

DRAFT FOR REVIEW

THE MANAGEMENT OF EXCEPTIONAL TROUT STREAM SYSTEMS
IN THE UNITED STATES: AN ANALYSIS OF STATE EXPERIENCES

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I. INTRODUCTION

Statement of the Problem

Faced with increasing fishing pressure and environmental stresses, U.S. state and federal fisheries management agencies in recent years have used several innovative approaches in an effort to satisfy demands for high-quality recreational angling experiences. One approach involves the identification and management of what we term "exceptional waters"--especially valuable and important rivers and streams distinct from the overall coldwater resources within a region or governmental jurisdiction. While "exceptional waters" programs may include warmwater systems and coldwater lakes, the information presented here is limited to stream and river "exceptional waters" that normally feature trout or salmon angling. Coldwater rivers and streams supporting such fisheries have long been a focus of natural resources management, and several states and other governmental units have led the way in protecting and managing the best of these riverine resources (commonly designating the waters "Blue Ribbon", "Gold Medal", etc.).

No synoptic analysis exists of the experiences of states and other units in managing their "exceptional" coldwater riverine fisheries. This study is an effort to fill that gap--to characterize and assess experience to date and to present a practical conceptual framework for managing these resources. In many respects, the "exceptional waters" approach represents a substantial departure from more traditional ways of describing coldwater fisheries management.

There is an enormous literature and information base regarding the management of trout and salmon fisheries addressing such major topics as particular species management, wild trout management, habitat improvement, and special fishing regulations (White and Brynildson, 1967; U.S. Department of Interior and others, 1974, 1979, 1984; Barnhart and Roelofs, 1978; Trotter, 1987; Graff, 1988). Many state coldwater fisheries management program descriptions and plans are in print of which Oregon (Oregon Department of Fish and Wildlife, 1987) and Pennsylvania (Pennsylvania Fish Commission, 1986) are good examples. Numerous trout management plans exist for individual rivers, such as the South Fork Kings River in California (California Resources Agency, 1982) and the Bighorn River (Montana Department of Fish, Wildlife and Parks, 1987). But there is no summary analysis of: 1) how states have identified their most important trout and salmon rivers and streams, and 2) how they have tried to coordinate or integrate management activities affecting this special class of resources in order to attain their management objectives.

We emphasize at the outset that some very advanced fisheries programs do not readily lend themselves to categorization on the basis of an "exceptional waters" management classification scheme. As with any classification effort, we have made judgments regarding various management programs to impose some order for purposes of our analysis. Given that our intent is to assess the present state of a very significant development in the management of sport fisheries, we felt it necessary to redefine some management programs in the context of our concept of "exceptional waters" management programs, with all the attendant risks of being overly subjective.

Benefits of Exceptional Waters Management Programs

During this study we encountered some fisheries professionals who oppose defining some portion of the resource as "exceptional" or "better" than the remainder. That view stems from the notion that they are charged with responsibility for the total fishery, or the entire coldwater fishery. While we find laudable the all-inclusive goal statements typified by legislative preambles and agency mission statements--e.g. "protect and manage all the waters and natural resources of the state"--fisheries agencies, in targeting limited human and financial resources, must make hard choices. No governmental unit with a significant natural resource base can command the fiscal support to do all the monitoring, research, planning studies, public information efforts, land acquisition, habitat manipulation, and regulation and enforcement needed to optimize the management of all coldwater fisheries. An exceptional waters classification and management system allows those waters deemed more valuable, important, unique, of special character or significance--i.e., exceptional--to be accorded higher priority, thereby receiving added management attention. Providing a higher level of management for exceptional coldwater trout and salmon fisheries does not imply neglecting the "rest"; it simply allows the conscious focusing of an investment in fisheries management.

Furthermore, fisheries are often an important dimension of other natural resources management programs. Wild and scenic river programs, both federal and state, require information not only characterizing the water resource in terms of its fishery, but also the relative importance and value of that fishery (California is one

excellent example). New water quality management initiatives, such as the federally mandated development of policies and rules pertaining to anti-degradation (U.S. Environmental Protection Agency, 40 CFR, sec. 131.12), require identification of outstanding or exceptional resource waters to be accorded this highest level of water quality protection. Exceptional waters programs like those described in this report can be a fundamental underpinning for such programs.

Lack of coordination and fragmentation of related natural resources management programs is an institutional management issue of longstanding concern (Council of State Governments, 1957; Beyle and others, 1975; Wilson, 1982; Lang, 1986; Rabe, 1986; Anderson and Baum, 1988). Improved coordination and integration of natural resources management programs is a rediscovered paradigm that continues to be difficult to achieve in most management settings. While genuine and effective coordination/integration of fisheries management activities with other closely related functions may not be widely achieved, more integrated management is generally essential to accomplish management objectives and goals typically specified for exceptional waters. The management tools allocated to fisheries managers are inadequate in and of themselves to fully realize exceptional waters program goals. They must be used in conjunction with water quality and water quantity management, land management and other tools. Thus, establishment of exceptional waters programs can provide a vehicle for developing the broader coordinated planning and management approaches extolled by most natural resources professionals.

II. RESEARCH OBJECTIVES AND METHODS

Exceptional waters management approaches are becoming more widely used. Accordingly, we need to better understand and assess U.S. experience to date with this emerging approach to coldwater fisheries, and more generally, resources management. This study of exceptional waters programs has the following objectives:

- * To provide an overview and status report regarding the exceptional waters approach to coldwater fisheries management;

- * To describe and compare U.S. state experiences with classification, designation, and management of exceptional trout and salmon rivers and streams;

- * To inventory and analyze the factors and criteria used in management programs to distinguish a portion of the coldwater fishery resource as exceptional;

- * To examine the management implications resulting from the identification and designation of exceptional waters, including specific review of what management tools pertaining to the land and water environment, the fishery, and the user community are employed to implement programs;

- * To assess linkages and coordination with other potentially complementary natural resource management programs;

- * To preliminarily assess the key factors associated with successful experiences in exceptional waters management.

The study focuses on state governments but includes brief overviews of non-state and Canadian provincial activities relevant to the exceptional waters management concept. A preliminary literature review provided background information on various aspects of coldwater fisheries management in the states, and indicated there had been no prior study of this type. Contacts with leading fisheries professionals confirmed this. The primary research instrument was a survey (Appendix A) distributed in February 1988 to the most appropriate people within the fisheries management agency in those states (and Canadian provinces) with coldwater fisheries. Substantial information regarding state responses and programs was garnered through follow-up telephone interviews and analysis of documents provided by respondents.

The survey was detailed and complex. To compensate, design adhered to the major guidelines for survey administration outlined by Dillman (1978). We sought to identify survey respondents who would have high salience in the results of the study. A cover letter from the director of the Bureau of Fish Management, Wisconsin Department of Natural Resources, to his professional counterparts suggested the potential utility of the results and urged completion of the survey. Costs of responding were minimized. The questionnaire was organized and designed to positively influence response behavior. The survey went through extensive revisions and was pretested on natural resources academics, fisheries professionals, and survey research specialists. An administrative schedule was established providing for re-mailings and telephone calls to non-respondents. Our response rate--95 percent (37 of 39 surveys sent to states)--was very

high. No state with a significant coldwater fishery failed to respond.

State coldwater resources and management programs exhibit great variability, so responses to survey questions presented some problems in comparability. Further, knowledge of respondents varied, particularly with regard to management programs and tools outside their immediate administrative unit or agency. Some respondents found difficulty in completing survey questions, because their state program did not conform to the framework in the questionnaire; some responses required interpretation. A number of follow-up calls and internal consistency checks were made to clarify ambiguous responses. Overall, the survey response data provided a satisfactory information base for this analysis.

III. THE STATUS OF STATE EXCEPTIONAL WATERS PROGRAMS

Categorizing Exceptional Waters Programs

Many states with coldwater riverine fisheries have elements of what we have termed "exceptional waters" management programs. We want to stress that we are distinguishing between "exceptional waters" and the much narrower concept of "special fishing regulation waters." While exceptional waters commonly have special fishing regulations applied to them, special fishing regulations are not a requisite and represent only one of a large array of management tools that can be employed to attain objectives.

In some places, special fishing regulations have been applied to the "best" waters. The waters subject to these regulations have often been identified based on the subjective judgments of fisheries managers, without explicit criteria. We want to consider whether an explicit classification system should underpin identification of such exceptional waters; and, in turn, how can those waters be managed using a variety of tools, including special fishing regulations?

To examine these questions, we identified a subset of states that have established, fully developed exceptional waters management programs. We used the following threshold criteria to differentiate these exceptional waters states:

- 1) use of a formal classification system by which exceptional waters are identified;
- 2) use of a formal process by which these waters are officially designated;
- 3) coordinated or integrated management programs stemming from the designation, thus linking traditional fisheries management measures to other complementary natural resources management actions.

