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February 10, 1993

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AN ABSTRACT OF THE THESIS OF

Ann L. Root for the degree of Doctor of Philosophy in Geography presented on February 10, 1993.

Title: Improving Instream Flow Protection in the West: An Evaluation of Strategies with an Analysis of Oregon's Program.

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In the American West keeping water instream to protect fish and wildlife, recreation, and water quality is in direct conflict with traditional water laws. While most western states have established instream flow protection programs, protection has been hindered by the basic tenet of the prior appropriation doctrine, first in time, first in right. This allows senior appropriators to fulfill their rights without regard for streamflows. Methods to improve instream flow protection include proposals to reallocate water rights with early priority dates.

The purpose of this research was to analyze existing and proposed streamflow protection strategies to determine which are the most effective and to recommend strategies which can be used to improve protection in the West. Methodologies used included an analysis of state statutes and policies to compare programs and application of a policy analysis model, adapted from Mazmanian and Sabatier, to identify the important factors of policy implementation.

The comparison of programs demonstrated that states have different levels of protection with the most comprehensive programs in Alaska, Idaho, Montana, and Oregon. Recommended strategies such as marketing, planning, conservation and the public trust doctrine have been incorporated only to a limited extent. Oregon's program was examined in more detail and the policy analysis model was applied to it.

The model revealed that Oregon's program lacks clear policy goals, adequate jurisdiction to reallocate flows and improvements are needed in the areas of agency integration, program coordination, and funding. Several proposals have been made to improve Oregon's program. Most of those proposals would address the major policy deficiencies, but would also impose substantial changes on existing water users. Consequently the proposals have generated significant opposition which has prevented their enactment.

Efforts to revise Oregon's program should focus on improving the program deficiencies, but should also heed the concerns of water users. This can best be accomplished through local planning and market incentives. Each western state will need to develop individual programs, but much can be learned from Oregon's example. Achieving protection for instream flows will not be easy, but it can be facilitated through cooperation rather than confrontation.

Improving Instream Flow Protection in the West:
An Evaluation of Strategies with an Analysis of
Oregon's Program

by

Ann L. Root

A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Doctor of Philosophy

Completed February 10, 1993

Commencement June 1993

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ACKNOWLEDGMENTS

The completion of this Ph.D. degree often seemed to be a lonely process, but actually involved the support and assistance of many people. I would like to take this opportunity to thank all the people who have helped me attain this goal.

On an academic level, I am indebted to the various researchers on the subject of instream flow protection who proceeded and inspired me. The people at the Oregon Water Resources Department were generous with their time and information. I would especially like to thank Mike Mattick and Becky Kreag.

My tenure in the Department of Geosciences has been a rewarding experience. My graduate committee has been supportive and understanding. The Parenzin Award provided me with needed funds to complete the dissertation. The office staff, especially Joanne Van Geest and Therese Belden, provided invaluable assistance.

Randy Baker saved me much frustration and by doing the computer work on the tables and figure. Pam Homer once again provided valuable editorial assistance.

My friends and family have provided valuable support, especially in the last year. Two people deserve special recognition. Keith Muckleston, my major professor and friend, has been an inspiration throughout my graduate career. My husband, Ken Rauscher, has provided crucial encouragement and I could not have completed the degree without him.

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LIST OF ABBREVIATIONS

Federal

EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FWCA	Fish and Wildlife Conservation Act
FWS	Fish and Wildlife Service
NEPA	National Environmental Protection Act
NPPC	Northwest Power Planning Council
NPS	National Park Service
USGS	United States Geological Survey

Oregon

DEQ	Department of Environmental Quality
DFW	Department of Fish and Wildlife
ODFW	Oregon Department of Fish and Wildlife
OWRD	Oregon Water Resources Department
SWMG	Strategic Water Management Group
WRC	Water Resources Commission
WRD	Water Resources Department

IMPROVING INSTREAM FLOW PROTECTION IN THE WEST: AN EVALUATION OF STRATEGIES WITH AN ANALYSIS OF OREGON'S PROGRAM

CHAPTER 1

INTRODUCTION

Instream Flows and the Prior Appropriation Doctrine

Water and its allocation have long been the subject of conflict in the American West. Most of the West is classified as semi-arid and precipitation is inadequate in many places to meet mining, industrial, municipal, and particularly agricultural needs. For this reason, the West has developed a complex and extensive network of water projects and intricate legal systems to support these traditional water uses. These have often been implemented at the expense of environmental or other instream water uses.

As the population of the West has increased, demand for offstream water uses has increased accordingly. But as the population has become increasingly urbanized, values of society have changed and people have also demanded increased protection for environmental uses of water. These demands have put increased pressure on a scarce resource and led to increased conflicts between offstream and instream water uses.

Instream flow protection involves attempts to keep water flowing in streams for uses such as fish and wildlife habitat, recreation, navigation, and maintenance of water quality. These instream uses conflict directly with traditional offstream uses. Part of the conflict stems directly from the prior appropriation doctrine, the basis of western water law.

The prior appropriation doctrine originated in the late 1800s to allow for the diversion of water from streams for irrigation and mining uses. It established a priority system of water uses wherein water users appropriate a specified amount of water from a stream and the most senior users are entitled to that amount of water even if their appropriation leaves no water available for junior users. In contrast to the riparian doctrine of the East, ownership of adjacent land is not required. Water rights are considered to be usufructory, i.e. the holder has a right to use of the water, but does not own it. The right to use the water is considered a vested property right. The prior appropriation doctrine has been the accepted form of water law in the western states since the turn of the century.

The doctrine was designed only for offstream uses and until recently failed to recognize the value of instream uses. There are three main aspects of the prior appropriation doctrine which impeded the protection of instream flows. The first is that water must be put to certain uses determined to be beneficial. In most states beneficial uses were limited to offstream uses such as mining and irrigation. Where such things as recreation and fish and wildlife were included as beneficial uses, a second aspect of the doctrine restricted instream flow protection; the requirement that water appropriations had to be diverted from the stream. The third impediment of the prior appropriation doctrine to instream flow protection was the use-it-or-lose-it aspect. Since a water right can be lost through lack of use, rights holders must divert the full amount of the water right to retain its validity. This requirement has been an obstacle to water conservation efforts and has been accused of encouraging waste. It also prevented instream appropriations because they were interpreted as not being used.

Protection of instream flow values has been an issue in water resources for nearly twenty years. The early research focus was how to provide legal

protection for instream flows under a legal system designed for offstream uses. Most of the legal obstacles have been overcome in the last 15 years and most western states have granted some form of protection to instream flows. This protection has come about in two ways. The first and most common is that state legislatures have adopted laws which incorporate instream flow protection into the prior appropriation doctrine. The second way is through the courts which have ruled that state water laws which recognize instream flow values as beneficial uses cannot deny appropriations of water to protect those values even if there is no diversion.

The laws and the court rulings, however, cannot guarantee that instream flow values will be protected. This is due to the seniority aspect of the prior appropriation doctrine. The prior appropriation doctrine has been in effect in many parts of the West since the 1870s, while the earliest recognition of instream flows came in 1955 in Oregon with most states not recognizing them until the 1970s or 1980s. Consequently, even where instream flows have been granted legal protection, they are junior to most other uses. In dry years and in overappropriated areas, there is often no water left to fulfill instream needs even where instream rights have been recognized.

Enforcement of instream flow protection is difficult. The enforcement of water rights is dependent on a "call" system. Senior appropriators who do not receive the full share of their rights, place a call on the river by notifying the local watermaster. The watermaster then shuts off the diversion of junior rights until senior rights are satisfied. Even in areas where instream flows have seniority, enforcement under this system is difficult. There are few means to monitor and place calls for instream flows. It is also difficult to enforce priority of instream flows over junior diversions for offstream uses which are generally viewed as having greater economic value than streamflow protection. There have been

cases in times of water shortages where courts have overturned instream flows in favor of junior offstream users.

These problems with instream flow protection and the increasing conflict between instream and offstream uses have caused the focus of instream flow protection research to change. The concern now is with how to find water to meet instream flow needs and to restore streamflows in overappropriated areas. Several proposals have been made to improve protection. Many of these strategies involve reallocation of existing water rights to new uses. These include market mechanisms such as allowing private instream flow appropriations and the sale and transfer of water rights to instream uses, water conservation, state or basin wide planning to assess instream flow needs, and application of the public trust doctrine to instream flows.

Purpose of the Research

From the statutory or legal viewpoint, the protection of instream flows has improved significantly in the last twenty years. However, the improved legal status has been ineffective in actually protecting flows for instream needs. The purpose of this study is to analyze existing and proposed instream flow protection strategies to determine which are the most effective and to recommend strategies which can be used by western states to improve protection.

Specifically, the research:

1. Describes the strategies which have been suggested to improve streamflow protection and evaluates the extent of their current application.
2. Evaluates the important components of effective streamflow protection strategies and analyzes their use in existing programs.

3. Applies a policy analysis model to instream flow protection policies in Oregon to identify the factors which have impeded streamflow protection.
4. Uses the results of the policy analysis to recommend changes for improved streamflow protection in Oregon.
5. Makes recommendations for how the policy analysis model and other results of the research could be applied to other states.

Literature Review

The published literature on instream flow protection is extensive, reflecting the long history of research on the subject. The subject has attracted researchers from a wide range of fields including law, economics, recreation planning, and fish and wildlife biology. Literature on instream flows first appeared in the 1970s and has increased substantially to the present.

The literature from the 1970s reflects the instream flow concerns at the time. Government reports on water resources stated that water laws gave inadequate protection to instream flow values and recommended that state laws be amended to protect public interests in water (NWC 1973, 63). Most researchers were lawyers concerned with how state laws could be amended (Tarlock 1975, 1978, 1979; Reed 1975; Radosevich and Sabey 1977) or biologists, hydrologists, and recreation planners concerned with how to quantify the amount of water required for instream needs (Stalnaker and Arnette 1976, Tennant 1976, Bovee and Milhouse 1978, Hyra 1978). A conference in 1976 addressed the instream flow concerns of the time and summarized the existing research (Orsborn and Allman 1976).

Researchers at Washington State University were involved with instream flow problems in the 1970s. Workshops were conducted in the Northwest

addressing instream flow needs for the region and a publication addressed the institutional and technical aspects of instream flow protection (Doerksen 1975, Doerksen et al. 1975). Doerksen and Lamb (1979) also researched the administrative decision-making process in instream flow protection. Doerksen and Lamb's interest in instream flow protection has continued and they authored the instream water use section of the United States Geological Survey (USGS) 1987 National Water Summary which documents some of the progress made since their original research (Lamb and Doerksen 1990).

Since the 1970s, interest in instream flow protection has increased vastly as has the literature related to it. Two recent publications highlight the timeliness of the topic. In 1989, the Natural Resources Law Center at the University of Colorado published Instream Flow Protection in the West (MacDonnell, Rice, and Shupe 1989). This book was the product of a symposium dealing with instream flows and contains summaries of the major issues in instream flow protection and of the status of protection in fourteen western states. In 1990 the first issue of the journal Rivers: Studies in the Science, Environmental Policy, and Law of Instream Flow appeared. As the title indicates, the journal addresses the multi-disciplinary aspects of instream flow research.

There are several different aspects of instream flow research and the following literature review is divided accordingly. Much of the literature concerns strategies to improve streamflow protection. The literature review of the publications addressing improved strategies will be expanded upon in Chapter 2.

Fish and Wildlife Service Publications

In 1976 a group was founded within the U.S. Fish and Wildlife Service (FWS) to address the impacts on instream flows under continued development

of natural resources (U.S. Fish and Wildlife Service 1979). The Cooperative Instream Flow Service Group [now the National Ecology Research Center] has produced a number of publications dealing with instream flow research. The subject matter includes flow quantification methodologies (Bovee and Milhouse 1978, Hyra 1978) and recommendations for expert testimony in instream flow cases (Lamb and Sweetman 1979, Wassenberg et al. 1979). Many of these publications are targeted towards agency personnel active in instream flow protection. A framework for institutional analysis in instream flow program implementation was developed by the group (Wilds 1986, 1988). This framework is a computerized procedure for conflict resolution and negotiation.

An early project of the FWS group was a series of publications addressing strategies of instream flow protection in western states. The series began with a general assessment of strategies under existing state and federal laws (Dewsnup and Jensen 1977, Dewsnup et al. 1977). Individual studies were prepared for 13 western states which assess the application of strategies in each state and include matrices that allow for comparison between states (e.g. Nelson, Horak and Wilsey 1978). Recently the Strategies series was updated and expanded into an Opportunities series which also contains charts for comparison (e.g. Brandes 1985). Unlike the previous series, this one includes several eastern states. Both series merely suggest means of protection and do not analyze the effectiveness of the methods and thus were useful in only a general way to this study.

Methodologies

A major area of instream flow research for the FWS and others is methods to quantify flows needed for instream uses. Early efforts were concerned with flows for fisheries. Several methodologies have been developed and have

been accepted by courts and administrative agencies. These methods and their application are summarized by Lamb (1989). More recently researchers have been concerned with flow levels for recreational and aesthetic values. The status of this research is summarized by Brown, Taylor, and Shelby (1991) and Shelby, Brown, and Taylor (1992). Another area of recent research has been the determination of flow regimes which mimic natural regimes and create habitat conditions (Hill, Platts, and Beschta 1991).

Economics

Economists have been attracted to the instream flow research arena just as they have to other water resources issues. Their research has largely been in two areas of instream flow protection. The first involves the use of a free market system to protect flows (Weatherford 1982, Anderson 1983a, 1983b, Huffman 1983, Colby 1989). This group of researchers contends that if water rights can be freely bought, sold, or transferred, they will be allocated by the market system to the most economically efficient use. Therefore, if instream flows are valued highly enough, they will be purchased and protected. Some economists also advocate the privatization of instream flow rights (Anderson and Johnson 1986, Anderson and Leal 1991).

Another branch of economic research on instream flow protection is in the area of assessing the value of the flows so they can be compared with traditional water uses. These researchers have developed methods for assessing the value in economic terms of instream uses such as recreation (Daubert and Young 1981), fisheries (Johnson and Adams 1988), and river preservation (Sanders, Walsh, and, Loomis 1990). The numerous studies which have been conducted in this area are summarized in Loomis (1987), Douglas (1988) and Colby (1989).

Recently a group of economists has begun to evaluate the usefulness of economic models in explaining changes in environmental policies (Livingston 1987) and specifically instream flow policies (Livingston and Ruttan 1990).

Interest Groups

While several interest groups have been active in promoting and denouncing instream flow protection, this interest is not reflected in their literature. Many environmental groups advocate instream flow protection, but a survey of their national journals found no articles dealing specifically with instream flows, although other water issues were presented. The exception is The Nature Conservancy's publication which has presented articles on their efforts to purchase water rights (Wiley 1990, Vetter 1991). There were also very few instream flow articles appearing in agricultural and irrigation journals. One such article presented ranchers' perspectives on instream flow protection (Magagna 1990).

Legal Articles

A large portion of the literature on instream flows is found in law reviews. In the early years of instream flow research, lawyers were concerned with how streamflows could be protected under the prior appropriation doctrine. Since most of the legal problems have been solved, many lawyers researching this area have shifted their interest to ways to improve protection (Bagley, Larson, and Kaploski 1985, Ferguson 1987, Clyde 1989, Wigington 1990) or to specific state programs (Welsh 1976, Scribner 1979, Ranquist 1980, Sherton 1981, Thorson, Brown, and Desmond 1985, Reynolds 1986, McElyea 1989).

A major topic in the legal field has been the public trust doctrine and its ability to protect streamflows. The idea of using the public trust doctrine for the

protection of natural resources was originally proposed by Joseph Sax (1970). A symposium at the University of California, Davis in 1980 expanded on this role of the public trust doctrine (Dunning 1980, Johnson 1980, Sax 1980, and Stevens 1980). The article by Johnson focussed on the use of the public trust doctrine to protect streamflows.

In 1983, the Supreme Court of California ruled that the California Water Board was required to consider public trust values in water allocation decisions. This decision, known as the Mono Lake case, opened the door for the application of public trust considerations in water rights allocations and started a flurry of articles dealing with the public trust doctrine and instream flows (Dunning 1985, Josephson 1987, Davis 1988, Walston 1989). This culminated in a 1988 symposium at Lewis and Clark College School of Law on the public trust doctrine and western water rights (Blumm 1989, Bodi 1989, Huffman 1989, Johnson 1989, Reed 1989, Sax 1989, Schmidt 1989, Stevens 1989, and Wilkinson 1989b).

Not all lawyers interested in water resources favor application of the public trust doctrine to instream flow protection. Some find it ineffective or too much of a threat to existing water rights (Walston 1982; Ausness 1986; Lazarus 1986; and Huffman 1986, 1987, 1989).

Implementation

Most of the literature associated with instream flow protection has been concerned with the processes of protection—how to provide legal or administrative protection, and how to quantify the needed flows. Few of the articles go beyond the legitimization phase to discuss implementation (Butler 1990). Few of the articles attempt to assess the effectiveness of policies or to make concrete suggestions for improvements. The exceptions are articles written about spe-

cific state policies including Wyoming, Oregon, and Nebraska (Reynolds 1986, Sherton 1981, and Aikens 1990).

The FWS made an early attempt at evaluating instream flow policies in a four-part series (Sweetman 1980, Olive 1981a, 1981b, 1983). This series was concerned with the enactment of instream flow policies in Montana, California, Idaho, and Iowa, but in general did not assess how they were implemented. Some of the ideas presented have been useful in developing the policy analysis model used in this research.

Another attempt at evaluation was made by the FWS in 1988 (McKinney and Taylor 1988). This report compares the legislatively enacted instream flow programs in nine western states and includes a summary of programs in 45 states. McKinney and Taylor attempt to identify factors crucial to the design of an effective policy, including the areal scope of the program, who can obtain an instream water right, and the decision-making process in each state (McKinney and Taylor 1988, 4-15). Their initial evaluation has been valuable in the preparation of this study.

