

An undefined process and an unclear commitment. Cortner and Moote warn that collaborative decision making remains in the same evolving state as ecosystem management. They caution that "there exist few models and techniques for actually integrating diverse values, changing organizational behavior patterns, or improving relationships with the public (Cortner and Moote 19935)". Questions such as "just what is meant by decentralization and what encompasses the local community of interest" remain unresolved (Cortner and Moote 1993:5). While this undefined state may be necessary for both collaborative decision making and ecosystem management to remain flexible-and thus remain powerful—in makes many actors nervous, and they often either avoid the uncertainty by avoiding the tool, or try to make an adaptive process into a cookbook, cdokie-cutter approach which fails to address the complexities of the local situation.

In addition, a certain amount of tension exists in the literature between the oft-stated desire for bottom-up, collaborative social decision making, and the apparently foregone

conclusion that such decisions will result in more ecologically sensitive management. As Cortner and Moote point out,

> . . . the concept of populist management . . . rests upon the premise that ecological values will fare much better in processes built on free discourse among equals. In other words, proponents of public deliberation often appear to assume that participation will lead to decisions more consistent with their own preferred policy options (Cortner and Moote 1993:5).

However, local opposition is frequently cited as an obstacle to ecosystem management (Keiter and Boyce 1991, Goldstein 1992). When populist decision making and the protection of ecological values find themselves in competition, the need to shift to more ecologically-based management practices appears to take precedence over the importance of incorporating the public in decision making and objective setting. For example, the *Vision for the Future* planning document prepared by the Greater Yellowstone Coordinating Committee in 1990 appeared to issue a call for "a national debate over difficult value-laden policy choices" (Reich 1985: 1637, cited in Cawley and Freemuth 1993:51). However, ". . . the language of the document implied that crucial decisions already had been made-the NPS and the USFS already were committed to ecosystem management under scientific prescriptions"(Cawley and Freemuth 1993:51). How are the interests of regional, national, and international publics to be weighed against those of local populations?

A key question here is the extent to which landscape or ecosystem management is a social decision making process, and the extent to which it is a means to maintain chosen ecological processes or functions. To the extent that both the general (such as biodiversity preservation, protection of ecological goods'and services) and the specific (such as riparian zones of a particular width) principles of ecosystem management are not the product of political dialogue among the various affected interests, the commitment to social decision making appears to take a back seat to the preservation or restoration of ecological systems. Is there any point-and if so, at what point-is it legitimate for a resource manager to avoid social decision processes and take a bio-physical action in the face of social opposition?

Issues of representation. While a primary goal of consensus decision making is to bring together stakeholders to make and implement social decisions on contentious issues of resource management, not all affected individuals will actually sit at the table. An essential question to ask is to what degree parties can be represented? This question has to aspects. One, how many people must be at the table to adequately represent the range of views of participants? Two, if decision making as a social process which either changes participants in the process, or by which they commit to decisions, then how functional is a decision when most actors do not directly participate in its making? At the same time, decision-making bodies reach critical mass at a relatively small scale; if the number of individuals who actually make decisions goes beyond a certain number, successful problem solving becomes much less likely. As Halbert and Lee describe, "The

TFW cooperators face the thorny problem of trying to maintain the informal consensus that has been effective in containing conflict, while expanding the circle of participating landowners and the public." They quote Harry Bell, a timber industry representative to TFW from the Olympic Peninsula:

> I think that it will be to the detriment of TFW if TFW is opened up to anybody who wants to join and therefore become involved in the review of specific forest practices. And the reason I say that is because you will lose industry and landowner support real fast (Bell, pers. comm., cited in Halbert and Lee 1990: 157).

Often actors are excluded from decision making processes if their positions are viewed as extreme by actors controlling resources. Such exclusivity may increase the cohesiveness of the group, and its ability to reach consensus, but excluded parties may be able to block implementation of decisions, or call into question the credibility and legitimacy of the organization. Alternatively, these interests may themselves choose not to participate. Non-participants may proceed along alternative pathways, working to undermine the activities of the consensus group, such as through continued litigation.

Possible approaches for dealing with limited space at the table include institutional structures which provide for multiple layers of decision making, or alternative means of involvement, such as citizen's advisory committees. Public forums involving true two-way dialogue can also increase representation. In addition, it is important for collaborative decision making groups to maintain the flexibility to increase and change their membership as new interests develop.

Still, admission to a decision making process is not sufficient to ensure equal power in decision making. Participants having less information may be disadvantaged relative to other participants. Also, those whose interests are more threatened by business as usual, and who thereby have more to gain from reaching a consensus decision, are likely to sacrifice more in the attempt to reach a compromise position than those who suffer less under the status quo.

Need for social cohesion through time. If an actor views interactions as independent exchanges in a market forum, that actor is unlikely to accept particular choices which go against its material interests. In contrast, if an actor perceives itself as a member of an ongoing social group where its needs are integrated with others, that actor is more likely to accept individual negative actions, because those actions are part of a beneficial whole. Halbert and Lee argue that the TFW process may be strengthened if consensus decision making is limited to the larger questions: "TFW needs to be able to preserve consensus on the long-range goals of forest management while making it acceptable for individual interests within the club to lose on particular issues at particular sites" (Halbert and Lee 1990:165).

Because trust and open communication are crucial to the success of negotiated settlements, and issues of resource management are often sources of great interpersonal and inter-group polarization, the creation and maintenance of an appropriate atmosphere requires substantial and continued effort. McKinney argues that for successful mediation, there "must be a low degree of polarization among the key stakeholders . . . "; however, highly skilled and credible mediators can often bring together even extremely polarized interests. In the initial TFW negotiation, participants overcame intense polarization and worked to achieve a cooperative agreement. In contrast, during the Salmon Summit negotiations participants remained more distrustful of others and were not able to reach agreement. It is not clear whether this difference in outcomes resulted from differences in trust, or differences in the possibility of solutions which met the interests of participants.

Room for negotiation. Alternative dispute resolution, as it is currently practiced, may seek to get participants to view a dispute in terms of a different value previously held by that participant. This is implied when mediators ask participants to work from interests, not positions. It does not attempt to get participants to interact with others with the goal of getting participants to change their interests to accommodate the co-existence of all. Moving away from the competitive marketplace of interests, mediators sometimes attempt to get'participants to change which of several alternative value frames held by participants that those participants use as their main lens for interpreting the conflict at hand. An example of this invoking alternative value frames is when mediators enter a situation where participants are each trying to capture the benefits from the allocation of some good, and tries to change the dynamics of the interaction by asking disputants what kind of world they want their children to live in. This approach has been labeled as an attempt to get people to act as citizens, rather than consumers (Sagoff 1988). However, this is still essentially a pluralist approach which takes interests as given. I does not seek to get participants to interact with each other and through interaction create a new, shared set of interests.

Instead, the essence of consensus decision making is finding "options for mutual gain" that encompass the interests of disputing parties, and looking for creative ways to take advantage of these overlapping interests (Fisher et. al. 1991). This approach to consensus building only works in cases in which the disputing parties have some room for negotiation. In the Great Lakes Basin, a recent study of consensus based Citizen's Advisory Committees found that in cases where environmental improvement is seen as directly opposed to economic viability, and where the process of negotiation itself is seen as a threat to a community's economic livelihood, the likelihood of reaching consensus is reduced (Landre and Knuth 1993).

Another limitation on consensus decision making is that in a group of participants, one is likely to be strongly risk averse. Actors who are risk averse may oppose choices which the see as possible resulting in significant or irrevocable harm. As Pendleton points out, based upon experience in Cooperative Watershed Management in California:

> Consensus is both a strength and a limitation of the process. Any agreement reached is stronger when it is supported by all participants. yet required consensus clearly tends to limit riskier sorts of management decisions . . . (Pendleton 1993:SO).

Finally, collaborative, consensus based decision making is no panacea. As McKinney argues:

> This type of planning process should be regarded as a supplementary tool that may or may not be more effective and efficient in particular circumstances. Traditional public involvement, conflict management, and planning processes remain important options. Water and natural resource issues are so varied that no one decision-making process is likely to be successful in all situations (McKinney 1988:345).

STRUCTURING INSTITUTIONS TO LEARN

A landscape management institution must be capable of responding both to the changing social priorities resulting from the decision making discussed above, and to the changing body of knowledge and understanding about the effects of human management of natural systems. Adaptive management, as described by Kai Lee (1993), "is an approach to natural resource policy that embodies a single imperative: policies are experiments; *learn from them"* (Lee, K. 1993:9). The simplicity of this statement belies a complex management system. Crucial elements include 1) a "mandate for action in the face of uncertainty" which includes sufficient social tolerance for change; 2) informational needs: centralized or coordinated collection, monitoring, and evaluation of information resulting from different management experiments over the long term; and 3) an incentive structure which works against institutional inertia and encourages the risk inherent in managing through experimentation.

Tolerance of change. Institutions are notoriously conservative, and any type of change, regardless of its eventual goal, faces obstacles in the form of inertia and a potential lack of tolerance for insecurity and dramatic change (Powell and DiMaggio 199 1). The institutional changes required in the shift to ecosystem management are likely to lead to changes in power, income, and prestige; increased conflict will inevitably result (Cortner 199 1). Agencies and individuals rarely take voluntary steps that will lead toward increased conflict, and few policy initiatives are sold to the public on their ability to foment dissent. Those whose power, wealth and prestige are likely to decline will resist such change. As Caldwell writes, " A basin-wide ecological approach . . . might require that governments act against the present interests of important constituents, action not likely to elicit enthusiasm from responsible public officials" (Caldwell 1988:9).

Because of the unsettling potential of the shift to ecosystem management, it is important to assess the tolerance of all affected parties for institutional change and the conflict it

requires, prior to engaging in such change (Caldwell 1988:25). Ciriacy-Wantrup cautions, "If the demand for institutional change originates outside the groups directly involved, the changes required . . . usually involve various degrees of persuasion" (Ciriacy-Wantrup 1969: 1320).

While individuals on 'both sides' of the debate-private industrial landowners and environmental advocates-may support the shift toward ecosystem management, their perceptions of precisely what it entails, and why a change is needed, are highly divergent. Change may be favorably perceived by all parties, but universal agreement on the direction in which this change should go is highly unlikely. And while most parties recognize or accept the need for a change, some parties stand to lose more in the shift than do others. To the extent that the situation is viewed as one of satisfying interests, and change benefits some stakeholders more than others, compensation or other coping strategies which allow 'losers' to buy into the changes may be required.

The rate at which change is carried out is also of great significance (Society of American Foresters 1989). Incremental institutional change is widely described as more likely (North 1990, Caldwell 1988), more socially palatable (R. Lee 1990) and more efficient than dramatic institutional change (Donahue 1988, Milbrath 1988). In addition, people are often more tolerant of change in which they have had some input. Placing a substantial amount of decision making authority in the hands of those most directly affected by the decisions can reduce the fear and unpredictability of externally imposed decisions.

Open flow of information. In order for tomorrow's managers to learn from today's successes and failures, it is necessary to keep track of management experiments undertaken; monitoring and evaluation play crucial roles in adaptive management. The different management regimes being practiced today across various ownerships can be viewed as simultaneous experiments, but if the information required for analysis. comparison, and evaluation is not collected, and if one manager does not learn from another's mistakes, the capacity for learning through doing is substantially restricted. For the Greater Yellowstone Ecosystem, Goldstein recommends the adoption of "consistent, ecosystem-wide indicators for a number of ecological and social variables and . . . common standards for research conducted across institutional boundaries" (Goldstein 1992:3 15). In addition, time and resources may be more efficiently used if data collected by one organization is made easily available to another, and duplication of effort is avoided.

Impediments to communication of information across ownership boundaries work against management on a multi-ownership scale. One impediment which requires further investigation is the concern, primarily expressed by private industrial forest managers. that any coordination of harvest scheduling between companies will put them at risk of prosecution under federal anti-trust regulations. In addition, the Washington Forest Protection Association argues that "proprietary and commercial information must remain confidential" (WFPA 1993 :2). While private landowners in both the Yakima Resource

Management Cooperative and the Nisqually Basin Management Plan were persuaded to share three year harvest plans with one another? indicating some flexibility in this regard, their concerns for confidentiality remain substantial (YRMC 1993, Ringgold, pers. comm.).

Because land managers work within different mandates and priorities, the information which they collect is not necessarily conducive to aggregation. Staff trying to produce an accurate synthesis of land management on six national forests surrounding Yellowstone National Park faced substantial difficulties, as much of the information was collected in incompatible formats (Budd 1988). The aggregation of data from landscapes with an even greater number of owners and data sets will pose an even greater challenge.

Critics of the informational requirements of adaptive management worry that a focus on those types of information that are more amenable to quantitative analysis may lead to biased conclusions. To the extent that quantifiable, scientifically derived knowledge is perceived as the only valid form of knowledge, those parties with the ability to produce and use this type of information will be at an advantage (McLain 1993). Additional difficulties posed by the informational needs of adaptive management include the large amounts of time and money needed to maintain such a database. While the advantages of learning may be great, the costs must be weighed against other social priorities; society's willingness to commit the necessary resources has not been conclusively demonstrated.

The risks of experimental management. In adaptive management, failed experiments provide an invaluable source of learning. In order to learn how to more effectively manage on a landscape scale, risks must be taken. There are several constraints to the amount and type of risk that a land manager on the Peninsula may take. Individual managers who fear the consequences of failed experiments more than they value the learning which such experiments can provide will be unlikely to engage in such experimental management. Well established organizations and bureaucracies face strong tendencies toward institutional inertia and conservatism, reinforced by internal incentive structures which do not favor risk taking. Jennifer Belcher, Washington State Commissioner of Natural Resources, recently outlined the guiding principles of the Department of Natural Resources: one of which was to be particularly careful about decisions with irreversible impacts (ONRC Coastal Resources Conference, Aberdeen, WA 1 l/16/93). Experimenting with the habitat of already sensitive wildlife species is considered by some to be too much of a risk, while others may view the probabilities of species survival under current management as so low as to encourage experimental management.

A crucial element of this assessment of risk is the question of who evaluates these risks, and who determines which are acceptable. McLain expresses an ethical concern: "Use of the adaptive management approach without also ensuring that institutional structures provide all stakeholders adequate representation in the decision-making process is . . . highly questionable from an ethical standpoint" (McLain 1993:43). In this regard, the

requirement for adaptable institutions which can learn through experimentation reinforces the need for institutional structures capable of collaborative social decision making.

WORKING AT LARGE TEMPORAL AND SPATIAL SCALES

Institutional constraints to managing over a large landscape include many of those discussed above: the inability of present institutional structures to reach collaborative decisions, restrictions on the open exchange of information, and avoidance of both change and conflict. Added to these is the most fundamental obstacle to managing on a wide spatial scale-the fragmentation which human use patterns have imposed upon the landscape. From checkerboard ownerships to overlapping and contradictory agency jurisdictions, these layers of human organization create divisions in administration and management, in places which, on the landscape, appear indivisible. Salwasser et. al. write of the cumbersome nature of dealing with interagency agreements (Salwasser et. al. 1987). The logistics involved in getting them approved and signed are often complicated and time intensive; coordinating the implementation is an even greater challenge. The widespread ambivalence toward interagency committees which Goldstein found in the Greater Yellowstone Ecosystem renders this coordination even more difficult (Goldstein 1992). Some of this ambivalence may stem from agency and landowner desires to protect their 'turf and authority; no one wants to feel that someone else is telling them what to do. Even environmental organizations partition the landscape, with the Washington Environmental Council focusing primarily upon forested lands managed by Washington State, while the Wilderness Society and other national conservation organizations pay almost exclusive attention to federally managed lands (Rowland, pers. comm.).

The issues involved in managing ecosystems over an extended period of time are plentiful and complex. They are of supreme importance to the institutional framework of ecosystem management. have been the topic of extensive discussion in the literature! and require considerably more analysis than can be provided within the scope of this assessment.

STRATEGIES FOR IMPLEMENTING LANDSCAPE MANAGEMENT

We do not believe there is a single structure for institutions for carrying out resource management on a landscape or ecosystem scale. As Ostrom advises:

> Instead of presuming that optimal institutional solutions can be designed easily and imposed at low cost by external authorities, I argue that "getting the institutions right" is a difficult. time-consuming, conflict evoking process. It is a process that requires reliable information about time and place variables as well as a broad repertoire of culturally acceptable roles. New institutional approaches do not work in the field as they do in abstract

> models unless the models are well specified and empirically valid and the participants in a field setting know how to make the new rules work (Ostrom 1990: 14).

This is not to say that institutional models should not be developed, or that lessons learned elsewhere, through both failure and success, can not be effectively and usefully applied to the task at hand.

Strong principles and theoretical commitments to ecosystem management will not be sufficient to overcome the institutional constraints discussed above and the many more which remain undiscussed. No matter what institutional approach is taken, it is widely acknowledged that substantial and continued funding and political support will be required in order to transform ecosystem management rhetoric into implementable action (Salwasser et. al. 1987, Goldstein 1992). Caldwell observes what governments do—perhaps sometimes appropriately—when there is some-support and some opposition to cross-jurisdictional management:

> Deliberate action being unacceptable, the closest approximation would be to declare in favor of a basin-wide ecological approach and to then do as little as possible. under the excuse (too often justified) of jurisdictional or budgetary restraints (Caldwell 1988: 10).

In addition, Cortner and Moote highlight the importance of legal authority: " . . . it must be asked how much coordinating arrangements can accomplish without the power and capability to develop and enforce rules and regulations . . ." (Cortner & Moote 1993:6). Reidel cites concerns that the Northern Forest Lands Council will be overwhelmed by the complexities of taking a regional approach to forest management, particularly given the Council's "vague authority [and] limited resources" (Reidel 1993:56). However, Collins points out the limited value of formal authority, and the tremendous significance of the informal authority that is derived from substantial public participation and support: "A policy making body will not flourish if it relies on written authority to make things happen . . . It must have the kind of processes that involve others at every level so that the policy becomes not the Council's policy, but the region's policy" (Charles Collins, Chairman of the Northwest Power Planning Council, quoted in Lee, K. 1993:49).

Most importantly, as Donahue describes, there will be no single solution:

> . . . there appears to exist an unalterable faith that a 'preferred approach,' albeit yet undiscovered or even understood, holds the promise of resolving the myriad issues present today. Discovering this approach, or *simply realizing that we must settle for something* less, is the challenge before US (Donahue 1988:121; emphasis added).