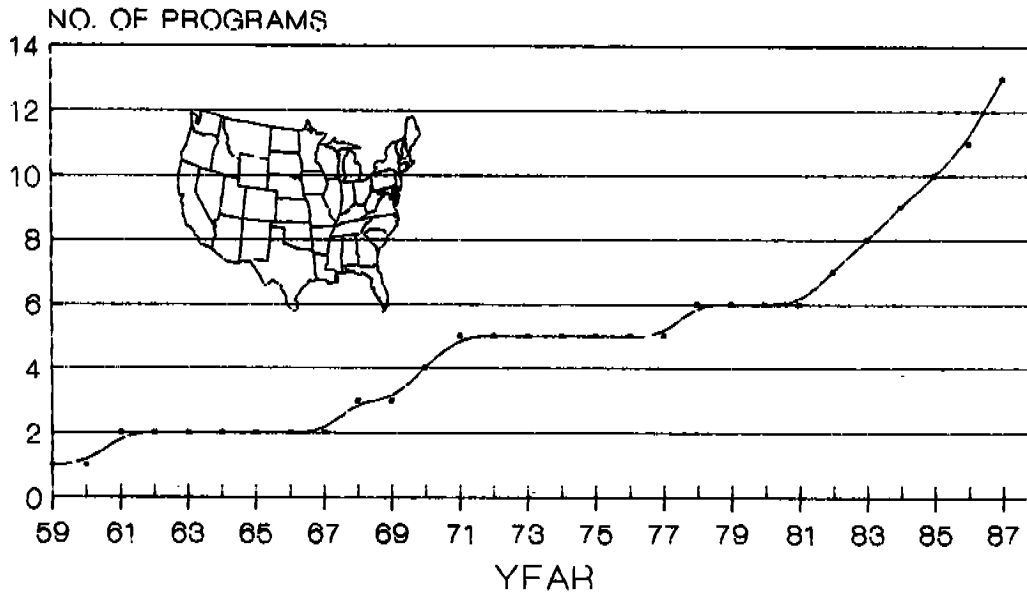
Those states not meeting all of the criteria were considered not to have a formal exceptional waters management program. However, many of the states in this latter category have components of such a program. Several states, for example, had informal classification schemes with management implications. Others had no provision for formal exceptional waters designation. Some states have formal exceptional waters programs under development and likely would be grouped differently a few years hence. We emphasize that the absence of an exceptional waters management program does not suggest a state is lagging in its management efforts; some states simply have focused their management efforts differently.

Findings

Based on the above criteria, 13 U.S. states (one-third of the 39 states with coldwater riverine fisheries) have formal exceptional waters management programs: Alaska, California, Colorado, Idaho, Kentucky, Maryland, Michigan, Missouri, Montana, New Hampshire, Oregon, Pennsylvania and Wyoming. The states vary in geographic region, miles of coldwater riverine systems, resource potential, population and industrial base. Their programs range from Maryland's fledgling program, begun in 1987 and managing five miles of designated exceptional waters, to Montana's senior program, established in 1959 and now managing 581 miles of exceptional coldwater riverine systems (Figure 1).

State responses show the exceptional waters concept to be a highly flexible one for balancing needs of fish, anglers and other stream users. Densely populated Maryland has a limited coldwater

EVOLUTION OF U.S.A. EXCEPTIONAL WATER PROGRAMS SINCE 1959



resource--only 400 miles of trout streams--while sparsely populated Montana is resource rich--14,200 miles of trout waters.

Pennsylvania, with 11.9 million people, a substantial industrial sector and 10,000 coldwater riverine miles, went to an exceptional waters management system in 1983 and now has 400 miles designated as exceptional waters. Michigan, another state having a plentiful resource (15,000 miles of trout streams) and large industrial base, started an exceptional waters program in 1985; it now has 950 miles designated exceptional.

Many states with significant coldwater riverine fisheries and well-developed management programs did not fit our criteria. Three states--Connecticut, Massachusetts and Wisconsin--have highly developed management programs and are in the process of developing formal exceptional waters programs (or their equivalents) to focus on those riverine systems needing special management attention. Other states, such as those in the southern Appalachians, have fisheries management programs that recognize the important and fragile wild trout resource; however, they lack a formal and public designation procedure or management practices going beyond special fishing regulations and other traditional fisheries management tools. And seven others--including Vermont and Washington--said they have no classification system of any kind for their coldwater riverine resource.

We emphasize again that states without a formal exceptional waters program are not necessarily lagging in management efforts. States may be using other approaches that could well be best for them. But survey data and follow-up telephone interviews indicate

that the exceptional waters framework is in place and working in a number of diverse states.

IV. THE IDENTIFICATION OF EXCEPTIONAL WATERS

Introduction

To specify the range of applicable criteria, states having coldwater riverine resources were asked to identify factors they used in identifying exceptional waters (Table I) and whether the classification scheme was formal (based upon explicit written criteria) or informal (relying upon subjective judgments of professionals). We organized relevant factors commonly used to characterize trout and salmon fisheries and to inventory water resources under six broad headings: 1) fishery characteristics, 2) unique natural resource attributes, 3) historical significance attributes, 4) accessibility attributes, 5) user demand/fishing pressure, and 6) unique angling factors. Survey respondents were then asked if they employed any kind of rating or ranking system, and, further, if any of the factors were essential and of "overriding" importance in the selection of exceptional waters.

The results presented in the following sections (Table I) indicate which factors are utilized by states with exceptional waters (hereafter EW) programs in the identification/classification of those resources. Many of the same characteristics were viewed as important by non-EW states, though they were cited less frequently.

Fishery Characteristics

These factors are commonly used by fisheries biologists to characterize a fishery and to measure a stream's productivity or

Table I

Factors Used by States to Identify Exceptional Waters

<u>Fishery Characteristics</u>	<u>EW (N=13) Number (%)</u>	<u>Non-EW (N=24) Number (%)</u>
Special or Rare Native Species	5 (38)	5 (21)
Wild Trout/Natural Reproduction	12 (92)	10 (42)
High Growth Rate Biologic Productivity	6 (46)	7 (29)
High Standing Stocks/Carrying Capacity	10 (77)	7 (29)
Trophy Trout	7 (54)	5 (29)
Other Fishery Characteristics	1 (8)	0 (0)
<u>Unique Natural Resource Attributes</u>		
Wild Undeveloped Landscape	7 (54)	5 (21)
Scenic Features	6 (46)	5 (21)
Exceptional Water Quality	6 (46)	5 (21)
Stream Characteristics	5 (38)	4 (17)
Stream Flow Characteristics	3 (23)	3 (13)
<u>Historical Significance Attributes</u>		
Past Usage	4 (31)	1 (4)
Public Investment in Watershed	2 (15)	2 (8)
Historical Significance	2 (15)	0 (0)
<u>Accessibility Attributes</u>		
Near Population Centers	3 (23)	1 (4)
Public Access	7 (54)	4 (17)
State Park/Other Public Lands	5 (38)	2 (8)
Other Accessibility Attributes	1 (8)	1 (4)
<u>User Demand-Fishing Pressure</u>		
General Popularity	4 (31)	4 (17)
User Group Interest	2 (15)	3 (13)
Other User Demand/Fishing Pressure Factors	2 (15)	0 (0)
<u>Unique Angling Factors</u>		
Insect Hatches	2 (15)	2 (8)
Trophy Fishing Opportunities	5 (38)	7 (29)
Angling Challenge	1 (8)	1 (4)
Ease Wading/Casting	1 (8)	3 (13)

its capabilities to support coldwater salmonid species. For both EW and non-EW states, "wild" trout/natural reproduction is the most often used factor among all categories for identifying EW. Twelve of the 13 EW states (92 percent) said they used "wild" trout/natural reproduction; 10 of the 24 non-EW states (42 percent) used that factor. Other often-used characteristics in this category include: high growth rates/biologic productivity; high standing stocks/carrying capacity; and presence of trophy trout. States with mature EW programs, such as Montana and Pennsylvania, often employ quantitative criteria and/or relatively sophisticated numeric rating systems as a basis for determining the comparative worth of stream fisheries.

Unique Natural Resource Attributes

These characteristics captured many of the aesthetic criteria used in identifying EW. For both EW and non-EW states, three factors dominate: 1) wild, undeveloped landscape; 2) scenic features; and 3) exceptional water quality. More than half of the EW states (54 percent) use wild, undeveloped landscape as a key factor.

Historical Significance Attributes

These factors attempted to focus on how states viewed waters that have traditionally (not necessarily formally) been recognized as exceptional. Only EW states used these factors to any extent, and only one of the category's factors--past usage--received significant response (31 percent).

Accessibility Attributes

These factors indicated if states viewed angler accessibility (or inaccessibility) as important in choosing exceptional waters. For both EW and non-EW states, availability of public access is the most widely used criteria (54 percent of EW states; 17 percent of non-EW states). EW states also view the location of streams--near population centers and proximity to state parks or public lands--as important in determining what waters are exceptional.

User Demand/Fishing Pressure

These factors indicated the extent to which fishing groups and anglers in general affect selection of EW. For both EW states and non-EW states, general popularity and user group requests are important. For EW states, general popularity has more effect than user group request (31 percent to 15 percent).

Unique Angling Factors

These factors showed whether states took into account practical angling considerations, such as ease of wading and significant insect hatches. In both EW and non-EW states, trophy fishing opportunities for anglers are viewed as most important. Insect hatches are viewed as more important by EW states (15 percent to 8 percent).

Summary

In addition to the frequency with which various factors are used in identifying exceptional waters, the survey data provide insights regarding what EW states deem to be critical or "overriding" in the

recognition of these resources. The overriding factors most commonly used by EW states include "wild" trout/natural reproduction (eight states), high standing stocks/carrying capacity (eight), trophy trout (four), and public access (four). These are all established criteria used by fisheries management professionals in generally assessing fisheries. In fact, most EW states use their overall stream-fisheries resource classification scheme for differentiating exceptional waters.

Note that fisheries specialists tend to weigh less heavily criteria that fall outside their immediate management responsibilities. For example, criteria such as scenic features, exceptional water quality or proximity to state parks and public lands are generally not ranked among the most important. A broader approach may be more appropriate in light of trout anglers' changing attitudes. As recent studies show, anglers are not just looking to harvest fish; they also want to find aesthetically pleasing, clean-water settings in which to enjoy the outdoors (Jackson and others, 1988). Clearly, fish population factors (species, number, size, etc.) are requisites in identifying exceptional waters. But the quality of recreational fishing also depends on access, facilities available, local aesthetics, etc. (D. Rimmer, Alberta Fish and Wildlife, personal communication, 1988). A high quality fish resource base by itself may not qualify as an EW, i.e., there is an important difference between a fish population and an EW fishery based on the fish population.