Geographical Perspective

Geographers have long been involved in research on natural resources issues as summarized in Mitchell (1989). One aspect of this research has been the development and application of policy analysis models. Several other disciplines also conduct policy analysis research, including political scientists, economists, and management scientists (Mitchell 1989, 285). Geographers have incorporated the work of other disciplines into their studies to better understand environmental issues involved in the man-environment relationship. This relationship is one of the core traditions of geography and attempts to understand the adaptations man makes to his environment (Barrows 1923).

There are two types of policy analysis models. Prescriptive models establish normative standards for evaluating policies while descriptive models demonstrate the actual policy process (Mitchell 1989, 264). Examples of prescriptive model applications in geography include the work of Sewell (1973) and Mitchell (1971, 1974).

Most of the policy models which geographers have developed are descriptive and many are based on the basic framework developed by Gilbert White (1961). White's framework contrasts the actual choices made in resource decisions to the theoretical range of choice and describes how the choices are constrained by various factors. This framework was developed into a stress model first proposed by Kasperson (1969) and modified by O'Riordon (1971), Wood (1976), and Wilson (1990). The premise of the stress models is that decision-making in natural resources responds to stresses such as environmental crises and demands by interest groups. According to these models, decision-makers respond to such stresses by adapting policies or administrative procedures, but the adaptations are limited by their goals, values, and perceived constraints.

Both the prescriptive and descriptive models used by geographers have focused primarily on the development of natural resource policies. More recently geographers have begun to develop and apply models which evaluate the implementation of policies. Mitchell (1987, 7-9) proposed a framework for evaluating the full range of institutional arrangements involved in resource management. His framework includes many of the components identified by Ingram et al. (1984) as needed for analytical rather than descriptive studies. Mitchell's framework was applied to the integration of water management in several countries (Mitchell 1990). Good (1992) also borrowed from the field of political science in employing a policy analysis framework developed by Maz-

manian and Sabatier (1981, 1983) to evaluate the effectiveness of shore protection in Oregon. This researcher has incorporated the ideas of Mitchell, Ingram, and Good into a modification of the Mazmanian and Sabatier framework to analyze the instream flow protection program in Oregon.

Methods and Organization of the Research

The goal of this research is to identify the essential strategies of effective instream flow protection policies and make recommendations for improved protection in Oregon and other western states. To do this, two major research methods are used. The first is a comparison of existing western streamflow protection strategies. This comparison is an expansion and update of the work done by McKinney and Taylor (1988) and is used to identify the programs and strategies which are most effective in protecting streamflows. The comparison was done by analyzing state statutes and administrative rules and practices.

The second step of the research is the application of a policy analysis model. The model is based on one developed by Mazmanian and Sabatier (1981) and is applied to Oregon streamflow protection policies. The analysis will attempt to identify the key variables involved in effective implementation of streamflow protection.

The paper also summarizes the strategies which have been suggested for improved instream flow protection. Because the state of Oregon has been active in streamflow protection for over 40 years, and is currently attempting to develop some innovative instream flow programs, the history of its protection efforts is discussed.

Chapter 2 contains the summary of strategies to improve protection and an expanded review of instream flow literature. Existing state programs are analyzed and compared in Chapter 3. The status of Oregon's protection efforts

is the subject of Chapter 4. The policy analysis model is discussed and applied in Chapter 5. The study concludes with recommendations for strategies that can be incorporated into streamflow protection programs in the West.

CHAPTER 2

EVALUATION OF INSTREAM FLOW PROTECTION STRATEGIES

Introduction

Most western states have some type of streamflow protection. Those programs, however, do not insure actual protection for instream flows as noted in Chapter 1. Several strategies have been proposed to improve protection programs. Some of these strategies are being used for other aspects of water allocation and could be applied to instream flow protection with minor revisions. Others will require major changes to western water law. The proposed strategies will be summarized in this chapter and their current application in western states will be analyzed.

Strategies Recommended for Effective Protection

A primary focus of the literature on instream flows has been suggestions for effective protection strategies. These range from detailed evaluations of specific state programs to broad recommendations for all states. The strategies can supplement existing programs or replace them. The suggestions can be grouped into general categories: market strategies, water conservation, water resources planning, and use of the public trust doctrine. In addition to strategies within state water laws, there are several methods to protect flows through federal or cooperative state-federal actions. These strategies and their potentials for implementation are discussed below.

Market Strategies

Market strategies have frequently been proposed to improve water resources management. It has been suggested that water would be allocated

more efficiently if it were traded in a free market system (Weatherford 1982, Anderson 1983a and 1983b, Howe, Schurmaeier, and Shaw 1986, Colby, 1988, Shupe, Weatherford, and Checchio 1989). Some researchers contend that market allocations would result in opportunities for improved instream flow protection (Anderson 1983a, Huffman 1983, Colby 1989, Wigington 1990, Wahl 1990). Market transfers combined with private appropriations of instream rights could significantly improve streamflow protection. Water market systems and their related problems are briefly described below and their potential application to instream flow protection is discussed.

Water market systems consist of transfers of water rights between willing buyers and sellers. Prices are negotiated between the parties and the resulting transfers are seen as a means of allocating water to higher value uses (Colby 1989, 92). There are several mechanisms for achieving these transfers, the most common of which is the outright purchase of water rights (Shupe, Weatherford, and Checchio 1989, 422). Other mechanisms include short or long term leases, water banking, and other contractual arrangements. All of these have the advantage that the transferred water right retains its original priority date. Transfers are advocated as a means of adding flexibility to the water allocation system by improving responses to droughts and changing economic and social conditions (Colby, McGinnis, and Rait 1989, 697).

Limitations to Transfers

As demand for western water has increased, the value of irrigation water has declined relative to urban and industrial uses (Dumars and Tarlock 1989, 343). In some parts of the West this has caused an increase in transfers of water rights from agricultural to other uses. Transfers are still limited in number and especially in areal extent, with most occurring in the southwestern states

(Schoolmaster 1991, 292). There are two main reasons for the limitations. The major reason is state water laws which impede transfers (Colby 1988, 726). Demand is the other limitation. More transfers are occurring in areas with rapid population growth which has increased demand for reallocating water supplies (Colby 1989, 91).

A major tenet of the prior appropriation doctrine is that any change to existing water rights cannot adversely affect other users, even if those users have junior rights. This third party effect or no injury rule can impede water transfers. Downstream water users are often dependent upon upstream return flows—the portion of a diversion which is not consumed and returns to the stream. If an upstream water right is transferred to a new location or new use and return flows are reduced, there is less water available for downstream uses. If the flow is reduced enough that other users are affected, state laws require that the transfer be denied.

Because third party effects can block transfers and because the calculation of such effects and the amounts of return flows are complicated, some states have developed strategies to address the issues. The amount of water that is subject to transfer is sometimes limited to the amount consumed by the existing use (Gould 1989, 464). Texas has developed an apparently effective way of dealing with the problem (Schoolmaster 1991, 298). Texas transfer laws allow only a fixed percentage of an agricultural water right to be transferred to other uses. Such policies can reduce third party effects and expedite water transfers.

Another problem associated with transfers is referred to as the area of origin problem and involves impacts on the area from which water is transferred. These impacts can be both economic and environmental. Economic impacts occur in an area when transfers cause agricultural land to go out of

production. This can negatively affect the local economy by decreasing the property tax base (Colby 1988, 737) and by reducing the money spent in local businesses (Shupe, Weatherford, and Checchio 1989, 428-29). Environmental effects are caused when once cultivated lands are abandoned leading to erosion and weed problems. In addition, large-scale transfers from rural areas cause concerns about destruction of the agricultural lifestyle (Shupe, Weatherford, and Checchio 1989, 429).

While state laws require that third-party effects be considered before transfers can occur, most states do not require consideration of area of origin problems and scholars have been accused of understating the impacts (Weber 1990). As transfers and the resulting impacts increase in some areas, states have taken steps to offset the problems. Arizona passed a law in 1991 requiring some area of origin protections for transfers of groundwater (AS 45-546 to 556). The law requires control of weeds and dust from source areas and requires anyone transporting groundwater away from an area to pay an annual fee to the county of origin. The law also restricts the transfer of groundwater from some areas. The Colorado legislature has also attempted to require compensation, but the proposed bills have not passed (Shupe, Weatherford, and Checchio 1989, 429).

Some authors contend that compensation by the purchaser is the reasonable solution to the area of origin problem (MacDonnell and Howe 1986, 544-45). They recommend that compensation should account for all estimated losses due to transfers and be placed in a fund which could be used for whatever purposes were deemed necessary to alleviate losses.

A third problem associated with reallocation of water rights through transfers is that public interest and public trust considerations are not adequately considered (Colby 1988, 741). Transfers of water from a stream or

basin may have adverse effects on instream values. While water laws require that impacts on third parties must be evaluated, the impacts on instream flows are not included unless they have a specified water right (Colby 1989, 96). This problem can be lessened by requiring states to give more attention to public interest criteria in transfer laws (Gould 1989, 473-74; Colby et al. 1989, 63). These criteria require that the public interest be considered in issuing water rights permits, in transfers, and other changes to water rights. They range from vague policy statements to specific lists of economic and environmental values to be considered. Strict adherence to these criteria could restrict transfers, and some believe that consideration of public interest values, including instream flows, will limit water transfers (Livingston and Miller 1986).

These problems and others are cited as reasons for the currently limited number and extent of water rights transfers. Methods for resolving these problems exist and some researchers believe market transfers will be the solution to water allocation problems. Solutions to the problems of area of origin and public interest criteria will add costs which may restrict the transfers, but these increased costs will more accurately reflect all the costs involved in transfers (Colby 1988, 741).

Transfers to Instream Flows

While some water transfers may damage instream flow values and corrections of this problem may restrict transfers, market strategies are being advocated as a means to reallocate water to instream flows (Anderson 1983a, Huffman 1983, Driver 1986, Colby 1989, Wahl 1990, Wigington 1990). These researchers suggest that the best way to provide reliable streamflow protection is to purchase existing water rights and convert them to instream flow rights. Because the converted right retains the original priority date, this is potentially

an effective strategy for overappropriated streams. In addition to outright purchases, leases of water rights to protect flows during droughts are advocated.

In order to adequately protect streamflows under the market system and to improve protection in general, many researchers believe that private individuals and entities should be able to appropriate and acquire instream water rights (Scribner 1979; Anderson 1983a, 1983b; Anderson and Johnson 1986; Driver 1986, 70; Colby 1989, 94; McElyea 1989; Wahl 1990, 201-04; and Anderson and Leal 1991, 100-14). Currently most states restrict acquisition and management of instream flows to state agencies. Private appropriations would allow environmental groups and others to obtain water rights for streamflow protection through appropriations or purchases, thus increasing streamflow protection. Private parties may be more willing to obtain instream water rights and be able to obtain them more quickly than state water agencies (Western Governors Association 1987, 89).

Economic valuation studies have shown that the value of instream flows can exceed the value of traditional water uses (Daubert and Young 1981, Johnson and Adams 1988). Therefore, proponents of the market system believe that if the market is open to instream flows, they will be protected by it. In addition to state agencies purchasing water rights for streamflow protection, private individuals and groups will protect flows if their values are perceived as high enough. While the potential exists for instream flow protection through the market, few such transactions have occurred due to problems involved in protecting public goods through market strategies (Colby 1989, 94) and problems associated with private appropriations (Wahl 1990, 201).

A major problem involved is called the "free rider" issue. Since free flowing waters are a public good, it is difficult to exclude those who do not pay for their maintenance from enjoying their benefits (Anderson 1983a, 74). Since

many people who benefit from instream flows cannot be forced to pay for their protection, it is difficult to adequately finance the acquisition of flows through the market (Colby 1989, 95). The "free rider" problem is often cited as a reason why instream flow protection should be provided by governments.

State water laws present some obstacles to protection of streamflows through markets (Colby 1989, 94). Not all states permit appropriation of instream water rights, so market strategies are limited in those states. The process of changing a water right from a traditional use to an instream flow right can be complicated in some states. Changes need to be made to state laws before instream flows can compete successfully in water markets (Livingston 1987, 286).

A major reason why there have not been many purchases of water rights for instream flow protection is a lack of funding. Some state agencies have the legal authority to purchase water rights for streamflow protection, but often do not have adequate funding for purchases (Driver 1986, 69). Private individuals and groups also have financial difficulties in purchasing water rights, especially environmental groups which are dependent on donations.

There are several objections to allowing private individuals and groups to acquire water rights for instream flows. These have been cited as the reasons most states prohibit such acquisitions even though private parties can obtain water rights for other beneficial uses (Wahl 1990, 201). Reasons cited include concerns that private rights could be used for speculative purposes, agencies would be overburdened with claims, economic development would be hindered, and that public interests in water cannot be protected by private rights.

The first two reasons are procedural and can be solved by rule making. Because instream flow protection involves no construction costs for diversions

or distribution systems, such water rights can be obtained at a relatively low cost and some believe private acquisition of flow rights would lead to speculation and later sale for consumptive uses (Anderson and Johnson 1986, 538). This problem could be reduced by administrative rules which impose application fees high enough to discourage speculation and to require state approval for transfers from instream rights (Wahl 1990, 203-04). The application procedure could also discourage speculation by requiring applicants to prove the need for the instream flow. The high costs of applications, both financial and informational, should serve to restrict the number of applications for instream flow rights and thus not overburden state agencies (Wahl 1990, 202).

The other problems are not as easily resolved. The argument that private instream flow rights could hinder economic development is part of the larger objection to instream flow protection on economic grounds (Anderson 1982). Opponents contend that if private instream flow appropriations are allowed they will prevent future economic development because of a lack of water for new uses. Proponents of the market system argue that if instream flows can compete economically they should be protected and that flow preservation can benefit the local economy (Wahl 1990, 202). Another argument against this objection is that if water rights can be freely transferred, they will be allocated to the highest value use whether instream or consumptive (Huffman 1983, 276-77; Wahl 1990, 203).

A major reason for restricting the acquisition of instream water rights to public agencies relates to the idea that instream flows are a public good and therefore cannot be adequately protected by private rights (Scribner 1979, 1113; Wahl 1990, 202). This problem is closely tied to the "free rider" problem discussed above. The belief is that private appropriations may restrict public access to instream flows by restricting access to the adjacent land and thus not

adequately protect public rights to streamflows (Wahl 1990, 204). A solution to these problems would be to allow both public and private acquisition of streamflows.

Privatization of Instream Flows

Most proponents of market strategies for instream flow protection advocate a combined system of government protection and private acquisitions. One group of economists, however, advocates the privatization of instream flow protection (Anderson 1983a, 1983b, Huffman 1983, and Anderson and Leal 1991). The current center for this school of thought is the Political Economy Research Center at Montana State University. Researchers there believe that centralized political control of natural resources cannot adequately protect them—only a well developed system of property rights to resources can provide adequate incentives for protection (Anderson and Leal 1991, 3).

For instream flow protection they advocate the use of market systems through purchases and conversion of water rights, but believe this should be done by private parties, not governments. In the 1980s when the group first introduced the idea of New Resource Economics, they advocated private rights to natural resources as a supplement to governmental protection (Anderson 1983a, Huffman 1983). In a recent book, Free Market Environmentalism (Anderson and Leal 1991), the group argues for market protection as a replacement for governmental protection which they find inadequate (Anderson and Leal 1991, 100).

According to this school of thought groups such as The Nature Conservancy and Trout Unlimited will play a major role in protecting instream flows. The groups will purchase existing water rights and convert them to instream rights in critical areas. In addition to such actions, the free market philosophy

believes more exclusively private rights are needed. They contend that if a free market system exists and if instream flow uses are valued higher than other uses, private landowners will have incentives to protect flows and provide access to protected streams.

Proponents of this approach cite two examples of working models. The first is the fishing streams of England and Scotland where private landowners maintain streamflows and riparian vegetation to protect salmon habitat, then charge fees for fishing access (Anderson 1983a, 82-83; Anderson and Leal 1991, 112). The fees provide owners with incentives to preserve flows. A similar situation exists in parts of Montana where spring fed streams originate and end on private property (Anderson 1983a, 81; Anderson and Leal 1991, 109). Landowners protect the streams and collect fees from fishermen. As an example of the advantage of such private actions, another case in Montana is cited. A similar spring creek which is state managed is suffering from "inevitable crowding and a reduced fish population" (Anderson and Leal 1991, 109).

Advocates of privatization of instream flow protection contend that the approach would lead to a more efficient and flexible allocation of instream flows (Anderson and Leal 1991, 111). Under a private market system, water for flow protection could be more easily acquired during droughts and critical habitat could be protected. In addition, private rights and a free market system would prevent water rights from being locked up for instream uses if society's values change and other water uses become a higher priority (Huffman 1983, 273, 276). In a private system, rights would be traded depending on their value.

There are several problems associated with the privatization approach. Some problems are procedural while others are ethical or philosophical.

The first procedural problem is that the approach requires that all property rights to water be "well defined, enforced, and transferable" (Anderson

1983a, 18). As discussed previously, this situation does not always exist, especially regarding instream flow rights; changes are needed to existing laws before a privatization system could work.

Another procedural problem associated with privatization of instream flows is the funding problem discussed above. While it is generally true that state governments often lack adequate funds to acquire instream water rights, the environmental groups who are to play a key role in private instream flow protection also have funding problems. The groups are dependent on donations and must make specific fund appeals for acquisition projects.

The ethical and philosophical problems which confront the privatization of instream flow protection center around the idea of equity. The free market approach is concerned only with an economically efficient allocation of water. Economic efficiency involves the allocation of resources to the highest valued use. The value is assigned by the market and economic efficiency has been charged with inadequately valuing environmental, cultural, and other nonmonetary values (Ingram, Scaff, and Silko 1986; Burton 1991, 44-45). Equity involves fairness and recognition of the nonmonetary values of water. Most proponents of market systems for improved streamflow protection believe that government intervention is needed to insure equity in water allocations (Colby 1988, 722). The New Resource Economics school is concerned only with efficiency, not equity.