We return to our initial typology of landscape management strategies: Ad hoc and council. These strategies are presented to illustrate two of the many paths which a new landscape management institution could follow: the typically bottom-up and informal approach of an ad hoc organization. or the more formal structure of a council. These types are not intended to represent two ends of a dichotomy, but rather points along a continuum. Nothing about either structure precludes or ensures its ability to meet the above outlined principles of ecosystem management.

AD HOC STRATEGIES

Ad Hoc organizations tend to start out at a small scale, in response to a locally felt problem or concern. For example, the Applegate Partnership, in southern Oregon, was founded on the initiative of two local residents-an environmentalist and a partner in a logging company. The mission and structure of these voluntary organizations are initially specified by founding participants, but may remain flexible to the changing priorities of the group. An ad hoc group may exist purely in order for members to share information. or it may be formed as a decision-making body. Decision making in ad hoc organizations is often based upon consensus, although members can select any decision making process; within the Applegate, decision making is by consensus among Board members. Within an ad hoc group, attention is often focused upon areas of agreement, and potentially divisive issues may be tabled as areas in which members 'agree to disagree'. Ad hoc organizations rarely hold formal sources of power or authority. However, the credibility that derives from community based dialog, particularly that which represents cooperation among formerly feuding parties, is in some cases sufficient to earn either formal or informal support from official organizations or agencies. For example, regional leaders from the Bureau of Land Management, the USDA Forest Service and the Fish and Wildlife Service have all endorsed the Applegate Partnership's locally based attempts at collaborative problem solving (Fattig 1993).

Strengths of Ad Hoc structures. Informal arrangements tend to be more flexible than formalized structures, both to changes in social priorities and to adjustments in societal understanding of landscape processes. In addition, ad hoc organizations which are voluntarily developed out of the overlapping interests of affected parties are more likely to be appropriate to local conditions, relationships, and history than are externally imposed decision making structures. Present mechanisms for public participation in resource management decisions have been criticized as relying too heavily upon formal, and potentially exclusive, methods of public involvement (Shannon 1991). Ad hoc arrangements are less likely to involve such off-putting formalities, and may be able to provide opportunities for more creative problem-solving and dialog, and for more inclusive public involvement. Machlis summarizes the traditionally valued role of voluntary organizations in American society: "They provide a sense of participation in democratic processes, distribute power at the grass roots level, provide support for members, and serve as social mechanisms for continual social change" (Machlis 1990:272). He also highlights the "overriding local support for home rule, that is, the

American faith that local residents have special rights (often unrecognized by formal institutions) regarding local issues of property" (Machlis 1990:277). Locally based ad hoc organizations may derive strength from this support for "home rule" and also from "societal preferences for decentralized solutions" (Cortner and Moote 1993:6). Finally, lacking a formal structure and the bureaucratic baggage that such structure often entails, ad hoc organizations are generally logistically easier to establish than more formal entities (Salwasser et. al. 1987: 163).

Limitations of **Ad Hoc structures.** In the past, individuals and organizations have most often come together in ad hoc institutions in response to a specific issue or crisis; much like the species-by-species 'crisis management' that landscape management is trying to avoid (Agee and Johnson 1988:228, Hoffman, pers. comm.). However, recent steps have been made by relatively informal voluntary associations, such as the Applegate Partnership, to expand the mandate of such management alliances. While still established in response to a crisis, the Partnership aims to move beyond a crisis mentality response: "to make future land management in the Applegate Watershed ecologically creditable, aesthetically acceptable, and economically viable" (Applegate 1992:2). Agee and Johnson express concern that ad hoc approaches rely predominantly upon key players; Salwasser et. al. caution that they are "vulnerable to the frequent changes-that can occur in personnel, directives and budgets" (Agee and Johnson 1988, Salwasser et. al. 1987: 163). For an ad hoc organization to have the endurance and continuity required by landscape management, it must institutionalize its existence.

Voluntary, ad hoc organizations are less likely to rely upon, or have access to, formal sources of authority to ensure compliance. Ideally, decisions reached through consensus among all stakeholders will be perceived as commitments to action, and the informal relationships between members will be sufficient to ensure compliance. However, the Tribal Environmental Policy Committee of TFW has complained of the "ineffectiveness of past voluntary efforts at comprehensive resource management protection "(TEPC 1993:3). The Yakima Resource Management Cooperative has attempted to deal with this issue by contrasting 'cooperative' and 'voluntary':

> Cooperative means that after consensus is voluntarily reached, your word is your bond. Each participant is then committed to implement the agreement, plan or standard. If a member did not agree, there would not have been consensus. Voluntary alone has been taken to mean that you have the choice of doing something or not. Vast differences exist in the results on the ground. Consensus with cooperative implementation is slow and painful but effective; agreement to a voluntary process is quick, and unreliable at best (YRMC 1993: 1).

Finally, Halbert and Lee warn that "The very strengths of informality-the ability to negotiate privately and to change procedural rules during the process-invite abuse," and also that private organizations, lacking governmental policies of open information, may be less open to public inquiry (Halbert and Lee 1990: 157).

COUNCIL STRATEGIES

Often formed at the initiative of an elected official or a legislative body, councils are frequently provided with a fairly specific task. In addition, the process that they are to use in accomplishing that task may also be specified in advance. Some councils are established as short-term problem-solving entities, which issue a report, and disband, such as the Northern Forest Lands Council, established in 1991 (by the Governors of New Hampshire, New York, Maine, and Vermont), which issued its final recommendations in 1994 and disbanded. Others may be summoned on a periodic basis, to update recommendations and monitor outcomes. Councils can be created to deal with issues over a very large (the Great Lakes Basin), or a relatively small (the Dungeness River watershed) scale, depending upon the mandate. In addition, a council may focus upon specific issues, such as water quality, or it may address a wider variety of resource management issues in a more holistic manner. Often direct regulatory authority is not invested in a council. However, Kai Lee, discussing the Northwest Power Planning Council, points out that "influence can be more important than authority" (Lee, K. 1993:33). The three sources of power upon which the NWPPC relies are common to other councils: "the credibility of its members, the analyses of its staff, and its standing among the public" (Lee, K. 1993:33). The credibility of council recommendations-both to individuals and bodies with the power to formalize their recommendations (i.e. regulate) and to the affected publics- from any council depends to a large extent upon the individuals who create and participate in the council, and the extent to which council decisions are perceived by the public as being fair and representative. Decision making practices vary: consensus decision making is frequently employed, but council members may be forced to 'agree to disagree' on particularly contentious issues, and voting may also .be used.

Strengths of Council structures. Agee and Johnson argue that "a structured. formal approach is . . . most likely to encourage the definition of common goals from which individual units can make definitive plans" (Agee and Johnson 1988:228). Mandates from above may be more likely to encompass the broad spatial scales of management required by ecosystem management than grassroots initiatives. Salwasser et. al. suggest that "Formal organizational arrangements are probably most effective in dealing with the complexities of managing for viable populations " (Salwasser et. al. 1987: 162). From the outset, officially established bodies such as Councils have at least a measure of credibility, and may be provided with some funding and staff support, and possibly authority.

Limitations of Council Structures. Councils are often presented with vague and broad mandates. limited budgets. and-often most restricting—highly limited authority and resources to implement their decisions. In addition, Agee and Johnson also acknowledge the potential of formal approaches to exclude minor parties (Agee and Johnson 1988:228). Based on the belief that a representative 'core group' of stakeholders can reach

publicly acceptable collaborative decisions, council membership is most often selected by the initiating agency, with concerted effort made to include all directly affected parties. However, councils are most often structured to be problem solving entities; as such, there may be some attempt to exclude perceived 'problem' individuals or organizations, who are less likely to buy into the consensus building approach, or who advocate potentially unsettling alternatives. As Bachrach and Baratz (1970) show, the use of power is often to keep issues off decision making agendas, and to exclude certain groups or interests. In addition, as in the case of the Greater Yellowstone Coordinating Committee, the top down mandate and selection of members can be perceived by local residents as an external intrusion or imposition, and can be a strong source of local opposition.

MIXED STRATEGIES FOR LANDSCAPE MANAGEMENT

As we face the challenges of landscape management, we need to know how, as citizens to deliberate and develop policy. We also need to know how to make our institutions learn. It may be that somewhere in the fertile middle ground between the ad hoc and council strategies described here, where we construct institutions which "blend[s] the openness of formal processes with the trust embedded in personal relationships" (Shannon 199 1:29), to take advantage'of the strong points of each approach.

Future work could be fruit if it examines more closely the dynamics of participation of actors in decision making and the links between participation and institutional learning. The typology of ad hoc and council structures highlights the tension between institutional flexibility on the one hand and durability and power on the other hand. Further research could perhaps show us more effective ways to incorporate the flexibility we need to adapt to changing values over time and respond to unpredicted events, while maintaining the productivity of ecosystems over decades and centuries.

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APPENDIX: CASE STUDY NARRATIVES

CASES:

Tennessee Valley Authority
Northwest Power Planning Council
Great Lakes/International Joint Commission
Chesapeake Bay Program
Northern Forest Lands Council
Timber Fish Wildlife Agreement
Yakima Resource Management Cooperative
Nisqually Resource Management Council
Salmon Summit
Western Oregon Special Forest Products Council

TENNESSEE VALLEY AUTHORITY CASE STUDY

I. Identifying Characteristics

The Tennessee Valley Authority (TVA), operates 47 dams, manages 650 miles of waterways, and services 92,000 square miles in the Tennessee River Valley. Energy supply is the TVA's most visible operation, as the Authority has a power-generating capacity of 30 million kilowatts. The Authority manages $13 billion in assets.

The original purpose of the Tennessee Valley Authority was to create a regional planning authority which would operate with the flexibility and initiative of a private corporation, but would be accountable to the United States President and Congress. At the time of creation of the Authority, during the Great Depression, the area was one of the least economically developed regions in the nation. Proponents of the Authority believed it could accomplish economic development by undertaking broad social development activities enhancing the organization capacities of the region's residents and institutions.

Under the Tennessee Valley Authority Act of 1933, the primary purposes of the TVA were:

- To improve navigability of the Tennessee River
- To provide for flood control of the Tennessee River
- To provide for reforestation and the proper use of marginal lands in the Tennessee Valley
- To provide for the agricultural and industrial development of the Tennessee Valley

Other objectives specified under the 1933 Act included the generation of power, the production of fertilizer, and the re-forestation of marginal lands..

The Tennessee Valley Authority is considered the first attempt at watershed-based regional planning, which blended aspects of public and private managerial structure. The characteristics of loosely coordinated planning and the regional focus give it a unique place in the history of regional development.

II. Origins of Institution

In 1933, President Franklin D. Roosevelt called for the creation of a corporation which would "be charged with the broadest duty of planning for the proper use, conservation, and development of the natural resources of the Tennessee River drainage basin and its adjoining territory for the general social and economic welfare of the Nation." The resulting Tennessee Valley Authority Act, written by Senator George Norris, was the result of a 15 year-old search to find a use for the previously

abandoned facilities at Muscle Shoals on the Tennessee River. which consisted of two darns and two fertilizer production facilities. The Act established a Board of Directors with significant flexibility to design the Authority and its operations, and gave them the authority to begin work immediately.

III. Nature of Resources

The Tennessee Valley Authority was intended to harness the productive capabilities of the Tennessee River, formerly considered a major liability. The Tennessee River basin covers 4 1,000 square miles and receives the heaviest rainfall of the Eastern coast, most of it during the winter. As a result, the water flow of the river is uneven and traditionally caused heavy flooding and soil erosion during the winter and drought during the summer. Other resources provided by the river are not of direct concern to the TVA, unless they affect the Authority's ability to generate and distribute power.

As previously noted, the Authority commands substantial resources in the form of technical staff, revenues from hydiopower generation, and capital facilities including dams, power generating stations, and power transmission lines.

IV. Authority of Institution

The TVA was granted the authority to acquire and sell land, to produce and market fertilizer, and to provide and operate facilities for the generation, transmission and sale of electrical energy. However, beyond the specified operational activities, the TVA does not have any formal authority to provide for regional development. When the Authority was established, the objectives were generally perceived as separate operations which, when combined. would automatically provide for an overall program of regional development.

V. Internal Structure of Institution

The Board of Directors was given all responsibility and control over the organizational structure of the Authority by the TVA Act of 1933. An Office of Power was created in 194 1 which is responsible for power administration, and is comprised of five major divisions and five district offices. Power Boards, which are the local agencies in charge of distribution of power, are intended to be non-political entities which will ensure low rates and appropriate distribution. and they are typically established within municipalities, upon TVA recommendation.

VI. Capacities of the Institution

The TVA has the capacities of a corporate electrical utility, the only restriction being that it is responsible to the U.S. President and Congress. and receives annual appropriations from Congress. TVA's authority for managing the flow of rivers within the basin gives it a substantial capacity to affect power supplies, floods, navigation, and riparian habitat. Technical staff give the Authority substantial capacity to perform civil engineering and modeling analyses, and manage the design and construction of facilities. A "command-and-control" organizational structure gives the organization ability to implement centrally-developed orders. This structure appears to limit the Authority's ability to respond to non-market social concerns, including concerns over the hazards (and costs) of nuclear power facilities and increased public interest in maintaining riparian ecological functions.

VII. External Environment

When the Authority was established, the Tennessee Valley was the poorest region in the nation, and existing federal and state programs were not directed at regional development across the watershed. Following WWI and the Depression, Roosevelt's New Deal and the TVA promised increased employment, economic development, and technical improvements, as well as the development of the previously abandoned Muscle Shoals dam and fertilizer production facilities.

The Tennessee Valley Authority was introduced with an air of romantic idealism and the TVA continues to be held up as an example of a successful government institution. Its history has been marred, however, by controversies including the decision to construct nuclear facilities and the increase in rates during the late 1960's. Essentially considered a permanent government institution in the Valley, the Authority continues to shape its history according to technological advances and regional demands.

VIII. Internal/External Interactions

Currently, the two primary operations, which consist of power distribution and agricultural, remain very separate operations with differing levels of regional involvement. At the level of an electrical utility, the TVA holds control of the facilities and assumes responsibility for all operations. However, power distribution systems are purchased by municipal governments and responsibility for distribution is typically placed in the hands of local power boards. In the area of agricultural development, which includes the promotion of fertilizer use and soil conservation techniques, the Authority has delegated many of its responsibilities to state university experiment stations and agricultural extension services.

Although the TVA operates within a watershed which is multi-jurisdictional, the operations supported by the TVA are exclusively owned by the TVA, thus there is no question of coordination

and cooperation, except in its roles as a public service agency or private provider of services. Though it has a multi-faceted mandate, the TVA does not engage in significant multiple-resource or substantially coordinate resource management with other organizations, except as those activities pertain directly to the management of TVA power and navigation operations.

IX. Results

The Authority has been faced with criticisms which include doing too much, overcommitting to nuclear energy and failing to hold rates down, but generally, the Authority is considered a successful regional institution. It is commonly held that the Authority contributed to the economic development of the Tennessee Valley through the widespread distribution of power. In addition, the TVA created solutions to the massive navigational and flooding problems of the Tennessee River, resulting in the potential for industrial development in the Valley.

In terms of regional development, the operations of the TVA can be considered a series of isolated dams which provide power to the region, or they can be considered "a continuous network" which have created opportunities for development. As opposed to other multi-jurisdictional management projects which often cite cooperation and coordinated action as the measurement of success, the TVA is most well-known for the magnitude and scope of its operations. This difference in measurement of success could be directly related to the lifespan of the project or could be a function of its design and implementation.

The TVA might be viewed as an institution which succeeded in regional development at a single-resource level, but did not succeed at the multiple-resource level. However, the Authority is still an interesting example of an institution created for the purpose of development across a watershed. Perhaps it is an example of an institution which succeeded at a single-resource level but failed at the multiple-resource level.

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NORTHWEST POWER PLANNING COUNCIL CASE STUDY

I. Identifying Characteristics

The Northwest Power Planning Council primarily addresses hydropower and fish management in the portions of the Columbia River basin in the states of Washirigton, Oregon, Idaho and Montana. This area includes about 166 million acres.

Stated in the Northwest Electric Power Planning and Conservation Act of 1980, creating the Council, the mission of the Council is to "develop and adopt...a program to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River and its tributaries" (Public Law 96-501). Other major directives in the establishing legislation are that the Council should treat the river as a system and consult with various interested groups, including tribes.

II. Origins of the Institution

The Council was established by the Northwest Electric Power Planning and Conservation Act of 1980 (P.L. 95-50 1). Congressional action responded to increasing demands to restore rapidly decreasing salmon runs on the Columbia and its tributaries. Runs had declined from an estimated 16 million fish per year before white fishing and dams, to about 2.5 million per year at the time of the passage of the act (with total returns still decreasing in the early 1990s). The act was intended to mitigate the damages of half a century of federal and non-federal hydropower development in the Columbia basin. It was also intended to give fish a priority close,or equal. to the priority given to power generation. All major fish and power interests were to be involved in planning. The Council was to use data to move decision making from congress to a regional forum. The act placed federal authority and resources behind protecting fish and wildlife.

III. Nature of Resources

Hydropower: Annual variation in power generation capacity depends on timing and volume of precipitation. More than 30% of generated power goes to aluminum production and power demand varies with the robustness of the regional economy. Demand for power by electric utilities peaks in winter and the greatest need of fish for water flow is in spring). Storage capacity in the system of dams and reservoirs is relatively small. compared to total annual flow.

Fish: Fish stocks of concern are mostly anadromous but include populations of resident species. Mid 1800's salmon runs are estimated to have varied between IO and 16 million fish; runs at the time of creation of the NWPPC were about 2 million fish; present runs are about a million fish. Fish stocks of concern are sensitive to increases in water temperature, turbidity, siltation of spawning gravels, availability of resting and hiding cover, travel time to ocean, fishing pressure, and up and down-stream trave hazards. An estimated 15% of smolts are killed by passing through the turbines of a dam. Fish from the upper reaches of the basin may have to pass as many as eight dams to get to the ocean, which could result in cumulative mortality of over 70% of smolts, from passing through turbines alone. Logging and grazing also damage habitat. Benefits to one fish stock may be detriments to other populations. Hatchery fish may compete with wild fish, spread disease, and interbreed with wild fish to introduce non-locally-adapted genes into wild stocks. Fish also are sacred and central to the culture of some tribes, and protected by treaty.

Irrigation: The Columbia is a major source of water for agricultural irrigation. This water use gives rise to related issues of water quantity and chemical pollution from agricultural chemicals and leaching from the earth. Lands irrigated from the Columbia generate 75% of the region's agricultural revenues.

Navigation: Large volumes of barge traffic depend on moderate water levels. Drawdowns for fish reduce shipping on the river, or increase shipping costs.