V. THE ORIGINS OF EW PROGRAMS AND FORMAL DESIGNATION OF EXCEPTIONAL WATERS

Origins of Exceptional Waters Programs

Survey respondents were asked to indicate what led to creation of their EW programs. Choices included support from the general public, support from special interest groups, a legislative proposal, a gubernatorial proposal, a proposal from state fisheries or natural resources agency staff, a proposal from fisheries or natural resources board or commission, or an idea that originated with one or several influential citizens. The results support the notion that the origins of most EW programs are rooted in the fisheries agency or unit. Ten respondents indicated their EW programs originated with a proposal from state fisheries or natural resources agency staff. Support from special interest groups was indicated five times, while support from the general public was indicated four times. Note that no EW state indicated the EW program idea came from the Legislature or Governor, suggesting such issues are relegated to fishery agencies, their professional staffs, and client groups for action and decisions.

Formal Designation of Exceptional Waters

Identification of exceptional waters is only one of the requisites for a state to be categorized as having an EW program. Having identified its exceptional coldwater resources, a formal designation of those waters for special management attention is a key ingredient of a fully developed EW program. Only when the significance of this portion of a state's resources is officially acknowledged can management opportunities be fully pursued--within

the fisheries management agency, with sister state agencies, with other levels of government, with the Legislature, and with the general public.

States formally designate their EW by legislation, administrative rules of an authorized state agency, or incorporation into state fishing regulations. Although some survey responses were not definitive (in part because respondents were not always familiar with administrative and governmental procedures), results indicate that the majority of mechanisms for EW designation rest with the fisheries agency. As expected, administrative rules and fishing regulations are the most widely used mechanisms for formal designation of EW by the 13 EW states. Seven states employ administrative rules while six use fishing regulations to designate EW. Four states--California, Michigan, Missouri and Oregon--indicated that some form of governing board or commission is responsible for formal designation. Wyoming fisheries agency staff include the EW waters in an inventory and then "officially" map them.

VI. STATE MANAGEMENT APPROACHES FOR EXCEPTIONAL WATERS

Introduction

This study was designed not only to determine which tools are most prevalent in state EW management programs, but to ascertain to what degree various management tools are used in complementary ways to better attain EW management goals. Lack of coordination among related resource management programs is a longstanding problem; solutions are elusive. The necessity for coordination is especially evident in the management of EW, where lead program responsibility generally rests with the fishery management agency. Nevertheless, much of the ultimate programmatic success depends on non-fisheries management activities. EW programs are representative of many current complex natural resource management problems where there is both need and opportunity to integrate compartmentalized but inter-related programs and activities. Experience with EW programs, therefore, may have transfer value to many resources programs.

Management Tools and Their Use

A large array of scientific and technological, economical, legal and educational tools comprise the "tool kit" for managing EW. For purposes of this study, management tools were categorized under three broad headings: 1) fish management tools; 2) natural resources management tools, including water quality, quantity, and watershed land use management tools; and 3) stream user management tools. Sub-categories and the frequency of use of tools by states with EW programs are shown in Table II.

Table II

Management Tools used by States with Established
Exceptional Waters Programs

<u>Tool</u>	<u>% Used</u>
Fish Management	
Fish Population Management/Stocking	92
Instream Habitat Management	92
Special Fishing Regulations	100
Water Quality Management	
Standards Setting	92
Point Source Discharge Permits	92
Nonpoint Source Land Use Practices	
Shoreland or Riparian Zone Controls	54
Agricultural Restrictions	46
Silvicultural Restrictions	62
Other (Mining, Transportation) Restrictions	62
Recreational Restrictions (e.g., snowmobiles)	31
Water Quantity Management	
Instream Flow Reservations or Allocations	54
Surface Water Diversions/Withdrawal Limitations	62
Groundwater Management	31
Regulation of Dam Flows for Tailwater Fisheries	77
Other Watershed Management Tools	
Restrictions to Protect Scenic Beauty/Viewshed	54
Special Planning or Review Requirements Within Watershed	62
Priority for Public Acquisition of Land	54
Priority for Private Acquisition of Land	62
Stream User Management	
Public Information Programs	62
Limited Entry	15
Reservation Use or "Beat" System	15
User Fees Charged	15
Special Fishing Regulations (e.g., flies only)	54
Motorized Access Restrictions	23
Restrictions on Non-fishing Uses (e.g., boating)	31

As expected, fish management tools--fish population management and stocking, instream habitat management and fishing regulations--are the most widely used. These range from stocking programs guided by detailed numeric criteria to sophisticated wild and native fish management strategies to instream habitat and streambank restoration programs. These fish management tools are part of the traditional arsenal of fishery professionals and as such, have been the focus of much fish management activity. However, there is considerable variability in the use of other management tools by the states.

Water quality management tools should play a major role in EW programs. Indeed, as Table II shows, standard settings and point source discharge permits are used by most of the states with EW programs. However, nonpoint source pollution controls, such as agricultural restrictions, silvicultural restrictions and other land use controls were used less frequently. Agricultural restrictions are used by less than half of the states, even though drainage from agricultural lands is considered one of the major sources of sediments and other pollutants to most riverine systems (Sonzogni, et al, 1980). Silvicultural and development restrictions, such as those on mining and transportation, are, in fact, used more frequently than agricultural restrictions as a nonpoint source management tool. It should be noted that silvicultural and mining/transportation restrictions are applied mostly by Western states.

Water quantity management tools are widely used in conjunction with state EW programs, with more than 77 percent of EW states

indicating they regulate dams for tailwater fisheries. Recent successes at developing thriving coldwater tailwater fisheries below warmwater impoundments in all parts of the country have made flow regulation and release operating rules critical tools. More than half of the EW states use minimum instream flow reservations or allocations and control of surface water diversions or withdrawal limitations.

Although groundwater flow is the lifeblood of many coldwater riverine systems, groundwater management tools are infrequently used. The constant supply of cold water from springs and other groundwater discharges is what makes many streams, including spring creeks, very special and productive trout fisheries. Well-developed EW programs, such as those in Montana and Pennsylvania, give specific attention to their spring creeks. Protecting groundwater sources by preventing land use changes that limit groundwater recharge or impair quality may be necessary for the long-term survival of these streams.

Natural resources managers are coming to recognize that managing the resource itself is only part of the management equation. Understanding the sociologic aspects of resources management is a critical component. Thus, the survey sought information pertinent to managing the EW user community. Public information programs and special fishing regulations are the most widely used management tools to influence the behavior of the user community. Restrictions on recreational uses that might conflict with angling, such as canoeing and rafting, are used in about one-third of EW states. Other user management techniques, such as limited entry and user fees, were used infrequently (Table II) but may become more widespread with increasing user pressure on the resource.

Dispersion of Authority

Given our hypothesis that coordinated natural resources management can be essential to achieving the objectives of state EW programs, we sought information regarding the dispersion of management authorities. Survey respondents were asked what organizational entities were responsible for the use of those management tools identified in Table II. Our intent was to document the extent to which authority for use of these tools resides outside the fish management unit or agency. As expected, we found that agencies other than the fisheries agency are commonly responsible for the array of related natural resources management functions. This is especially true for water quality standards setting and point source discharge permits, as well as land management in watersheds. Conversely, stream user management of EW is often the responsibility of the fishery agency itself.

Because of variations in governmental organization among states and incomplete survey responses, it was not possible to get detailed documentation of the dispersion of authority. Based on a review of responses, it is apparent that management authorities affecting EW programs are widely distributed. Montana is illustrative.

Water quality management in Montana is largely the responsibility of the state Department of Health and Environmental Sciences, though Fish, Wildlife and Parks has a role. Nonpoint source land use management practices are divided among Fish, Wildlife and Parks, the Department of State Lands, federal agencies such as the Corps of Engineers and the U.S. Forest Service, and local entities such as conservation districts. Water quantity management

is largely the responsibility of the state Department of Natural Resources and Conservation. Regulation of flows from dams and tailwater fisheries is shared among federal agencies, Fish, Wildlife and Parks and the Department of Natural Resources and Conservation. Stream user management tools are largely the responsibility of Fish, Wildlife and Parks.

In other states, such as California, limited entry policies and restrictions on stream uses are the responsibility of local units. Private entities--individual landowners and groups like the Nature Conservancy--play variable roles in land management and acquisition. In sum, in most states we examined there is substantial dispersion of the requisite authorities for sound management of their fisheries, the surrounding watershed, and the user community. This suggests the importance of coordinated, if not fully integrated, resources management.

Coordination with Related Programs

Given that one attribute of our criteria for a state EW program is coordinated resources management between the fishery program and related programs, the survey attempted to identify the types of management programs linked (directly or indirectly) to a state's EW program. The percentage of positive responses by those states with formal EW programs are listed in Table III. The results varied from 31 to 77 percent, except for groundwater management programs. Table III also shows that groundwater management apparently plays a small role in EW programs in most states. Clearly, state and federal wild and scenic river programs (69%) are closely coordinated with EW

Table III

Natural Resource Management Programs that are Coordinated
with Formal Exceptional Waters Programs

<u>Programs</u>	<u>% of States</u>
Water Quality Management Programs	
Point-Source Pollution Abatement	77
Nonpoint-Source Pollution Abatement	69
Water Quantity Management Programs	
Minimum Instream Flow Reservations	54
Surface Water Diversion or Withdrawal	38
Groundwater Management	15
Regulation of Flows from Dams for Tailwaters	62
Land Management Programs	
On Private Lands of Utilities or Industries	38
On Lands Owned by Conservation Groups, etc.	62
State Programs	
Wild/Scenic Rivers	69
State Parks	38
Special Areas (historic, wildlife refuge)	54
Federal Programs	
Wild/Scenic Rivers	69
National Parks	54
National Recreation Areas	31
Other Areas (historic, scientific, wildlife)	38

programs. State responses indicating no coordination with federal programs may simply be the result of little or no federal land presence in the state.