One of the equity considerations that privatization ignores is public access to protected flows. The system makes protected streamflows, which are considered a public good, a private good. If a primary method of instream flow protection is for private landowners to preserve flows because they can collect access fees, then individuals will be denied access. The system would favor those able to pay the fees. Anderson and Leal (1991, 109) contend that a state

managed spring creek is overused while privately managed creeks are being preserved. The question arises, however, whether the overuse is caused because of state management or because the public is denied access to other spring creeks.

Another equity issue which is not addressed by the free market system is stewardship. An advantage which is cited for the system is that privately held flows will not be locked up if economic values change. This stance favors an efficient allocation system over preservation (Huffman 1983, 276). Yet preservation of flows and their related values is a major reason for protecting instream flows.

The free market system also seems to ignore the ecological aspects of instream flow protection. Dependence on private streamflow protection may protect flows in isolated areas where recreational demand is high enough to encourage private protection or where an environmental crisis prompts enough donations to purchase water rights for flows. It does not, however, guarantee a systematic approach to streamflow protection that can provide fish habitat or insure adequate water quality.

Summary of Market Strategies

Several market oriented strategies have been proposed to improve instream flow protection. Those strategies which are suggested to augment existing protection systems offer considerable potential for reallocating water to streamflow protection. The privatization of instream flow rights may seem a likely solution to government budget shortages, but does not offer a comprehensive approach to protection.

In order for market strategies to improve instream flow protection, changes would have to be made to existing laws to facilitate transfers, to allow

private acquisitions, and to compensate for third-party damages. It is problematic that such changes would be made on the scale required to adequately protect streamflows. The main advantage market approaches offer streamflow protection is that water rights with senior priority dates can be obtained to secure flow protection without encountering the takings issue, a problem associated with the public trust doctrine approach to reallocation.

Water Conservation

Water conservation is another proposed strategy for improved instream flow protection. "Water conservation" can generate controversy because the term is considered to have two meanings. The dichotomous definition stems from debate over conservation at the turn of the century epitomized by the controversy over Hetch Hetchy Reservoir in Yosemite National Park (Nash 1967, 129). To some, water conservation means the planned and efficient use of water by providing storage for later use (Hays 1959, 5). To others, water conservation means improving the efficiency of water use so that less water is diverted or consumed. Both aspects of the definition have been proposed to improve instream flow protection.

Conservation as Increased Efficiency

Many in the water resources field think that more water can be made available for new uses if present users improve efficiency and convert the saved water to other uses (Weatherford 1982). The usual targets of this approach are irrigators who account for 65 percent of surface water withdrawals and 93 percent of consumptive losses in the West (USGS 1985 25, 59, 64). The conserve-and-transfer strategy is closely associated with the market strategy of transferring existing rights to instream uses and shares many of the associated prob-

lems. In addition, conservation suffers from a specific problem found in the language and interpretation of the prior appropriation doctrine.

This is the use-it-or-lose-it principle of traditional western water law. This principle is viewed as a disincentive to water conservation because it requires water users to utilize the full amount of their water right. It is believed that the portion of a right not used as a result of conservation is not the property of the user and reverts to the state or is available to junior appropriators. As such, the salvaged water cannot be transferred. Additionally, abandonment provisions of the prior appropriation doctrine require that any portion of a water right not used for five consecutive years is considered abandoned and that portion of the water right can be cancelled.

Proponents of the conserve-and-transfer strategy for protection of instream flows and for other water reallocation purposes contend that this aspect of western water law is outdated and should be amended to permit users to conserve and transfer salvaged water to other uses (Brown et al. 1982, 215; Driver 1986, 56-57; Colby 1988, 731-32; McKinney and Taylor 1988, 19; Gould 1989; 469). These authors believe that irrigators will only have incentive to conserve if they can sell the unused portion of their water right and use the proceeds to improve irrigation efficiency. Some suggest that part of the cost of efficiency improvements could be borne by those purchasing the surplus water (Driver 1986, 10).

Amendments to existing laws and an open market will encourage voluntary water conservation efforts and make some water available for instream uses. Streamflow advocates may need to take more aggressive approaches to expand conservation and make more conserved water available for streamflows. One such approach would be to lobby for mandated irrigation efficiency improvements and to require that a portion of the conserved water be converted

to instream protection. Such legal actions should be accompanied by economic incentives to make the efficiency improvements affordable for irrigators (Wilkinson 1990, 84).

Advocates of streamflow protection may also be able to use a conservation strategy recently employed by the Metropolitan Water District of Southern California. The District agreed to pay for efficiency improvements for the Imperial Valley Irrigation District in exchange for being able to purchase the conserved water (Sax 1990, 278). Environmental groups could provide the capital for conservation measures in areas with critical instream flow needs.

Conservation as Water Storage

Some irrigators and other water users think that the best way to supply water for instream flows in some areas is to provide additional storage to supplement irrigation and provide releases for instream flows during critical periods (Boettcher 1990; Magagna 1990, 9). New structures could augment streamflows in overappropriated areas with critical instream flow needs. However, the possibility of new dam construction has been limited in recent years and many believe that the era of federal dam construction has ended (Engelbert and Scheuring 1984, 1; Reisner and Bates 1990). There are several reasons for the apparent demise of major water projects. One is the reluctance of the federal government to fund projects in view of budget restrictions. Another is that in economic terms, the best dam sites have already been used and the drastically increased cost of dam construction makes large projects increasingly infeasible (Muckleston 1990, 31). Environmental concerns have also added to the cost of storage and complicated the approval process. Because of these impediments to dam construction, storage projects for instream flow protection would have to

be of a size and design which could be funded through state or local sources as suggested by Boettcher (1990).

Summary of Conservation Strategies

Both aspects of water conservation have been proposed to improve instream flow protection. The conserve-and-transfer strategy could make water available for streamflow protection, but would require changes to state water laws, especially the use-it-or-lose-it aspect of the prior appropriation doctrine. Conservation improvements and transfers to instream flows could be required, but the financial burden to irrigators should be offset by economic incentives. In some cases it may be worthwhile for instream flow proponents to pay for efficiency improvements themselves. Construction of new storage facilities may be the only means of improving streamflows in some areas, but the projects are unlikely to receive federal funding.

Comprehensive Water Resources Planning

Comprehensive planning has long been advocated as the solution to water allocation problems and there has been a long history of water resources planning in the United States. Basin-oriented planning was first advocated by John Wesley Powell and sporadic efforts at such an approach occurred until 1981 when the Title II River Basin Commissions were abolished (Powell 1962; Wilkinson 1989a, 23-26). Recently Congress passed legislation was establishing a new water planning authority in the West (Water Intelligence Monthly 1991, 6). Some regional planning commissions still exist including the Delaware River Basin Commission, the Susquehanna River Basin Commission, the Tennessee Valley Authority, and the Northwest Power Planning Council. The latter and its role in instream flow protection are discussed later in this

chapter. With the exception of the plans listed, regional plans generally have not been implemented. Reasons cited for their failure include inadequate funding, lack of authority over other water management agencies, and the fact that the federally instituted plans were seen as a threat to state authority over water management, a strong states' rights issue (Wilkinson 1989a, 24-25).

In addition to federal water resources plans, most western states include some form of planning in their approach to water management (Getches 1988). Here again most plans have had little effect on management activities. The plans are often advisory only and are not incorporated into decision-making processes (Getches 1988, 24).

Several researchers believe that comprehensive planning is a potentially effective means for improving streamflow protection and incorporating non-monetary values of water into allocation decisions (Getches 1988; Tarlock and Nagel 1989; Western Governors Association 1987, 112-14; Wilkinson 1989a). Planning should be used to identify existing water uses and to prioritize future uses (Wilkinson 1989a, 22). A comprehensive plan could identify areas with instream flow protection needs and identify strategies for allocating water to instream flows. Evaluating instream flow needs as part of comprehensive planning could allow decisions on protection to consider competing water uses and lead to more comprehensive protection (McKinney and Taylor 1988, 7). By identifying instream flow needs, planning could be used to determine public interests which would conflict with proposed water developments (Tarlock and Nagel 1989, 145). Public interest in water transfers could be defined by specifying in plans what uses and values should be protected (Getches 1988, 8).

Comprehensive planning could be used to unify other instream flow protection strategies such as transfers and conservation (Tarlock and Nagel 1989, 143, 145). In addition to broad scale plans, localized planning could

identify methods to protect critical instream flow needs. Public participation in the planning process may contribute innovative methods for a specific locality.

In order for planning to be an effective strategy for improving streamflow protection, several changes would be required in current planning approaches. First, nonmonetary values of water need to be recognized as an appropriate use of water and should be given equal footing with development uses. Some states currently recognize noneconomic values in planning, but several plan only for development-oriented water uses or for specific projects (Getches 1988, 44-45). Water resources agencies also need to improve the information base that is used to plan development, including inventories of supplies and existing and future uses of water and ecological and cultural information (Getches 1988, 18; Wilkinson 1989a, 22, 26-27). A third needed revision is that plans need to be legally integrated into water allocation decision-making (Getches 1988, 18). Plans should form the basis for needed legislative amendments and should serve as a guiding document to administrative bodies issuing water rights. Plans should also be flexible and amended as needed (Getches 1988, 23; Wilkinson 1989a, 22).

Comprehensive planning will not be implemented without a struggle. It has traditionally been "bitterly opposed by western water interests" (Wilkinson 1989a, 22). An effective plan should be basin-oriented and should incorporate all the entities involved in water management. This necessitates involvement by federal agencies and will cause conflicts due to the states' rights issue. Wilkinson (1989a, 24-26) envisions cooperative basin planning in which state agencies would play the dominant role, but federal agencies would be consulted and would be bound to planning decisions.

Comprehensive planning offers a potential for identifying instream flow needs and coordinating strategies to improve protection. In order for it to be

successful, current planning processes will have to be amended to include nonmonetary values of water and to integrate plans into allocation decisions. The inherent opposition to planning will remain, but as conflicts over water increase, planning may become more acceptable as an equitable means of resolving disputes.

The Public Trust Doctrine

The previously discussed strategies involve working within the structure of the prior appropriation doctrine and applying existing tactics to streamflow protection. While the public trust doctrine is an ancient legal doctrine, its application to streamflow protection is very recent. The public trust doctrine is not a component of existing water law and invoking it to protect flows threatens established water rights. Many legal scholars have discussed the public trust doctrine in detail (Johnson 1980, 1989; Sax 1980, 1989; Walston 1982, 1989; Dunning 1985, 1989; Ausness 1986; Huffman 1986, 1987, 1989; Lazarus 1986, Blumm 1989; Wilkinson 1989b). This discussion explains the doctrine's salient points, summarizes the arguments for and against its application to streamflow protection, and discusses the potential for its application to comprehensive instream flow protection.

History of the Doctrine

The public trust doctrine has its origins in Roman law and is part of English common law (Sax 1980, Stevens 1980, Wilkinson 1989b, Ausness 1986). It passed from English law to American common law where it has been interpreted separately by each state. The doctrine holds that certain properties are common properties and are held in trust by the state for public uses such as navigation, commerce, and fishing (*Illinois Central Railroad v. Illinois*, 1892).

These common property rights cannot be alienated by the state as private property rights. Traditionally the doctrine has been applied to tidelands and the beds of navigable waterways. The first major court decision on the public trust doctrine in the United States was Illinois Central Railroad v. Illinois in 1892 in which the U.S. Supreme Court ruled that the state of Illinois could not grant private rights to the shorelands and bed of Lake Michigan (Wilkinson 1989b, 452-53).

The traditional application of the public trust doctrine to navigable waterways continued until 1983 when the California Supreme Court ruled that the public trust applied to non-navigable tributaries of Mono Lake (National Audobon Society v. Superior Court, 1983). The Court ruled that the State Water Resources Control Board was required to consider public trust values when allocating water, that trust values included scenic and ecological values impaired by diversions from non-navigable tributaries of waterways, and that the state could reconsider water rights decisions and retroactively apply public trust values. The Court did not specify an allocation of water to Mono Lake nor did it require that lake levels be protected. Instead it required the state to achieve a balance between public trust values and the economically efficient allocation of water. This ruling has given impetus to efforts to apply the public trust doctrine to instream flow protection.

Arguments Favoring Use of the Doctrine for Instream Flows

Authors favoring use of the public trust doctrine to protect streamflows argue that it offers a means of overcoming the junior priority of instream water rights and of rectifying the unbalanced allocation of water to offstream uses by the prior appropriation doctrine (Johnson 1980, 1989; Sax 1980, 1989; Stevens 1980, 1989; Dunning 1985, 1989; Blumm 1989; Wilkinson 1989b). Proponents

believe that streamflow protection can be improved by incorporating public trust values into current and future allocation decisions. Full consideration of trust values could prevent issuance of water rights to projects which would reduce streamflows below acceptable levels. Public trust considerations could be incorporated into water use decisions by clarifying public interest criteria which already exist in most western states.

A major advantage of using the public trust doctrine to improve streamflows is that it has the potential to be retroactively applied. Protection of trust values is considered to have always been part of state law and protection of the trust extends to possible revocation of existing rights (*National Audobon Society v. Superior Court* 1983). Therefore, the public trust doctrine could be used to reallocate water from existing diversionary uses to instream flow protection.

An aspect of the public trust doctrine that makes it appealing to some as a means of reallocating existing water rights is that it is not generally considered to be a taking (Blumm 1989, 584). Therefore reallocation to instream flows would not require compensation. Retroactive application of the public trust doctrine is not considered a taking because any private rights granted for trust resources have always been subject to the public trust. The takings issue has not been reviewed by the U.S. Supreme Court, however (Dunning 1989, 115-16).

In response to researchers who contend that retroactive reallocation is not equitable to water users with valid existing rights, proponents argue that application will not place new limits on existing rights, but will enforce existing limits of the public trust doctrine (Sax 1989, 481-82). They take the position that expansion of the public trust doctrine reflects changing public values and offers a means of obtaining water to protect values such as instream flows which have recently gained public support (Sax 1989, 474). Goldfarb (1988, 133) suggests

that since instream flow values have been sacrificed to offstream uses for so long, it is the general public—not irrigators—who should be compensated and that the public trust doctrine is a means of providing this compensation. Joseph Sax suggests that compensation should be provided even if it is not legally required in order to reduce the impact on water users caught by the changing rules (Sax 1990, 261).

Arguments Against Use of the Doctrine for Instream Flows

Not all legal scholars believe the public trust doctrine is the solution to instream flow problems (Walston 1982; Gould 1988; Huffman 1986, 1987, 1989; Hughes and Umphres 1986; Lazarus 1986; and Thorson and Schmidt 1986). Those opposing application of the public trust doctrine take three general stances. Some argue against it on the grounds that a retroactive application will lead to economic uncertainty and unjustly affect vested property rights. Another argument is that the doctrine relies on judicial decisions and avoids the legislative arena. Others oppose its application because they do not believe it will lead to comprehensive or effective streamflow protection.

The major provisions of the prior appropriation doctrine evolved to provide stability and security to irrigators who had to make large investments to bring water to their lands (Somach 1987, 2). Priority of senior rights and protection of all users from damages due to changes in water rights provides a degree of stability in an area with uncertain water supplies. Opponents of the public trust doctrine contend that its retroactive application would destroy the security of the prior appropriation doctrine which is essential to economic expansion in the West (Ausness 1986, 427-28, 436; Somach 1987, 3). These researchers believe the public trust doctrine could have a "catastrophic" and destabilizing effect on prior appropriation rights if it permits existing rights to be reviewed and

reallocated to instream uses (Somach 1986, 13; Ausness 1986, 408). They advocate that other methods be employed to protect streamflows or that public trust considerations be based on the concept of reasonable use (Somach 1987, 26-28). Other opponents of the public trust doctrine contend that it places unfair burdens on irrigators because it changes the rules in the middle of the game (Clyde 1989, 454) and that it is an attempt to circumvent the takings issue and avoid paying for water rights to meet new uses (Huffman 1986, 1987).

A major objection to the use of the public trust doctrine to improve streamflow protection is that it is a judicial remedy and that such a complex issue would best be resolved in the legislative forum. Lazarus (1986) and Gould (1988) argue that the doctrine relies too heavily on a pro-environmental judicial bias and depends on court settlements at a time when most resource issues are being settled by statutes. Lazarus views the doctrine as an avoidance of democratic debate and contends that improvements in administrative law and the standing of environmental issues in the courts have made reliance on the doctrine unnecessary (Lazarus 1986, 658-90).

Most who object to the reliance of the public trust doctrine on judicial rulings do so because they do not believe the courts have the ability to balance all the competing interests in water (Johnson 1980, 263; Walston 1982, 81; Hughes and Umphres 1986, 89; Gould 1988, 47; Dumars and Tarlock 1989, 341). Lazarus (1986, 712) suggests that courts may lack the competence in environmental issues that is necessary to evaluate the issues. Some believe the legislature, through the political process, is in a better position to hear all sides of the issue and balance the competing values of instream protection and diversionary uses and to determine who should bear the costs of reallocation. Thorson and Schmidt (1986) cite examples in Montana where the legislature, by responding to public input, developed a more equitable and workable solu-

tion than did a public trust ruling on a similar multiple interest resource issue. In their words,

The legislative process, for all its shortcomings, does allow for consensus building and the opportunity for all contestants to claim some ownership in the resulting compromise. The judicial process for all its merits, tends to translate complex and delicate controversies into "win-lose" results" (Thorson and Schmidt 1986, 158).

Another area of objection to the use of the public trust doctrine is the contention that it will not result in efficient or comprehensive protection for streamflows. In addition to the contention above that courts do not have the capability to properly evaluate claims by competing interests, courts are seen as time consuming and unpredictable. Gould (1988, 45) terms the doctrine a "lawyer's delight," requiring years of litigation. The Mono Lake case was first filed in 1979 and the ruling came in 1983, but only recently have subsequent court decisions required that water be maintained in the Lake's tributaries.