Wildlife: Wildlife habitat has been inundated by hydro projects and other habitat is threatened by development. Part of the mission of the Council is to preserve habitat elsewhere to mitigate habitat loss from hydro development. This includes wetlands species and communities as well as riparian species and terrestrial species partly dependent upon riparian habitat destroyed by reservoirs.

Recreation: Council models show flow regimes which benefit fish to generally benefit recreation. Major recreation activities are boating and angling. However, because of the creation of reservoirs, much recreation is now flat-water recreation.

Flood control: Generally, scheduling water flows for fish (i.e. mimicking flows that existed before dams) generally increases flood damage to human structures.

IV. Authority of the Institution

Congress directed the council to put fish and wildlife on an equal basis with power generation, involve other parties, and develop plans for power generation and fish and wildlife enhancement. Funding for Council activities comes from BPA power revenues. Under the statute creating the Council, other federal agencies are to take the Council's plans "into account at each relevant stage of decision-making processes to the fullest extent possible." The Council must elicit cooperation from state and local authorities and tribes. The Council has influence over non-federal power producers by providing input into FERC relicensing actions. Federal funding allows the Council to

purchase land and services (particularly for fish and wildlife habitat protection and improvement). The Council's 1982 plan explicitly discussed the Council's congressional mandate and (while acknowledging the legal limits of its authority) asserted that it expected federal agencies to follow its plan. 1994 plans contain no such discussions and appear to assume that agencies, especially BPA, will follow council plans.

Additional data is needed to describe the authority the Council may exercise in relation to non-federal hydro project operators, state agencies, and tribes.

V. Internal Structure of the institution

Consists of 8 member council, 2 members appointed by each of the governors of Washington, Idaho, Oregon and Montana. Most council members are politicians. Major divisions of Council staff are the power planning and fish/wildlife. Council has authority over an amount of water to benefit fish--called the water budget--with flows scheduled by wildlife agencies. Other than analysis and plan writing, most work of the Council is carried out by other organizations in cooperation or under contract to the Council. Staff present annual work plans to the Council for approval.

VI. Capacities of the Institution

Recent costs for Council programs, including foregone 'power revenues, have been about $160 million per year. The Council has developed and operates sophisticated models of water flows, power demand, and economic effects of flow/power generation regimes. Council analysts have expertise in economics, power generation, and field biology. The Council also contracts for external research. Major foci of Council-sponsored research are water flow and hatchery effects on wild fish stocks. Additional work addresses issues of the effectiveness of various fish enhancement practices, private utility actions, and predicting future electricity demand. These technical activities give the Council significant scientific authority in many arenas. Council staff seem to have extensive communication and some influence with dam operators. Tribes (and perhaps environmental groups) appear to trust the Council more than they did ten years ago.

VII. External Environment

Electricity demand in the pacific northwest increased substantially during the middle of the twentieth century. Experts predicted continued increases in demand, but due to economic downturns and increased efficiency of energy utilization, increases in demand in the 1980s were far less than projected. However, demand is again increasing and the BPA is looking for significant new power "sources," including conservation. Increasingly, federal courts are upholding suits demanding that agencies take actions to benefit (or cause less damage to) fish and wildlife. The

direct service industries and agriculture are becoming relatively smaller sectors of the northwest economy. Public valuation of resource and species preservation appears to be growing stronger relative to agriculture and estractive resource uses. Fights over old-growth and protection of the spotted owl have lead to efforts to also protect fish stocks in regionally-directed management activities on federal lands. Adaptive management has become stylish in academic circles and gets lip-service in political and administrative circles, but there is little evidence that politicians and administrators are willing to pay the costs of adaptive management or risk discovering information which could make existing management practices look bad.

VIII. Internal/External Interactions

The Council has formal public comment procedures in its plan development processes. Acting in a policy community with highly organized and bureaucratically skilled interests, the Council receives substantial input through its formal processes. Repeated interactions over time and visible results of whether or not actors carry out their promises (and the efficacy of their actions) provide incentives for good-faith interactions. Because of the ongoing nature of interactions and the relatively small number of groups and individuals involved in the Council's activities (perhaps a few hundred) many actors establish professional relationships with individuals in other organizations. Enabling legislation requires the Council to explain why it does not adopt agency comments to its draft plans. Given congressional intent that the Council become **a** new forum for addressing conflicts between various resource users, enabling legislation emphasized the inclusive, coordinating role of the Council and the Council appears to expending significant effort at' involving state and local governments (including fish, wildlife, and land management agencies) and tribes. Not surprisingly, industrial power users also have an active association conducting public relations and representing industry interests to the Council. Council efforts to manage adaptively appear to also serve a conflict mediation function by giving credibility to the accuracy of Council data and developing agreements about what data is correct. More research is needed to describe the functions performed by Council technical committees and subcommittees. Uncertainty and the multiplicity of outside factors affecting fish populations make the Council's work more difficult.

IX. Results

By the criteria of increasing the number of returning fish, the Council has failed because the absolute number of returning fish is less than half the number it was at the time of the passage of the NW Power Act. However, there is some evidence that particular stocks which have been the focus of Council recovery efforts have increased. Also, Council efforts may have slowed the rate of fish population decline from what it would have been had the Council not been acting. The Council appears to have built a fair amount of credibility with interest groups, including groups which believe the Council is taking too much or too little action. The Council has gathered substantial amounts of data on power and wildlife needs in the pacific northwest. The Council appears to be making substantial efforts to learn about complex fish population dynamics through

adaptive management. However, there is resistance within the Council to spending the money needed to manage experimentally. Also, some fish advocates argue that fish are too threatened to experiment with, and actions which are presently believed to benefit fish should be immediately enacted without variation to allow testing of the efficacy of those practices. Direct service industries (DSIs) are conducting public relations campaigns to tell the public that they are contributing to fish management (albeit through Council and BPA actions paid for from power revenues; the industries purchase power). At the same time, DSIs object to actions which increase the cost of power more than an extremely small amount: They support the installation if fish diversion screens and reduction or elimination of fishing, but oppose spilling water for fish that increases power rates by $0.0005 per Kilowatt hour. More data is needed about the views of individual interests on the success or failure of the Council.

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GREAT LAKES BASIN MANAGEMENT NETWORK CASE STUDY

I. Identifying Characteristics

The Great Lakes and their connecting waterways represent one of the richest and most economically vital natural resource bases in the United States and Canada. This area is also one of the most populated regions in either country. The waters of the Basin are crucial for transportation, fisheries, drinking water, recreation and much more for eight Great Lakes states, 11 contiguous states, and the Canadian provinces of Ontario, Manitoba, and Saskatchewan. Authority for land and water management in the Great Lakes Basin is vested in an intricate web of agencies which are compartmentalized by geographical areas and types ofjurisdictions. However, since 1909 the U.S. and Canadian governments and agencies have also recognized a need for cohesive management across the Canadian/U.S. boundaries and more recently throughout the entire Great Lakes ecosystem. The current philosophy, an "ecosystems approach" to management of the Great Lakes Basin, stems from the 1972 Great Lakes Water Quality Agreement (GLWQA) between the governments of the United States and Canada. The expressed purpose of this agreement is stated in Article II of the 1978 updated version of the GLWQA:

> "The purpose of the Parties [U.S. and Canada] is to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem. In order to achieve this purpose, the Parties agree to make a maximum effort to develop programs, practices and technology necessary for a better understanding of the Great Lakes Basin Ecosystem and to eliminate or reduce to the maximum extent practicable the discharge of pollutants into the Great Lake System." (GLWQA 1978 in Caldwell, 1988: **355)**

Although the GLWQA is only one part of the Great Lakes management effort, it represents the greatest effort towards large-scale, integrative, and cooperative management in the Basin. It is this Agreement that sets the stage for most of the ecosystem management efforts that are currently occurring within the Great Lakes jurisdiction by the federal governments, states, provinces, regions, and local areas.

II. Origins of the Institution

In 1909, the governments of Canada (Britain) and the United States recognized the shared nature of the Great Lakes region and entered into the Boundary Waters Treaty to negotiate navigation and boundary water disputes due to increased navigation technologies (canals, dams). They established the International Joint Commission (IJC) to address these issues. Also at this time, a clear link was established between widespread outbreaks of cholera and typhoid and polluted water. Thus, the Boundary Waters Treaty contains an article addressing water pollution (Article IV).

This provision became much more important over the intervening years as pollution in the Great Lakes Basin escalated to alarming levels. By the 1960s and 1970s, there was great public concern for the Great Lakes water system. Visible evidence of severe pollution such as fish die-offs, river fires, beach closures, offensive water smells and tastes, and fish toxicity warnings were key factors in the expansion of the IJC's authority through the creation of the GLWQA in 1972.

The 1970s marked the scientific and policy understanding that the Great Lakes water resources could not be studied, analyzed, or managed for quality without looking at the entire ecosystem, including "the interacting components of air, land, water, and living organisms, including man" within that system (GLWQA 1978). It was this understanding that is central to current research and management efforts in the region.

III. Nature of Resources

Great Lakes water is what ties all of the transnational and regional agreements together. Whether they focus on transportation (IJC). water quality and pollution (GLWQA), fisheries (Great Lakes Fisheries Commission created in 1955 between U.S. and Canadian governments), or regional development (Great Lakes Commission established in 1955 by 8 Great Lakes states to focus on coordinated development, use, and conservation of water resources), each part of the network recognizes the interconnected nature of the Great Lakes Basin system. Degradation in a localized area inevitably affects a greater portion of the Basin ecosystem. Recognizing the interconnectedness of land and water, the IJC's Great Lakes Water Quality Board (derived from the GLWQA) studies not only water bodies, but also Basin wide land-uses as they relate to pollution control. The ecosystemic approach, a concept that has been reiterated and confirmed in each GLWQA renewal, means that the entire system must be examined as a whole, and every local, regional. state, provincial, or federal policy should take the whole system into account. As shown below, the approach has been generally agreed upon, but corresponding actions and responses have not been forthcoming.

IV. Authority of Institution

Virtually all of the institutions which are part of the Great Lakes network (IJC and offspring research/policy groups, Great Lakes Commission, Great Lakes Fisheries Commission, Council of Great Lakes Governors) were created through formal governmental agreements. The IJC is the oldest. most comprehensive portion of the network. Its authority, while derived from direct federal agreement between the U.S. and Canada, has undergone real change over the course of its existence.

When first created, the IJC could only make policy recommendations to the Parties (U.S. and Canadian governments) if both Parties jointly referred cases to it for study. The Commission did

not have the power to ensure compliance with its recommendations. The GLWQA expanded the IJC's authority and changed the Commission from a purely reactive to a proactive organization. The GLWQA authorized the IJC to collect, analyze, and disseminate information on water quality efforts throughout the Great Lakes. It also authorized the IJC to advise the federal governments on water quality research and problems, and it was to help coordinate pollution control efforts. The GLWQA also gave the IJC authority to initiate investigations, make recommendations, and provide advice on policy directions without waiting for direction from the two Parties.

While the IJC remains an advisory commission, the fact that it has mandated missions expressed in such agreements as the GLWQA gives it official federal support and a clear mission. However, the IJC only reports to the federal governments of both Parties, while actual regulatory or clean-up actions are still left to federal, regional, and local governments of these countries. Recognition of the IJC's lack of direct enforcement authority has been central in arousing citizen concerns in the entire basin. In fact, non-governmental organizations and citizen's advocacy groups have played a critical role in pressuring action by both Parties to uphold their commitments as stated in the GLWQA. NGOs and citizen's groups have also applied pressure to state and local governments to enact policies which work towards the GLWQA stated goals of water quality restoration and maintenance. Efforts during the 1980's to expand the authoritative role of the IJC to include enforcement were rejected by the Office of Canadian Affairs in the US. State Department (Manno 1992). Instead the IJC was directed to continue its role as advisor and monitor as specified in the 1978 GLWQA. Additionally, the Council of Great Lakes Governors was created in 1982 as a forum for discussion of U.S. regional issues concerning Great Lakes research and policy.

One of the important formal mandates of the IJC is its capacity to coordinate and analyze research efforts on water quality and ecosystems functioning throughout the Great Lakes ecosystem. After the GLWQA was signed, the IJC established two proactive boards: the Water Quality Board which advises the IJC on the legality of provisions of the GLWQA, and the Great Lakes Science Advisory Board which advises the IJC on research and scientific progress and new issues that arise in the Basin. The latter plays the critical role of providing expert technical and managerial experience to the IJC (and thus to both Parties). The boards have documented water pollution causes and recommended government responses. Through various community-involvement activities, they have also alerted the public to new problems and gathered ideas for new solutions.

V. Internal Structure of Institution

The Great Lakes Basin management network is large and complex. This section will focus on the IJC as representative of the most comprehensive sector of the network, and as the driver of the whole movement towards an "ecosystems approach" to management of the Great Lakes.

International Joint Commission [6-member panel, 3 from U.S., 3 from Canada, appointed by federal governments] - settles navigational and boundary disputes. including water pollution.

Great Lakes Water Quality Board - advisor to Commission, also has powers to initiate investigations through its monitoring mandate throughout the entire 5,000 square mile international Basin.

Remedial Action Plan Program (RAP) - Set up by the IJC's Water Quality Board in 1985. The IJC recommended clean-up plans for 42 areas in the Great Lakes Basin with the most severe pollution problems. The RAP program "was approaching an ad-hoc institutional status by 1987," but it did not have any formal legal mandate in the GLWQA. During the 1987 review of the Agreement, the issue of RAPs was central to many citizen and NGO concerns, and became incorporated into the GLWQA due to public concern and pressure (Manno 1992: 83-92).

Other Action Plans - These are predominantly toxic chemical management strategies for direct dumping into lakes, drinking water concerns, air-borne chemicals such as acid rain, persistent toxics which either kill fish or remain in fish flesh to be consumed by humans, and banning of certain toxics for agriculture and industry.

Great Lakes Science Advisory Board - provide technical expertise to the Water Quality Board and the IJC on ecosystems research and remediation methods.

IJC Study Groups - Established as a result of GLWQA

Upper Lakes Reference Group (ULRG) - set up public outreach workshops to explain Great Lakes policies and issues and to assess public opinion on clean-up projects, regulatory initiatives, or progress on improving water quality.

Pollution of Land-Use Activities Reference Groun (PLUARG) - 5-year pollution study which used public outreach and consultation panels to study land issues in the Great Lakes Basin as they relate to water pollution (forestry, agriculture, and industrial land uses).

VI. Capacities of Institution

The impetus behind each large-scale agreement and coalition in the Great Lakes Basin is the mobility localized political and management organizations to effectively control water pollution in the region. The IJC itself was set up in order to look out for the interests of the entire watershed as opposed to localized interests of individuals, regions, industries, or nations (Manno 1992). Since the 1970's, the primary focus in the IJC has been on water quality, but the IJC's authority to recommend action also encompasses navigation, land-use practices, water diversions, energy resources of the lakes (primarily hydropower), recreational uses and abuses, and fisheries (the IJC has coordinated jointly with the Great Lakes Fisheries Commission since 1980).

Due to the interconnectedness of the Great Lakes system, each separate community was aware that actions of its neighbors would inevitably affect its own portion of the system. They recognized this

with respect to polluted drinking water, low fish populations, inedible fish, massive flooding of riparian areas due to artificial water retention facilities and destroyed wetlands, and invasion of the lamprey eel into the entire Great Lakes Basin due to new canals and waterways. Basically, the basin-wide problem was critical and obvious, and the governments were forced to act. By creating a purely advisory commission, however, the Parties withheld most policy-making and impeimentation authority for their own politically drawn regions (nations states/provinces, municipalities). This has been changing in recent years, after compartmentalized policy-making was shown to be ineffective in reaching the goals mandated in the GLWQA. The Protocol additions added to the GLWQA in 1987 gave greater recognition to the importance of state and local governments, and incorporated the Remedial Action Plans (RAPs) into the official Agreement.

One major component to the whole Great Lakes clean up (remediation) effort is that of the non-federal governmental agencies and advocacy groups. The IJC does not have the authority to regulate, but local governments do, and non-governmental organizations have been crucial catalysts for clean up and local/state policy changes. Success has occurred in waste reduction, toxic waste controls, controls on excessive fishing, controls on mining and pesticide contamination effects, reductions in phosphorous levels in the lakes, and restrictions on introductions of exotic species. Laws regulating these practices vary from federal to state/provincial, to local, but all can be said to have resulted in the IJC's recommendations. When the IJC directed local areas to create RAPs, it was more than a recommendation, and these regions complained of an unfair burden in the basin-wide cleanup (Manno 1992). Nonetheless, it is precisely in these "Areas of Concern" where real learning is taking place about community participation in policy making:

> The key to successfully implementing an ecosystem approach in RAP development is establishing a basin committee, stake-holders' group, public advisory committee, or comparable organization broadly representative of social, economic, and environmental interests in the area of concem...Public participation in the development and implementation of RAPs has led to a sense of local ownership of RAPs...and can be viewed as a positive step towards empowering stakeholders to plan and ensure their own futures more effectively." (Hartig and Hartig 1990: 29)

Public participation in the identification of problems, creation of expressed clean-up goals, education/information programs, and public review of the progress of the RAP have all been critical to the success of implementing the RAPs (Hartig and Hartig 1990). Success is relative, however, and virtually everyone recognizes the persistence of certain problems such as effects of acid rain on humans and the entire ecosystem, persistent effects of toxins, chronically polluted sediments, continued destruction of wetland habitats, controls on erosion at construction areas, and inappropriate,shoreline development (Regier et al., 1988).

VII. External Environment

The high visibility of the water quality problems in the Great Lakes, most notably the burning of rivers, was the main reason govemements and the public took notice of the Great Lakes Basin in the 1970s. The increasing power and influence of the nation-wide environmental movement during those years also helped advertise the water quality and biological health crisis of the Great Lakes' waters.

The Clean Water Act was passed in 1977, five years after the first GLWQA in 1972. However, the Clean Water Act was a regulatory document. set up to make standards for industry in order to protect water resouces. The GLWQA, on the other hand, had no regulatory authority, but it had the power to direct research efforts and to continually recommend policy and regulatory strategies, as well as to enlist the support of community groups and local governments to help reach its goals. In other words, the Clean Water Act had the "muscle," but the GLWQA had the "brains."