Given the intricate relationship between water quality and fisheries, and the reported high level of coordination (77%, Table III), we were interested in whether EW programs (and coldwater fishery programs generally) capitalized on the potential of new water quality programs. The federal Clean Water Act of 1987 required states to develop and adopt anti-degradation policies as part of their water quality management programs. As part of this new anti-degradation policy, states must designate "outstanding national resource waters" that will receive the highest level of protection. One might expect a correlation between EW programs and anti-degradation water quality programs because of their complementary objectives. While most EW states have also adopted an anti-degradation policy, our survey results indicate that only a few states closely linked these two programs.

Information on specific coordination mechanisms was also sought. Table IV summarizes the frequency of use of various mechanisms. Joint planning, plan review, informal communication, and environmental impact reviews are cited most often. Note that of the four mechanisms most used, all except joint planning might be considered passive or reactive coordination mechanisms. Further, the mechanism used more than any other, both by states with formal EW programs and those with less-developed programs, was "informal communication." This indicates that coordination, while definitely occurring and undoubtedly an intent within state programs, still largely relies on informal arrangements. Mechanisms that require more resource commitment (e.g., cost sharing and joint staffing) are less common.

Table IV

Coordination Mechanisms Used by States
with Exceptional Waters Programs

<u>Coordination Mechanism</u>	<u>Use</u>
Joint Planning	Frequently
Plan Review	Frequently
Formal Coordinating Committees	Rarely
Informal Communication	Frequently
Memoranda of Understanding	Occasionally
Environmental Impact Reviews	Frequently
Cost-Sharing for Acquisition, Studies, etc.	Occasionally
Joint Staffing or Staff Sharing	Occasionally

VII. IMPLEMENTING EW PROGRAMS--LESSONS FROM THE STATES

Introduction

A significant number of states have organized formal exceptional waters programs as an important component of their overall fisheries, water and natural resources management programs. To provide more specific perspectives on state EW programs, we briefly profile here three representative examples. Pennsylvania, Montana, and Kentucky were selected because they 1) represent a wide range in geography and resource base, 2) have relatively mature EW programs (and thus experience in program implementation), and 3) illustrate the variability in scale of EW programs. We have supplemented survey responses and program documents with a limited set of telephone interviews for ideas about what factors are critical to successful implementation of EW programs. A detailed analysis of state implementation experiences would require in-depth site visits, program reviews, and structured interviews with pertinent actors. While such an analysis is beyond the scope of this study, we hope the information presented in this section will be of value to states with fledgling EW programs and to states contemplating the establishment of EW programs.

Montana

History and State Profile

In area, Montana is the third-largest state in the nation. With only about 800,000 residents, it is one of the most sparsely populated states. The fish and wildlife resources of the state are

an important component of Montana's high quality of life. Fishing demand is growing and Montana presently ranks third nationally in nonresident fishing license sales with 280,000 in 1987. Over half of the more than 3 million angler days spent fishing is on streams. A recent survey by Montana's Fish, Wildlife and Parks agency estimated sport fishing had a net economic value of \$215 million (Graham, 1988). Montana's mountainous terrain constitutes the headwaters of some of the nation's largest river systems. There are approximately 14,200 miles of rivers and streams in the state supporting salmonids; 581 miles are designated as "blue ribbon fisheries."

In 1906 the Montana Department of Fish and Game built its first hatchery at Anaconda, and hatchery production of trout was a dominant theme of state fish management into the 1960s. Montana was a national leader in concluding, based on research studies, that most streams have adequate natural reproduction and should not be stocked because planting harms wild trout populations. This conclusion shifted the state's trout stream management focus from stocking to protection and maintenance of good fish habitat. Since 1974 nearly all trout streams have been managed for wild populations. Montana enacted one of the earliest streambank protection laws in the nation (1963) and has been a leader among Western states in passing legislation and taking action to reserve instream flows for fisheries and other beneficial uses. The net result of Montana's coldwater fisheries and environmental management programs is the maintenance of some of the nation's most legendary trout fisheries, including the Madison, Gallatin, Yellowstone, Missouri, Bighorn, Big Hole, Beaverhead, and Rock Creek.

Current Program

Montana's EW program is very mature and well-established. It has a sophisticated inventory and classification component, a formal designation mechanism, and reflects strong efforts to achieve more integrated resources management.

In 1958 the Department, in cooperation with federal agencies, developed a stream rating system to communicate the comparative worth of Montana's trout streams. In 1959 the official EW program was started with the designation of specific "blue ribbon fisheries." Building upon Montana's long-established interagency stream fishery data base, the state's stream rating system was recently revised in conjunction with the Pacific Northwest Rivers Study (a study performed under the auspices of the 1980 Northwest Power Planning Act to identify resource considerations that might preclude hydropower development on the region's rivers). Montana's classification and ranking system is elaborate and explicit. A numeric assessment scheme deals with two categories of stream reaches: 1) habitat and species value and 2) sport fishery value. The habitat and species category not only considers important habitats of fishes of special concern, but it can also account for local community significance, including special recognition of spring creeks. The determination of sport fishery value is based on an evaluation using 1) fish abundance, 2) public access, 3) aesthetics, and 4) fishing pressure. Criteria are quantified to a high degree. For example, fish abundance is indicated by biomass (where available) and fishing pressure is measured in fisherman-days/year/10 km. The classification system provides for consideration of traditional

fishery characteristics (special native species, self-sustaining natural reproduction, high standing stocks, and trophy fish), and for other important factors (scenic features and undeveloped landscapes, public access, and user demand). This formal rating system thus identifies reaches of Montana streams for inclusion in the state's EW system. Official designation is accomplished by administrative rules adopted by the Department of Fish, Wildlife and Parks.

The Fisheries Management Bureau uses traditional management tools in its fish management programs, including population management practices, instream habitat management, and special fishing regulations. As noted above, stocking of salmonids is largely limited to lakes and reservoirs. Montana, like many other states, had a longstanding policy of keeping fishing regulations simple. This policy was reversed as increasingly complex regulations were needed to regulate harvest and to sustain both the quality and diversity of opportunity of fishing experiences (Graham, 1988). Portions of 20 streams presently have special regulations.

The fisheries unit long has recognized the importance of other natural resources management measures for which they had limited or no authority, and it has been aggressive in linking with other state units and federal agencies with management authorities influencing their fishery management objectives. The bureau collaborates with the state Department of Health and Environmental Sciences in the state standard-setting and point source water quality management program. Coordination mechanisms employed include environmental impact reviews and shared staffing. The bureau uses joint planning and informal communication in working with other Fish, Wildlife and

Parks units, conservation districts, and the Army Corps of Engineers in riparian zone land use regulation. Water quantity management, including instream flow reservations for fisheries and surface water withdrawal limitations, are coordinated with the state Department of Natural Resources and Conservation. Specifically, water use permit applications on waters where Fish, Wildlife and Parks holds water rights or reservations are reviewed with regard to fishery concerns. Instream flows have been reserved for the Yellowstone River and many tributaries; the process for reserving water is in progress for the Missouri and Clark Fork rivers, which when completed will provide coverage for all but the northwestern part of Montana. In 1988 the Northwest Power Planning Council formally adopted the protected areas program, based on Montana's revised classification and river basin assessment. This action in effect provides protection to hundreds of miles of streams from the threat of low-head hydropower development regulated by the Federal Energy Regulatory Commission. Additionally, the fisheries program reviews plans and interacts informally with federal agencies, especially the U.S. Forest Service, regarding watershed and other resource decisions affecting the fishery.

Montana's EW program has made significant efforts to link the fisheries program to water quality, water quantity, and land management. The management program has not only been directed at the resource but has also focused on the users. Surveys have been conducted to measure trout anglers' preferences and to assess change in angler opinion. Active and early public involvement in agency planning has become the norm. The Upper Bighorn River Fisheries Management Plan 1987-92 (Montana Department of Fish, Wildlife and

Parks, 1987) and public involvement process epitomizes Montana's continuing commitment to maintain its EW. Montana does not anticipate increasing its mileage of blue-ribbon streams; by limiting this designation to 5-6 percent of the resource base, Class I streams will truly mean exceptional waters (S. McMullin, Montana Fish, Wildlife and Parks, personal communication, 1988).

Pennsylvania

History and State Profile

Pennsylvania, a state with 11.9 million people and a large industrial base, has a diverse fishery. It is rich in high-quality coldwater riverine systems, from Upper Delaware tributaries to Appalachian Mountain brooks. Of its 45,000 miles of flowing water, about 10,000 are managed to provide trout fishing (Pennsylvania Fish Commission, 1986). About 400 miles of those trout waters are managed as "exceptional waters," primarily based on the presence of wild trout.

The state's substantial residence receives heavy fishing pressure. About 60 percent of Pennsylvania's 1.12 million licensed and unlicensed anglers, about 850,000 people, fish for trout. A substantial majority of Pennsylvania anglers fish streams (Pennsylvania Fish Commission, 1986).

For years heavy demand drove a large hatchery-stocking program. In 1981 Pennsylvania fish commissioners shifted the state's philosophy from "recreation first" to "resource first." The policy's broad goal is to protect resources and provide continued and varied angling opportunity (Pennsylvania Fish Commission, 1986). A detailed

strategic plan, addressing sociological as well as biological issues, was formulated by a multidisciplinary task force of Commission staff and invited specialists. In practical terms, the policy shift meant self-sustaining trout populations would be nurtured and stocking would be limited. Annual hatchery production was expected to remain at about 5 million trout. The controversial policy, with attendant regulations and angler fee increases, went into effect in 1983.

Current Program

Pennsylvania has an advanced EW management program for its coldwater fishery. The trout management program has a detailed formal inventory, classification and identification system. Exceptional waters are officially designated either by Fish Commission or Commission staff (R. Snyder, Pennsylvania Fish Commission, personal communication, 1988).