Not only has application of the public trust doctrine been viewed by some as inefficient, it is also seen as not leading to a comprehensive program for streamflow protection. Again the inability of the courts to effectively balance competing issues can be cited. Court decisions also are applicable only to the litigants in a particular case and cannot be applied on a statewide basis (Johnson 1989, 511). Public trust rulings would have to be applied on a case by case basis.

Potential Applications of the Public Trust Doctrine

Application of public trust considerations to instream flow protection offers a means of including nonmonetary values of water in allocation decisions and of reallocating existing rights to instream flow uses. It has the advantage of permitting reconsideration of existing rights and of avoiding the takings issue. It

provides proponents of instream flow protection with a means—through the courts—of improving protection without confronting irrigation-biased legislatures. However, reliance on court decisions to protect streamflows is inefficient and will not produce comprehensive streamflow protection. If the public trust doctrine is used to improve instream flows, it must be done by incorporating trust considerations into other aspects of instream flow protection. The following discussion suggests ways this could be accomplished.

The public trust doctrine can be used to protect streamflows by incorporating trust considerations into water rights reviews and allocation decisions. This can best be done by improving public interest evaluations. As noted previously, most states require some evaluation of the public interest when water rights are issued or transferred, but the criteria for that evaluation are often vague. The public trust could be used as a basis for clarifying and strengthening the criteria and for requiring that they be considered in allocation decisions. Enumerating the public interest issues which should be considered does not provide guidance to decision-makers on how to weigh the issues (Grant 1987, 695). It does, however, insure that the externalities of water allocations are presented to decision-makers, and it provides a forum for instream flow proponents to argue against new diversions and transfers which would harm streamflows. Expanding public interest considerations would only protect existing instream flow rights and unappropriated water.

A more extreme approach to using the public trust doctrine to protect streamflows would be to legislatively recognize the doctrine. This approach would recognize a state's responsibility to protect streamflows and reallocate water to them by making the priority dates of all instream water rights and reservations senior to offstream uses. Legislating the doctrine would have a major impact on existing water rights and would generate opposition from water users.

It is doubtful such a measure would pass in a western legislature. Retroactive application of the public trust doctrine without compensation to users with valid rights is potentially as inequitable as past favoring of diversionary uses over instream uses and proponents of streamflow protection would be well advised to avoid the takings aspect of the doctrine.

Another means of using the public trust doctrine to restore streamflows would be to require that all water rights be reviewed periodically. The review would assess whether water was being used wastefully and would reallocate wasted water to streamflow protection. Periodic review would also allow abandoned water rights to be identified and possibly reallocated to instream flows. This approach is less extreme than legislating the doctrine, but would still generate considerable opposition. The review process could, however, provide an effective means of restoring flows in critical areas.

While legislatures are opposed to radical changes to water laws generated by the public trust doctrine, they are not immune to the threat posed by the doctrine. That threat may provide the impetus to improve streamflow protection by other means. Legal scholar Ralph Johnson, discussing the use of the doctrine to prevent nonpoint source pollution, cautions that the doctrine will not be a panacea to problems associated with the prior appropriation doctrine, but its potential threat may lead to improvements in the existing system (Johnson 1989, 512). He suggests that the threat may be what makes other measures effective. His remarks are just as applicable to instream flow protection.

The public trust doctrine has considerable potential for improving streamflow protection, but its implementation will be difficult. Since it is seen as a potential threat to the economic stability of the West, legislators and administrators will not willingly adopt it. The threat of its application by the courts, however, may lead to incorporation of trust considerations into legislation and

agency policies. According to Charles Wilkinson, the potential value of the public trust doctrine is to pressure agencies to acknowledge their trusteeship in natural resources (Wilkinson 1991, 16-17). This acknowledgment would take years to achieve, but would greatly improve protection of streamflows and other natural resources.

Federal Authority over Instream Flows

All the strategies discussed above originate in and are implemented through state water laws. There are also several ways that streamflows can be protected by federal regulations or policies. Since the focus of this study is development of comprehensive state administered streamflow protection programs, federal strategies will only be briefly described.

Generally the federal government defers to state laws in areas of water management, especially in the West, but there are several exceptions some of which directly or indirectly affect instream flows. In general federal interest in streamflow protection derives from management of public lands and regulatory powers in natural resources (MacDonnell and Rice 1989, 69). Public lands management results in water rights claims for the land while regulatory powers indirectly protect streamflows. The potential for instream flow protection through federal action was outlined for several states in the Strategies series issued by the Fish and Wildlife Service (see Nelson, Horak, and Wilsey 1978).

Reserved Water Rights

The most direct influence federal powers could have on streamflow protection is through acquisition of water rights for instream flows for waters on federally managed lands. This power stems from federal reserved rights which were first confirmed for Indian reservations with the landmark Winters decision

in 1908 (*Winters v. United States*, 1908). Reserved rights were extended to other federal lands by the 1963 Supreme Court ruling in *Arizona v. California* (1963) (Dunbar 1983, 195-203). Reserved rights grant federal reservations quantities of water sufficient for the primary purposes of the reservation and have a priority date of the establishment of the reservation.

Federal reserved rights are highly controversial because they conflict directly with supposed state sovereignty over water and because the early priority date of reserved rights, if claimed, would supercede most existing western water rights. The controversy remains largely theoretical, however. Reserved rights are restricted by the same limitations which restrict private water rights and thus have not been the wholesale federal appropriations feared by some users (Tarlock 1991, 171). In addition, the judicial system and Congress do not favor recognition of reserved rights. Recent court decisions and administrative rulings have limited the application of reserved rights (MacDonnell 1989, 397-99).

Potentially, federal agencies could claim reserved rights to protect instream values associated with national forests, parks, monuments, wildlife refuges, wilderness areas, and rivers protected by the Wild and Scenic River Act. Most of the federal reservations for which reserved rights could be claimed are located in headwater areas and thus would have minimal impact on existing water rights. As more federal reservations such as wilderness areas are established downstream of existing diversions, the potential impact increases (Brown 1991, 311). To counter the opposition of water users, legislation designating some wilderness areas and Wild and Scenic Rivers has prohibited the acquisition of reserved rights (Brown 1991, 316).

Reserved rights for Indian reservations may also play a role in instream flow protection. *Winters* rights are generally reserved for agricultural purposes,

but some treaties specified that some reservations were established to maintain tribal hunting and fishing (MacDonnell and Rice 1989, 74-75). Therefore, instream flow protection for fisheries can be granted to some tribes. If Indians are granted Winters rights for instream flows, the impact on existing rights could be considerable because of the priority dates. Not only were most Indian reservations established before most irrigation development, but fishing rights are considered immemorial, so flows protecting them would preempt all other water rights (Crow 1991).

Several disputes over Indian water rights have involved instream flows, especially in the Pacific Northwest where tribes have been traditionally dependent on fishing (Burton 1991, 48, 50-57). In some cases Indians have decided to use some of their reserved rights to provide instream flows for fisheries enhancement and other values. Courts and a special watermaster ruling have upheld the right of the Wind River Reservation in Wyoming to use its Winters rights for instream flow protection and members of the Yakima Reservation in Washington have been granted similar rights (Burton 1991, 38; Crow 1991). While these tribes and others have been granted paper rights for streamflow protection, it has been difficult to actually obtain water to fulfill the rights just as it has been difficult for Indians to assert other Winters rights (Water Intelligence Monthly 1990, 12-13; Burton 1991; Crow 1991; U.S. Water News 1991, 16). Winters rights for instream flows, like federal reserved rights, may remain a theoretical approach to streamflow protection.

Federal Regulatory Policies

There are several regulatory policies which can be used to require flow releases from dams or to prevent impoundments or diversions to protect instream values. Three of these policies can create "de facto regulatory water

rights" for the federal government—the Endangered Species Act, the Federal Power Act, and the Clean Water Act (Tarlock 1989, 9-25). These Acts can be retroactively applied to state water rights to protect flows (Tarlock 1985, 17).

Endangered Species Act

The Endangered Species Act was passed in 1973 to protect biotic resources. Animals or plants which are in danger of or likely to become extinct are listed by the Fish and Wildlife Service or the National Marine Fisheries Service as endangered or threatened. Listing initiates a series of protection and restoration mechanisms. Listing of aquatic and riparian species could require protection of flows or releases from dams to maintain flows. Several sections of the Act could affect streamflows.

First, the Act prohibits federal actions which would jeopardize listed species (Endangered Species Act 1986, 1536 (a)(2)). Many actions have been determined to jeopardize species including logging and dam construction. This section of the Act has been used to prevent dam construction in Colorado to maintain flows downstream in Nebraska for the endangered whooping crane (Tarlock 1991, 173-75). Since most dam construction involves federal action, operation of many dams could be affected by the Act.

Second, protection of critical habitat for listed species must be designated when the species is listed (Endangered Species Act 1986, 1533(a)(3)(A)). Unlike species listing, habitat designation may include economic considerations. Streamflows have been designated as critical habitat for the Concho water snake, little Colorado spindace, and Warner sucker (Estes 1992, 1038).

Third, the taking of a listed species is prohibited by all persons (Endangered Species Act 1986, 1532, (19)). Taking has a broad definition

which includes habitat modification or degradation (Kohm 1991, 10-22). This section of the Act could be used to require maintenance of streamflows to protect aquatic and riparian species even if those flows are not designated as critical habitat (Estes 1992, 1041).

Recovery plans are prepared and implemented for each listed species (Anadromous Fish Law Memo 1990, 7). The plans list actions which should be taken to protect and restore the species and/or their habitats. Recovery plans have included alteration of operations of a dam on the Sacramento River and conditions on a new project in the upper Colorado Basin to protect fish (MacDonnell 1989, 404; Anadromous Fish Law Memo 1990, 4).

The Endangered Species Act could require modification of vested water rights to protect streamflow habitats for listed species. The impact on water rights has been minimal to date, but court rulings and Congressional action clearly indicate that water rights are not exempt from Endangered Species Act requirements. In 1982 a Nevada court ruled that the Bureau of Reclamation was not obligated by its contract to deliver irrigation water when it conflicted with protecting a listed fish species (Carson-Truckee Water Conservancy District v. Watt, 1982). In 1988 an amendment was proposed which would have exempted state authority over water rights from the Act's provisions (Estes 1992, 1051). The measure failed and was replaced by a provision calling for federal cooperation with state and local agencies in protecting species. A 1992 court ruling emphasized further the potential impact of the Act on water rights. A California court upheld the effort of the National Marine Fisheries Service to curtail irrigation diversions which were threatening a listed species on the Sacramento River (United States v. Glenn-Colusa Irrigation District, 1992).

For water dependent species, habitat protection may include protection of streamflows or dam releases to maintain adequate flows. As more fish

species are listed as threatened or endangered, there may be more impact on water projects and water rights. The West Coast anadromous species are especially vulnerable to extinction. Three Columbia River fish runs and one Sacramento River species have been listed and the American Fisheries Society has identified more than 200 species or races of fish in the area which are potentially threatened (Young 1992).

Federal Power Act

The Federal Power Act of 1920 granted the federal government licensing power over all hydroelectric plants constructed on navigable waterways. The interpretation of navigable has been broad so most rivers in the United States fall under this provision. The Federal Energy Regulatory Commission (FERC) is in charge of hydroelectric licensing and is required to consider if a proposed project is "best adapted to a comprehensive plan for improving or developing a waterway . . ." (Federal Power Act 1920). The 1986 Federal Electric Consumers Protection Act amended the Act to require that fish and wildlife and other public uses be given equal consideration in relicensing. Thus FERC has the authority to deny permits or to require flow releases to protect instream values (MacDonnell and Rice 1989, 76). Hydroelectric licenses must be renewed every fifty years and the relicensing process provides opportunities for renegotiating project operations. Between 1991 and 2000 over 200 projects are scheduled for relicensing (Birnbaum 1991, 153).

The project relicensing process could potentially benefit streamflow protection in some areas, but gaining protection will not be easy. FERC is required to give equal consideration to nonpower interests, but is not required to give them equal treatment (Bearzi 1991, 327). Recent court decisions and rulings by FERC have not favored streamflow protection (Birnbaum 1991). In 1990, The

Supreme Court ruled that FERC's authority through the Federal Power Act preempts state authority to establish instream flows at hydroelectric sites (California v. Federal Energy Regulatory Commission, 1990). FERC has a reputation for favoring the monetary aspects of projects over environmental values and this ruling may strengthen its stance. In spite of these indications that instream flows may not fare well in FERC proceedings, the process is still considered an option for protection and was the topic of several presentations at a recent instream flow and recreation workshop (Whittaker 1991).

Clean Water Act

The third regulatory act with the power to provide instream flow protection is the Clean Water Act of 1972. There are several aspects of the Act which can be used to require maintenance of streamflows (MacDonnell and Rice 1989, 78-79). Section 404 regulates the dredge and fill of U.S. waters and may require protection of streamflows to maintain aquatic ecosystems. The Act also authorizes the Environmental Protection Agency (EPA) to evaluate the need for storage on Corps of Engineers and Bureau of Reclamation reservoirs to provide releases to maintain instream values. The EPA may also determine if storage is needed to protect water quality on FERC license applications.

Most of the responsibility for establishing water quality standards was reserved to the states by Section 303 of the Clean Water Act. Another section, 401, allows states to maintain those standards against federal licensing authority (Birnbaum 1991, 149). Birnbaum contends that this provision of the Act provides states with a means of circumventing recent rulings limiting the ability of states to establish minimum flows at FERC licensed projects. Section 401 requires applicants for licenses, such as hydroelectric, to obtain a certificate from the state which declares that the project will comply with state water quality

standards. The section also states that the standards are not restricted to chemical requirements, but may include biological criteria needed to maintain habitats. This provision may allow states to request minimum flows to maintain water quality for habitat protection, but the extent of state authority to impose water quality standards on hydroelectric projects has not yet been resolved (Bearzi 1991, 331).

Other Federal Policies

There are other pieces of federal legislation which can be used to require streamflow protection, but which lack the regulatory aspects of the previous Acts. These actions depend on cooperation from federal agencies over which there is no direct control. The National Environmental Policy Act (NEPA) contains no mandates to protect the environment, but its procedural requirements have been used to block projects which would adversely affect instream values (MacDonnell and Rice 1989, 77). The Fish and Wildlife Coordination Act (FWCA) requires that the Fish and Wildlife Service be consulted when water projects are considered to insure that wildlife are protected (MacDonnell and Rice 1989, 75-77). Like NEPA the FWCA has no enforceable requirements, but it also has been used to block projects and require flow releases. The Pacific Northwest Power Planning and Conservation Act of 1980 created a unique body with the dual mandate of improving the reliability of the power supply in the Pacific Northwest and enhancing fish and wildlife. One result of the creation of the Northwest Power Planning Council (NPPC) was the establishment of over 40,000 miles of protected areas on streams judged as valuable fish habitat. No hydroelectric construction is permitted in these areas, therefore, they establish indirect flow protection for streams in the Columbia River Basin (NPPC 1988a,b). The NPPC has no enforcement authority, but actions by FERC, the

Bonneville Power Administration, the Corps of Engineers, and the Bureau of Reclamation are required to be in substantial compliance with Council plans. Because the Council is made up of gubernatorial appointees with no federal powers, implementation of NPPC policies has been problematic.

Summary of Federal Policies

The ability of federal agencies to provide streamflow protection is important in the West where they own a large percentage of the land. Most federally owned lands have important instream flow values which observers feel deserve protection. Reliance on federal protection for streamflows, however, will not lead to comprehensive streamflow protection. Water resources management is primarily the responsibility of states and comprehensive protection can best be incorporated into state policies.

There are three federal actions which could significantly improve streamflow protection in the West. First, negotiations for water releases from federally operated dams will be important because of the profusion of such dams in the West. Second, more Indian tribes may seek to use their Winters rights to preserve streamflows. The early priority dates of Winters rights could provide secure streamflow protection if Indians are successful in obtaining instream flow rights. Third, and perhaps most importantly, federal actions may serve as a catalyst to change state attitudes towards protection of instream values such as fish and wildlife, recreation, and water quality. In the past federal policies have led to changes in state laws to avoid direct federal intervention in areas of water quality and may have a similar effect on streamflow protection in the future.

Use of Recommended Strategies in the West

The potential federal actions described in the previous section and pressures from interest groups may impel western states to improve their streamflow protection programs. Improvements to those programs will likely involve reallocation of water rights to instream flow protection through the state strategies presented at the beginning of the chapter. While some western states are beginning to adopt some of these strategies to improve water allocation, few are currently being used to improve instream flow protection. The following section summarizes the limited application of the recommended strategies to streamflow protection in the West. These applications are illustrated in Table 1 compiled from state statutes and Grant (1987), Western Governors Association (1987), Western States Water Council (1987), Colby (1988), and Getches (1988). The legend follows the Table.

Market Strategies

The instream flow regulations of most western states do not specifically address the transfer of existing rights to instream rights. Authority comes indirectly from state transfer laws. These laws generally permit transfers to new uses, but some states have restrictions which prevent transfers to instream uses (Western Governors Association 1987, Appendix A). Columns 1-3 of Table 1 summarize the legal status of transfers to instream flows. Thirteen western states allow water to be transferred to instream uses. In Washington the mechanism for the transfer is uncertain due to the type of instream flow program in the state. Montana does not allow transfers to instream uses, but does allow water to be leased to protect streamflows. California, South Dakota, and Texas allow transfers to instream uses, but the value of this is unclear since those states only protect flows by placing conditions on offstream water rights. Seven

Table 1. Inclusion of Recommended Strategies in Western Water Laws.