VIII. Internal/External Interactions

NGOs have forced their way into the official bilateral policy making process in the Great Lakes Basin. During the 1980s, a wide assortment of U.S. and Canadian recreational and environmental advocacy groups joined together to form Great Lakes United (GLU). This effort was spear-headed by the Michigan United Conservation Clubs (MUCC) and was eventually supported by such diverse groups as the National Wildlife Federation, hunting and sporting clubs, native peoples, civic groups, educators, and scientists (Manno 1992). These groups all shared the belief that a coalition was needed to collectively advocate improvement of Great Lakes water quality. GLU created a de-centralized organization which serves as a clearinghouse for information and sharing of **ideas,** but where no one group or interest has central control or power. This sharing of ideas, especially across the border with Canadain NGOs, proved vitally important during the 1987 review of the GLWQA. GLU was concerned that the Agreement would be diluted by the Parties during the review. and therefore concentrated on lobbying the respective governments for GLU participation in the review process. Both countries agreed to this unusual setup, and GLU delegates were invited to join both sides of the "bargaining table" at the Agreement review. The understanding between GLU leaders on opposite sides of the table, and their knowledge of the other country's concerns and problems gave the GLU delegates vast credibility in the eyes of more official, but less informed delegates (Manno 1992). Though non-government input into formal agreement processes was not unprecedented in the U.S., it marked a major advance for citizen-based participation in policy making in the Great Lakes Basin. In the 1987 review, the locally-organized RAPs were incorporated into the more general goals of the Agreement, therefore recognizing the importance of local and citizen-based authority in helping meet the goals of the GLWQA.

While industrial and commercial interests are often well-represented in local and state discussions of water quality initiatives and ecosystem management (this is often presented under the label of "sustainable development"), these economic powerhouses have not played a major role in the bilateral agreements in the Great Lakes Basin. The GLWQA and related boards and committees do not have legal authority to make laws or to enforce compliance. Because of this, industrial and

commercial interests have not participated in the reviews and amendment processes of the GLWQA, but have focused instead on lobbying Congress or Provincial governments and on challenging laws in the courts. The Agreement deals with goals and definitions, not restrictive laws, and thus industry has not pushed for representation as the environmental advocacy groups have. However, many U.S. laws in recent years which restrict industry and require compliance refer to the GLWQA as their mandate. In this way, industries have missed out on representation in the formulation of broad policy which will likely have continuing financial repercussions (Manno 1992). In future policy discussions around the Great Lakes, industry may provide a stronger voice, and thus perhaps influence future shaping of binational agreements.

IX. Results

> "...it might be argued that Great Lakes management is not a perfect puzzle in which all the pieces fit. It is an unending process, with many players, by which the pieces of that puzzle are continuously reshaped and reworked. The goal - a complete picture acceptable to all - is an elusive one, but certainly worth striving for." (Donahue 1998: 136)

The main outcome of the network of Great Lakes coalitions has been the cooperative expression of stated goals in the GLWQAs. Taking an "ecosystems approach" has been universally agreed upon, but actions which put this in use have not happened. Scientists complain about too much focus on specific issues and not enough emphasis (i.e. funding) on basic, systemic research which would provide large-scale, ecosystemic applications. Analyses of the diversity of scientific research in the Great Lakes have indicated that in the U.S. federal review of the proposed 1993 research budget there was "no mention of environmental research other than the global climate change initiative." (Hafner 1992). In addition, the most active remediation efforts occur at a local level (RAPs) in very specifically prescribed areas. While people acknowledge that these areas are particularly damaged, the policies involved in their implementation can not be translated directly across the entire ecosystem. They are local initiatives, set in motion by the directive of the IJC.

One view of Great Lakes management approaches is expressed by Christie et al.:

> "The emergence of an ecosystemic approach to planning, research, and management in the Great Lakes has not been accidental. It is the most recent phase in a historical succession of management approaches from egocentric to piecemeal to environmental and now to an ecosystem approach...[it emerged] with the realization, in part from the discovery of toxic chemicals in human food chains, that people and environments can only be managed effectively in relation to ecosystems of which the are parts." (Christie et al. 1986:4)

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CHESAPEAKE BAY PROGRAM CASE STUDY

I. Identifying Characteristics

The Chesapeake Bay Program covers the Chesapeake Bay ecosystem, which consists of the Chesapeake Bay, its watershed and the airshed above it. The ecosystem, totalling 64,000 square miles, includes parts of New York, Pennsylvania, West Virginia, Maryland, Delaware, Virginia, and the District of Columbia. The total population in the watershed is about 13.6 million and is expected to increase dramatically. The Chesapeake Bay Program has targeted the entire watershed as a single, complex ecosystem in need of restoration.

The basic mission of the Chesapeake Bay Program is "to improve and protect water quality and living resources of the Chesapeake Bay estuarine system." The Program is a response to the decline of living resources as a result of excess nutrients and sediments, toxics, low dissolved oxygen and loss of 'habitat. As established by the 1987 Chesapeake Bay Agreement, the goals focus on the following:

-Living Resources
-Water Quality
-Population Growth and Development
-Public Information, Education and Participation
-Public Access
-Governance

The Chesapeake Bay Program is typically distinguished by its emphasis on the watershed as an ecosystem and by its emphasis on public participation, as well as by the sheer magnitude and scope of the program.

II. Origins

In 1975, in response to concerns of Senator Charles Mathias of Maryland and Russell Train, administrator of the Environmental Protection Agency (EPA), Congress authorized a five year $25 million scientific study of the Chesapeake Bay in order to estimate the nature and magnitude of threats to the Bay ecosystem. The Environmental Protection Agency established the Chesapeake Bay Program Office for the organization of the research activities. A research team of scientists produced a summary report in 1983 concluding that the Chesapeake Bay was in fact threatened by environmental degradation, particularly by overabundant nutrients from phosphorus and nitrogen, as well as toxics in the bottom sediments.

The 1983 Chesapeake Bay Agreement was signed by the EPA, Virginia, Maryland, Pennsylvania, and the District of Columbia. The Agreement established the primary elements of the cooperative structure, including the Chesapeake Bay Executive Council, its Implementation Committee, and the EPA's Chesapeake Bay Office.

In 1985, the Chesapeake Bay Restoration and Protection Plan identified five specific goals, 32 programs to meet those goals. and 430 individual projects to be administered by the jurisdictions. The Chesapeake Bay Agreement of 1987 updated the previous Agreement and Plan, adding 3 new goals and 7 new federal agencies as full partners.

III. Nature of Resources

The 1987 Agreement focused on the restoration and protection of living resources, their habitats, and their ecological relationships, establishing the health of the living resources as the best measure of success. Water quality, and to a certain extent air quality, was established as the best tool for restoring and protecting living resources. However, the Bay Program managers have not yet determined the precise relationship between water quality and living resources. The levels of submerged aquatic vegetation (SAV), blue crabs and striped bass (rockfish) are typically used as general indicators of Bay health.

The Chesapeake Bay Living Resources Task Force has established the Habitat Objectives Development Process for determining the habitat requirements for any area in the watershed. This process takes into consideration the Requirements Component (habitat requirements for individual living resource), the Geographical Component (distribution of habitat for each representative living resource), and the Temporal Component (timing of the critical life stage for each living resource), and creates a summary of the most critical habitat requirements from all the representative species with overlapping geographical distribution. From this summary, regional habitat objectives will be determined.

IV. Authority of Institution

The Chesapeake Bay Program does not have any regulatory authority over the Chesapeake Bay watershed, although its influence, formal and informal, is significant. The signatories to the 1987 Chesapeake Bay Agreement include the governors of Maryland, Pennsylvania and Virginia, the mayor of the District of Columbia, the Director of the EPA, and the Directors of seven other federal agencies. The program is authorized by federal statute, and the signatories have jurisdiction over more than 90% of the watershed. The structure of the Program conciously provides for participation by federal, state, and local representatives. The institutional choice was made in response to a study by Resources for the Future, Inc., which indicated that a multiple-institutional structure would be preferable to the creation of a new institution with regional authority.

Cited as a critical missing link has been the Chesapeake Bay Program's lack of influence over local land-use decisions.

The principle incentives used for cooperation are public pressure and money. The involvement of the EPA and other federal agencies has made it possible to use state and local dollars as an incentive for cooperation; as well as for the establishment of technical assistance programs. In addition, the Program's emphasis on public participation and education is intended, in part, to put pressure on elected officials to participate in the Chesapeake Bay Program.

V. Internal Structure of Institution

The Chesapeake Bay Commission, formed in 1980, consists of the governors of Maryland, Pennsylvania and Virginia, the mayor of D.C., and the director of the EPA. The Commission's role is to make policy recommendations to the bay states. The Bay Commission has taken a back seat to the Chesapeake Executive Council, which was established in 1985, and which is the current focus of the Bay Program's decisions and activities. The Executive Council's membership includes the governors of Maryland, Pennsylvania and Virginia, citizens and members of the legislatures of the three states, and the Director of the EPA, and its function is to endorse policy initiatives.

The Executive Council is advised and assisted primarily by four committees: the Principals' Staff Committee, the Implementation Committee, the Citizen's Advisory Committee, and the Local Government Advisory Committee.. The Principals' Staff Committee, which advises the Executive Council on policy issues, is comprised of directors of environmental protection and natural resources agencies. The Implementation Committee consists of managers of state and federal natural resource agencies, and it directs the work of several of the subcommittees. The Citizen's Advisory Committee and the Local Government Advisory Committee advise both the Executive Council and the Implementation Committee regarding issues of concern to the public and to local governments. The Implementation Committe is also advised by several operational and managerial committees including the Scientific and Technical Advisory Committee. The working subcommittees which implement programs and projects include Nonpoint Source, Toxics, Monitoring, Modeling, Living Resources, Public Access, Growth and Development, and Communications.

VI. Capacities of Institution

Due to the multi-institutional structure of the Chesapeake Bay Program, and the high level of involvement by federal and state government, the Program has the ability to influence policy by:

-undertaking scientific study
-recommending policy initiatives
-recommending institutional mechanisms/instruments

-recommending institutional framework
-recommending and activating programs and projects
-resolving conflicts
-promoting cooperation and coordination
-increasing public awareness and involvement
-identifying issues

VII. External Environment

Activities which are supported by the watershed and directly affect the health of the ecosystem include fishing, intercoastal transport, steelmaking, shipbuilding, leather tanning, agriculture, food processing, and municipal waste processing. The watershed supports the economies of several major cities and 13.6 million people. The Chesapeake Bay Program has the support of federal, state and local agencies, as well as citizens' groups and other basin-wide protection agencies. However, the Bay is facing increased population growth, and development continues to threaten the wetlands which are integral to the survival of the living resources in the ecosystem. The economy is growing, as is the demand for land and resources, and the stresses on the Bay continue to grow. A major concern involves the distance between the source of pollutants, and the Bay itself, as evidenced by nonpoint source pollutants from Pennsylvania agricultural contaminants.

VIII. Internal/External Interactions

The creators of the Chesapeake Bay Program intended it to be a comprehensive model of ecosystem management, made up of diverse players representing all levels of government, the private sector, the scientific community and the public. Constant communication, particularly betweeen the committees and the public. is emphasized, as is constant reassessment of goals and institutional framework.

IX. Results

The following goals were established by the 1987 Chesapeake Bay Agreement (as well as corresponding objectives, programs, and projects):

Living Resources
-Provide for the restoration and protection of living resources, their habitats, and ecological relationships

Water Quality
-Reduce or control point and nonpoint sources of pollution to attain a water quality condition necessary to support the living resources of the bay.

Popuiation Growth

-Plan for and manage the adverse environmental effects of human population growth and development in the Chesapeake Bay system.

Public Information, Education and Participation

-Promote greater understanding among citizens about the Chesapeake Bay system, the problems facing it, and policies and programs designed to help it.

-Provide increased opportunities to citizens to participate in decisions and programs affecting the bay.

Public Access

-Promote increased opportunities for public access to the Bay and its tributaries.

Governance

-Support and enhance a comprehensive cooperative, and coordinated approach toward management of the Chesapeake Bay system.

-Provide for continuity of management efforts and perpetuation and commitments necessary to ensure long-term results.

With regard to actual resource success, the Chesapeake Bay Program's most significant success is a 20% reduction in phosphorus. Nitrogen levels have been held steady, even in the face of increased growth and development. A 75% increase in the levels of submerged aquatic vegetation, as well as significant increase in striped bass, has indicated that water quality in the Bay has improved enough to allow for the return of these indicator species. Significantly, the Chesapeake Bay Program has also allowed for coordinated scientific monitoring, documentation, and analysis of Bay resources.

The Chesapeake Bay Program is often considered a model for a multi-jurisdictional ecosystem management institution, because of the level of support that it receives from a spectrum of institutions. The Program's emphasis on public participation and education is evidenced by the involvement of over 700 citizen groups. The leadership has demonstrated an ability to reassess goals and structure when confronted bv new information as well as an ability to incorporate the information into structure and programs.

Current challenges include the pressure of increased population growth on water, land and air quality. It is expected that the increased development will bring an increase in pollutants, loss of farmland, forestland and wetlands, as well as increased air pollution.

"Weaving ecosystem management into our national framework will require reevaluating current approaches to resource protection. To succeed, public management strategies must become as comprehensive, interactive, and responsive as the ecosystems we are trying to manage" (Swanson **1994)**

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NORTHERN FOREST LANDS CASE STUDY

I. Identifying Characteristics

The Northern Forest Lands (NFL) cover an area of 26 million acres, from the Great Lakes to the Atlantic Ocean, spanning four states and comprising "one of the largest tracts of continuously forested land in the nation" (NFL Study Report Summary 1990). Eighty-four percent of the region is held in private ownership. Approximately 1 million people live within the NFL, while 70 million people in the United States and Canada live within an eight-hour drive of the area. The region supports a significant timber products industry, offers "innumerable" recreation opportunities, and is subject to intense development pressure from tourism and second-home markets.

The Northern Forest Lands Council (NFLC or "Council") was created and funded by Congressional legislation in 1990. The Council's mission is "to reinforce the continued existence and traditional land uses of large forest areas in the Northern Forests of Maine, New Hampshire, New York and Vermont which have characterized these lands for decades." The Council was charged with "examin[ing] further the issues identified in the [NFL] study and develop[ing] specific recommendations to Congress, state governments, and state, local and federal officials" (Finding Common Ground, p. 5). The Council was formed as a temporary body and disbanded in September 1994 after issuing its final recommendations.

II. Origins of Institution

The NFLC was formed in response to increasing changes and pressures to change the landscape across the northern tiers of New York and New England. "Economic boom and extension of highway system results in rising land values and the development of many vacation homes in the Northern Forests during the 1980's" (Northern Forest Update 1991, p. 3). In particular, the sale of one million acres of NFL in the spring of 1988 from Diamond International Corporation to forest products companies and developers caused the formation of the Governor's Task Force on Northern Forest Lands (fall 1988) and the initiation by Congress of the Northern Forest Lands Study. The study was carried out by the USDA Forest Service in cooperation with the Governors' Task Force. The two groups were charged to "identify changes and threats to Northern Forests and develop possible strategies" for its protection (Northern Forest Update 1991, p. 3). This charge was later clarified in a letter from two Senators which observed that "the current land ownership and management patterns have served the people and forests of the region well. We are seeking reinforcement rather than replacement of the patterns of ownership and use that have characterized these lands." During 1989 - 90, the Forest Service and four states (Maine, New Hampshire, New

York and Vermont) collected data, conducted public hearings and interviews with landowners, and released a draft study for public review and comment, all under the supervision of the Governor's Task Force, which met monthly during this period. In April 1990, the final "Northern Forest Lands Study" and report of the task force were released, and the formation of the Northern Forest Lands Council was recommended. The Council was formed by Congress in 1990 and met regularly between 1991 and 1994.

III. Nature of Resources in Question

The NFL is a 26 million acre forested region which covers parts of Maine, New Hampshire, New York and Vermont. The forest lands are characterized by six forest types (northern hardwoods (beech-birch-maple), spruce-fir, red-white pine, aspen-birch, elm-ash-red maple, oak-hickory) and home to over 1 million people. The total annual economic contribution of forest-based activity (including timber products, tourism/recreation, other special forest products) is estimated at approximately $26 billion across the four states (Findings and Options 1993, p. 27). Of this, $15 billion may be attributed to stumpage, firewood, manufacturing and wood fuel; $7.3 billion for tourism, recreation and Christmas trees; and $3.3 billion for payroll to both recreation and manufacturing (Northeastern Forest Alliance 1994, p. 4). Recreation and manufacturing provide an estimated 227,000 jobs in the region (14 1,000 for recreation and 86,000 tied to "wood-based forest economy, including manufacturing") (Northeastern Forest Alliance 1994, p. 2). The region supports more than twenty-five pulp mills, fifty paper mills, sixty sawmills, six veneer mills, five panel mills, and ten cardboard mills. Outdoor recreational opportunities include backpacking, big game hunting, bird watching, camping, canoeing, cross-country skiing, downhill skiing, fishing, hiking, kayaking and more. Scenic landscapes and views are an important attraction for visitors and investors in the region and numerous species of fish and wildlife are abundant.

Approximately 14% of the region is comprised of agricultural land (2.2 million acres). Commercial forestry is the dominant land use on 60% of the land. (13 million + acres in > 5000 acre tracts), with 45 companies and families owning the majority of this land. This land is managed for timber and for a variety of other objectives. This leaves approximately 14% of the land, or 4.3 million acres, in public ownership, of which only 300,000 acres are in federal hands. (Northern Forest Lands Study of New England and New York, p. 4).

The Northern Forests Lands Study researched by the Forest Service identified the following eight criteria for "defining and identifying areas [in the NFL] with the greatest importance for the future:"

wildlife habitat
scenic areas
river corridors
recreation opportunities
productive forest land (high potential for wood production)
natural areas (unique, diverse)

lakeshore (undeveloped)
large (> 5,000 acres) contiguous blocks of forested land

(NFL Study 1990, pp. 30-3 1)

IV. Authority of Institution

The mission defined for the NFLC "is to be achieved by: enhancing the quality of life for local residents through the promotion of economic stability for the people and communities of the area and through the maintenance of large forested areas; encouraging the production of a sustainable yield of forest products; and protecting recreational, wildlife, scenic and wildland resources" ("Northern Forest Update" 199 1, p. 2). However, the Council is advisory only, and has no regulatory power. States retain all existing authorities, including responsibility for land use planning and regulation. The Council was authorized by Congress to develop recommendations, which will seek to conserve and enhance public and private values of the Northern Forest Lands area, for the Congress, governors, state legislatures and local governments (Findings and Options, p. 9). The Council was funded federally through the Forest Service to study the issue (Technical Report, Introduction, p. i). Upon publication of fmal recommendations in "Finding Common Ground," the Council disbanded, on schedule, in September 1994.