Because data was lacking, Pennsylvania committed itself to a continuing scientific inventory of its fishery resource. The state began with a survey and inventory of all streams and lakes managed for trout, with a priority on stocked streams. An electronic data processing system was designed to analyze the large volumes of data from the survey, which was conducted 1976-82. From this data base came a formal stream classification system, based primarily on a stream's ability to support natural reproduction. Stream trout fisheries are classified first as either wild trout, hatchery trout or a hatchery-wild trout combination. Then streams are further classified according to abundance of trout, measured by biomass standards. For example, stream sections meeting certain standards are considered Class A and managed for wild trout only with no

stocking (Class B allows some stocking). Wild trout stream biomass standards are species-specific for wild brook trout, wild brown trout, mixed wild brook/brown trout and wild rainbow trout.

The Fish Commission uses a system of resource categories, objectively determined, which trigger certain management options. Criteria for the resource categories include: trout abundance, stream width, recreational use potential and human population density. Combined ratings for these criteria are used to determine the appropriate EW management option and resultant management mechanisms, such as special regulations or limited access. The EW management options, each with their own set of objectives and regulations, are wild trout waters, catch and release, limestone springs, fly-fishing only, trophy trout, wilderness trout streams and natural yield. The options are variously based on social considerations (fly-fishing only), stream and fish biology (catch-and-release and trophy) and habitat (limestone springs, wilderness and natural yield) (Pennsylvania Fish Commission, 1986; R. Snyder, 1988).

Pennsylvania's exceptional streams have natural reproduction. These streams represent the state's best waters--about 5 percent of the trout stream mileage (Pennsylvania Fish Commission, 1986). Management options designed for limestone springs and wilderness streams appear to represent the Fish Commission's best attempts at integrative watershed management. The limestone springs are targeted for special consideration not only because of their valuable trout habitat but also because of importance gained in traditions and values of fly fishing. This small part of the overall resource base is restricted to fly fishing.

Emphasis in the "wilderness trout streams" program (established in 1969) is based on providing "a wild trout fishing experience in a remote, relatively natural and 'unspoiled' environment." These streams are not stocked, although they may not meet the requisite biomass standards (R. Snyder, personal communication). This designation is not as restrictive on land-use practices as the federal or state "wilderness area" designation. But activity that would degrade "exceptional value" of the water is excluded. Mining activities, in most cases, are limited. But "responsible" timber management is allowed in some cases (Pennsylvania Fish Commission, 1986). A memorandum of understanding between the Fish Commission and the Commonwealth Bureau of Forestry results in buffer zones along all trout streams going through state forest land. Off-road vehicles generally are prohibited in these areas (R. Snyder, personal communication).

At first these wild trout streams were primarily "walk-in" streams with limited access. After the extensive stream inventory, the category was based on biomass of wild trout (R. Snyder, personal communication).

Water quality management is an integral part of Pennsylvania's EW management program, with primary responsibility housed in the state Department of Environmental Resources (DER). DER does not have a consolidated statewide watershed management program that considers water quality and water quantity issues, as well as surface and groundwater issues. In 1979 DER implemented a new set of water quality standards that includes two special categories for protection of special streams or watersheds--"high quality waters" and

"exceptional value waters." EW streams in the state can be placed under either of the two DER categories. A high-quality water is "a stream or watershed which has excellent quality waters and environmental or other features that require special water quality protection." An exceptional value water is "a stream or watershed which constitutes an outstanding national, state, regional or local resource, such as waters of national, state or county parks or forests, or waters which are used as a source of unfiltered potable water supply, or waters of wildlife refuges or state game lands, or waters which have been characterized by the Fish Commission as "wilderness trout streams," and other waters of substantial recreational or ecological significance (Chap. 93, P.L. 1987, Pennsylvania Code). Many EW streams were placed immediately in the EW category (R. Snyder, personal communication).

While DER is responsible for water quality management, the Fish Commission, an independent agency with regulatory authority over fish management, provides substantial input and technical advice (R. Snyder, personal communication). For example, the Fish Commission petitions DER to include certain waters under the high-quality or exceptional value categories.

Not all of Pennsylvania's EW are included in the more protective exceptional value water-quality category because of political-bureaucratic compromises and because of a five-year backlog of petitions. A natural tension appears to exist between DER and the Fish Commission over the water quality issue. Bureaucratic and political realities prevent the Fish Commission from going as far as it would like in placing EW under the exceptional value category.

Some dissatisfaction over DER enforcement of water quality regulations also seems apparent. But DER and the Fish Commission, by necessity, cooperate and share data (R. Snyder, personal communication).

Program monitoring is ongoing. In addition to an angler attitude survey to be conducted in 1991, the Fish Commission plans a reassessment of its entire wild trout program. A report is anticipated in 1990 (Pennsylvania Fish Commission, 1986; R. Snyder, personal communication).

Kentucky

History and State Profile

Kentucky, located in the southern Appalachian Mountain region, is moderately sized--both in area (40,409 square miles) and population (3.7 million people). It also has a modest coldwater resource (315 stream miles is classified as trout water), including about 90 miles of major tailwater fisheries and about 30 miles of mountain streams (with largely naturally reproducing stocks). Coal mining and farming are important industries, and pollution from them adversely affect the state's coldwater resources. The state's hot summers often make stream waters too warm for a year-round trout population. Thus, Kentucky has had to make special efforts to manage and enhance its limited resource.

About 600,000 Kentucky residents are licensed anglers. Coldwater species must compete with warmwater species for attention, but sportfishers have increasingly demanded more trout fishing opportunities. (One indication is that Trout Unlimited in recent

years has become an organized state group.) In 1984 the state Department of Fish and Wildlife Resources responded by moving to expand the coldwater fishery beyond the traditional put-and-take of hatchery trout. Extensive stream and trout population surveys began, and a stream rating system was devised. Following the 16-year-old lead of the U.S. Fish and Wildlife Service in Cumberland Historical National Park, the Department re-introduced brook trout into four publicly owned mountain watersheds and stocked brown trout fingerlings in about 11 others--all on federal land. In addition, stocking in the tailwaters fisheries has resulted in trophy trout fishing opportunities.

Kentucky in the 1980s also made a commitment to comprehensive watershed planning. Detailed statewide water management plans were written in 1984 and 1987. Important water resources legislation resulted from the 1984 plan, and the 1987 plan sets laudable goals in managing the state's waterways for, among other things, water quality, water quantity and groundwater protection.

Current Program

Kentucky's EW program, because it manages a more modest and much different resource base, differs significantly from EW programs in Montana and Pennsylvania. Kentucky relies more on stocking than those two states, but less on complicated special regulations. The five major tailwater fisheries receive yearly stockings of 8-inch trout. And for the first time outside of the Cumberland National Park, a special harvest restriction will be in effect on 13 miles of brook trout waters: a daily limit of two brook trout at least

10 inches long can be taken after Jan. 1 only with artificial lures or flies. The current statewide limit is eight trout of any size (J. Axon, Kentucky Fish and Wildlife, personal communication, 1988).

Because of climate, geography and land ownership, Kentucky must also stress cooperation with the U.S. Forest Service and the U.S. Army Corps of Engineers. Agreements with the Forest Service provide important "shade strips" and undisturbed watershed protection to fragile mountain streams and trout requiring low turbidity and temperatures. All but one of the five major tailwater fisheries have minimum instream flow requirements to benefit the trout fishery. (T. Anderson, Kentucky Division of Water, personal communication, 1988; J. Axon, personal communication). Increased monitoring and support for water resources set out in the state's latest water management plan bolster the expanded coldwater fisheries effort (Natural Resources and Environmental Protection Cabinet, 1987).

Since 1978 the state's Division of Water (in an agency separate from Fish and Wildlife) has classified the state's water resources into coldwater aquatic, warmwater aquatic and outstanding resource waters. Streams supporting year-round populations of trout fall into the coldwater aquatic category, providing more protection from pollution sources such as coal mining. A coal strip mine operator, for example, would have to obtain permits from the state's Department for Surface Mining Reclamation and Enforcement and from the Division of Water before mining in the watershed of a stream designated coldwater aquatic. The presence of a restored native trout population would play heavily in the decision to grant the permit (T. Anderson, personal communication).

However, few streams that state Fish and Wildlife considers EW are included in the more highly protected outstanding resources waters category. That category is reserved for riverine systems under the state's Wild Rivers program (established 1972) and those waters containing endangered species. The Division of Water does not take into account Fish and Wildlife's in-house stream ratings system, which is used to formally classify the state's coldwater resources. The biologically based ratings system considers the following criteria: water quality, turbidity, stream temperature, instream habitat, fish population, aesthetics and angler utilization. A numerical rating is calculated, and the stream is accordingly designated by the fisheries agency for certain management practices, such as re-introduction of native species (J. Axon, personal communication, T. Anderson, personal communication).

Because the fisheries agency is assigned to the Tourism Cabinet in the state bureaucracy (it formerly was in Commerce), cooperation with sister natural resources/environmental protection departments and agencies is essential. Informal cooperation between actors is frequent and complements formal mechanisms such as Memoranda of Understanding and interagency committees. Philosophical differences sometimes exist between fisheries and other natural resource managers, but the movement toward comprehensive watershed planning is helping overcome those obstacles (Natural Resources and Environmental Protection Cabinet, 1987; J. Axon, personal communication; T. Anderson, personal communication).

Program Implementation Strategies

EW programs can be controversial and thus difficult to adopt and implement. To gain insights into the development and implementation of successful EW programs, we contacted a limited number of state fisheries managers, user group leaders, and other knowledgeable individuals in the above case states. Through interviews, we sought their opinions about the key strategies and factors associated with the acceptance and implementation of EW programs in their states.

Successful EW states place a premium on good data and analysis. The programs stand the test of time and withstand challenges because sound scientific bases for EW programs are provided, along with carefully constructed classification system. Continued monitoring and data analysis are essential to make adjustments in programs. At the same time, EW fisheries professionals caution that even without the desired data base, states should not be reluctant to rely on good professional judgment, especially in the early phases of EW programs. States funded data collection and monitoring creatively by making these activities conform to the available funding and seeking added money from various federal programs and other financing sources.