	1	2	3	4	5	6	7	8	9	10	11	12	13
	Are Transfers Allowed to Instream Users?	May a Private Party Purchase Water for Instream Uses?	May Water Rights Be Donated for Instream Flows?	May a Private Party Obtain an Instream Water Right?	Are Transfers of Conserved Water Allowed?	State Water Plan?	Comprehensive Plan?	Ongoing Plan?	Are Instream Flows Considered?	Has Public Trust Been Applied to Instream Flows?	Public Interest Evaluation for Water Rights?	Public Interest Evaluation for Transfers?	Are Criteria Specified?
Alaska	Yes	Yes	Yes	Yes	No	No	-	-	-	No	Yes	-	Yes
Arizona	Yes	Yes	Unclear	Yes	No	5	-	-	-	No	Yes	-	No
California	Yes	3	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes
Colorado	Yes	No	Yes	No	No	No	-	-	-	No	No	-	-
Idaho	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kansas	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Montana	1	No	No	No	Yes	Yes	Yes	Yes	Yes	No	6	Yes	Yes
Nebraska	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Nevada	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes	No
New Mexico	No	No	N/A	N/A	4	No	-	-	-	No	Yes	Yes	No
North Dakota	No	No	N/A	N/A	No	Yes	No	No	No	No	Yes	Yes	No
Oklaoma	No	No	N/A	N/A	No	No	-	-	-	No	No	-	-
Oregon	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	-	Yes
South Dakota	Yes	Yes	N/A	N/A	No	Yes	No	Yes	Yes	No	Yes	Yes	No
Texas	Yes	2	N/A	N/A	No	Yes	Yes	Yes	No	No	Yes	-	No
Utah	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes	-	No
Washington	2	2	8	No	8	Yes	No	No	Yes	No	Yes	-	7
Wyoming	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes	-	No

**Table 1. Inclusion of Recommended Strategies in Western Water Laws.
Legend**

- 1. Can be leased and transferred.**
- 2. Not prohibited, but the mechanism for transfers and purchases is uncertain.**
- 3. Applies only to storage releases or diversions.**
- 4. If no harm to other users can be proved.**
- 5. Groundwater only.**
- 6. Applies only to applications exceeding 4,000 af. or 5.5 cfs.**
- 7. Instream flows are given priority.**
- 8. Washington's trust water rights program allows transfers or donations to the state for instream flows and transfers to the state of conserved water in designated areas.**

of the states allow private parties to purchase water rights and convert them to instream uses. Several states which do not allow private parties to purchase water rights for their own instream uses do allow individuals to donate rights to the state for instream uses. It should be noted that in most states the issues surrounding transfers to instream protection are unresolved.

In most states transferred water rights retain their original priority dates, making acquisition of existing rights desirable for instream uses. In Idaho, however, instream water rights are restricted to unappropriated water and cannot have a priority date earlier than 1978, the date the law was enacted (Schellbach 1992, 15).

The legal structure of most state water laws allows for the potential transfer of existing, consumptive water rights to instream flows. That potential has not been realized for the most part, however. Some purchases and transfers for instream flows have occurred in the West, most notably in California, Colorado, Idaho, Nebraska, Nevada, New Mexico, and Wyoming (Brown 1991, 318-19; Water Strategist 1992).

The most active participant in the instream flow market is The Nature Conservancy which has purchased water rights for instream uses in several states (Wigginton 1990, Wiley 1990, Brown 1991, Vetter 1991, Water Strategist 1992). The purchase of water rights is an extension of the Conservancy's traditional mission of purchasing land for habitat protection and in western states is becoming a priority (Wiley 1990, 9). The Conservancy has been instrumental in negotiating water rights for the Stillwater Wildlife Refuge in Nevada and in other areas in the West (Wigginton 1990, Vetter 1991).

An important aspect of market strategies is the acquisition of instream flow rights by private parties. Currently only Alaska, Arizona, and Nevada allow this (Column 4). Authority for this in Alaska comes from the 1980 instream flow

law and was the result of lobbying by the placer mining industry who wanted flows to dilute effluents (Harle 1989, 164). Arizona has no instream flow law, but the courts have interpreted state law as allowing in situ appropriations for recreation and fishing (Dishlip 1989, 174). The Arizona Department of Water Resources has ruled that individuals may apply for such rights. A similar court ruling in Nevada is the basis for streamflow appropriations there (Potter 1990).

While Alaska law allows private instream flow appropriations, requirements of the law have hindered individual applications (Harle 1989, 165-69). The law places the burden of proof for data supporting the application on the applicant. The process is hampered by the lack of hydrologic and fisheries data for the state and by the absence of a standard methodology for flow quantification. As a result no private party has been granted an instream water right although state agencies and the Bureau of Land Management have.

In 1991 The Nature Conservancy was granted a certificated water right for instream flows for its Ramsey Canyon preserve in Arizona (U.S. Water News 1991a, 16). This was the first water right issued for instream flows in Arizona. Several other instream flow applications have been filed with the state. The Department of Water Resources has formed a task force to establish guidelines for evaluating applications, but the Department's priorities have been channelled toward its Groundwater Management Plans, delaying progress on instream flow management (Dishlip 1989, 179-80). Appropriations for instream flows have been allowed in Nevada since a 1988 court ruling. Federal agencies and The Nature Conservancy have appropriated and purchased water rights for streamflow protection, but the state still has no formal instream flow program (Wigington 1990, Vetter 1991).

Water Conservation

The biggest obstacle to conservation of water and transferring it to instream flows is the use-it-or-lose-it aspect of the prior appropriation doctrine. Only four states have passed laws allowing holders of water rights to retain the right to conserved water and thus be able to transfer it—California, Oregon, Montana, and Washington (Column 5). Similar legislation has been introduced in Colorado, but has not passed. New Mexico allows the transfer of salvaged water if no damage to other uses can be proved, but has no instream flow protection program (Colby 1988, 731-33). In all other states, conserved water is considered to revert to the state.

In an effort to encourage transfers to improve allocation of its limited water supply, California amended its water law to allow the use and transfer of conserved water (California Water Code Sec. 1011) (Western Governors Association 1987, 69). The salvaged water retains its original priority date. But this amendment will have little impact on streamflow protection because California has no instream flow laws. The state can require flow releases for fish protection and if conserved water comes from storage, it could be used for such releases.

Oregon's 1987 water conservation law was specifically aimed at streamflow protection (ORS 537.455-500). This law allows water right holders to reduce their water uses and retain title to the salvaged water. Twenty-five percent of the conserved water is allocated to the state for instream or other uses. The water right holder is granted a new right for his portion of the salvaged water and may apply it to new uses or transfer it. The new right retains the original priority date with the state's share having a priority of one minute after the right holder's. Implementation has been hindered by a complicated appli-

cation process and by uncertainties about definitions and the law's intent (Reed 1990).

Montana adopted legislation in 1991 to encourage water conservation by allowing salvaged water to be retained by right holders (MCA 85-2-419). Any transfers of the salvaged water are subject to state approval and the water may be leased for instream flow purposes.

Washington also passed legislation in 1991 allowing transfers of conserved water, but under restricted conditions (RCW 90.42). Conserved water may be transferred to the state as trust water rights which are managed by the Department of Ecology and can be used for instream flows, irrigation, municipal, or other beneficial uses. The law applies only to specially designated pilot and water resource areas.

Comprehensive Water Resources Planning

Most western states have some form of water resources planning (Columns 6-9). Many of these plans, however, are not comprehensive or have not been updated (Getches 1988, 18, 44-45). Only seven states have comprehensive, on-going plans—California, Idaho, Kansas, Montana, Nebraska, Oregon, and South Dakota. Many of these are modelled after Kansas' plan which is a policy-development process (Getches 1988, 30). The Kansas Water Plan is submitted annually to the legislature. It considers water management, conservation, development, fish and wildlife, and recreation. All the other states consider instream flows in the planning process except South Dakota which has no formal instream flow program.

Montana and Oregon have recently released instream flow policies as part of their water plans. The Montana policy makes recommendations for resolving streamflow problems including legislative and administrative actions

to improve implementation of streamflow protection (Montana DNRC 1989). The recommended means for enhancing streamflows are voluntary leases of water rights by the Department of Fish, Wildlife, and Parks and the purchase or lease of stored water. In response to the recommendations, the 1989 legislature enacted and the 1991 legislature renewed a water leasing program and changed the priority date of instream reservations to the date of application (McKinney 1991).

The Oregon Instream Flow Protection Policy was adopted in 1990. It contains a number of strategies for implementation. These include improvements in monitoring and enforcing instream water rights, increased public participation in the issuance of water rights, and cooperation with other state agencies concerned with streamflows. Conservation and transfers of existing rights are recommended strategies for enhancing or restoring streamflows.

The Public Trust Doctrine

To date the public trust doctrine has directly influenced the instream flow protection programs of only two states—California and Idaho (Column 10). That influence is due to court cases in the states which have addressed instream flows and the public trust. The Montana Supreme Court recently rejected an application of the public trust doctrine to instream flows in that state (U.S. Water News 1992b, 15).

California's landmark Mono Lake decision has been described previously (p. 34). Subsequent court decisions in the state have required that streamflows in the Lake's tributaries be maintained (Dunning 1991). The decision, however, places no requirements on the State Water Resources Control Board to protect streamflows on other streams (Gray 1989, 191-93).

Public trust rulings in Idaho have had a more decisive impact on instream flow protection. The Idaho Supreme Court has consistently upheld the public trust doctrine in recent years (Reed 1989, 657). A 1985 ruling, Shokal v. Dunn, affirmed the doctrine and defined the "local public interest" which the Department of Water Resources (DWR) is required to consider in issuing water rights permits (Shokal v. Dunn, 1985). The DWR, as a result, revised the forms it uses for applications to include the public interest criteria specified by the ruling (Reed 1989, 665). The criteria have been used as the basis for denying water rights in at least two cases.

All western states except Colorado and Oklahoma have public interest criteria for issuing water rights and several states have such criteria for water transfer approvals (Columns 11-12) (Grant 1987, 683-84; Western States Water Council 1987, 11-12; Colby et al. 1989, Table 6). In many states the criteria for evaluation of the public interest are vague (Column 13). As noted previously (p. 39) public interest criteria offer states a means of injecting public trust values into allocation decisions. Idaho's example could be useful to other states.

No state has legislatively adopted the public trust doctrine, but an attempt to do so has been made in Oregon. In 1990, WaterWatch, an Oregon advocacy group for stream preservation, introduced a proposal with the intent to "legislatively establish the public trust doctrine in all waters of this state" (WaterWatch 1990). The most significant aspect of the proposal was its requirement that by 2020 all instream water rights would be granted a priority date of February 14, 1859, the date of Oregon's statehood. WaterWatch hoped that the proposal would be incorporated into legislation, but was prepared to submit it to the public as a ballot initiative (Simmons 1990). No legislative action was taken on the proposal, and WaterWatch may pursue the initiative idea in the future. A similar

initiative was suggested by the Montana Wildlife Federation, but has not yet been acted on (VanLoo 1990).

Summary of Recommended Strategies

Strategies to improve streamflow protection are not being rapidly adopted in most western states. This slow acceptance parallels the slow acceptance of similar strategies to improve other areas of water allocation. Water marketing has only recently been accepted in some states as a means of providing new supplies for municipal and other uses. The strategies may be employed more frequently as pressures increase to improve instream flow protection.

It can be seen from the above discussion that this is already happening in some states. Montana and Oregon have incorporated many of the recommended strategies into their streamflow programs. In both cases the acceptance of these strategies appears to be in response to pressure from environmental groups.

These recommended strategies can improve streamflow protection, but comprehensive flow protection requires an effective instream flow law to provide the framework for protection. The next section analyzes the existing instream flow laws of western states.

CHAPTER 3

ANALYSIS AND COMPARISON OF STATE INSTREAM FLOW PROGRAMS

Introduction

The value of instream flows has been recognized by most western states. Only two states, New Mexico and Oklahoma, do not recognize or protect streamflows in some manner. The degree of protection given to instream flows varies considerably from state to state and is a function of the components of the protection program. Some components enhance protection while others detract from it. The existing state streamflow protection programs are compared and analyzed in this chapter based on their inclusion of key components. The chapter concludes with a summary of the potential effectiveness of the programs.

Comparison of Programs

In 1988 a Fish and Wildlife Service publication evaluated instream flow programs in nine western states (McKinney and Taylor 1988). One method of assessment used was a comparison of the number of stream segments and stream miles protected by the programs (McKinney and Taylor 1988, 15-17). As the authors note, this evaluation of implementation is impaired by not considering the diversity of stream conditions and instream flow needs in the different states. It also does not consider the different length of time the programs have been in effect.

A more effective method of assessment used by McKinney and Taylor is their evaluation of the design of state programs. They note that design is critical to the implementation and effectiveness of the programs (McKinney and Taylor

1988, 4). Their design evaluation considers the purpose of programs, their areal extent, strategies employed, who can obtain a water right, the decision-making process in each state, and methods of monitoring and enforcement (McKinney and Taylor 1988, 4-15).

The comparison used in this study employs some of the same criteria used by McKinney and Taylor, but expands on their study both in the types of components used and in the number of states evaluated. In addition, this study updates the changes made since 1988.

Criteria for Selecting Components of the Evaluation

State Selection

The evaluation compares the programs of the seventeen contiguous western states and Alaska. Some eastern states have instituted instream flow protection measures, but this study is restricted to the West because its unique water laws and its pervasive aridity pose serious obstacles to the protection of streamflows. Hawaii also has an instream flow program, but is excluded from this study because the water law system and hydrology of Hawaii are different from other western states. Some western states have no structured instream flow programs, but they will be included in the comparison so that the opportunity for protection in those states can be assessed.

Component Selection

To develop the criteria for evaluating the state programs, critical questions were formulated about instream flow protection. These questions were based on the author's research and insights into instream flow protection. The questions formed the basis of the comparison matrix (Table 2). Answers to the

questions came from an analysis of state water laws and published materials on state programs.

Discussion of the Components

The results of the comparison and analysis are summarized in Table 2, compiled from state statutes and MacDonnell, Rice, and Shupe (1989). The legend follows the table. The matrix is the framework for the discussion of state programs. Each component is discussed, its importance evaluated, and each state's application of the components is reviewed.

Managing Agencies

It has been suggested that instream water rights should be managed by independent agencies rather than by the same agency which manages diversionary water rights in order to insure adequate protection for streamflows (Potter 1989, 57). Instream flows are managed by the same agencies which issue offstream water rights in all western states (Column 1). In some states those agencies have broad resource management mandates, but in states such as New Mexico and Wyoming, the primary objective is diversionary uses. While the ideal situation for instream flow protection might be to have a preservation oriented agency manage the rights, bureaucratic practicalities dictate a single agency to manage all water rights. A better strategy might be to allow other agencies to apply for or recommend instream flow protection while leaving one agency to manage all water rights.

Instream Flow Statutes

The state instream flow protection statutes are listed in Column 2 of Table 2. Statutes are listed only for those states which have a legislated streamflow protection program. Arizona and Nevada protect streamflows based on court

Table 2. Comparison of State Instream Flow Programs.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	Managing Agency	Instream Flow Statutes	Type of Protection	Year Adopted	Recognized Beneficial Uses	Recognized Instream Uses	Who May Request or Recommend Instream Flows?	Scope	Priority Date	Subject to Reevaluation/Years	Restricted to Minimum Flows	Legal Challenge to Law/Date	Administrative Procedures	Wild & Scenic Rivers	State River Protection System	
Alaska	Department of Natural Resources	AS 46.15.145	A	1980	1,2,3,4,5,6,7, 8,9,10,11*	1,2,3,4	any public or private entity	S	F	10	No	No	1,2,3,8	[3210] 25	[499] 6	
Arizona	Department of Water Resources	None	A	1976 ^a	1,3,5,6, 8,9,13	1,2	any public or private entity	S	F	No	No	1976	—	[40.5] 1	—	
California	State Water Resources Control Board	CWC Sec. 12, 43, 1255, 1257, 1260	C	1955	* 1,3,4,5,6,8,9	1,2	—	S	—	—	—	—	—	[1775.75] 10	[1277] 47	
Colorado	Colorado Water Conservation Board	CRS 37-92-102	A	1973	* 8,9	10	Colorado Water Conservation Board*	S	A	No	Yes	1979	1,2,3,4,6,8	[76] 1	—	
Idaho	Department of Water Resources	IC 42-150, 1 to 150, 5	A	1978	1,2,3,4,5,6, 8,9,10,12*	1,2,3,5,7	Water Resources Board*	S	F	varies	Yes	1974	1,2,3,4,5,8	[574] 6**	[663.56] 6	
Kansas	State Board of Agriculture, Div. of Water Resources	KSA 82a-700-703	R	1980	* 1,2,3,5,6,7	1,2,3,5,6,7	Key Water Agencies	S	A*	No	Yes	No	1,4,5,8	—	—	
Montana	Dept. of Natural Resources, Water Resources Div.	MCA 85-2-316	R	1973	1,2,3,4,5, 6,8,9*	1,2,3,8	Any state, federal, or local agency	S	F	10	No	No	1,2,3,7,8	[368] 2	*	
Nebraska	Department of Water Resources	NRS 46-2, 107 to 2119	A	1984	*	1,2	Game & Parks Comm; Natural Res. Dist.	S	F	Yes*	Yes	No	1,2,3,8	[193] 2*	—	
Nevada	State Engineer	None	A	1988 ^a	* 9	1,2,9	Any person	S	F	No	No	1988	*	—	—	
New Mexico	State Engineer	None	None	—	* 1,3,8,9	None	—	—	—	—	—	—	—	—	—	
North Dakota	State Engineer	None	C	—	* 8,9	1,2	—	—	—	—	—	—	—	—	—	
Oklahoma	Water Resources Board	None	None	—	* 1,3,4,5,6, 8,9,10	None	—	—	—	—	—	—	—	—	[179] 6	
Oregon	Water Resources Department	ORS 537.332 to 360 (536.325)	A	1987 ^b [1955]	1,3,4,5,6, 8,9,10	1,2,3,4,5,8	Depts. of State Parks, Fish & Wildlife, Env. Qual.	S	F	No	No	No	1,2,3,4,7,8	[1450.9] 45**	[1148] 19	
South Dakota	Department of Water and Natural Resources	None	A*	—	Consistent with public interests	*	—	—	—	—	—	—	—	[98] 2*	—	
Texas	Water Commission	TCA 11.147 to 11.152	C	1985	1,3,4,5,6, 7,9,13,14*	* ,1	—	—	—	—	—	—	—	[191.2] 1	—	
Utah	State Engineer	UCA 73-3-3(11)	A	1986	* 1,2,3,4,5,6 8,9,12,13*	1,2,11	Divisions of Wildlife Res. and Parks & Rec.	L	F	No	No	No	—	—	—	—
Washington	Department of Ecology	RCW 90.22 to 90.54	R	1971 ^c [1949, 1969]	1,2,3,4,5,6 8,9,12,13*	1,2,3,4,5	Department of Ecology	S	A	No	No	1985	1,2,3,4,8.	[176.5] 3	[67] 6	
Wyoming	State Engineer	WSA 41-3-1001 to 1004	A	1986	* 1	1	Water Development Commission	L	F	varies	Yes	No	1,2,3,4,5,8	[20.5] 1	—	

Table 2 . Comparison of State Instream Flow Programs.
Legend

1. Agency Managing Instream Flow Program.
2. Instream Flow Protection Statutes.
3. Type of Protection.
 A = appropriation R = reservation C = conditions on water rights
 * South Dakota has no instream flow protection program, but has issued two permits for instream flows.
4. Year Adopted.
 a. year of court decision allowing instream flow appropriations
 b. Oregon adopted a minimum streamflow program in 1955 and an instream water rights program in 1987.
 c. Washington started placing conditions on water rights in 1949, minimum flows in 1967, and establishment of base flows in 1971.
5. Recognized Beneficial Uses by State Water Laws.