V. Internal Structure of Institution

Originally, the Council was formed with thirteen members: three members appointed by the governor of each participating state, plus one U. S. Forest Service representative. An additional representative from each state was subsequently added, for final Council membership of seventeen. The following four constituencies are represented for each state: forest landowners, environmental interests, state conservation agencies and local communities. The Council members volunteered for service and did not receive compensation. The Council was assisted by a three-member staff and a "Northern Forest Coordinator" in each state (three in Vermont). Council members ranged widely in their individual authority, and included elected town officials, industry members (International Paper), natural resource consultants and state agency representatives.

VI. Capacities of Institution

"In all the work of the NFLC landowners will be consulted and treated openly and fairly. . . . The NFLC will build upon the work of the NFL Study and the Report of the Gov. Task force on NFL... The Council will seek public input at all stages of its process" ("Northern Forest Update" 1991, p. 2). The Council's major task was to "combine the research and ideas of the most knowledgeable people available with the beliefs and expertise of all those interested in the future of the Northern Forest" (Findings and Options, p. 5). To do this, they established work groups and committees,

including wide volunteer membership from outside the Council itself, organized around the following topics: biological resources, conservation strategies, land conversion, local forest-based economy, property taxes, recreation/tourism and state/federal taxes. Each committee commissioned studies from individual contractors, held public forums and consulted with experts to come up with a set'of observations and recommendations ("Findings and Options") regarding its specific topic. All findings and options were compiled and issued for public comment; a draft document was then prepared and again disseminated to the public for comment; a final set of recommendations was published in September 1994.

VII. Internal/External Interactions

As noted above, the public was consulted frequently during the Council's information gathering and report writing. Hundreds of individuals attended numerous public meetings, mailed in written comments to various draft reports. and contacted Council members and staff in person. The Council viewed the process by which they accomplished their goals as equal in importance to their final recommendations.

> "We have shown that people of different perspectives can work together, gather information, consult experts, discuss emotional and important issues with a broad spectrum of the public, and then proceed in a rational way to accomplish common goals . . . We have made specific recommendations for how the people of the region can approach their own planning for the future of the Northern Forests in this same way, with the involvement of -- and respect for -- everyone interested in participating in the process" (Finding Common Ground, p. 20).

IX. Results

In the space of less than four years, the Council coordinated a process of research, report writing and ongoing public involvement which resulted in the publication of materials rich in detail about the social and ecological resources of the region and reflective of the opinions of both regional experts and local residents. Council documents published in 1994 both thoroughly outline the current state of the NFL and offer numerous recommendations for future action. These options appear to represent a wide range of possibilities, from "do nothing" to major changes in policy. The Council appears to have held true to its mission to solicit the input of individuals who live in, know about. and care about the NFL region. The creation of such comprehensive published materials, including detailed reports of public comments, suggests that the Council did indeed meet its goal to lay the groundwork for action by others (presumably federal, state, and local government) to "enhance the quality of life for local residents...encourage the production of a sustainable yield of forest products, and protect recreational, wildlife, scenic and wildland resources!' (Findings and Options, p.8).

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TIMBER, FISH, AND WILDLIFE AGREEMENT CASE STUDY

I. Identifying Characteristics

The Timber, Fish, and Wildlife Agreement (TFW) was established in February 1987 after six months of negotiation between state agencies, Native American tribes, environmental organizations, and the forest products industry in the State of Washington. TFW is an informal, unsigned agreement that sets forth the process by which forest practices on private and state forest lands are regulated and managed in Washington State.

State actors involved in the initial TFW negotiations included the Public Lands Commissioner, the Department of Natural Resources, the Department of Fisheries, the Department of Game (later renamed Department of Wildlife and recently merged with the Department of Fisheries to form the Department of Fisheries and Wildlife), and the Department of Ecology. Environmentalists were represented by the Washington Environmental Council and the Audubon Society. Native American concerns were represented by participants from seven tribes (Colville Tribe, Lummi Tribe, Point-No-Point Treaty Council, Quinault Tribe, Squaxin Island Tribe, Tulalip Tribe, and Yakima Tribe), the Northwest Indian Fisheries Commission, and the Northwest Indian Fisheries Commission. Four large private industrial forest landholders cooperated in the TFW negotiations (Weyerhauser, Georgia Pacific, Plum Creek Timber, and Simpson Timber). Both large and small forest landholders are represented through the Washington Forest Protection Association and the Washington Farm Forestry Association. Over time, two new cooperators - the U.S. Forest Service and county governments - have been allowed to take part in the TFW process. State agency involvement has been expanded to include the Department of Labor and Industry.

Cooperators in the TFW agreement identified five goals:

* To provide diversity in wildlife habitat (especially old growth, wetlands, and riparian zones) and to assure species diversity within these habitats so that the native wildlife of Washington can be maintained;

* To maintain long-term habitat productivity for wild and other fish, and to protect hatchery water supplies;

* To maintain adequate quantities and qualities of water needed by people, fish and wildlife;

* To promote the growth and development of the forest products industry; and

* To develop an inventory process for identifying and cataloguing cultural and archeolocical sites in forested areas, to evaluate and protect those sites, and to ensure tribal access to traditional cultural spaces.

II. Origins of Institution

The TFW Agreement was developed as a means to deal with the virulent controversy that had arisen in Washington State between timber, fish and wildlife interests during the 1970s and early 1980s over what types of forest practices were acceptable on non-federal lands. The controversy stemmed from attempts by the Washington Department of Natural Resources (DNR) to enforce uniform restrictions on forest practices throughout the state, from efforts by environmentalists to lobby for regulations on private lands that would promote wildlife habitat conservation, and (most importantly) from federal court decisions that effectively expanded the control of Native American tribes over forest management activities affecting critical salmon spawning grounds and habitat. Faced with prospects for expensive and time-consuming litigation likely to yield limited gains, representatives of the timber industry, the environmental community, Native American tribes, and State regulators agreed to attempt to resolve their differences in a collaborative, rather than confronational, manner. TFW participants were particularly interested in ensuring that proposed revisions to the 1974 Forest Practices Act provided adequate protection for riparian zones and addressed cumulative effects issues without completely undermining the ability of landowners to profitably harvest timber.

The negotiation process was mediated by the Northwest Renewable Resources Council, a Seattle-based nonprofit coalition of industry, tribal, and environmental interests interested in resolving conflicts over natural resource management. During the first meeting, a set of ground rules that continues to govern the TFW process was established. Chief among these ground rules were 1) the use of consensus-based decision-making, 2) recognition of the legitimacy of other participants' purposes and goals, and 3) emphasis on incentives and voluntary cooperation as a means for maintaining and enhancing joint production goals. The cooperating parties were able to find common ground on several key issues including: 1) the desire to maintain land in forest cover, 2) the wish to minimize road building, and 3) the desire to shift funds and staff from intensive court battles to on-the-ground resource improvement and/or management programs.

The resulting agreement contains three principal components: 1) suggested changes to the 1974 Forest Practices Act, 2) cooperative efforts behveen TFW cooperators to improve forest management and enhance resource protection (including pre-harvest planning and the development of cooperative resource management plans), and 3) adaptive management in which cooperators commit themselves to the idea of making a conscious effort to change management interventions and regulations in response to new research findings on the impacts of various harvesting practices on resources such as fish and wildlife. Under the original agreement, the TFW Agreement was to be reviewed annually and in its 3rd, 5th, and 8th year to determine whether the basis of the agreement required re-negotiation. Certain problematic issues, including rates of harvest, old-growth

harvesting, and forest conversion were deliberately omitted from TFW negotiations so that cooperation could be obtained. These issues were subsequently addressed in the Sustainable Forestry Roundtable (which was convened from November 1989- 1990) sponsored by the DNR and the Public Lands Commissioner, but consensus on how to approach them could not be reached.

III. Nature of Resources

The TFW Agreement is concerned with the joint production of three resources (timber, fish and wildlife) and the protection of two additional resources (clean water and archeological sites). Of these resources, only archeological sites are not renewable. Fish, wildlife, and clean water are potentially renewable over a fairly short-term period (ie 5 to 10 years); timber, particularly old-growth, has a much longer period of renewability (from several decades to several centuries). All of these resources have become increasingly scarce over the last century, in part because of industrial logging on public and private lands throughout Washington State.

Historically, both fishing and timber production and processing were critical sources of employment for residents of rural and urban communities across the state. Although other sectors such as high tech industry and service now surpass fishing and forestry in terms of the State's overall business earnings, the fishing and forest products sectors continue to contribute substantially to local economic well-being. However, the long-term sustainability of current fishing and logging operations is questionable. Over the last fifty years, fish runs have decreased dramatically throughout the state, and a number of species are threatened with extinction. The decline in fish populations is due at least in part to increased sedimentation and the resulting destruction of fish spawning grounds and other critical habitats. Much of the increased sedimentation is attributable to increased erosion in areas where logging roads have been built and steep slopes have been clearcut.

Wildlife habitat has also been affected (in both negative and positive ways, depending on the species in question) by timber harvesting activities. Past logging practices have contributed to forest fragmentation, hampering the ability of certain species to circulate freely among the total range of habitats needed for them to survive. Ecological studies in the Pacific Northwest have identified loss of critical habitats as a major factor in the decline of a number of species, including the northern spotted owl and grizzly bears. The replacement of forests characterized by the presence of multiple species and a variety of vegetative structures with managed forests composed of one or two species of uniform age, with fewer snags and limited coarse woody debris, has reduced the availability of habitat for certain species even in areas where forest cover has been allowed to regenerate.

Road building also has a negative impact on archeological resources. Certain kinds of archeological and historic sites tend to be concentrated on ridges and hilltops, which are also desirable for road construction. In addition, large clearing operations negatively affect the spiritual qualities of important Native American cultural sites.

IV. Authority of Institution

The TFW Agreement did not lead to the establishment of a formalized structure for decision-making and implementation, and no permanent funds or staff exist to carry out the process. Funding and staffing levels are dependent on the degree to which TFW cooperators are able or willing to commit resources, or to lobby third parties, such as the state legislature or Congress, for appropriations.

Although the TFW process has provided critical input leading to the development of new state forest practices regulations, the TFW process itself has no legally binding authority and relies upon the good faith and voluntary support of cooperating parties to function. Decisions anived at through the TFW process derive their authority from the willingness of TFW cooperators to adhere to the guidelines set ddwn in the plans and policies drawn up as a result of cooperative discussion and action among the participants. However, a number of TFW participants are highly-placed individuals who carry considerable authority with the Forest Practices Board. As a result cooperators have been able to influence the development of state-sanctioned rules and regulations that support TFW goals. This quasi-formal aspect of TFW's authority has been enhanced through State appropriations that have allowed DNR and DOE to strengthen their forest practices compliance programs.

V. Internal Structure of Institution

Several ad-hoc decision-making and implementation structures were created to carry out TFW-related activities. Structures that are or have been involved in TFW related state-wide policy development and implementation include the Policy Group (PG), the Administration Committee (AC), the Cooperative Monitoring, Evaluation, and Research Committee (CMER), the Training, Information, and Education Committee (TIE), and the Field Implementation Committee (FIC). Each of these is divided into several sub-committees charged with tackling specific issues.

At the sub-state level, the TFW process relies on ad-hoc field interdisciplinary teams (known as field ID teams) to establish site-specific conditions for timber harvesting on private and state lands. In addition, two cooperative watershed resource management plans (RMPs) - the Yakima RMP and the Nisqually RMP - have been developed and partially implemented as a result of the TFW process.

Membership on the various committees and ID teams is open to all of the constituents cooperating in the TFW agreement (i.e. State agencies, tribes, environmentalists, forest landowners, local governments, and the U.S. Forest Service). Public involvement is indirect: the various interest groups who participate in TFW committees and field teams are responsible' for communicating concerns from their constituencies and for disseminating information about TFW activities to their members. One analyst of the TFW process has compared its operations to that of an exclusive club: for those in the club, access to decision-making authority is relatively egalitarian; those who are

excluded or choose to exclude themselves from membership, however, have limited opportunities to contribute to decisions that potentially affect their lives.

VI. Capacities of Institution

Although TFW has no permanent or dedicated source of funding, the overall funding and in-kind support for TFW activities has been quite substantial over its lifetime. During its first years of operation, all of the cooperators were able to generate funds, either through membership contributions, outside grants, or State and Federal appropriations, to hire staff to participate in TFW meetings, CMER projects and field ID teams. In the first biennium of TFW (1987-88), DNR received appropriations from the State legislature totailing $4.5 million; a figure that increased to $7.7 million in TFW's second biennium (1989- 1990). Cooperating Indian tribes were able to come up with $6 million dollars over the same four-year period; the environmentalist groups contributed $700,000 for the years 1987-89; and, for 1988 alone, the various landowners contributed close to $14 million in terms of foregone profits and increased administrative costs required to comply with TFW recommendations for road building, riparian management, and upland management areas.

The tribes have been most successful at obtaining permanent funding for TFW activities: cooperating tribes have a permanent line item devoted to TFW from the funds they obtain from the Bureau of Indian Affairs. As the novelty of TFW has worn off, TFW funding for the State agencies has been folded into overall agency budgets and TFW activities have had to compete for increasingly scarce State funds. Both environmentalists and landowner cooperators have found it increasingly difficult to generate support for TFW activities from their members as its shortcomings have become apparent.

It is difficult to obtain accurate figures for current TFW funding levels as few of the TFW cooperators have specific budget line items for TFW activities. Informants noted that the state has $ 1.2 million dollars allocated to CMER for the current biennium, with matching contributions from federal sources. WFPA contributes approximately $200,000 per year; and various landowners contribute amounts ranging from $1 0,000-$15,000 each. In addition, all of the cooperators continue to contribute substantially in terms of person-hours and non-monetary resources. Shortly after the Agreement was initiated, the four principal State agencies involved in TFW increased their staff at the field and policy level, and created TFW coordinator positions to oversee their ageny's activities in TFW-related activities. The environmentalist cooperators were able to generate funding to hire regional coordinators to oversee volunteer participation in the field ID teams during the late 1990s and early 1990s. However, the environmentalist groups have not been able to sustain full- fledged voluntary participation in the wake of TFW's failure to address wildlife habitat issues and funding for permanent TFW staff has been shifted to more promising avenues (media campaigns and litigation). The tribes have been able to fund continued staff involvement through the use of federal appropriations; landowners fund involvement through in-kind and monetary contributions from companies and trade associations.

The TFW process makes use of a variety of motivational tools to encourage the use of desired forest management practices on private and state lands. These tools fall into 4 categories: regulatory, voluntary compliance, cooperative processes, and public outreach.

Regulatory tools: The TFW process has focused in part on getting forest practices regulations adopted that require landowners to harvest trees in ways that minimize soil erosion and maintain critical types of fish and wildlife habitats. Riparian management zones, limits on clearcut sizes, and more stringent road construction specifications are some of the regulations that have been incorporated into Forest Practices Rules and Regulations as a result of TFW discussions

Voluntary compliance: In addition to helping establish legally binding restrictions on harvesting, TFW also relies on encouraging individuals and corporations to abide by non-binding harvesting conditions recommended by the field ID teams. For example, landowners in environmentally sensitive areas are asked to leave a certain amount of upland habitat uncleared as a means of preserving critical wildlife habitat.

Cooperative processes: TFW cooperators engage in a number of cooperative activities designed to improve resource management at the landscape and watershed level. For example, cooperators participate in pre-harvest reviews in which information about the location and size of upcoming harvesting operations is exchanged among landowners. Collaborative resource management plans have been developed for the Nisqually and Yakima Watersheds as part of the TFW process. On the research side, TFW cooperators collaborate in designing and implementing research on the impacts of forest practices. This information is then used to modify forest practices regulations and voluntary compliance recommendations.

Education: In the early years of its operation, TFW's Training, Information, and Education Committee took on the task of training cooperating landowners and management staff to use new harvesting and road building techniques. In addition, workshops were held to train field ID team members how to determine the types of conditions to place on forest practices applications. Tribal members were also trained how to monitor and evaluate stream quality.

VII. External Environment

In Washington State, timber harvesting on state and private land is regulated through the Forest Practices Act, first passed in 1974 and revised several times during the past seven years. The Act provides for a Forest Practices Board responsible for promulgating forest practices that protect public resources. Regulation is accomplished through the use of Forest Practice Applications (FPAs). FPAs set forth the classification status of the harvesting application (ie whether or not it is located on environmentally sensitive land) and imposes conditions governing allowable harvest practices. The DNR is charged with administering and enforcing FPA requirements.

A large percentage of Washington's forest land falls under the jurisdiction of the Forest Practices Act: In 1989 49% of Washington State's forested area was located on private land and 12% on state land. The remaining forest land is distributed among the tribes (9%), the Forest Service (29%) and other public lands (2%). Timber lands managed by DNR account for about 2/3 of state's total trust lands and a majority of the State's trust income is derived from these lands. During the 1970s and 1980s, the DNR harvested timber at a faster rate than it was replaced. Consequently state revenues from timber have dropped drastically, creating increased competition for other state funds.

The increasing scarcity of state funds has been accompanied by a drop in federal forest revenues derived from National Forests in Washington. The TFW Agreement emerged during the early stages of the controversy over old-growth forests in the Pacific Northwest. Since its negotiation, environmentalists have successfully challenged old growth sales on federal lands throughout the region. A 1989 court injunction has effectively prohibited the cutting of old growth on Forest Service lands until the Forest Service produces a plan that conforms to the requirements of the Endangered Species Act. In 1993, the Clinton Administration issued a new plan for managing federal forests in the spotted owl region but the plan has been challenged as too restrictive by timber interests and as too weak by environmentalists. Spotted owl habitat conservation areas have been identified throughout the region, and restrictions on harvesting apply to both private and public lands within those circles. Landowner fears that broader application of the Endangered Species Act may restrict even further their ability to cut timber in the future, coupled with rapid price increases in lumber over the last two years, have contributed to a rise in harvesting activity on private land. Increased urbanization, with the subsequent demand for housing development and road construction, has contributed substantially to the increases in forest clearing activities.

VIII. Internal and External Interactions

Responsibilities for carrying out TFW activities are divided as follows:

1) Policy Group: Develops strategic plans, establishes TFW priorities, and sets funding levels; interprets and modifies TFW agreement; links TFW process to the legislature, the Forest Practices Board, interest groups, and the public. Members tend to be high-level decision-makers within their respective organizations. Critics claim that the Policy Group had become increasingly ineffective during the last few years, but note that it has recently been revitalized to address the issues of forest conversion, wildlife habitat, and cultural resources.

2) Administrative Committee: Provides day-to-day management for TFW activities; recommends policy and agreement changes to the Policy Group. Members tend to be TFW coordinators for the cooperating agencies and organizations. Has suffered from lack of direction during the last few years according to critics.