EW programs have been developed without significant involvement of state political leaders. However, the full support of the top administrative levels of the agency is essential. Furthermore, EW programs must be enthusiastically endorsed by the scientific community in that the support of leading academic experts and specialists from other agencies (e.g., U.S. Fish and Wildlife

Service) gives further technical legitimacy and stature to programs. Finally, there must be strong professional leadership from within the fisheries agency to serve as a driving force in program implementation.

Aggressive, well-orchestrated public information and education efforts--starting during program development and continuing throughout the life of the program--are critical for advancing EW programs. Fisheries agencies have prepared information documents, developed special sections for state natural resource magazines, utilized popular media, made countless talks to constituent and other groups. Close ties with potential support groups, as well as other directly affected parties, are crucial. All states emphasized the need to be fair, objective and scrupulously honest in conducting information/education activities. At the same time, agency staff should not be hesitant to point out management success stories. Montana attributes the wide public acceptance of its EW program to an intensive multi-year public education campaign about the importance of quality habitat and river values; this effort has raised public consciousness and ultimately helped establish a broad base of support, including economic development interests.

User surveys can be important tools in carrying out EW programs. Although neither Pennsylvania nor Montana utilized user preference surveys prior to undertaking their EW programs, both states now subscribe to their value. The chief fisheries biologist for Montana for three decades of program implementation was initially skeptical about surveys but now believes them to be invaluable

management tools, especially where more restrictive regulations on resource users are contemplated (G. Holton, Montana Fish, Wildlife and Parks, personal communication, 1988).

One interesting strategy recommendation coming from Pennsylvania involves capitalizing on the opportunity to make significant changes when presented with the chance. Rather than making incremental changes, an agency should consider moving decisively and making broad programmatic changes all at once. By doing so, public understanding and support need not be re-energized with each small programmatic step.

Another key strategy is to attempt to tie EW programs to other related programs, from water quality programs to local natural area inventory activities. EW program staff should search for a basis for cooperation and take the lead in moving towards more comprehensive coordinated resources management. Efforts are needed to get other key parties to take a vested interest in EW programs, expanding the base of programmatic support and involvement. EW programs can be measurably strengthened by actively linking to related efforts, such as Montana's participation in the Pacific Northwest Power Planning Council's river basin assessments.

Finally, successful EW program staff stress the importance of being persistent. Implementation takes time, and EW programs will need to be tailored to address changing threats and opportunities.

VIII. SELECTED NON-STATE EW PROGRAMS

Introduction

EW program activities are not limited to states. Some of the most "exceptional" waters and coldwater fisheries are found in lands administered by federal agencies, including the National Park Service, the U.S. Forest Service and the Bureau of Land Management. Such agencies operate management programs similar in many ways to the EW programs described here. Some non-governmental entities have also initiated programs for specific waters that represent leading examples of EW management. While our focus in this study is on state experience, the following section illustrates some types of non-state programs that fit the EW framework. We have also briefly summarized the responses of Canadian provinces to the survey, which although skeletal, provide some measure of EW programmatic activity elsewhere in North America.

Yellowstone--National Park Service

Yellowstone National Park, the first national park in the United States (1872), represents a unique exceptional waters case because the entire region (and riverine system) is exceptional. Within the park's 2.2 million acres in northwest Wyoming and parts of Idaho and Montana are some of the best coldwater streams in the world. Fisheries biologists (and anglers) recognize the special characteristics of the Yellowstone River, the Madison, the Firehole

and Slough Creek, among others. In addition, the park, which is 80 percent forested, encompasses a variety of unique floral, faunal and geologic features--hot springs, geysers and canyons. While the park has an excellent angling reputation, Yellowstone fisheries managers are dedicated to preservation of wild trout and the freshwater environs only as they relate to the larger ecosystem. Providing ample angling opportunities is secondary.

Yellowstone National Park was established while surrounding states were still territories, thus the National Park Service has exclusive legal jurisdiction within park boundaries. The park superintendent has great independence in administering new programs. However, this broad jurisdictional authority is complicated by bordering governments: three states, seven counties and five national forests in three different regions of the national forest system. Growing gateway communities exist at each of the five paved entrance roads into the park. There are concerns that the park's jurisdiction doesn't go far enough in coping with the demands presented by approximately 2.5 million annual visitors (about 200,000 of whom are anglers).

Yellowstone National Park is classified as a natural area and thus managed to preserve pristine conditions (Jones, 1984). Fish, unlike other forms of wildlife, may be harvested in some circumstances. The undeveloped nature of the park, coupled with federal ownership, practically eliminates the need for traditional water quantity and quality management and developmental controls. Thus the EW program here is largely focused on management of fish and the recreational user community.

The park's sport fishing program goals are:

- 1) to manage the fishery as an integral part of the park's ecosystem.
- 2) to preserve and restore native species and aquatic habitats.
- 3) to provide anglers with a high-quality angling experience with wild trout in a natural setting (Jones, 1984).

Sportfishing has been popular in Yellowstone since its creation as a national park. In the mid-1930s, park administrators banned stocking of non-native fish in native fish waters. Native fish included three subspecies of cutthroat trout, the Montana grayling and mountain whitefish (Jones, 1979). Commercial fishing existed until 1917. Only in the latter part of this century have highly restrictive fishing regulations been established.

Since the 1960s protection and maintenance of fish populations and natural aquatic habitat have had priority over angler harvest. Special angling regulations have proven best for accomplishing these goals. Catch-and-release-only regulations were implemented in 1973 on several popular roadside waters, selected because heavy fishing pressure was hurting the stocks. This type of regulation has provided maximum protection of fish stocks as determined by numbers, biomass, size and age, while enhancing angling experience in most situations. Catch-and-release-only regulations are a success in managing vulnerable cutthroat trout and grayling, providing the highest landing rate and average size (Jones, 1984; Gresswell, 1986). In 1987 the park replaced stream-specific regulations with new species-specific regulations to advance its goal of perpetuation

of native strains of trout (Jones, personal communication, October, 1988). Other means used to maintain the wild trout fishery have included elimination of put-and-take stocking of park waters, manipulation of season dates, closure of certain waters during spawning, public education and enforcement (Varley, 1983; Jones, 1984; Gresswell, 1986).

For the last decade park fisheries managers have been conducting an extensive inventory of Yellowstone's exceptional waters. The "ecological profile" of lakes and riverine systems includes examination of geology, water quality and fish populations. Classification of the waters is based primarily on species, though habitat and aesthetics are considered (Jones, 1988). The technical assistance division of the U.S. Fish and Wildlife Service bases a staff at Yellowstone to advise the National Park Service on fisheries issues. The Park Service may reject the staff's recommendations for managing certain waters or fish species within the park.

The Fish and Wildlife staff has formal ties with sister federal agencies in the park and region, but mostly informal ties with surrounding states, unless a specific project or study is underway. Regulation and management of exceptional waters in adjacent states do not necessarily conform to the preservation-oriented management practices inside the park, though states in recent years appear more willing to cooperate (Jones, 1988; Gresswell, U.S. Fish and Wildlife Service, personal communication, 1988). Fisheries managers monitor progress of the Yellowstone EW program through ongoing angler surveys, biological sampling and creel censusing. Angler cooperation has been generally positive (Jones, 1984; Jones, U.S. Fish and Wildlife Service, personal communication, 1988).

Some comparable federal agency efforts, with EW program dimensions, are underway. In the eastern United States, for example, the U.S. Forest Service and the Park Service (Great Smoky Mountains National Park) are pursuing a coordinated approach to management of native brook trout in the small headwater streams of the southern Appalachians. The focus of this effort is fishery management to restore the native brook trout to its original range. This has included, in a few cases, eradication of exotic populations of rainbow trout, followed by introduction of brook trout. The Forest Service, with its multi-purpose management objectives, has restricted certain types of land uses such as logging practices near streams. For the most part, however, these efforts are comprised largely of fishery management and management of the user community.

Silver Creek, Idaho--The Nature Conservancy

Silver Creek, a stream in central Idaho formed by hundreds of springs, is regarded as one of the world's finest trout fisheries and a non-governmental model in EW management. In the early 1970s, however, the creek was endangered by cattle grazing, heavy sedimentation, wetland drainage and aerial spraying of herbicides and pesticides.

The difference, more than a decade later, is attributed to The Nature Conservancy and its management efforts at the Silver Creek Preserve (about 25 miles south of Sun Valley). Improved farming and ranching practices in addition to stream work and restrictive fishing regulations have led to larger and longer-living rainbow trout. Concurrent with this has been an increase in the angler population.

The Nature Conservancy, a national land conservation group specializing in acquisition and protection of endangered biota, formally entered the project in 1976 with the \$500,000 purchase of the 479-acre Sun Valley Ranch and 2 1/2 miles of frontage on Silver Creek. Today the Conservancy's investment has grown to about 2,500 acres and 14 miles of stream and tributaries. The Preserve also is a sanctuary for a variety of waterfowl and wildlife. About \$1.5 million had been spent for acquisition and management in the project's first decade (The Nature Conservancy, 1986).

The Nature Conservancy was successful at Silver Creek because of a management scheme that combines: purchase of land and conservation easements in the upper watershed; use of the latest soil conservation farming and ranching practices; implementation of special fishing regulations (fly-fishing only--catch-and-release and barbless hooks mandated); and initiation of cooperative research with Idaho State University and the Idaho Fish and Game Department. The Conservancy has a policy of unlimited access to the Preserve, but it has been under pressure to limit the number of visitors.

The Conservancy's jurisdiction covers the upper portion of Silver Creek, a tributary of the Little Wood River, which is part of the Snake River system. The state of Idaho, however, places all of Silver Creek in its "highest-valued fishery resource" category. Criteria for this classification category include the documented occurrence of any state or federal endangered or threatened species and a population of species of high interest to the state. These criteria were developed for use by federal and state agencies and water users to assess the impact of proposed water development

projects on existing fishery resources (U.S. Fish and Wildlife, 1978).