1 = irrigation	6 = power	11 = sanitary
2 = agriculture	7 = navigation	12 = aesthetics
3 = domestic/municipal	8 = fish & wildlife	13 = stock watering
4 = industry/manufacturing	9 = recreation	14 = public parks & game reserves (Texas)
5 = mining	10 = water quality	

 * = not restricted to those listed
6. Recognized Instream Uses by Instream Flow Laws.

1 = fish & wildlife	8 = future consumptive uses
2 = recreation	9 = maintenance of wetlands
3 = water quality	10 = "to preserve the natural environment to a reasonable degree" (Colorado)
4 = navigation	11 = "reasonable preservation of natural stream environment" (Utah)
5 = aesthetics	
6 = domestic	* = not specified
7 = aquatic life	
7. Who May Request or Recommend Instream Flows.
 * = Recommendations from other agencies
8. Scope.
 S = statewide L = limited

Table 2 . Comparison of State Instream Flow Programs.
Legend Cont'd.

9. Priority Date of Protected Flows.
 A = date adopted F = date application filed
 * In Kansas rights filed before July 1, 1990 have a priority date of April 12, 1984; thereafter of the date of approval.
10. Subject to Reevaluation.
 years between reevaluations
 * Nebraska — with each application for junior rights.
11. Applications for instream flows restricted to the minimum amount necessary.
12. Legal challenge to instream flow law — year.
13. Administrative Procedures.
 1 = application and quantification 5 = legislative review
 2 = technical review 6 = court proceedings
 3 = public comment and review 7 = citizen's board review
 4 = additional public and agency review 8 = adoption
 * = same as other water rights
14. Wild and Scenic Rivers.
 number in each state with mileage in parentheses
 * Nebraska and South Dakota share segments of the Missouri.
 ** Idaho and Oregon share a segment of the Snake.
15. State River Protection Systems.
 Number in each state with mileage in parentheses.
 * Montana has administrative means to protect, but has not utilized.

interpretations of water rights statutes. New Mexico, North Dakota, Oklahoma, and South Dakota have no protection programs although North Dakota does place conditions on water rights to protect flows and instream flows rights have twice been appropriated in South Dakota (Smith 1986).

Type of Protection

The statutory and administrative programs for instream flow protection fall into three categories—conditions on new water rights, reservations of minimum flows, and appropriative instream flow rights (Column 3). Appropriative rights are generally considered to offer more effective protection than the other two programs (Gray 1989, 199).

Appropriative rights give instream flows the same legal status as other water rights. The rights have a priority date allowing protection against junior appropriations. Instream rights, like other water rights, are protected from damage by transfers or changes to other water rights by the no injury rule. Water rights status allows instream flows to be marketed like other rights and permits the transfer of other rights to instream rights. A major disadvantage of appropriative rights is that they are usually junior in priority to most diversionary rights. Appropriative rights are also usually filed on a case by case basis and only protect the designated section, not the entire stream.

Reservations of minimum flows require that a level of water be left in the stream and withdrawn from appropriation. New water rights cannot be issued if they would reduce flows below the minimum reservation. Reserved flows are only effective in areas which are not overappropriated and have flows to reserve. Reserved flows do not necessarily have the same legal status as appropriative rights, although such status can be granted to them.

The use of conditions on water rights to protect streamflows could be an effective strategy if it were consistently applied. Under this system, conditions are attached to new water rights requiring that streamflows be maintained. The system can be extended to deny water rights which would damage instream flows. This system incorporates public interest criteria into the assessment of water rights permits. Conditions on new water rights do not allow for comprehensive protection, but must be applied on an ad hoc basis as permits for new water rights are issued. Protection of flows is left to the discretion of the water rights issuing agency. Like flow reservations, conditions offer no means of protection in overappropriated areas. Streamflows have no legal status under this system and water rights cannot be purchased or transferred to instream uses.

While reservations and conditions on new rights may be effective means of protecting streamflows where water exists to be appropriated, appropriative rights and the market system offer the only means of protection in overappropriated areas. The legal status of appropriative instream flows facilitates the enforcement of the rights and it is this legal status which generally makes appropriative rights a more effective method for instream flow protection.

The distribution of the three programs in the West and the dates of their adoption are listed in Columns 3 and 4 of Table 2 and displayed in Figure 1. The majority of states have chosen to grant instream flows the same status as other appropriated water rights. Three states reserve minimum flows in streams—Washington, Montana, and Kansas. The three states administer their flow reservation programs differently. Washington establishes instream flows through comprehensive basin plans and Instream Resources Protection Programs (Barwin and Slattery 1989, 374). In Montana flow reservations can be applied for like other water rights, but have generally been requested for major drainage basins (McKinney et al. 1989, 290-92). Kansas flow reservations are

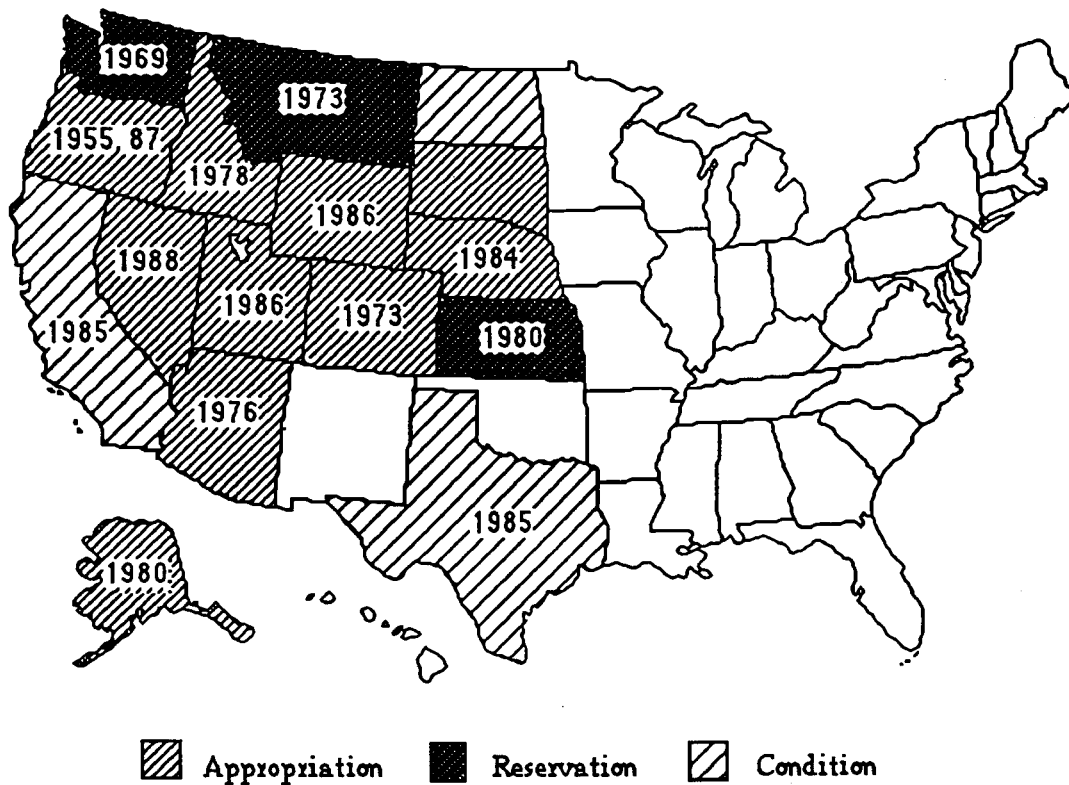


Figure 1. Western Instream Flow Protection Programs

recommended by major water agencies to the legislature as part of the state water plan (Rolfs 1989, 279-80). Washington and Montana have granted their flow reservations water rights status. Oregon's original instream flow legislation established minimum flow reservations, but a 1987 law created instream water rights and required the conversion of existing reservations to instream rights. California, North Dakota, and Texas place conditions on new water rights to protect streamflows. In the Great Plains states, the use of instream flow conditions on water rights has been limited, whereas California has used the authority frequently (Gray 1989).

Year of Adoption

Since a major problem of instream protection is that most protection is junior to diversionary uses, the date of adoption of the programs is important. Earlier programs have an obvious advantage over later programs, but when viewed relative to diversionary uses which began in the late 1800s, all instream flow protection programs are at a disadvantage. The first instream flow program in the West was Oregon's 1955 minimum flow reservation law. Several programs were established in the 1970s, but many have been enacted in the last ten years.

Recognized Beneficial Uses

One of the early obstacles to streamflow protection was that water could only be appropriated for what states had determined to be beneficial uses. In states where instream uses were not recognized as beneficial, laws had to be amended before streamflow protection could be instituted.

In several states, recognized beneficial uses are not specified or some uses are named, but the laws state that the uses are not restricted to those listed

(see Column 5). In these states the definition of what uses are beneficial is left to the interpretation of state agencies and/or courts. Some states have found it necessary to state that certain instream uses are beneficial although other uses are not specified. Among these states are Colorado, Nevada, and North Dakota (CRS 37-92-103(4), NRS 533.030, NDC 61-04-01.1) In New Mexico fishing and recreation were defined as beneficial uses by a 1945 court ruling (State ex rel. State Game Comm'n. v. Red River Valley Co., 1945). Only Oklahoma has neither recognized instream uses as beneficial nor adopted an instream flow policy.

Court cases in Arizona and Nevada emphasize the importance of recognizing instream uses as beneficial. In 1976 the Arizona Court of Appeals ruled that since recreation and fish and wildlife were beneficial uses and since such uses did not require diversions, appropriations could be made for in situ purposes (McClellan v. Jensen. 1976) (Scribner 1979, 1110-11). This ruling led to the filing of instream water rights by The Nature Conservancy and the recognition of private appropriations for instream flows in Arizona (Dishlip 1989, 174-75).

A similar case was heard in Nevada in 1988 (Nevada v. Morros, 1988). In this case the Nevada Supreme Court ruled that the state's recognition of recreation as a beneficial use did not require a diversion (Potter 1990, 65-66). The Court upheld a water right requested by the Bureau of Land Management for recreation and other uses. While Nevada still has no instream flow program, this court ruling has led to the acquisition of instream water rights in the state, including purchases by The Nature Conservancy and the Fish and Wildlife Service to protect Stillwater National Wildlife Refuge (Vetter 1991).

The possibility exists to use court rulings to extend protection to stream-flows in other states which have not enacted programs. The most notable

potential for this is in New Mexico, which has rejected numerous instream protection laws, but recognizes fish and wildlife and recreation as beneficial uses.

Recognized Instream Uses

There are many values of water which require flows to be left instream. Streamflow protection programs which recognize all these values will have better opportunities to develop comprehensive instream flow protection.

Most instream flows which have been protected in the West have been for fish and wildlife (McKinney and Taylor 1988, 5) (see Column 6). There are several reasons for this in addition to the fact that fish and wildlife is the most frequently recognized instream flow value. One is that the methodologies for quantifying flows for fish are relatively well established. Also, it is easier to weigh the benefits of fish protection against the value of traditional water uses than it is for other instream uses. Another reason is that it has often been assumed that if flows are adequate for fish, they will be adequate for other uses (McKinney and Taylor 1988, 5). In many cases this is not true. For example, recreational flows required for boating can be much higher than flows for fish habitat.

The demand is increasing for protection of other instream values (Just 1990, Whittaker 1991, Shelby, Brown, and Taylor 1992). Those instream flow programs which have the broadest interpretations of instream values will be best able to meet that demand.

Idaho, Kansas, Oregon, and Washington have the most comprehensive definitions of instream values which can be protected (see Column 6) (IC 42-1502(f); KSA 82a-703 a,b; ORS 537.336; RCW 90.22.010). Alaska also has a broad interpretation of instream values (AS 46.15.145). These states all allow instream appropriations or reservations for fish and wildlife, recreation, and

water quality. Nebraska and Utah limit appropriations to fish and wildlife and recreation (NRS 46-2,108, UCA 73-3-3(11a)). Wyoming restricts streamflow protection to fish and wildlife only (WSA 41-3-1001(a,b)). Colorado has a unique definition of instream uses: "to preserve the natural environment to a reasonable degree" (CRS 37-92-103(4)). This has been interpreted to allow appropriations for fish and wildlife and recreation, but most instream water rights have been issued for fish protection (Shupe 1989a, 19). Montana and Oregon also permit instream appropriations as reservations for future consumptive uses (MCA 85-2-316; ORS 537.356). These are somewhat speculative water rights which allow flows to be reserved instream and later used for diversionary uses.

Who May Request or Recommend Instream Flows

One of the potential strategies for improving instream flow protection is to allow private parties to appropriate instream water rights. As discussed in Chapter 2, most states restrict acquisition of such rights to a single agency (see Column 7). Allowing only one agency to hold instream water rights may simplify management, but restricting flow protection to an agency with a single directive may not allow protection of many instream values. More comprehensive protection will occur in states which allow a broad range of entities to request streamflow protection. While appropriation of streamflows by private entities may be a controversial issue, other options exist for expanding protection. The acquisition of flows can be extended to all agencies with a water oriented directive such as fish and wildlife, water quality, and recreation. Another option is for the single managing agency to solicit or accept recommendations for instream flow protection from other agencies and entities.

As discussed, Alaska, Arizona, and Nevada have the only instream flow programs which permit private entities to appropriate instream rights. Only Alaska's program has been legislated; the others are based on court rulings and the ability of individuals to request streamflow protection may be challenged.

In some states one agency holds the instream water rights or reservations, but other agencies or individuals are allowed to file for flow protection. Montana's Board of Natural Resources and Conservation holds title to all instream reservations, but any state agency or state political subdivision, and federal agencies may reserve flows (MCA 85-2-316(1)). Oregon assigns responsibility for acquiring instream flows based on the purpose of the flow and allows the Departments of Fish and Wildlife, Environmental Quality, and State Parks to request flows for fish and wildlife habitat, water quality, and recreation and scenic attraction respectively (ORS 537.336). All of Oregon's instream water rights are held in trust by the Water Resources Department (ORS 537.332(2)). Nebraska authorizes both the Game and Parks Commission and Natural Resources Districts to file for instream flows (NRS 4602,108). In Kansas the Division of Water Resources, the Board of Agriculture, the Department of Health and Environment, and the Department of Wildlife and Parks make recommendations to the legislature for minimum flow reservations (KSA 82a-903).

Other states restrict acquisition of instream flows to a single agency, but many consult with others for recommendations for flows. The Colorado Water Conservation Board solicits recommendations from the Division of Wildlife and the Division of Parks and Outdoor Recreation (CRS 37-92-102(3)). A 1986 amendment to the Colorado law permits the Board to request recommendations from the U.S. Departments of Agriculture and the Interior (Shupe 1989a, 241). The Idaho Water Resources Board is the only entity with the authority to appro-

appropriate instream water rights in the state, but the law allows "any person, association, municipality, county, state or federal agency" to request the Board to consider instream flow applications (IC 42-1504). Administrative rules have limited these requests to government entities (Just 1990, 309). Wyoming, which allows instream water rights for fish habitat only, requires the Game and Fish Commission to make studies and recommend flows for critical streams to the Water Development Commission once a year (Reynolds 1986, 462). Utah's limited streamflow program vests authority for instream flow acquisition with the Divisions of Wildlife Resources and Parks and Recreation (UCA 73-3-3(11a)). Washington's Department of Ecology has sole responsibility for instream flows in that state (RCW 90.22.010).

Scope of the Programs

To insure comprehensive streamflow protection, instream appropriations or reservations should be allowed on all streams in the state. This is the case in most states allowing instream appropriations or reservations (see Column 8). Utah's program only allows instream flow protection through conversion of existing flows to instream uses (UCA 73-3-3(11a)). The flows can be purchased or acquired through donation, gift, exchange, or lease. The Divisions of Wildlife Resources and Parks and Recreation cannot file for instream flows on unappropriated waters (UCA 73-3-3(11e)).

Wyoming places geographical restrictions on instream appropriations. The law limits the amount of water that can be appropriated for instream flows in each river basin (WSA 41-3-1006h). The limit is intended to prevent instream flows from allowing more water to leave the state than is allotted through interstate compacts and other agreements. Another restriction with the same pur-

pose prevents the appropriation of instream flows on streams within one mile of the state's borders (WSA 41-3-1002(d)).

Utah's instream flow program is an initial effort at streamflow protection in a state where most waters have been appropriated (Holden 1989, 368). Because little water is left for appropriation, it was believed that conversion of existing rights to instream rights would be an appropriate starting point for streamflow protection. The provisions of the Wyoming law reflect its status as a headwaters state concerned that downstream states would benefit from flows in excess of the compacts (Fassett 1989, 408-09). The limitations of these two programs can be explained by conditions and attitudes in the states, however, the restrictions will prevent comprehensive streamflow protection.