3) Cooperative Monitoring, Evaluation and Research Committee: Administers the design and implementation of the TFW research and monitoring program; reviews related research, addresses

questions from the Agreement, provides technical services requested by the Administrative committee. CMER's research programs are both conducted in-house and through contracts with university or private research institutions. Sub-committees include Wildlife, Fisheries, Ambient Monitoring, Temperature, Water Quality, Sediment, Hydrology and Mass Wasting, and Information Management.

4) Training Information, and Education Committee: Provided training for TFW cooperators and disseminates information to the public about TFW activities during the first years following the negotiation of the Agreement. No longer functional.

5) Field Implementation Committee: Oversees field operatons and establishes field inderdisciplinary team (ID team) guidelines.

6) Field ID Teams: Conduct pre-harvest site inspection visits and develop recommendations for conditions to be placed on forest practices applications.

The PG, AC, CMER and FIC hold regularly scheduled meetings to discuss on-going activities and future directions. The field ID teams meet on an ad-hoc basis when the DNR forester determines that a Forest Practices Application merits special attention. An annual review is held to assess the current years activities and to modify TFW operations as a function of new research findings or difficulties encountered in implementation of specific regulations and recommendations.

Of the structures that make up the TFW process, CMER and the field ID teams have been the most consistently active and effective structures. TIE no longer functions and the Administrative committee and the Policy Group have functioned only sporadically during the last few years. In January 1994, the Public Lands Commissioner threatened to disband TFW unless it reached resolution on forest conversion, wildlife habitat, and cultural resources protection issues. In response: the Policy Group has renewed its attempts to develop a consensus among the various parties on these issues.

Membership in TFW was deliberately limited to the four principal State natural resource agencies, forest landowners, Native American tribes and environmentalists during its formative years. Other stakeholders, including local governments, the U.S. Forest Service, the U.S. Environmental Protection Agency, hunting and sports fishing interest groups, were excluded from the initial negotiations and subsequent policy discussions on the grounds that too many cooperators would weaken the coalition and make it impossible to achieve consensus. The weakness of this approach, became evident in 1989, when conflict emerged over a forest harvesting application for a site near Lake Roesiger in Snohomish County. The county filed suit against the State for incorrectly assigning a Class III rather than a Class IV rating to the forest practices application. The unspoken issue at stake, however, was whether the relatively exclusive TFW process could make decisions that reflected the public interest. To avoid similar conflicts in the future, the regular membership of TFW committees was expanded to include local governments and relevant federal agencies.

TFW's requirement for consensus has made it difficult for cooperating parties to address issues that are not obvious win-win situations. The force of Indian treaty rights coupled with the clearly identifiable economic losses associated with the destruction of fish habitat by logging operations gave the tribes and fish biologists a strong bargaining position with timber interests. The struggle to define mutually acceptable rules for wildlife and cultural resource protection has not been so easily resolved as both habitat and archeological site protection require tangible, and often large, sacrifices on the part of individual landowners, and wildlife and cultural resource proponents lack equivalents to the Boldt decisions that would give them sufficient leverage to negotiate major management trade-offs.

Disheartened by the slow progress of TFW on wildlife issues, environmental cooperators brought suit against the Forest Practices Board in 1991 to force the Board to resolve evaluation thresholds issues for forest practices, In 1992, a coalition of timber and tribal interests deliberately removed themselves from TFW discussions on cumulative effects and negotiated separately with the FPB to develop rules requiring watershed assessments in certain watersheds. According to one agency staff member, some of the State agencies now prefer to interact directly with the FPB rather than working through the TFW policy group.

Ix. Results

In the view of most participants, TFW has been a success because it created a forum, however temporary, in which competing interests could discuss their differences and work out mutually acceptable solutions. It was most successful in this respect during its first year of operation when cooperators focused on developing specific regulatory changes (i.e. mutually acceptable regulations governing riparian management and road-building) to the 1974 Forest Practices Act. Recommendations for changes in the Forest Practices Act were approved by the 1987 Washington State Legislature and the Forest Practices Board subsequently developed the administrative regulations needed to implement the revised FPA.

For some participants, TFW was also successful in that it increased the efficiency and accountability of DNR by separating its regulatory functions from its management functions. While acknowleding this shift as an improvement, representatives from the cooperating environmental groups believe that the division has not gone far enough. Industry representatives consider TFW successful because it has led to greater flexibility in forest practices regulation by permitting the DNR forester to place site-specific harvesting conditions on forest permit applications, rather than using a blanket approach. From the industry perspective, the existence of the TFW process and its ethic of voluntary compliance has been an important factor in keeping demands for much stricter regulation on private land under control.

For the non-State cooperators, TFW was also successful in that the cooperative process, particularly the use of field ID teams composed of representatives from all cooperating interests, greatly increased the opportunity for stakeholders other than the State agencies to influence the nature of

timber harvesting operations on environmentally sensitive State and private lands. This aspect is particularly important for the environmental and tribal stakeholders who otherwise would have had a much harder time getting access to information about how landowners are proposing to manage it. Most of the people interviewed for this study indicated that CMER-related activities and the field ID teams have been the most successful elements of the TFW process. Both activities have created forums where the various cooperators are able to work jointly on specific problems on a repeated, and long-term basis.

From the standpoint of improving resource conditions and attaining its explicit goals, TFW has received mixed reviews. Most of the participants interviewed felt that fish habitat and water quality and quantity issues are being dealt with fairly well by TFW-related regulations and voluntary measures, However, environmentalists, State wildlife biologists, and tribal representatives note that the process has not been at all successful in addressing wildlife habitat and cultural resource protection. These same actors note that TFW has also not been able to address any of the issues that were orginally left aside as "agreement breakers". Key weaknesses of TFW include: 1) inability of cooperators to establish measurable criteria for evaluating whether resource conditions have improved; 2) expense and difficulty of maintaining a long-term state-wide monitoring system; 3) extreme differences in the distribution of financial resources and expertise among TFW cooperators; 4) lack of a clear long-term commitment to the TFW process from State policy makers, and 5) exclusion of certain stakeholders.

> "Forest regulations now are better than before the agreement, but they are not what we want them to be. There is an impatience about the pace of application of scientific knowledge to field regulations. There is a need for general resource information to be given to a broader audience. In addition, there is little data about cultural issues, and information is needed to make watershed decisions" (Pissot, National Audubon Sociey 1990: 3).

> "We did the regulatory stuff and CMER is going well. But the relationship stuff still needs work. The relationships have gotten better, but they still need to be improved... We're back to arguing positions again and the effectiveness of TFW is less than I would have hoped it to be. We don't have the upper level support for focusing on relationship building" (Bob Gustavson, WFPA).

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YAKIMA RESOURCE MANAGEMENT COOPERATIVE CASE STUDY

I. Identifying Characteristics

Yakima Resource Management Cooperative. The Cooperative addresses natural and cultural resource issues in the Upper Yakima Basin, an area of about 760,000 acres on the east side of the crest of the Cascade Mountains of Washington State. The Cooperative is not a legal entity and has no formal authority or capacity to administer funds. Membership is very similar to the make-up of timber/fish/wildlife (T/F/W) negotiating organizations. The Cooperative's brochure states the following mission for the Cooperative: "The group works through a consensus effort to develop strategies that the landowner may voluntarily adopt. The strategies may be changed through adaptive management." Curiously, the mission does not even mention natural resources. The Cooperative explicitly does not address the inflammatory rate of harvest issue.

II. Origins of Institution

Various interests have fought for decades about logging in Washington state. Fights over logging and fish were linked by a federal court in 1976, when the court affirmed tribal treaty rights to fish in their usual and accustomed areas and prohibiting state and federal agencies from impairing the health of salmon fisheries. With this legal recognition, tribal litigation over logging continued. In an attempt to avoid costly, slow and uncertain litigation, state agencies, the timber industry, tribes, and environmentalists developed the consensual T/F/W agreement. The 1987 T/F/W agreement approved forest practices (later made part of the state forest practices act and regulations) which provided more protection for fish and wildlife during timber harvest. The T/F/W agreement encouraged voluntary action by state and private forest land owners to mitigate cumulative effects. The T/F/W agreement designated three basins where interested parties were to negotiate site specific plans which could be submitted to the state for ratification, to address cumulative effects and substitute for site-by-site logging permits. The Upper Yakima basin was one of the three areas designated for basin planning; the Yakima Resource Management Cooperative grew out of this basin planning effort. However, on of the first actions of the group was to not seek state approval (and thus regulatory authority) for a basin plan, but instead to meet together and discuss resource management goals and issues.

III. Nature of Resources

The upper basin includes approximately 760,000 acres, from elevations of 9400' down to the lower limit of trees at about 2000'. Most of the area is less than 4000' in elevation. Most of the area is dry

conifer forest. About 60% of the land in the basin is in public ownership; about 80% is managed by organizations represented on the Cooperative's policy committee. Primary foci of the cooperative are maintaining timber harvest, water quality, habitat for selected wildlife and fish species, protecting cultural resources, and establishing a basin-wide GIS. A secondary activity is providing increased economic stability and activity to communities in the basin. Much of the land in the basin is in a checkerboard of one mile squares of intermingled National Forest and industrial forest ownership. Several blocks exist where a single owner possesses more than 10,000 contiguous acres. The basin includes the towns of Roslyn and Cle Elum. Much of the land is hot and dry enough that one of the industrial owners has had a long-standing policy of using partial cuts instead of clear cuts. Late-successional wildlife species still exist, but many people are concerned about their continued viability because of habitat fragmentation and loss of snags. Meeting state water quality standards for turbidity and chemical purity also meets fish needs. Additionally, several fish habitat concerns are manifested in the basin: high water temperatures from loss of stream side vegetation, loss of pool habitat ('particularly from loss of inputs of large organic debris because of logging eliminating large stream side trees), sediment filling spawning gravels (largely generated by erosion from logging roads), and road and culvert barriers to fish passage. Cultural resources are primarily native american archeological sites which are unmapped and subject to damage from logging.

Iv. Authority of Institution

One of the first actions of the basin planning group (following up on the T/F/W recommendation for basin planning in the Upper Yakima) was to decide not to seek state approval as a basin plan with regulatory force and substituting for operation-by-operation logging permits. The authority of the cooperative is largely based on the strength of the personal relationships of the individuals involved int the cooperative. All participants in the Cooperative emphasized that they wish to keep their word and fulfill their agreements. Environmentalists assert that the development of the agreement was consensual and when parties agreed to standards they committed themselves to meeting those standards. Industry representatives emphasize the voluntary nature of the standards agreed to by the Cooperative. The other major source of authority of the cooperative is the information it gets to interests, who can bring violation of state or federal standards to the attention of land owners. Because the relationships and obligations are personal, between representatives of bureaucratic institutions, when the new individuals represent the bureaucracy personal relationships must be built anew.

V. Internal Structure of Instituion

As mentioned above, the Cooperative has no legal existence. It has a policy committee and several technical committees (called task groups) with report proposed resource management guidelines or Cooperative actions to the policy committee for approval. 1993 task groups were water quality and fisheries resources, wildlife resources: archaeological and cultural resources, timber/landowner

committee, communications committee, GIS committee, and budget committee. Representatives of organizations participating in the Cooperative also meet on an ad-hoc basis to address specific issues. Resources devoted to the work of the cooperative are provided by members of the cooperative; grants obtained in the name of the Cooperative are administered by a member organization.

As of July 1993, the members of the Cooperative were (in alphabetical order) Boise Cascade Corp, Central Washington Univ, Kittitas County, National Audobon Society, Plum Creek Timber Co, USDA Forest Service, Washington Environmental Council, Washington Farm Forestry Association, Washington Department of Ecology, Washington Department of Fisheries, Washington Department of Natural Resources, Washington Department of Wildlife, and the Yakima Indian Nation.

The Cooperative has divided the Upper Yakima into several sub-basins for analysis and measuring resource conditions. The task groups have developed five thresholds for unacceptable resource conditions. When a threshold is approached, the task group seeks ways of mitigating damages. The Cooperative has agreed to thresholds for snag density, sedimentation, percent of early and late successional forest, pool/riffle ratio, and open road density. Supposedly when a threshold is reached, activity which might cause further damage is stopped. This does not mean that logging necessarily stops. A threshold was reached and the logging company got the relevant task group to agree that additional logging would not cause further damage and carried out the logging.

There is not complete agreement about how the cooperative should operate and what activities it should undertake. As noted above, there is some disagreement about how binding the Cooperative's agreements are. Also, one of the timber interests would not agree to the Cooperative seeking foundation funding to substantially further its chosen tasks; the group proceeded to obtain the funding without the agreement of that member.

VI. Capacities of Institution

As noted above, initially the Cooperative existed exclusively on the donated effort of participants. The cooperative did obtain small grants, administered in the name of the Cooperative by participating organizations, to carry out specific research projects. Total YRMC costs for 1992 and 1993 were over $500,000 per year, including the cost of people attending meetings and on-the-ground activities. In August 1993, the YRMC received a $300,000 grant to perform some management activities, conduct several resource inventories, and perform some analyses. One of the greatest capacities of the Cooperative appears to be interpersonal communication and the norm creation and enforcement that engenders. One achievement of the organization has been to keep conflicting parties focus on defined problems and engaged in conflict resolution.

Individuals have established personal relationships with people from organizations on other sides on harsh conflicts. These personal relationship combine with increased visits to the areas in

question result in on-the-ground problems being brought to the attention of resource managers, and appears to often get minor problems fixed quickly. The Cooperative is establishing GIS data layers for several resources in the basin. GIS operators believe that this gathering and formatting of data will allow basin-wide analysis which has previously not been possible. Others in the Cooperative have not yet found the GIS to be particularly valuable.

While the agreement establishes thresholds which, when reached in a sub-basin or management area, are supposed to trigger a stop to further activities which might cause further damage, there appears to be an unresolved problem of allocating costs and benefits to the different land owners in a sub-basin. In particular, the agreement sets a threshold of a minimum amount of late successional forest but apparently says nothing about one land owner cutting until the threshold is reached and leaving another land owner in the position of not cutting or violating the threshold.

Not all parties to the conflict see the Cooperative as a viable way to address their concerns. RIDGE, an environmental group in the town of Roslyn concerned about rapid logging around the town. has chosen not to participate in the Cooperative because it does note believe the Cooperative will prevent further resource damage.

VII. External Environment

The external environment bears heavily on the YRMC. The Cooperative grew out of T/F/W and many participants in the Cooperative also participate in T/F/W activities: Conflicts and policy choices in T/F/W affect YRMC. While participants in the cooperative appear not to be suing each other about activities in the Upper Yakima, several are parties to suits in other areas or at the state level. Changes in state forest practices or other legislation would apply to the Yakima. Because regulations implementing the 1992 state forest practices act were in part based on thresholds developed in the Cooperative, some participants are quite cautious about developing standards, for fear that those standards will be copied in new regulations. Also in the external environment are political fights over what property rights land owners and others possess.

Federal actions can supersede state and local actions. In particular, critical habitat protection and restrictions on taking of threatened and endangered species by the US Fish and Wildlife Service under the Endangered Species Act can negate all actions of the Cooperative and end logging for an indefinite period. The Upper Yakima is included in an adaptive management area (AMA) in the President's forest plan. The area was included because the Cooperative had made a start at cross-owner management. However, designating the Upper Yakima as part of an AMA brings in what ever regulations federal agencies establish for AMAs, and the associated bureaucratic weight and imperatives of those agencies.

VIII. Internal/External Interactions

As noted above, Agencies have served as fiscal agents to administer grants to the Cooperative. The policy board can come to agreement on an issue, and members of the Cooperative can then represent those positions in other forums.

Original members of the Cooperative were apparently parties active in the T/F/W process. In 1993 an off-road vehicle group asked to become a member in the Cooperative. Though the Cooperative has no legal conditions of membership and no formal process for becoming a member (in fact there was some debate about whether two of the less active members were actually members), the group denied membership to the off-roaders stating that the off-roaders concerns were not central to the work of the cooperative (despite the appearance that the off-roaders appear to be at least as affected by road and trail closures initiated by the Cooperative as environmentalists are affected by logging). Perhaps the Cooperative insiders thought the off-roaders would oppose the common interests of the environmentalists, timber industry, tribes and Department of Ecology. Curiously, the Alpine Lakes Protection Association, an environmental group with interests in the upper reaches of the Cooperative area, was invited to join the Cooperative. Similarly, establishing thresholds for snags has resulted in elimination of cutting snags for firewood, with an impact on a substantial number of local residents who heat with wood but without their participation in the decision making.

Ix. Results

It is unclear whether the Cooperative can or will be successful at maintaining the plant, animal and human communities in the Upper Yakima. In favor of sustainability, @Cooperative has set some measurable standards for the condition of basins within the watershed. Participants differ in their views of these thresholds--some see the protection as rigorous, some see it as minimal. Against sustainability, the Cooperative may not be able to stop actions violating the thresholds, may not be addressing crucial factors, or may just be overwhelmed by outside forces.

Different participants in the Cooperative have different views about the success of the Cooperative. One of the timber company representatives reported that the Cooperative has been successful because it allows the company to keep informed about the activities of environmental interests and the environmentalists have not gone to the legislature to seek more stringent laws regulating forestry in the area. In a surprisingly similar view, representatives of an environmental group not participating in the Cooperative state their reasons for not participating to be that the Cooperative has not slowed rate of harvest (and does not address the issue) and has not stopped logging when a threshold was reached. Other participants claim success in getting better adherence to existing regulations and getting concrete action beyond that required by regulation (particularly revegetating roads to prevent erosion, modifying logging operations to minimize erosion, eliminating some barriers to fish travel, mapping archeological sites, limiting snag cutting, and limiting recreational travel contributing to erosion.

Certainly, the Cooperative has been successful in promoting a basin-wide view and has increased communication between actors and information about actions and conditions in the basin.

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NISQUALLY RESOURCE MANAGEMENT PLAN CASE STUDY

I. Identifying Characteristics

The Nisqually Resource Management Plan (NRMP) is comprised of 100,000 acres in the Nisqually River Basin. Lands in the Nisqually drainage are used for suburban, rural, fish, wildlife, agricultural and forestry purposes. The lands committed to the NRMP represent 23% of the drainage.

The lands within the NRMP are owned by five major participants, both private companies and public agencies, all of whom maintain their lands primarily for timber production. These include the Weyerhaeuser Company, Champion International, the University of Washington, the Municipality of Metropolitan Seattle, and the Department of Natural Resources. Other members of the NRMP include the Departments of Ecology, Fisheries, and Wildlife, as well as the Nisqually Indian Tribe, the Washington Environmental Council, the Washington Farm Forestry Association, and the Nisqually River Council.