The Conservancy's goals for managing this exceptional stream are to protect the most critical reach of the stream, maintain the native trout fishery, and restore the natural qualities of the stream system. Stream restoration is based on continuing scientific research, and progress is monitored through scientific indicators. The restoration effort includes: silt control and removal; expansion of wetlands; revegetation of stream banks; control or removal of grazing and cropping from riparian zones; and, on certain parcels, elimination of agriculture. Conservation farming practices are utilized on Preserve and easement lands to demonstrate that a healthy spring creek is compatible with profitable farming (The Nature Conservancy, undated).

The Preserve obviously is popular, receiving more than 7,000 visitors during the 1987 fishing season. The Conservancy estimates that 1,000-1,500 anglers per season visited the property in the mid-1970s. A local Conservancy professional staff (numbering nine in 1985) administers the preserve with the help of the national organization and many volunteers. During the Preserve's existence, more than 1,500 people have made financial contributions in Silver Creek's name (The Nature Conservancy, 1988).

Support from government fisheries personnel and academic fisheries specialists has been good. In 1977 the Idaho Fish and Game Commission voted to grant TNC special fishing regulations. At about the same time, stocking of hatchery trout in Silver Creek was curtailed. The Conservancy by 1986 had financed more than \$40,000

worth of stream research. Idaho State University studies have led to programs that have reduced harmful sedimentation. Research also has showed an increase in size and age of rainbow trout within the Preserve.

While management of this EW resource appears to be successful, Conservancy managers are concerned about fishing pressure. The Idaho chapter of The Nature Conservancy included a questionnaire in its Winter 1987-88 newsletter designed to help gauge visitors' opinions on the subject. The questionnaire preamble said: "Based upon recent biological research, we find that the fishery is doing extremely well, considering the current number of fishermen. However, trends over the years point toward increasing use, and this certainly raises some questions for us and for those of you who use and have supported the preserve." Among the survey questions: 1) Have you ever experienced a day on the Silver Creek Preserve when you felt it was too crowded? 2) Do you favor and support our present policy of unlimited access to the Silver Creek Preserve? 3) Would you support and participate in a limited entry program--so many rods per day, either first-come, first-served, reservations or a combination of both?

Clearly, management of the user community, along with the fishery and related resources, is a growing concern for the Conservancy. In its 10-year report on the Preserve, the Conservancy rationalized its policy, saying Silver Creek has a long history of unlimited public access. Limiting public access, the Conservancy said at the time, would present enforcement problems and could result

in "flotillas of boats and tubing fishermen floating through the public waterway."

The management of Idaho's Silver Creek represents one of the best examples of a privately administered EW program. Although relatively limited in size by the stream reach managed, the Conservancy program appears to be both successful and popular. The Conservancy approach proves an alternative to EW programs operated as part of federal or state programs. Close cooperation with state and federal jurisdictions are necessary to make such a private management scheme work.

Canadian Provincial Survey Responses

Fisheries managers in the 12 Canadian provinces also were surveyed about their coldwater management programs. They were sent the same questionnaire as U.S. states with coldwater riverine fisheries; all but the Yukon Territory returned the survey.

Data from responses suggest that EW management described in this report for inland trout has yet to fully develop in Canada. However, advanced management programs exist for anadromous fish waters. A sophisticated EW management scheme was advanced in Alberta (it failed to gain approval). Ontario indicated it was developing a classification system and possibly an EW program. In addition, four provinces--Alberta, Nova Scotia, Quebec and British Columbia--noted they had informal EW programs for their best coldwater streams. As in the United States, some Canadian fisheries agencies view all their waters as exceptional. The provinces of Prince Edward Island and the Northwest Territories indicated their entire riverine resource deserved special protection and management.

IX. CONCLUSION

This paper presents the first overview of coldwater riverine exceptional waters (EW) management programs in the United States. Conclusions are based on the results of a detailed survey, review of agency documents and follow-up interviews with state experts. Emphasis was given to the key factors states use in identifying and classifying their EW resources and how states have coordinated related resource management programs with traditional fishery management activities. We have articulated what we have termed the EW management approach--an approach which has some parallels with what has elsewhere been called special area (or critical area) management.

Exceptional waters, as used here, are those especially significant rivers and streams supporting coldwater fishes. The existence of an EW program is based on three specific criteria: 1) a formal system for classifying these resources, 2) an official designation process, and 3) a coordinated fishery-water-land-user management program stemming from the exceptional waters designation. Using these criteria 13 states (of 39 with coldwater fisheries) have EW programs in place, and several other states have well-established elements of such programs. Related activities are underway in geographic areas managed by federal agencies, including the National Park Service and the U.S. Forest Service.

Specific findings from the study, based largely on the survey (95 percent return), are listed below.

1. The overriding factors most commonly used to identify

exceptional waters include the presence of "wild" trout/natural reproduction, high standing stocks/carrying capacity, trophy trout, and public access.

2. The origins of most EW programs are rooted in fishery agencies as opposed to interest groups, commissions, legislatures or the general public.

3. Administrative rules and fishing regulations are the most widely used mechanisms for formal designation of exceptional waters.

4. Among the array of tools used to manage exceptional waters--fish management tools, natural resources management tools (water quality, water quantity and land use tools) and stream user tools (limited entry, public information programs, special fishing regulations)--fish management tools are used the most.

5. Although standard settings and point source discharge permits are used by most of the states with EW programs, nonpoint source pollution controls, despite their importance to the quality of riverine systems, are used far less frequently.

6. Water quantity tools, such as instream flow reservations and regulation of dam flows for tailwater fisheries, are widely used; groundwater management is rarely considered in EW programs (despite the fact that groundwater flow is the lifeblood of many riverine systems).

7. While most states have adopted an anti-degradation policy as mandated under the federal Clean Water Act of 1987, only a

few states closely formally link their anti-degradation policy with their EW program at this time.

8. Public information programs and special fishing regulations are the most widely used management tools designed to influence the behavior of the stream user community.

9. The authority for managing the many facets of most EW programs is widely distributed among state agencies (and sometimes local and private organizations), resulting in a need for active coordination.

10. Coordination mechanisms most often cited are informal communication, joint planning, environmental impact reviews and plan review.

11. State and federal wild scenic river programs are closely coordinated with many EW programs.

12. An alternative approach to state-federal EW programs is a private approach, which can be effective for limited applications.

A practical model for states considering an EW approach consists of the following components:

(1) inventory, data collection and analysis, in order to characterize the coldwater resource (effective EW programs put a premium on quality data);

(2) a scientifically based, user-sensitive classification system or rating scheme to assess the comparative worth of the resource;

(3) a formal process for officially designating exceptional waters, using established governmental agency administrative

decision-making procedures and structures;

(4) specific actions that tie the fishery management component of EW programs to water quality and quantity management, land use-watershed management, and user management activities of federal, local and other state agency units, as well as non-governmental entities.

(5) EW program implementation is enhanced by:

(a) persistence

(b) an aggressive and well-orchestrated public information program

(c) top administrative support

(d) broad, one-time changes in policy

(e) strong leadership of fisheries professionals

Finally, exceptional waters programs do not imply neglecting the "rest" of the coldwater resources. Rather, these programs allow managers to consciously focus a finite investment in the management of fisheries resources. Exceptional waters programs do demand more coordinated approaches to natural resources management. They afford resource managers an opportunity to enhance the management of these special resources and gain experience in the emerging and difficult arena of integrated natural resources management. As such, we believe the development of EW programs is an important trend in the management of sport fisheries.

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APPENDIX A
EXCEPTIONAL COLDWATER FISHERIES RESOURCES
MANAGEMENT SURVEY

"EXCEPTIONAL" COLDWATER FISHERIES RESOURCES MANAGEMENT SURVEY

Respondent:

Title:

Agency:

Address:

Telephone:

Your cooperation is needed as part of a study to assess the classification and management techniques for "exceptional" coldwater fisheries (trout/salmon rivers and streams) — *hereafter referred to as "EXCEPTIONAL WATERS"*. The study also will examine how the management of these exceptional waters relates to other environmental management activities.

Please complete the following questionnaire using guidance contained within each section. If you need clarification on any question, telephone Drs. Stephen Born (608-262-9985) or William Sonzogni (608-262-8062). If you prefer, we will call you after receiving your questionnaire — just indicate which questions need clarification.

Please return the questionnaire AS SOON AS POSSIBLE. We have provided a return envelope for your convenience.

I. INVENTORY

We are interested in whether your agency identifies what we have termed "exceptional waters", *as distinct from the general array of trout or salmon waters in your state/province*. And if so, how? Some states/provinces have designated such streams as "Gold Medal" waters, "Blue Ribbon" streams, etc. We recognize, however, that there is great variability in the approaches of the states/provinces. Incorporated in the following sections of the survey are some of the factors that could be used to identify/classify "exceptional waters".

Please answer all questions unless otherwise instructed.