Priority Date

In most states the priority date for traditional water rights is the date the permit application is filed (see Column 9). Some states have made the priority date of instream water rights or reservations the date of approval of the application. Since there is often a long time lag between application and approval, this places instream rights at a disadvantage. It not only delays the priority date of rights which are already junior, but it allows subsequently filed diversionary rights to have an earlier priority than the instream flows. This could lead to filings of offstream rights to deny flows to instream applications.

Colorado and Washington delay the priority of instream flows until the application has been approved (see Column 9) (McKinney and Taylor 1989, 30; RCW 90.03.247). Kansas instream reservations also are dated upon approval, but a 1984 amendment created a time span in which all instream flows would have priority over new water rights (Rolfs 1989, 280-81). All instream reservations filed before July 1, 1990 were granted a priority date of April 12, 1984 and

all offstream permits filed during the period were conditioned as subject to those minimum flows. Since the object of the Kansas instream flow program is to incorporate identification of streamflow protection into the state water plan and request protection for several streams at a time, this grandfathering of priority dates guaranteed priority for many streams. Any flow reservations filed after July 1, 1990 will be junior to filings for offstream rights.

Originally the priority date for Montana streamflow reservations was the date of approval, but a 1989 amendment changed it to the application date (MCA 85-2-316(9a)). To prevent threats to instream applications Colorado, Washington, and Kansas would be well advised to follow Montana's example.

Subject to Reevaluation

Diversionary water rights are issued in perpetuity and are not subject to periodic reevaluation. However, a few states subject instream water rights and reservations to a reevaluation process (see Column 10). The rights can be periodically reviewed and altered if conditions warrant. While the flows could be increased, the general intent of the reevaluation process appears to be to insure that instream flows do not interfere with other uses. It has been suggested that periodic review of all water rights would improve the allocation system, but subjecting instream flows to reevaluation while not reviewing other water rights hampers streamflow protection and implies that protection is not permanent.

Alaska instream water rights are reviewed at least once every ten years (AS 46.15 145(f)). Montana law requires the same period of review (MCA 85-2-316(10)). Instream water rights in Idaho can be reevaluated every 10 or 15 years or at unspecified times (Just 1990, 311). The State Engineer of Wyoming

can place several conditions on instream flow permits including that they be reviewed at certain times (WSA 41-3-1006(e)).

Nebraska has the most restrictive reevaluation procedures. Instream water rights are reviewed with any junior application with which they might interfere (NRS 46-2,110). According to David Aiken this provision of the law

"largely nullified whatever protection could be obtained through an instream appropriation, and reflected continued hostility by water development interests"

to the instream protection law which was enacted in response to threatened litigation (Aiken 1989, 319).

Limited to Minimum Flows

The amount of water allocated to instream water rights or flow reservations can be restricted to the minimum amount of water necessary to protect the use or can be granted higher flows. Flows higher than the minimum would improve protection and allow for errors in quantification.

Some authorities contend that restricting instream flows to one minimum level does not adequately protect instream values (Stalnaker 1990, Tyus 1991). This is especially true for fisheries. Stalnaker suggests that minimum flows become the average flows in overappropriated areas and result in persistent low flows which do not adequately protect environmental needs (Stalnaker 1990, 31). Tyus recommends that fish be allocated recovery flows which meet habitat requirements rather than limited minimum flows which are "the same flows in which they are declining" (Tyus 1991, 33).

Laws which allow the protection of higher than minimum flows for instream values would provide greater protection, but opponents of streamflow protection contend that flows above the minimum level would be wasteful. In response to such criticism some states limit instream flows to the minimum level

(see Column 11). Colorado, Idaho, Kansas, Nebraska, and Wyoming do not allow appropriations in excess of minimum flows (CRS 37-92-103(4); IC 42-1502(f); KSA 821-703a,b; NRS 46-2,115(4); WSA 41-3-1001(c,d)). Montana restricts flow reservations to 50 percent of the average annual flow on gauged streams and limits flows on ungauged streams at the discretion of the board which approves reservations (MCA 85-2-316(6)).

Legal Challenges

Certain provisions of the prior appropriation doctrine presented legal obstacles to implementing streamflow protection. Those provisions have been the basis for legal challenges to some instream flow laws (see Column 12). To date the programs in Colorado and Idaho have been challenged and both survived intact. In addition, Arizona's and Nevada's instream flow programs are the result of court rulings upholding the ability to appropriate flows for instream uses in those states. These cases suggest that it is no longer valid to assert that instream flow protection cannot be granted under the prior appropriation doctrine.

Colorado's instream flow law was upheld by a Colorado Supreme Court ruling in 1979 (*Colorado River Water Conservation District v. Colorado Water Conservation Board*, 1979). Grounds against the law included that diversions were required under state water law (Shupe 1989a, 239). The legal challenge to instream flow protection in Idaho came before enactment of its current law. The case was filed against a 1971 designation of flows for spring water by the legislature (*State Department of Parks v. Idaho Department of Water Administration*, 1974). The Idaho Supreme Court ruled in 1974 that a diversion was not required for a valid appropriation and that while recreation and scenic beauty were not listed as beneficial uses of water by the state constitution, they were

beneficial (Beeman and Arment 1989, 267-68). This ruling paved the way for enacting Idaho's current instream flow law which has not been challenged.

The Washington instream flow law faced a different type of legal challenge in 1985, which has led to changes in its implementation (Barwin and Slattery 1989, 379-89). During that dry summer the Department of Ecology enforced minimum flows on streams in Central Washington. Its enforcement efforts led to protests from junior users and a class action suit by the Colville Indian Reservation (Louis Crowder et ux, et al. v. Department of Ecology, 1985). Since that summer, changes in enforcement procedures to provide better communication with water users, including public meetings and newsletters, have reduced conflicts somewhat. Studies have led to recommendations for improved instream flow legislation which have yet to be enacted (Adelsman 1991). The protests and court cases in Washington underscore the problems of enforcing instream flows against junior users.

Administrative Procedures

A key component of the design of instream flow programs is the administrative procedure involved in their implementation. These can either facilitate or hinder implementation of instream flow protection. McKinney and Taylor (1988) identified the major steps in the decision-making process. These steps include application, quantification, technical review, public comment, and approval. McKinney and Taylor's steps have been slightly modified for this analysis (see Column 13).

There are two separate questions involved in the decision process (Huffman 1980, 1-18; McKinney and Taylor 1988, 9). The first is a technical question of what level of flow is needed for the purpose of the instream flow. The second is a political question of whether protecting that flow is merited in

comparison to other water demands. The two issues are often not kept separate in the administrative process. Because value decisions between conflicting demands for water are difficult to resolve, the focus is often shifted to the technical question of how much water is needed. Reducing flows becomes a surrogate for resolving the political question. Huffman (1980, 1-18-24) recommends that to avoid confusion of the two issues, standardized methodologies should be used to determine the required flow levels and the costs and benefits of designating the flows. The policy decision should then be based on whether protecting the flows is in the public interest.

Most instream flow programs appear to separate the two issues in theory. All the programs with established administrative procedures involve the same first steps: 1) filing of the application and quantification of flows, 2) technical review of the application, 3) public review and comment, and 4) approval or rejection of the application. The technical questions should be addressed by steps one and two while the other steps should address the value issues. Whether the two issues are kept separate in reality could only be determined by evaluating the administrative process for each application.

Some states have included other steps in their decision-making process which increase the chances that value issues will be considered. In Colorado where all water rights are issued by water courts, the judicial system is involved. After instream flows have been approved by the Colorado Water Conservation Board, the Attorney General must file for a water right in the appropriate water court. The process involves further public comment and the Colorado Water Conservation Board must prove that there will be no damage to existing water rights. Appeals to court rulings can be made directly to the Colorado Supreme Court (Shupe 1989a, 251-52).

Once approved by the Water Resources Board, Idaho's instream flows must be submitted to the legislature for approval. The legislature can either directly approve the designated flows or they are approved by default if no action is taken on them in that session (IC-42-1503). The legislative process allows for public comments and hearings and for consideration of value issues. Another state which uses the legislative strategy is Kansas. Minimum flow needs are identified by water agencies and recommendations for reservations are included in the State Water Plan which is submitted annually to the legislature (Rolfs 1989, 279). Wyoming has a complex procedure for approving instream flow applications (Reynolds 1986). Applications for streamflows recommended by the Game and Fish Commission are reviewed by several state agencies including a division of the Economic Development and Stabilization Board which prepares feasibility studies for each recommended stream. The studies are presented to the Game and Fish Commission and the legislature. If the application is for a direct appropriation of streamflows, the legislature has no power to deny the application. However, if the application is for releases from proposed reservoirs as encouraged by the law, the legislature can deny permits or funding. After other reviews have been completed, the State Engineer acts on the application and conducts additional studies and hearings. The process in Wyoming has been accused of being so complex that it will prevent flow designations (Reynolds 1986, 480). It does, however, allow for separate consideration of the technical and political issues.

Another way to improve the chances that instream flow decisions are based on the relative values of different water uses is to place the decision-making responsibility with citizens' boards rather than a state agency (Huffman 1980, IV-6). While a citizens' board might not necessarily favor streamflow protection, it could be more responsive to public input and might be better

equipped to attempt to balance diversionary water uses and protecting streamflows. The final decision for instream flow permits is made by such boards or commissions in Montana, Oregon, and Washington.

River Protection Systems

A less direct method to protect streamflows than water rights or reservations is a river protection system such as the federal Wild and Scenic River Act of 1968. The Act protects river segments and adjacent land by prohibiting future development. Streamflows are not specifically protected, but the ban on future dams and diversions serves as a de facto streamflow reservation. Some states have enacted similar programs. These programs do not give instream flows the legal status of other methods, but they can provide some protection for rivers with outstanding qualities and federal reserve rights can be asserted for Wild and Scenic Rivers (Wilkinson and Anderson 1987, 229-30). Both the federal and state systems provide protection for the designated stream segment only and have little control over upstream activities.

Wild and Scenic Rivers

There are over 130 river segments currently in the Wild and Scenic River system with the majority in western states (National Park Service 1990, Congressional Quarterly Almanac 1991, 230). Of the 9647 miles of rivers in the system, 6587 are in the West, mostly in Alaska, California, and Oregon. Column 14 lists the number of Wild and Scenic Rivers and mileages for each western state. Most of these rivers are located in Oregon and Alaska. Protection for flows on these rivers remains largely indirect. Ironically the first water right granted for a Wild and Scenic River was in New Mexico, one of two western states which do not recognize instream flow protection (Garn 1986). Recently

the Bureau of Land Management received an instream flow right for Beaver Creek Wild and Scenic River in Alaska and water rights are being sought for other Alaska rivers (Shelby, Brown, and Taylor 1992, 7).

State River Protection Systems

Alaska, California, Idaho, Oklahoma, Oregon, and Washington have followed the federal example and established river protection systems. Column 15 indicates the number and mileages of rivers protected. As with the federal system, instream flows are indirectly protected through restrictions on future development within the protected section. A court ruling in Oregon (Diack v. The City of Portland, 1988) led the state to quantify streamflows for the scenic waterways, but instream rights have not yet been requested (Fujii 1991).

Summary of Program Effectiveness

Due to the many differences between western states, including water laws, hydrologic, demographic and economic conditions, no one instream flow protection program would be ideal for every state. However, there are certain components that should be included in streamflow programs to increase the probability of effective implementation. The preceding discussion evaluated the components of existing programs and the strategies which have been proposed to improve them. The programs which contain the most positive components and the most suggested strategies should have the best chances for being effective.

Table 3 and its following legend is used to assess the potential effectiveness of the instream flow programs evaluated. The assessment does not attempt to rate the individual programs. They are evaluated only for the presence or absence of positive and negative components. The Table was com-

Table 3. Evaluation of State Instream Flow Protection Strategies

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Type of Protection	Year Adopted	Recognized Beneficial Uses	Recognized Instream Uses	Appropriators	Scope	Priority Date	Subject to Reevaluation	Restricted to Minimum Flows	Administrative Procedures	State River Protection	Transfers Allowed to Instream Uses	Instream Flows Can Be Obtained Through Purchase, Lease, Gift, etc.	Transfer of Conserved Water Allowed	State Water Plan	Specified Public Interest Criteria
Alaska	■	■	■	■	■	■	■	□	■	□	■	■	■	□	□	■
Arizona	■	□	■	□	■	■	■	■	■	□	□	■	■	□	□	□
California	□	□	■	□	—	■	—	—	—	—	■	■	■	■	■	■
Colorado	■	■	■	□	▨	■	□	■	□	■	□	■	■	□	□	□
Idaho	■	■	■	■	▨	■	■	□	□	■	■	■	■	□	■	■
Kansas	▨	■	□	■	▨	■	□	■	□	■	□	■	■	□	■	■
Montana	▨	■	■	■	▨	■	■	□	■	■	□	□	■	■	■	■
Nebraska	■	□	□	□	▨	■	■	□	□	□	□	□	□	□	■	□
Nevada	■	□	■	■	■	■	■	□	□	□	□	■	■	□	□	□
New Mexico	—	—	■	—	—	—	—	—	—	—	□	□	□	■	□	□
North Dakota	□	—	■	□	—	—	—	—	—	—	□	□	□	□	□	■
Oklahoma	—	—	□	□	—	—	—	—	—	—	■	□	□	□	□	□
Oregon	■	■	■	■	▨	■	■	■	■	■	■	■	■	■	■	■
South Dakota	■	—	□	—	—	—	—	—	—	—	□	■	□	□	■	□
Texas	□	□	■	■	—	—	—	—	—	—	□	■	■	□	■	□
Utah	■	□	□	□	□	□	—	■	■	□	□	□	■	□	□	□
Washington	▨	■	■	■	□	■	□	■	■	■	■	▨	■	▨	□	□
Wyoming	■	□	□	□	▨	□	■	□	□	■	□	□	■	□	□	□

General Key: ■ advantage ▨ slight advantage □ disadvantage — inapplicable

Table 3. Program Evaluation.
Legend

1. Type of Protection
 - = appropriation
 - = reservation
 - = conditions

2. Year Adopted
 - = 1980 and earlier
 - = after 1980

3. Recognized Beneficial Uses
 - = instream uses included
 - = no instream uses

4. Recognized Instream Uses
 - = more than 2
 - = 2 or less

5. Who may appropriate or request appropriations?
 - = private appropriations
 - = more than 1 agency
 - = 1 agency

6. Scope
 - = statewide
 - = limited

7. Priority Date
 - = application filing
 - = approval

8. Subject to Review
 - = no
 - = yes

Table 3. Program Evaluation.
Legend Cont'd.

9. Restricted to Minimum Flows
 = no
 = yes
10. Administrative Procedures
 = additional review
 = agency review only
11. State River Protection
 = yes
 = no
12. Transfers allowed to instream uses
 = yes
 = Washington's trust water rights allow under certain conditions
 = no
13. Instream flows can be obtained through purchases, lease, gift, etc.
 = yes
 = no
14. Transfers of conserved water allowed.
 = yes
 = Washington's trust water rights allow under certain conditions
 = no
15. Comprehensive, ongoing state water plan
 = yes
 = no
16. Specified public interest criteria
 = yes
 = no

piled by combining and reorganizing Tables 1 and 2. Columns 1-11 summarize the comparison of state programs from Table 2 (p. 62). Some information was omitted such as the information components of managing agency, statutes, and legal challenges. The Wild and Scenic River column was also eliminated. Although the system provides an option for protecting streamflows, designation is largely dependent on federal action. The recommended strategies from Table 1 have been simplified to summarize the potential for applying market strategies (Columns 12-13), water conservation (Column 14), and comprehensive water planning (Column 15) to instream flow protection. Because of its uncertain legal future, the public trust doctrine is represented only by its most likely application—public interest review (Column 16).

Each component selected for the assessment in Table 3 was rated on whether its inclusion in streamflow protection programs was advantageous or disadvantageous to protection. Each component is treated equally, with no numerical weighting. The rating for each component is summarized in the legend to Table 3. The rating is based on the discussions in this chapter and in Chapter 2. A solid square on Table 3 indicates a positive component; therefore the programs with the most solid squares have the most positive components. Empty squares indicate a negative component. Dashes are used to indicate that the components were inapplicable either because the state has no protection program or its program does not encompass that component.

Alaska, Idaho, Montana, and Oregon have the most positive components. Those states have adopted comprehensive programs of instream water rights or minimum flow reservations and are actively administering them. New Mexico and Oklahoma, which have no instream flow programs, have the least positive components. Arizona and Nevada have not legislated instream flow protection, but because instream flows are treated like other water rights, they have several

positive elements. This suggests that if in New Mexico, like in Arizona and Nevada, courts rule that appropriations for instream flows should be allowed because they are recognized beneficial uses, the state could develop an effective program without legislation.

The states which protect streamflows through conditions on water rights—California, North Dakota, and Texas—have few positive elements because most components of effective programs are components of appropriation or reservation systems. California has more positive components than North Dakota and Texas because it has included several of the recommended strategies, such as marketing, in its water laws.

Of the states with appropriative instream water rights, Nebraska, Utah, and Wyoming have the least number of positive components. Each of those programs places restrictions on streamflow protection limiting the number of streams which have been protected. Utah's program is so restrictive that it has not yet been implemented and 1992 amendments to the law are unlikely to improve the situation (U.S. Water News 1992, 15).

Table 3 analyzes only the structure of the programs and their potential effectiveness. It does not address how effectively the programs are being implemented. An in-depth analysis of each state's instream flow program would be required to truly assess their effectiveness and the problems encountered in implementing the programs and that is beyond the scope of this study. The following chapters present such an analysis of the implementation of streamflow protection in Oregon, which appears from this analysis to have the components in place for a successful program.