The NRMP's mission is "to strive for a balance between managing forest land for commercial timber production and the protection of public resources," where public resources primarily include timber, fisheries, wildlife, and water. The purpose of the NRMP is as follows:

To develop a basinwide planning concept where forest management activities are balanced with the protection of fish, wildlife, water and other resources.

- To develop a cooperative and coordinated approach in identifying needs or problems for meeting the plan' goals and in seeking and implementing solutions through research, evaluation and monitoring efforts.
- To determine if the concept is a viable tool in a long-term drainage approach to forest management planning and to provide recommendations on its future use to the Forest Practices Board, the Department of Ecology and the Timber, Fish and Wildlife Policy Group.

Developers of the NRMP chose not to address activities which do not directly pertain to forest land management, such as over-fishing, hydroelectric development, agriculture, commercial/residential development.

II. Origins

The Nisqually Resource Management Plan was a direct result of the Timber, Fish and Wildlife Agreement (TFW), effective January 1, 1988. The NRMP is intended to allow participating landowners greater flexibility and predictability in managing forest land while still complying with forest practice regulations. It is also intended to provide greater opportunity for cooperation between landowners, state agencies and resource protection agencies. In 1987, a proposal for a pilot RMP project in the Nisqually drainage basin was proposed by the Weyerhaeuser Company, which resulted in the eventual Nisqually Resource Management Plan. The planning process and the plan were developed over the following two years, and the final plan was presented in October 1990.

III. Nature of Resources

Lands in the NRMP are primarily used for timber production, although forests are also used for public recreation, set-asides, and research activities. Intent of NRMP is to manage timber resources in such a way that other public resources are protected.

Timber:
Conifer forest constitutes 9 1,065 acres (92%), and hardwood forest constitutes 7,954 acres (8%) of the plan area. Less than 1% of the plan area contains 100+ year-old timber.

Fisheries:
Approximately 30 species of fish inhabit water in the NRMP, including coho, churn, pink and fall chinook salmon, winter and summer steelhead and resident cutthroat trout.

Wildlife:
Game species - elk, deer, black bear, cougar, snowshoe hare, ruffed and blue grouse, band-tailed pigeon and some waterfowl. Elk and black-tail deer are of highest concern in relation to forest practices.
Furbearers - beaver, coyote, raccoon, marten, fisher, ermine, long-tailed weasel, mink, river otter and bobcat. Beaver, marten, fisher and ermine are probably the most sensitive to forest practices.
Nongame wildlife - 233 species of vertebrate fish and wildlife.
Species of concern - bald eagle, osprey, turkey vulture, great blue heron, pileated woodpecker, vaux's swift, western bluebird, pacific water shrew.

Water resources:
Main stem Nisqually River flows are controlled by discharge rates from Alder and LaGrande dams, which are hydroelectric power operations owned and operated by the City of Tacoma.

Wetlands:
Cooperators recognize the value of wetlands in the forest ecosystem, although data on the wetlands is extremely limited. Wetlands in the plan area range from undisturbed high quality to degraded wetlands.

IV. Authority of Institution

The Nisqually Resource Management Plan has no regulatory force or effect. Cooperators are given two options for meeting or exceeding the Forest Practices regulations:

I. Forest practice proposals would be reviewed and adopted through a "master application plan", submitted by each landowner at the annual cooperators meeting. Each master application plan would cover one particular activity and the proposals would be coordinated with ongoing or proposed research and monitoring efforts.

II. Forest practice proposals would be submitted as a regular forest practice application subject to standard review, priority issues and ID team.

Landowners have the option to withdraw or add parcels of lands from participation according to intended uses.

V. Internal Structure of Institution

The Nisqually Resource Management Plan Committee is comprised of 13 members, each representing a cooperating entity. Each member signed a Memorandum of Understanding (MOU), detailing goals and rules for development and implementation of plan. According to the MOU, meetings are open to the public; public input should be directed through a committee representative. Committee actions which require decisions will be determined through consensus efforts. Subcommittees may be formed, as agreed upon by the committee, which consist of members, alternates, or technical experts. The representative for the regulatory branch of the Department of Natural Resources will be the Committe chairperson, and the DNR will monitor all NRMP activities.

Phase I - plan interest (January - July 1988)
Phase II - preliminaries to plan development (August - December 1988)
Phase III - plan development (January - December 1989)
Phase IV - plan review (January - July 1990)
Phase V - plan implementation (August 1990 - July 1993)
Phase VI - plan extension (August 1993 - present)

VI. Capacities of Institution

The Nisqually Resource Management Plan provides a new method for Forest Practices application approval, in which the landowner submits a master application plan for all forest practice activities

scheduled for the following year. The NRMP also has the capacity to establish resources objectives, recommend and undertake research projects: and facilitate cooperation between members.

VII. External Environment

The Nisqually River Drainage Basin has a history of cooperative resource protection activities amongst public entities, which includes the Nisqually River Management Plan, which was adopted by the legislature in 1987 and is administrated by the Department of Ecology. Entities involved in resource issues related to the river, basin, and delta include the Nisqually River Council (created by the Nisqually River Management Plan), The Delta Project, Nisqually Indian Tribe, Nisqually Delta Association, Nisqually Reach Nature Center, Nisqually River Basin Land Trust, and Nisqually National Wildlife Refuge.

VIII. Internal/External Interactions

Of the preceding agencies, the Department of Ecology, the Nisqually River Council, and the Nisqually Indian Tribe are all Committee members for the Nisqually Resource Management Plan. The NRMP is funded and administered by the Department of Natural Resources, which is also a member of the Committee.

IX. Results

The cooperators established five goals for the plan, corresponding with the five resources of concern. Action items were developed which could be implemented given the time and resources available.

1) Maintain and enhance a productive timber harvest base and minimize timber harvest costs.
2) Maintain and enhance fisheries habitat, fish use of the habitat and minimize fisheries costs.
3) Maintain and enhance wildlife and habitats, including habitat diversity, and the composition and abundance of wildlife using these habitats.
4) Maintain and enhance water quality and provide adequate water quantity for protecting water needed by people, fish and wildlife.
5) Develop an RMP process of value to both landowners and the public in protecting public resources.

Under the action plan for the 1994 calendar year, landowners have agreed to conduct operating plan reviews in order to help determine if adverse cumulative effects of management practices are occuring or is expected to occur within the NRMP. They have also agreed to inform non-landowner cooperators of proposed operations in order to allow time for identification of concerns

and possible discussion and modification of plans. In turn, non-landowner participants have agreed to jointly present current and projected status of any plans or projects that they have for the NRMP area which may affect the resources, operations and relationship of the cooperators.

Efforts which are currently underway include a NRMP Wetland's Inventory, conducted by the Nisqually Indian Tribe. In addition, the Water Quality/Fisheries committee has undertaken an effort to monitor elements for cumulative effects of forest practices on fisheries habitats which is focused on the Mashel River and Ohop Creek drainages.

The Nisqually River Management Plan is too young to assess long-term changes in forest management practices and subsequent effects on public resources. However, cooperators found that the development of the Plan itself enabled them "to learn more about each other, their concerns, programs, responsibilities and philosophies. It built solid, continuing communications which helped to clarify and resolve issues. This effort also contributed a foundation for undertaking short- and long-term cooperative timber and natural resource management efforts in the Nisqually River drainage."

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SALMON SUMMIT CASE STUDY

I. Identifying Characteristics

The Salmon Summit was convened in October, 1990 by Senator Hatfield (R-Ore.) in collaboration with four Northwest governors from Idaho, Washington, Oregon and Montana with funding through the Northwest Power Planning Council. The process had a deadline of February, 1991 that was later extended to March, 199 1. Mediators from The Mediation Institute of Los Angeles, California were hired to bring together representatives of groups (see Appendix 1) concerned with water and salmon in the Columbia Basin to:

> "develop an integrated, comprehensive plan that is realistic, scientifically credible and deliverable to protect and conserve petitioned salmon runs of Idaho's Snake River."

II. Origins

There has been a long history of conflict involving the multi-use nature of water (e.g., power, irrigation, habitat etc.) in the Columbia River Basin. Utility companies, sports/recreational fishers, environmentalists, agriculturally based water users, tribes and government agencies have been unsuccessful at meeting their water and fish needs because of what appear to be or may in fact be competing interests. Questions about maintaining wild salmon stock populations and fear of a repeat of the spotted owl, regulatory dilemma provided the impetus for the Salmon Summit negotiations.

What motivated the different parties to come together7 There is an extensive history of concern about loss of fish runs in the Columbia Basin dating back to the beginning of this century when industrial fishing technologies were brought to the river, and in the middle of the century when large dams blocked passage of numerous runs. More recently, in 1978 the NMFS and US Fish and Wildlife Service began a review process for listing of certain runs in the Columbia basin. However, these agencies postponed their review in hopes that the Northwest Power Planning and Conservation Act of 1980 would institute recovery measures. In 1990, petitions were submitted for listing the Columbia River chinook (summer, fall and spring) and the Redfish Lake sockeye under the Endangered Species Act. The petitions motivated representatives from hyrdopower companies, environmental organizations, tribes, and irrigation and recreational interests to try to come up with recommendations for a recovery plan. All the parties were confident that the petitioned species would be listed. The National Marine Fisheries Service would then be responsible for delivering a recovery plan along with proposals from the Northwest Power Planning Commission. Hydropower companies and water-user groups were especially concerned that the National Marine Fisheries

Service (NMFS) would eventually deliver an unfavorable regulatory plan. Environmental organizations and tribes of the Columbia River Water Basin feared that salmon recovery plans would be delayed. By coming together, the parties wanted to see if there was common ground in being able to meet their needs for water and for fish. Many of the parties, especially the hydropower, irrigation and recreational interests saw the Summit as an opportunity to maintain control over the process and the outcome. The stakeholders hoped to develop a recovery plan proposal to submit to NMFS to speed up recovery and to avoid formal regulatory requirements. The NMFS has a year to consider petitions to list species, and another year to draw up a recovery plan if a species is listed. Summit participants hoped to use this window of time to forge a consensus on how to manage for the fish, and hoped that the agreement of the conflicting groups would be powerful enough to cause the agencies to substantially adopt their agreement. A representative for the Northwest Conservation Act Coalition (an environmental coalition), Jim Baker said, "it was a way to get ahead of the curve . . ..and to get busy with recovery while the Act was working itself out."

III. Nature of Resources

Wild salmon stocks have been damaged by dams, pollution in the riparian zones, agricultural runoff, increases in competitive hatchery fish and poor logging practices. Dams have prevented salmon from completing their usual migration patterns of going out to the ocean as juveniles and making their way back as adults to spawn. According to the Northwest Power Planning Council, dams are responsible for 80% of the damage to fish runs in the Columbia River Basin. Many of the salmon runs that are still active are the result of the introduction of hatchery fish.. Hatchery fish stocks have increased while the more genetically diverse, wild stocks are decreasing.

In response to declining fish populations, the NW Power Planning Council 1) changed the water budget to make some water available from the power system for fish flows 2) put screens in the dams so that fish could avoid the turbines 3) put forth adaptive management schemes to measure salmon recovery 4) funding programs for improving the quality of fish habitat, and 5) tried to develop a system wide framework for managing fish and wildlife. However, the efficacy of these measures is doubtful. As a tribal member of the Yakima Indian Nation puts it, "Why isn't the fish population increasing?"

The Summit participants focused on four salmon stocks: spring, summer and fall runs of chinook and Redfish Lake sockeye. Although the Lower Columbia River coho stock was also petitioned for listing under the ESA, the Summit decided not to specifically address this stock because coho spawn below most dams and are thus minimally affected by dams. Coho were petitioned for listing with the belief that hatchery raised coho were causing declines in wild stocks.

IV. Origins of Institution

There was no assurance that NMFS would implement the decisions made by this ad-hoc, multi-party group. Yet, there is no apparent reason why NMFS wouldn't consider accepting a plan suggested by a group of participants that represent the interests at stake as long as the proposals weren't illegal or unconstitutional. There is power in collaborative efforts of private, interest groups, public agencies, tribes and environmental organizations (see Appendix I for list), and as a representative of the Idaho Water User's Association puts it, "no one has all the power." Throughout the Summit, there was an underlying awareness that a final plan ultimately would come from the National Marine Fisheries Service and The Northwest Power Planning Council.

V. Internal Structure of Institution

The Summit, facilitated by The Mediation Institute, consisted of a thirty member panel of individuals from tribal groups, farmers' organizations, recreational sports interest groups, environmental organizations, government agencies, and power companies as listed in Appendix 1. Summit Participants. The panel was organized to reach unanimous consensus on the following issues:

Establishment of population goals for each of the petitioned stocks
Development of harvest guidelines
Establishment of a system for physically transporting salmon past the Columbia and Snake River Dams

Summit participants formed a coordinating committee. Summit participants broke up into subgroups to deal with levels of harvest, salmon migration/survival, fish production and habitat, NEPA/legal issues, and economic, operational and environmental impacts. In addition to subgroup, technical advisors, a technical advisory group was enlisted to be called upon by the coordinating committee as needed.

VI. Capacities of Institution

The motivating factor for setting up this informal negotiation process was to avoid having to deal with delay in salmon recovery plan initiatives and regulatory red tape under the Endangered Species Act (ESA) as had happened with the spotted owl controversy. If the group could voluntarily decide upon a plan that they could all agree to, they would maintain some control of how each of their interests would be affected. If, however, the petitioned salmon runs were listed under the ESA, the Federal government would enter the scene --changing regulatory processes and possibly delaying recovery implementation procedures.

VII. External Environment

Participants in an informal negotiation process, such as the Salmon Summit, do not have full liberty to establish policy as if in a vacuum. The participants must still within the legal parameters that guide habitat and species protection and water use activities. The Salmon Summit negotiations were :

The Endangered Species Act (1973): The Endangered Species Act was designed to,

> "provide the means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes.of the treaties adn conventions set forth in the subsection (a) of this section."

Under this Act, NMFS has the authority to prohibit the taking of any threatened species. NMFS is currently responsible for coming out with a Columbia River Basin salmon recovery plan for the threatened and endangered salmon now listed under the ESA. Today, some of the Salmon Summit participants believe that NMFS is delaying the development of a Columbia River Basin salmon recovery plan for political reasons. The plan is now two years overdue. One can be assured that once a plan is out, many court cases will be sure to follow. A Summit representative of the Idaho Water Users Association expresses that the Association is almost sure to follow up with a law suit if NMFS' biology does not coincide with theirs. The Water Users Association representative is aware, however, that "economics don't play by the ESA." The "God Squad", in other words, has not been sensitive to economic concerns when it comes to protecting endangered or threatened species (see Snail Darter case).

Indian Treaties: Under the Supremacy Clause of the United States Constitution, it is generally accepted that treaty rights supercede state laws. The Boldt decision affirmed the Stevens Indian treaties that state that Indians of the Pacific Northwest have rights to 50% of the harvestable fish in the Pacific Northwest. The Indians stand strong behind the recognition of this treaty yet, claim that they only get what's left after ocean fishery extractions, sports fisher activity, dam influences etc.

The Northwest Power Act (1980): The Northwest Power Planning Council formed by this act was organized to,

> "protect, mitigate and enhance fish and wildlife" and "assist the electrical consumers of the Pacific Northwest through use of the Federal River Power System to achieve cost-effective energy conservation, to encourage the development of renewable energy resources, to establish a representative regional power planning process, to assure the region of an efficient and adequate power supply, and for other purposes."

As part of the Council's mandate "to protect, mitigate and enhance fish and wildlife" the Columbia River Basin Fish and Wildlife Program was developed in 1987 and funded through BPA. This program outlines Federal government and tribal activities necessary for the collaborative

management of fish and wildlife of the Columbia Basin by hydropower companies and water user groups. The program receives 130 million dollars per year mostly from BPA, its main funder (Lee 1991).

Ideally, the Council would build partnerships between fish and wildlife stakeholders and hydropower dam interests to develop a plan to recover salmon runs jeopardized by utility companies. After the Summit had failed to achieve consensus on its goals, the Northwest Power Planning Council delivered a salmon recovery plan which was knocked down in the 9th Circuit court because the NWPPC did not follow appropriate procedures. The NWPPC is due to come out with another revised plan this year. The Northwest Power Planning Council may be failing to do its job, hence lacking the necessary leadership on the Columbia River Basin salmon issues (Blumm and Simrin 1991).

VIII. Internal/External Interactions

See V and VII.

IX. Results

The Summit negotiations did not result in a set of salmon recovery recommendations by the extended Summit deadline of March, 1991. Governor Gardner claimed that there was simply not enough time. State and federal fish and wildlife agents did not participate in the Summit negotiations. This lack of participation on the part of those who be the authors and final enforcers of a Columbia River Basin salmon recovery plan may have damaged faith in the Summit negotiations from the start. A representative of the Water Users Association doubted that recommendations from Summit participants would be accepted by NMFS. The participants, however, were able to make recommendations regarding an insufficient water budget of the Snake River that had once left the salmon high and dry back in the 1980's.

According to some of the Summit participants, the mediators were not effective in dealing with the technical information and their impartiality was questionable. The mediators didn't know enough about hydrology and it took too much time to catch them up on the issues. The mediators' perceived impartiality was especially jeopardized when during the Summit sessions, the mediators delivered a preliminary draft document to show the participants what a final plan might look like. The utility companies and irrigation interests perceived the document to be weighted in favor of the fish and caused them to question the mediators' impartiality. The document, however, may have been a mediator strategy to help move the parties to consider others' interests. For, after the document came out, a caucus developed between the utility companies and water user representatives. This caucus may have moved its participants to shift from their original, hard line positions. The caucus created new relationships and perspectives or perhaps the document was a reality check of what the enforcement of the ESA might eventually bring if they didn't budge then

and there). Dan Silver, who was part of the original group to organize the Summit, says that he was the only one who felt that the mediators did a good job considering the complexity and high energy of the issue.

One of the difficult negotiation areas was the lack of, abundance of or manipulation of scientific information. Although Bill Bakke of Oregon Trout was quoted by Gannett News Service in January as saying, "'We're crippled by a lack of data.", Jim Baker claimed that there was a "glut of information .-bewildering, conflicting mass of information." Apparently the data was slim in some areas and controversially abundant in others. The data on the impacts of barging (transportation of fish past the dam) was scant,for example, but there was plenty of data on fish numbers. One of the reasons that NMFS may now be stalling with its final recovery plan may be its inability to make decisions in the face of insufficient information. Alternatively NMFS may feel that the information they do have could easily be challenged, and thus their decisions will be contested in the courts. One participant said that although some of the data reflected certain interests, he went along with it anyway for the sake of moving the negotiations along and for not getting bogged down by data.