1. Does your state/province have any kind of classification system for its coldwater river and stream resource?
 Yes No
2. Does your agency identify "exceptional waters"?
 Yes No (If no, please complete Part IV on page 5 and Part VI on page 6. Thank you.)
3. Does your agency use the above classification approach in identifying "exceptional waters"?
 Yes No
4. Your "exceptional waters" identification system is:
 INFORMAL (i.e. relying only upon subjective judgments of fishery or other resource professionals)
 FORMAL (i.e. based upon explicit written factors or criteria such as incorporated in legislation, administrative rules or written agency directives)
5. Which of the following factors are used in your "exceptional waters" identification system? (CHECK ALL THAT APPLY)
Fishery characteristics
 - special or rare native species
 - "wild" trout/natural reproduction
 - high growth rates/biologic productivity
 - high standing stocks/carrying capacity
 - trophy trout
 - other fishery characteristics (list)***Unique natural resource attributes***
 - wild, undeveloped landscape
 - scenic features
 - exceptional water quality
 - stream characteristics (width, depth, habitat, stream-bottom type, steepness of banks)
 - streamflow characteristics
 - other unique natural resource attributes (list)***Historical significance attributes***
 - past usage
 - public investment in watershed
 - historical significance
 - other historical attributes (list)

Accessibility attributes

- ___ near population centers
- ___ public access
- ___ state park/other public lands
- ___ other accessibility attributes (list)

User demand/fishing pressure

- ___ general popularity
- ___ user group request
- ___ other user demand/fishing pressure factors (list)

Unique "fishability" factors

- ___ insect hatches
- ___ trophy fishing opportunities
- ___ angling challenge
- ___ ease of wading/casting
- ___ other "fishability" factors(list)

-Other (please describe)

6. Do you use any of the above factors in a rating/ranking system to identify "exceptional waters"?
- ___ Yes ___ No
7. Which, if any, of the above factors are overriding in the selection of "exceptional waters"? List the factors by the small *coding* number preceding them.
- ___ , ___ , ___ , ___ , ___ , ___ .
8. What is the mechanism by which your government officially designates these "exceptional waters" for special attention? (CHECK ALL THAT APPLY)
- ___ legislation
 - ___ administrative rules by authorized state agency
 - ___ incorporation into state/provincial fishing regulations
 - ___ other (list)
9. In what year did your official "exceptional waters" program begin?
- 19__
10. Approximately how many miles of trout/salmon streams are in your state/province?
- "_____
11. How many miles of these are designated "exceptional waters"?
- "_____
12. Approximately how many miles could ultimately be included in the "exceptional waters" program?
- "_____

II. MANAGEMENT IMPLICATIONS

The purpose of this section is to enumerate the range and types of management tools used for "exceptional waters."

A) FISH MANAGEMENT

1. What fisheries management practices are your agency authorized to use in managing "exceptional waters"?
- (CHECK ALL THAT APPLY)
- ___ Stocking or fish population management practices
 - ___ Instream habitat management
 - ___ Special fishing regulations (e.g., size, bag limitations, lure restrictions, no kill)
 - ___ Other (list)

INSTRUCTIONS FOR PARTS B AND C:

First, use the space provided to the left to check off those techniques used. Then go to the right side and check how frequently the technique is used and the nature of compliance. Finally, write in the name of the agency responsible for using the management tool.

B) NATURAL RESOURCES MANAGEMENT

Over and above managing the fishery and instream habitat, other natural resources management measures can be used to achieve the objectives of an "exceptional waters" designation. Recognizing that the authority to use many of these management tools resides outside the fish management unit, we want to find out what tools are employed, and by whom.

1. Water Quality Management

- ___ standards setting
- ___ point-source discharge permits
- ___ nonpoint source land-use management practices (specify)
- ___ special shoreland or riparian zone land-use controls
- ___ agricultural restrictions
- ___ silvicultural restrictions
- ___ other development restrictions (e.g., mining, transportation, etc.)
- ___ recreational restrictions (e.g., limits on snowmobiles, trail bikes, ATVs)
- ___ other (list) _____

2. Water Quantity Management

- ___ minimum instream flow reservations or allocations for fisheries
- ___ surface water diversion or withdrawal limitations
- ___ groundwater management
- ___ regulating flows from dams for tailwater fisheries
- ___ other (list) _____

3. Other Watershed Management Factors

- ___ development restrictions to protect scenic beauty/viewshed
- ___ special planning or environmental review requirements
- ___ priority for public acquisition of important riparian or watershed lands
- ___ priority for acquisition of important riparian or watershed lands
- ___ by private conservation group
- ___ other (list) _____

C) STREAM USER MANAGEMENT

What stream user management practices result from designation of "exceptional waters"?

- ___ establishment of public information programs
- ___ limited entry
- ___ reservation use or "beat" system
- ___ user fees charged
- ___ institution of socially-based regulations (e.g., fly fishing only)
- ___ motorized access to stream restricted
- ___ restrictions on other stream users (e.g., boating, canoeing, rafting, swimming)
- ___ other (list) _____

	Technique Used			Compliance (if applicable)		Responsible Agency
	Frequently	Sometimes	Rarely	Voluntary	Mandatory	
___ standards setting	___	___	___	___	___	___
___ point-source discharge permits	___	___	___	___	___	___
___ nonpoint source land-use management practices (specify)	___	___	___	___	___	___
___ special shoreland or riparian zone land-use controls	___	___	___	___	___	___
___ agricultural restrictions	___	___	___	___	___	___
___ silvicultural restrictions	___	___	___	___	___	___
___ other development restrictions (e.g., mining, transportation, etc.)	___	___	___	___	___	___
___ recreational restrictions (e.g., limits on snowmobiles, trail bikes, ATVs)	___	___	___	___	___	___
___ other (list) _____	___	___	___	___	___	___
___ minimum instream flow reservations or allocations for fisheries	___	___	___	___	___	___
___ surface water diversion or withdrawal limitations	___	___	___	___	___	___
___ groundwater management	___	___	___	___	___	___
___ regulating flows from dams for tailwater fisheries	___	___	___	___	___	___
___ other (list) _____	___	___	___	___	___	___
___ development restrictions to protect scenic beauty/viewshed	___	___	___	___	___	___
___ special planning or environmental review requirements	___	___	___	___	___	___
___ priority for public acquisition of important riparian or watershed lands	___	___	___	___	___	___
___ priority for acquisition of important riparian or watershed lands	___	___	___	___	___	___
___ by private conservation group	___	___	___	___	___	___
___ other (list) _____	___	___	___	___	___	___
___ establishment of public information programs	___	___	___	___	___	___
___ limited entry	___	___	___	___	___	___
___ reservation use or "beat" system	___	___	___	___	___	___
___ user fees charged	___	___	___	___	___	___
___ institution of socially-based regulations (e.g., fly fishing only)	___	___	___	___	___	___
___ motorized access to stream restricted	___	___	___	___	___	___
___ restrictions on other stream users (e.g., boating, canoeing, rafting, swimming)	___	___	___	___	___	___
___ other (list) _____	___	___	___	___	___	___

III. COORDINATION WITH RELATED PROGRAMS

This section of the survey is intended to explore how related management programs are linked (directly or indirectly) to the "exceptional waters" management program; i.e., how is coordination accomplished?

INSTRUCTIONS:

In the spaces to the left, designate with a checkmark those natural resource management programs which are actively coordinated with your state/province "exceptional waters" program. Then use the following list of mechanisms in the large shaded box to indicate how the coordination between programs is accomplished by writing the letter(s) that best describe the means of coordination in the shaded answer slots to the right.

COORDINATION MECHANISMS

- a. joint planning
- b. plan review
- c. formal coordinating committees
- d. informal communication
- e. memoranda of understanding
- f. environmental impact reviews
- g. cost-sharing for acquisition, studies, etc.
- h. joint staffing or staff sharing
- i. other

*Water Quality Management Programs

- point-source pollution abatement
- nonpoint-source pollution abatement

*Water Quantity Management Programs

- minimum instream flow reservations or allocations for fishery
- surface water diversion or withdrawal limitations
- groundwater management
- regulation of flows from dams for tailwater fisheries

*Land Management Programs

- on private lands of utilities or industries
- on lands owned by conservancy groups, conservation organizations or land trusts

STATE/PROVINCIAL

- wild/scenic rivers
- state/province parks
- other (natural, scientific, recreation, historic areas; wildlife refuges; state/province gamelands)

FEDERAL

- wild/scenic rivers
- national parks
- national recreation areas
- other (natural, scientific, historic areas; wildlife refuges)

IV. ANTI-DEGRADATION

(U.S. respondents only)

In the United States, the federal Clean Water Act requires states to develop and adopt anti-degradation policies as part of their water quality management programs. The federal water quality anti-degradation policy (40CFR, sec. 131.12) further specifies that states designate "Outstanding National Resource Waters" that will receive the highest level of protection.

We would like *U.S. respondents* to answer these questions:

1. Has your state adopted an anti-degradation policy/program?
___ Yes ___ No (If no, go to Question 8)

2. Has your state begun to implement an anti-degradation policy/program?
___ Yes ___ No (If no, go to Question 8)

3. Does your state's anti-degradation policy/program relate to the kind of "exceptional waters" program described in this survey?
___ Yes ___ No (If no, go to Question 5)

4. Please describe how this coordination is accomplished:

5. Other than the "exceptional waters" for fisheries referred to here, what other types of waters are grouped under the "Outstanding National Resource Waters" category?

6. Does your state's anti-degradation policy contain any other special protection categories or classes?
___ Yes ___ No (If no, go to Question 8)

7. What criteria are used to determine which water bodies are included?

8. Please identify the key contact in your state for anti-degradation policy and program development.

Name:

Address:

Telephone:

V. ORIGIN OF "EXCEPTIONAL WATERS" PROGRAM

We would like to know what led to the creation of your "exceptional waters" program. (CHECK ALL THAT APPLY)

- support from general public
- support from special interest group (e.g. Izaak Walton League, Trout Unlimited, Federation of Fly Fishermen)
- legislative proposal
- gubernatorial proposal
- proposal from state/provincial fisheries or natural resources agency staff
- proposal from fisheries or natural resources board or commission
- idea originated with one or several influential citizens
- other (list)

VI. COMMENTS

We welcome any comments you have on this survey.

We would like to obtain any pertinent written materials describing your exceptional waters management program, including classification criteria, management plans, and planning or policy guidelines.

Also, please send us a copy of *your fishing regulations and overall statewide coldwater fisheries management plan or other appropriate documentation of state/provincial fishery programs*. Please send to:

**Exceptional Waters Project
c/o Dr. Stephen Born
101 Old Music Hall
University of Wisconsin-Madison
Madison, WI 53706**

Thank you for your help! We'll mail you the results as soon as possible.