What happened after the Summit? Various groups continued to negotiate and reports have been published that continue to address the salmon of the Columbia River Basin and the means for their recovery. Most groups, however, await the recovery plans from NMFS and the Northwest Power Planning Council to be presented.

This, however, will not be the end of the story. This last year, the Northwest Power Planning Council delivered, a plan that was knocked down in the 9th Circuit Court. They are now in the process of preparing another plan. Once NMFS puts out a salmon recovery plan, there are sure to many law suits over "bad science" to follow. The Water User's Association in Idaho state that after NMFS puts out its final recovery plan, their biologists will look over the science and if there are "unwarranted" conclusions, first they'll try to negotiate ("you always try to negotiate first."), then go to court if necessary.

FIGURE 1. LIST OF PARTICIPATING ORGANIZATIONS

Tribal Groups:
- Confederated Tribes of Warm Springs
- Yakima Indian Nation
- Nez Perce Tribe
- Confederated Tribes of the Umatilla Indian Reservation
- Shoshone - Bannock Tribes
- Columbia River Inter-Tribal Fish Commission

Recreational Sports Groups:
- Idaho Salmon & Steelhead
- Unlimited NW Resource Information Center: Mainstream Flow Coalition
- Oregon Trout
- Oregon & Idaho Chapters of the American Fisheries Service
- Trout Unlimited

Farm Groups:
- Idaho Farm Bureau Federation
- Idaho Water Users Association

Environmental Groups:
- NW Conservation Act Coalition
- American Rivers Council
- Oregon Natural Resources Council
- Columbia River and Ocean
- Idaho Conservation & Environmental Groups

Government:
- US Forest Service (Regions 1, 4, and 6)
- Bureau of Land Management (Oregon, Washington and Idaho)
- Bonneville Power Administration
- Offtce of Governor Goldschmitt
- Offtce of Governor Andrus
- Offtce of Governor Gardner
- Offtce of Governor Stephens
- US Army Corps of Engineers, NW Pacific Division
- US Bureau of Reclamation
- NW Power Planning Council

Power Organizations:
- Idaho Power Company
- NW Irrigation Utilities
- PNW Utilities Conference Committee
- Pacific NW Waterways Assoc.

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WESTERN OREGON SPECIAL FOREST PRODUCTS COUNCIL CASE STUDY

I. Identifying Characteristics

The Western Oregon Special Forest Products Council (WOSFPC) was founded in January 1991 by representatives from the National Forests and BLM Districts in westside Oregon. The council is an ad-hoc committee with no formal authority to make or implement decisions. The Council's officially stated sphere of action is limited to. western Oregon, but its actual activities cover Oregon, Washington and Northern California. The Council has five formally stated objectives:

1) Coordinate pricing guidelines between the USFS and BLM for commercial and personal use permits:
2) Share information and coordinate policy on SFPs between the BLM and the USFS;
3) Develop standard SFP contracts and accountability sytems;
4) Identify emerging issues in SFP management; and
5) Identify ways in which SFP management can contribute to land stewardship goals.

II. Origins

The Council was formed in response to growing concern among BLM and USFS field staff that national and regional forest management directives failed to address the growing demand among harvesters for a wide variety of non-timber forest products and the increasingly violent conflicts over access to these products in the Pacific Northwest:

> "[Mike Strange] originally got this committee going because there seemed to be a lack of direction from above. On the ground there were a lot of requests coming in for various products, some of which we had never sold to the public commercially before...There were a lot of questions to which there were no answers" (Anonymous, Notes for Jeff Gordon).

The Council seeks to improve SFP management in the Pacific Northwest by tilling information gaps, facilitating the development of consistent, region-wide federal SFP policies, and by educating agency staff and the public about proper harvesting and management techniques.

III. Nature of Resources

The Council is concerned primarily with how to manage a broad range of non-timber vegetative resources commonly referred to as "special forest products". These resources include such things as fungi, moss, berries, bark, leaves, boughs, and grasses. Economically, these products have long been important on a local scale, for both domestic and commercial use. For example, a small, but thriving floral greens industry has existed along the Pacific Coast since the 1930s. However, during the last ten years, the decline in the importance of logging combined with an increased demand for certain SFPs in domestic and international markets, has led to growing demand for access to SFPs on public and private lands. Historically, Western Washington (and specifically Mason County on the Olympic Peninsula) has been the major processing site for floral greens, although raw materials are drawn from throughout the Pacific Northwest. Efforts are currently being made to expand processing capacity into other parts of the Pacific Northwest, notably Northern California and Western Oregon.

Management of SFPs is complicated because of the diverse nature of these resources and the extremely high degree of uncertainty associated with them. SFPs differ considerably in terms of their renewability, production intervals, regularity of production, spatial distribution, economic value relative to size, and degree of conflict among user groups. As a rule, however, these resources tend to exhibit a high degree of spatial and temporal variability in terms of bio-mass production. Industrial level harvesting thus requires that harvesters have secure access to a large geographical area, which in the Pacific Northwest typically means that harvesters seek access to land regulated by a variety of political entities and held by many different types of owners.

Management is further complicated by the virtual absence of any scientific data on SFP production rates or the social organization of SFP management in the Pacific Northwest:

> "We are concerned about overharvest, but we get all kinds of conflicting information about what is acceptable and what isn't. How can we sort out what is valid from what is not?" (WOSFPC meeting, 1994).

Recent field studies indicate that local harvesters and buyers may possess a large stock of knowledge about how these resources grow and the effects of different harvesting practices on production. However, decision-makers appear to be unable or unwilling to make use of this information for policy and management purposes. Some harvesters and buyers have expressed a reluctance to share their knowledge with public land managers on the grounds that divulging such information could potentially jeopardize their ability to make a living in the SFP industry.

Differences in opinion about how to manage these resources and whether they are worth devoting a lot of effort to abound. These differences revolve primarily around the following issues:

1) appropriate levels of harvest
2) appropriate methods of harvest

3) mechanisms for controlling SFP use on federal lands
4) economic value (current and potential) of SFPs (especially relative to timber) and appropriate pricing policies.

One of the major issues in the SFP sector is how best to structure and achieve co-production of resources. Co-production is a critical issue from two standpoints. First, questions of how to manage in ways that ensure that the needs of different SFP producers/harvesters are adequately met need to be addressed. For example, certain ways of harvesting salal are reported to negatively affect mushroom production. Similarly, commercial management of certain species may conflict with recreational management of the same species. Second, questions of how to manage other forest resources, particularly timber, without compromising SFP production (and vice versa) also need to be addressed. For example, clearcutting reportedly decreases salal production for at least a fifteen year period, and the dust from off-road vehicles is reported to inhibit the production of sword ferns and salal leaves. Controlled burns, on the other hand, may result in higher morel and berry yields.

IV. Origins of Institution

As an ad-hoc committee, the council has no formal authority to make and implement decisions on federal or non-federal lands. However, as field staff and managers for the BLM and USFS, council members can potentially influence decision making and implementation informally:

> This committee is AD HOC. I think that means that no one appointed the committee, we just formed by ourselves (with concurrence by our supervisors). We had (and have) not real power, no authority to set policy or make decisions. BUT the committee's recomendations have been accepted by the two agencies because: No one else was doing this work; there was no coordinator for SFPs in the State/Regional offices; folks in this group had the most experience and/or were listening to people on the ground who had the experience (Anonymous, notes for Jeff Gordon).

As long as the council remains legitimate in the eyes of mid and upper managers in the BLM and USFS, its potential to affect management decisions will be high. Both agencies have federally mandated authority to manage SFPs on land under their control. It is unlikely that these agencies will lose rights to manage these resources but the kind of management they can do could be constrained through legislative and judicial action (and non-action). In principle, the Council can develop rules which, if accepted by their respective agencies, could potentially eliminate or restrict others' access to a wide variety of non-timber forest products on BLM and USFS land.

The degree to which the Council exercises influence over other management entities is unknown. Within the council, there is general agreement that SFP mgmt has been ad-hoc and that lack of consistent policies across federal lands has created ill-will among various

interest groups. Members also have expressed the belief that timber is declining as a revenue source and that SFPs are possible job-savers.

It is possible that the WOSFPC will be able to exert informal authority over a wider range of actors in the future as there appears to be growing agreement among various actors (notably recreational pickers and buyer/processors) that there is a need for greater coordination at the federal, as well as other levels.

V. Internal Structure of Institution

Formally, the Council is composed of two types of participants: representatives from the BLM districts and US national forests included in the geographic scope of the Council. These participants have the right to vote on committee proposals; they also run the various committees established by the Council to gather information and develop policy recommendations and plans of action.

The Council is headed by two co-chairs, one representing the USFS, the other representing the BLM. Both are elected from the general membership, and they appear to be equally influential with the membership. A variety of committees have been established to carry out Council activities. These committees are headed by a sub-committee chair responsible for coordinating activities, and are staffed by both formal and informal Council participants. Some of the sub-committees and the activities they have accomplished include:

Pricing:	Developed a recommended minimum price list
Product Accountability:	SFP load permits
SFP Contracts:	Proposed SFP contract for USFS
Educational:	Developed multiple language brochures on SFPs
Research:	Recommended research priorities to USFS/BLM

In theory, council meetings are held quarterly, but internal memos suggest that they occur two to three times per year. Attendance of formal members at Council meetings is sporadic due to lack of travel/participation funds from agencies involved. No data is available as to how this representation is distributed across various offices (i.e. which ones consistently send representatives, which ones send people sporadically, and which ones don't take part at all).

VI. Capacities of the Institution

The Council relies primarily upon its information-gathering and dissemination capacity to influence SFP management behavior. Members also make use of their positions within their agencies to influence management actions that might potentially affect SFP management. Examples of the Council's policy-making, public education, and research support activities are discussed below.

A. Cataloguing Policies and Developing New Policy Strategies

* WOSFPC has been a key force behind the BLM SFP Task Force for Oregon and Washington. In 1992, the Task force completed a report which reviewed current BLM SFP policies and identified critical policy issues for SFP management on BLM lands in Oregon and Washington (BLM 1993). In July 1994, the Task Force published a handbook on BLM regulations governing SFPs.

* WOSFPC has helped coordinate regional input into the national-level SFP strategy being developed by the USFS' Washington Office.

* The permit subcommittee has almost completed the Forest Products Permit System (FPPS), a computerized SFP contracts system for use by national forests in Oregon. The Washington Office has recently decided to test the system nationally. The system is designed to standardize the permitting process within the national forest system, while allowing sufficient flexibility for regional and local variations in prices and management concerns. It is also designed to help USFS SFP managers keep better track of SFP harvesting activities and revenues.

* The pricing subcommittee is developing a worksheet for calculating fair market values for SFPs. A major purpose of this worksheet is to encourage standardization of permit and/or contract prices across federal jurisdictions. Note that both the permitting system and the pricing system are important elements in the WOSFPC's campaign to convince their respective agencies that SFP programs require dedicated sources of funding.

* WOSFPC has been a strong force behind the move to incorporate SFP concerns into the federal environmental impact assessment, forest planning, and resource management planning processes. Members were influential in the development of an SFP environmental assessment for the Williarnette National Forest Plan, which is being used as a model for other forest planning efforts. They also were instrumental in the development of a mushroom permit lottery system for the Oregon Dunes National Recreation Area.

B. Public Education/Outreach

* In 1992, the WOSFPC developed an informational brochure on SFP harvesting on federal lands. The brochure has been translated into Cambodian Laotian Spanish and Russian.

* A video on mushroom harvesting is being filmed this summer (1994).

C. Workshops and Research

* WOSFPC members have been a key force in supporting information sharing and policy dialogue among government agencies, industrial and non-industrial private forest landowners, commercial and non-commercial harvesters, buyers, processors, and scientists. In 1992, for example, the Council assisted the USFS Region 6 Office in putting on three public-private meetings on SFPs (sponsored by the Rogue River, Willamette, and Gifford Pinchot National Forests). Members have contributed other meetings including the January 1994 conference "The Business and Science of Special Forest Products", and a Fungi Workshop held in May 1994.

* WOSFPC members have lobbied their respective agencies to support research on the ecological impacts of different harvesting methods, production rates of SFPs, market information, and strategies for enhancing the value'of SFPs to rural economies. As a result of their efforts, BLM has funded a literature search on the impacts of special forest products harvesting, the USFS has commissioned a study of mushroom harvesting (Dr. Trappe, OSU), and the USFS is seeking funding to finance a study of moss on the Siuslaw National Forest.

Lack of funding greatly constrains the WOSFPC's capacity to act. Most SFP activities are funded throughagency timber monies rather than through funding sources specifically dedicated to special forest products management. In addition, the overall reductions in Forest Service and BLM funding and staffing have negatively affected the ability of council members to participate in meetings and sub-committee activities. Finally, participants in the Council note that lack of mid and upper level support for the organization limits their ability to function effectively.

VII. External Environment

The rapidly dwindling supply of old-growth timber (Bolsinger and Waddell 1992), and the accompanying conflicts over forest management, are probably the aspects of the external environment that most affect the WOSFPC's possibilities for action. Until the last decade, timber extraction and processing was the mainstay of many western Oregon rural communities. However, national recessions and accompanying declines in housing starts in the early 1980s and 1990s, coupled with increased mechanization in the lumber and wood products sector over the last twenty years, contributed to annual unemployment rates exceeding 20% in some Western Oregon counties by the early 1990s. Court injunctions placed on timber sales from federal lands have restricted the supply of timber for mills dependent on old-growth since 1990.

As a result of these factors restricting timber harvest, the amounts of timber taken from Oregon forests dropped abruptly from 8.4 billion board feet in 1989 to 6.2 billion board feet in 1990 (Richardson, 1993: 27). In addition, competition from timber produced in Canada and the Southeastern United States resulted in the closure of many of Oregon's less efficient mills during the last decade and further increased job losses in Western Oregon's timber dependent communities. During this same period, however, the region experienced

economic growth in other sectors, notably services and trade. Tourism and retiree support services have been particularly important in providing new employment opportunities. Wage scales, however, are typically much lower in the service sector than in the timber production and processing sector. Increased harvesting and processing of special forest products has also been suggested as one mechanism by which rural communities can retain benefits from the forest in the face of a dwindling timber supply. It is unclear whether such activities are sufficiently reliable and profitable to provide the level of income needed to support a family on a year-round basis.

Two important population trends also affect the resource management context in which the WOSFPC operates: 1) During the last decade, a large number of young workers in rural areas have left the region, which has been economically depressed since the late 1970s; and 2) A large number of relatively wealthy, retirees of urban origin have settled in rural towns and communities in southwestern Oregon. As a result, the population is increasingly skewed toward older age classes. and toward persons coming from middle to upper class urban backgrounds. Studies comparing the values of the new immigrants with long-term residents indicate that the former tend to have a more conservationist oriented approach to resource management, while the latter tend to favor a more production-oriented approach. This clash in values has contributed to the highly polarized forest management context that currently exists in Western Oregon, and severely constrains the kinds of special forest products policies the WOSFPC can hope to implement.

Several legislative provisions constrain WOSFPC's ability to function effectively across ownership and jurisdictional boundaries. The BLM and the USFS work under different legal mandates, and WOSFPC members have noted that these differences make it difficult for consistent policies to be developed between the hvo agencies. Industry representatives have also expressed their concern that any involvement on their part in helping WOSFPC set permit fee structures would constitute a violation of anti-trust laws.

VIII. Internal/External Interactions

The WOSFPC relies on both informal and formal contacts among its official members to develop and implement activities. Committees are set up to include representatives from both agencies, as well as appropriate outsiders. Decisions within committees are based on consensus among the various participants.

In 1992, an effort was made to expand formal membership to include BLM Districts and National Forests in Washington and eastern Oregon, as well as State forestry representatives, the Oregon Mycological Society, and commercial harvesting/buying outfits. A majority of council members, however, felt that expansion would make the group unwieldy and undermine its effectiveness at carrying out its activities. Eventually a compromise was reached: membership is formally restricted to BLM and USFS staff from western Oregon, but non-members are allowed to participate informally through attendance at meetings and in sub-committees.

Informally, the Council allows for the participation of a number of other policy actors, including BLM District and State Office staff, USFS Regional Office staff, representatives of the Oregon Mycological Society, universities (mostly natural scientists), and the State of Oregon forestry department. Informal participation by large industrial landholders, buyers, harvesters, and processors is possible, but appears to be very limited at the present time. Informal participants are allowed to take part in discussions and serve on sub-committees, but don't have a vote in Council decisions.

Potentially affected stakeholders who appear to have little voice in Council meetings include: large and small industrial landholders, commercial harvesters, SFP buyers, SFP processors, SFP wholesalers and retailers, Washington and California forestry departments, and various Native American tribes. In some cases, lack of participation on the part of these stakeholders is voluntary. Several buyers, for example, have expressed an unwillingness to take part in WOSFPC meetings and workshops because they distrust the federal government's motives for re-vamping their special forest products policies. Some buyers consider the increased interest in a previously ignored policy arena an attempt to expand government revenues at the expense of private industry profits, without any concommitant concern for sustainable use or management of resources. Others are hesitant to share their knowledge about the location of special forest products for fear of losing access to those resources to better-connected competitors. Information sharing with the public has followed a classic extension model, in which the Council develops educational materials and then disseminates them. The merits of this approach are currently being debated within the council, with a number of participants arguing for the need to develop two-way information exchanges with other stakeholders.

IX. **Results**

Since the Council has only been operating for three years, it is difficult to determine whether it has been a success in terms of achieving better management of SFPs (one of its implicit goals). Moreover, the lack of baseline data, including resource inventories and productivity levels, make any comparative assessments of current resource conditions with past conditions impossible.

Despite the lack of any evidence of tangible improvements to the resource base, WOSFPC participants still think that the Council has been a success in the sense that it has greatly increased communication among two previously separate agencies. As a result of the WOSFPC meetings, a number of Forests and Districts have begun to work together on a more regular basis. For example, the Rogue River NF, the Siskiyou NF, and the Klamath Falls District hold monthly meetings to compare notes on their activities. They have evolved to the point where they are now issuing a joint monthly newsletter to keep interested parties up-to-date. One member noted that the WOSFPC's ability to garner the participation of well-known scientists and organized interest groups has also helped SFP programs gain credibility within their agencies. He believes that this type of organized

activity is likely to increase the chances of getting national level policy-makers to create a dedicated funding source for SFP management in the future.

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