CHAPTER 4

INSTREAM FLOW PROTECTION IN OREGON

Introduction

Oregon is perceived by many as a perpetually rainy state with few water problems, but there are many pressures on the state's water supply. Much of Eastern Oregon, is in the rainshadow of the Cascade Mountains and much of it is semiarid while the windward side of the Cascades receives most of its precipitation in the fall and winter. Therefore, irrigation is required for many crops in Oregon. Urban population increases and expanded agricultural operations have increased demands for municipal and irrigation water (Young 1992). In addition, there is increasing pressure to protect instream flows for fish and wildlife and recreational use. This pressure has led the state to develop a multifaceted program to protect streamflows. This chapter discusses the development of that program, the challenges it faces, and proposals to improve it.

History

Oregon was one of the first western states to recognize the value of keeping water in streams. In 1915 the Oregon legislature withdrew from appropriation creeks forming waterfalls in the scenic Columbia Gorge (ORS 538.200). This isolated act laid the groundwork for future instream flow protection in the state.

Oregon amended its 1909 Water Code in response to increased applications for water rights permits after World War II. The 1955 Water Appropriations Act created the State Water Resources Board [now the Water Resources Commission] to develop and enforce water policies. The primary tool for this was basin programs for the major drainage basins in the state. The programs

defined policies for future uses of unappropriated water. One policy which the Act specified was the establishment of minimum perennial streamflows, allowing the Board to designate streamflows to protect fish life or to minimize pollution (ORS 536.325).

Oregon's minimum streamflow program was notable in that it was the first concerted effort to protect instream flows in the West. However, problems with implementation of the program proved it to be an ineffective means of protection. Minimum streamflows were considered administrative rules, not water rights, but had enforceable priority dates (Borden 1989, 358). The minimum flows were reservations of water which suffered many of the problems of reservations discussed previously (p. 65). Implementation of the program was reviewed by Rousseau (1976), Sherton (1981), Griffith (1983), and Borden (1989). Their criticisms of the program included: 1) it could apply only to unappropriated water, 2) protection was limited to aquatic life and pollution abatement, 3) preference was given to human and livestock consumptive uses even if junior to minimum flows, 4) flows were only adopted through revisions to basin plans which occurred sporadically, and 5) there were problems with regulation and enforcement.

The continued issuance of junior rights on streams with minimum streamflows, lack of water rights status for the flows, and enforcement problems created special difficulties for the program. In 1973 the Water Policy Review Board overturned minimum flow enforcement in favor of junior uses in a water short area (Rousseau 1976, 82). Again in the severe drought of 1977, minimum streamflows were bypassed to fulfill junior rights, this time by a court ruling (Stafford 1977).

The problems with implementing and enforcing minimum flows led to revisions of the law in 1983. Amendments made the establishment of minimum

streamflows a priority issue for the Water Policy Review Board and the priority dates were changed to the date of application rather than the date of approval (Borden 1989, 359). The Departments of Fish and Wildlife and Environmental Quality were given the authority to request minimum flows, allowing establishment of streamflows outside the basin planning process. The two departments were specifically directed to file for streamflows on 75 streams with the highest priority needs. The renamed Water Resources Commission approved 65 of those requests and by 1987, minimum streamflows had been established on 456 stream segments (Borden 1987, 357). The earliest priority date for minimum flows is 1958, for eight streams in the Umpqua River basin (OWRD 1992).

The 1983 revisions did not overcome the major problems associated with using flow reservations to protect streamflows, however. In particular, the revisions did nothing to improve the enforcement problems against junior appropriators or to provide flow protection for overappropriated streams. To further improve streamflow protection, the 1987 legislature enacted a bill allowing appropriations of water for instream flows (ORS 537.332-360). Instream water rights were given the same status as other water rights and their broader provisions were expected to provide greater protection to streamflows.

Oregon's Instream Water Rights

Provisions

The instream water rights law allows the Departments of Fish and Wildlife (DFW), Environmental Quality (DEQ), and State Parks and Recreation (Parks) to request instream water rights (ORS 537.336). These three agencies may request flows to protect fish and wildlife and their habitat, to protect and maintain water quality, and for recreation and scenic attraction. Certificates for

instream water rights are held by the Water Resources Department (WRD) "as trustee for the people of the State of Oregon" (ORS 537.341). Under the law, existing minimum streamflows are required to be converted to instream water rights, retaining their original priority dates (ORS 537.346). The minimum streamflow law was not amended or deleted, but instream water rights are now the preferred method for streamflow protection in Oregon.

Instream water rights are issued certificates like other water rights upon approval of the application (ORS 537.341). The priority date for instream water rights is the date the application was filed. The Oregon law specifically states that instream water rights do not require a diversion or any other physical control of the water (ORS 537.332(2)). Instream water rights cannot be cancelled for lack of diversion structures, but can be cancelled through forfeiture if not used for five consecutive years when water is available (ORS 537.350(2)). This provision may have been included to placate offstream water users since it would be difficult to prove that instream rights were not used.

Instream water rights cannot impair existing water rights (ORS 537.334(2)) and may be subordinated to some future water uses (ORS 537.352). While Oregon does not reevaluate instream water rights at regular intervals, they are subject to review when requests are made for some water uses. The precedential uses are multipurpose storage projects, municipal uses, and municipal hydroelectric projects. Applicants for these water uses may petition the Water Resources Commission for precedence over instream water rights, but the precedence will not necessarily be granted. Instream water rights are also subject to the state's emergency water shortage provisions (ORS 537.354).

The 1987 law not only allows the three specified agencies to appropriate water for instream flows, but also allows any person to purchase, lease, or

receive as a gift water rights which can be converted to instream water rights (ORS 537.348). Conversion to instream flows is subject to state transfer requirements. Converted rights maintain the original priority date. A special provision of these rights is that they may not be subjected to the precedential uses noted above. The law specifies that rights holders who lease water for instream uses shall not lose the priority of their water rights, thus providing an incentive for leasing.

The instream water rights law also contains a provision allowing state agencies to reserve water for future economic development (ORS 537.356). The reservations are for specified uses and have priority over any water rights issued subsequently, including instream water rights (OAR 690-77-200).

Administrative Rules

The criteria and procedures for issuing instream water rights were established by administrative rules approved by the Water Resources Commission in October 1988. Amended rules were adopted in June 1992. The revisions were made in response to comments by an environmental group and a lawsuit by a water user group. The major changes to the rules are a clarification of public participation in instream water right application reviews and more specific definitions of the public interest.

The administrative rules state that instream water rights are "a means of achieving an equitable allocation of water between instream public uses and other water uses" (OAR 690-77-15(2)). Public uses include recreation, fish and wildlife habitat protection, pollution abatement, navigation, and other unspecified uses.

The rules establish guidelines for the amount of flows and how the flows are defined (OAR 690-77-015). Determination of flows for instream water rights

are not restricted by the amount of water already appropriated for diversionary uses. Instream water rights in excess of available unappropriated water are considered to protect against future appropriations and can be used to establish management objectives for flow restoration. The level of flows at which instream water rights are established may not exceed the estimated average natural flow except where periodic high flows are needed for specific purposes such as fish migration.

Determination of the amount of flow needed for instream water rights and the choice of flow quantification methodologies are delegated to the three filing agencies (OAR 690-77-020). They must specify on the application which methodologies are used. The agencies are also required to notify each other of intended applications and to coordinate protection efforts if possible.

Instream water rights applications are processed by the Water Resources Department. The amended administrative rules greatly expanded public involvement in this process. Upon receipt of an application the Director of WRD notifies interested parties as specified by rule and a 30-day comment period begins (OAR 690-77-024). WRD prepares a technical review of the application which assesses its compatibility with existing laws, rules, and land use plans; its impact on existing water rights; and whether the right would impair the public interest (OAR 690-77-026). The review also addresses the amount of water requested, including an estimation of the average natural flow for the stream and whether the amount requested is necessary for the purposes of the right.

The technical report is sent to anyone who submitted a comment and to anyone who requests it. A 60-day objection period begins the day the report is mailed (OAR 690-77-028). Objections must be filed on the technical aspects of the report and must include substantiation of allegations that the report is defec-

tive or that the proposed right is detrimental to the public interest. The Director determines the validity of the objections.

If the objections are valid the Director advises objectors that they may engage in alternative dispute resolution as specified by rule (OAR 690-77-034) or the issues may be considered at a contested case hearing. If the objections are rejected, objectors are allowed 30 days to protest. Protests must identify errors of fact or law in the rejection of an objection. Protests are referred to the Water Resources Commission for public interest reviews.

Public interest review is an important aspect of instream water rights processing. In cases of protests, the review is conducted by the Water Resources Commission. Otherwise the Director conducts the review. Standards for public interest are established by statute and promote the highest use of water (ORS 537.170(5)). The standards include both economic development uses of water and public uses such as recreation and fish and wildlife resources (OAR 690-77-042). The rules also provide guidance on evidence to be used in evaluating the public interest.

If no public interest issues are identified the Director or Commission issues a permit for the instream water right. If public interest issues are identified, alternative dispute resolution is offered or a contested case hearing is held. A contested case hearing is a formal procedure conducted by a hearings referee appointed by the Commission or Director. Findings of a contested case hearing may lead to rejection of an application or issuance of an instream water right.

The rules also contain provisions for converting an existing water right to an instream water right (OAR 690-77-070). Applications for converting a water right are filed with the Water Resources Commission, public notice of the appli-

cation is given and it is reviewed in terms of the amount, timing, and location of the flows, and their consistency with the public interest.

The administrative rules for instream water rights provide detailed guidance for processing applications. The amended rules were adopted in an effort to improve implementation of the law, which was hampered by issues discussed below.

Implementation

Oregon's instream water rights law has been in effect for five years. During this time, 504 minimum perennial streamflows have been converted to instream water rights. Applications for 877 instream water rights have been received, but only 36 certificates have been issued (OWRD 1992). There are many reasons for the limited number of certificates granted, including funding problems, lack of streamflow data, complications with flow methodologies, and opposition from water users.

When the instream water rights act was passed, no funds or personnel were allocated. That lack of funding has been a factor in implementation problems. One impact was a delay in establishing administrative rules. WRD's and DFW's rules were adopted in a timely fashion with WRD's approved in October 1988 and DFW's in October 1989. DEQ and Parks did not adopt their rules until December 1991 and January 1992, respectively. Parks has filed one instream water right application and DEQ has not filed any. DEQ has cited lack of funds and personnel as a factor in delaying their action (Oregon Insider 1991, 5).

Budget restrictions have also affected the filing and processing of DFW's applications. They have limited the staff available to prepare and process the applications and they have limited the ability of the agencies to collect data to support the applications as will be discussed.

The future of funding for resource agencies in Oregon is uncertain. In 1990 Oregon voters passed Measure 5, a ballot initiative limiting property taxes in the state. This necessitated major budget cuts for state agencies for the 1991-92 biennium and most agencies faced cuts of 20 percent for the next biennium. The governor's budget for 1993-94 proposed additional funding for WRD and would add positions to process and enforce water rights and to implement watershed enhancement and restoration programs. It remains to be seen whether the legislature will support increased funding to WRD when many state programs face severe budget reductions.

Initially WRD was able to process instream flow applications in a timely manner. Most of the minimum perennial streamflows were converted to instream water rights and 25 of the first 43 applications filed by DFW were certificated with few problems. In 1990 the rate of application filings increased dramatically. Processing those applications was hindered by a combination of technical factors and opposition from irrigators.

A major inhibitor to certificating instream water rights has been opposition generated by the amount of water requested and the flow methodology used by DFW. Requested flows often exceed the estimated average natural flow of the stream. WRD's administrative rules prohibit this unless the higher flows can be justified. Requests for higher flows have led to conflicts between the two agencies and accusations by water users that DFW is requesting excessive flows (Oregon Insider 1991, 5-6).

A major problem with processing instream water rights applications is the lack of streamflow data and the lack of funds to quantify flows and estimate natural flows. Because there are a limited number of gauged streams in Oregon and because of funding shortages, both WRD and DFW are dependent on indirect methods for those calculations. The uses simple mathematical formulas

and comparisons with known flows on similar streams to estimate natural flows when processing applications (Mattick 1992). DFW uses the Oregon Method to quantify flow requests. The method is conceptually similar to the more sophisticated Instream Flow Incremental Methodology (IFIM) in that it estimates flows for individual fish species for different life cycle stages (ODFW 1984). The Oregon Method is cheaper to use than IFIM and is used in part for that reason (Zarnowitz 1992). The field work and much of the flow quantification was done between 1961 and 1972 (ODFW 1984).

Disagreements between the two agencies over their respective methodologies led to delays in processing applications. The problem was resolved by a Water Resources Commission ruling in 1991 (Mattick 1992). Currently WRD will approve requests for instream water rights above the natural flow if it is satisfied with the justification for higher flows, or it will recommend lower flows and negotiate with the before taking unresolved issues to the Water Resources Commission (OWRD 1991a).

A major user group is not satisfied with the resolution of the problem. Water for Life, which is composed of Oregon irrigators not associated with irrigation districts, was formed in response to instream flow protection efforts and other new water policies. Water for Life has challenged both agencies' methodologies as lacking scientific validity (Oregon Insider 1991, 5-6). By October 1991, Water for Life had challenged 425 of the 670 instream water right applications filed and had filed a lawsuit against WRD alleging that its flow calculations were flawed and that public participation in the process was limited. An impetus for Water for Life's objections was fear that instream water rights would be granted priority over existing rights. This fear was based on proposals to improve streamflow protection which will be discussed below. If instream

water rights were granted priority over diversionary uses, instream flows established in excess of natural flows would essentially shut off all other water uses.

Revisions to WRD's administrative rules resolved many of the issues brought up in the lawsuit and the suit was dropped in 1992 (Mattick 1992). The revisions expand opportunities for public participation, but restrict objections to technical and public interest issues which must be well documented.

Processing of instream water rights applications has been improved by the agreement between WRD and DFW and by amendments to WRD's administrative rules. It is unlikely that certification will proceed more rapidly, however. Flow calculations and preparation of the technical reports will be lengthy until more flow data become available. WRD has developed a water availability model to predict natural flows (Robison 1991). The model has limited applicability and a new model was being developed in 1992 which will incorporate more basin characteristics and hopefully have wider application (Mattick 1992). The water availability models will speed up flow calculations, but processing instream water rights could still be delayed by the potential 120-day comment and objection period allowed by the new rules. Objections on technical grounds may be limited, but Water for Life and others will continue to object on public interest grounds.

Enforcement

Another challenge to implementation of the instream water rights program is enforcement of the rights. This problem is not unique to Oregon and was discussed in Chapter 1 (p. 3). Funding problems in Oregon make enforcement of any water rights difficult. Rights are administered by watermasters and the watermaster program has been underfunded for many years. There are only 17 watermasters in the state, each with two or three assistants.

This is an inadequate number of people to adequately monitor the streams and water rights in the state. The WRD's proposed budget would increase funding to the watermaster program, but the personnel would still be inadequate for the enforcement of water rights on the state's extensive stream network.

According to an Oregon watermaster, enforcement of instream water rights is more difficult than offstream water rights because of public attitudes (Jarrett 1992). There is a lack of public awareness about water rights in general and instream water rights in particular. Irrigators are more willing to have their rights shut off because of senior diversionary uses than they are for senior instream flows.

Currently the recommended method for monitoring instream water rights are staff gages (Mattick 1992). Installation of more sophisticated gauging devices could be made a condition of approval of instream water rights and would improve enforcement, but would be expensive. Since only state agencies may file for new instream water rights, the financial burden for monitoring would still fall on the state's limited budget. WRD is exploring the use of volunteers to monitor instream water rights (Mattick 1992). Although this would help the watermasters identify where rights are being violated, actual enforcement of the rights would still be the responsibility of the basin's watermaster whose time would still be limited (Jarrett 1992).

One of the problems of minimum perennial streamflows was that they were sometimes overturned in favor of junior offstream uses. It remains unclear whether that problem can be overcome by instream water rights. The fact that instream flows currently have water rights status like offstream uses should mean that the rights can be more readily enforced under the priority system. It is likely, however, that in dry periods junior users may attempt to have instream water rights overturned using the same economic arguments used against

minimum streamflows. Again the water rights status should be enforceable, but the issue has not been brought to court in Oregon; for this reason the position of instream water rights is still unclear.

Summary of Oregon's Instream Water Rights

Oregon's instream water rights have the potential to greatly improve streamflow protection. The rights can be more easily acquired, protect more instream uses, and should be more enforceable than minimum streamflows. Implementation of the new system has been hampered, however, by budget problems, methodology conflicts, and opposition from water users. It will likely be several years before the rights are fully implemented.

Other Streamflow Protection in Oregon

In addition to instream water rights, there are several other Oregon water resources policies which can be used to protect streamflows. The policies make up a management regime for instream flow protection in the state. The management regime consists of state statutes and administrative rules.

Basin Planning

The 1955 legislation which established minimum streamflows also created a planning process for Oregon's eighteen major river basins. The plans are required to be updated, but the review process has been slow. The purposes of the basin plans are to study existing water resources, to develop methods for augmenting and conserving those resources, and to study present and future water needs in each basin (ORS 536.300). Studies are used to "formulate an integrated, coordinated program for the use and control of all water resources" of the state (ORS 536.300(2)). The basin programs are adopted as administrative rules and are binding on all state agencies. In addition to estab-

lishing minimum perennial streamflows, there are two other instruments available in the basin programs for protecting streamflows—classifications and withdrawals.

WRD is authorized to classify or reclassify water bodies (including groundwater) to their highest and best use (ORS 536.340). Classification restricts water uses on streams and lakes. Water classification has been compared to zoning (Rousseau 1976, 83). It is useful for instream flow protection because it limits junior appropriations for diversionary uses.

Most Oregon river basins have been given unrestricted classifications allowing appropriations for domestic, livestock, municipal, irrigation, power development, industrial, mining, recreation, and fish and wildlife uses (Sherton 1981, 394). Some waters have more restrictive classifications and some restrict consumptive uses to protect instream values. The most notable example of this is the Lower Deschutes River where consumptive uses are limited to domestic, livestock, irrigation of lawns and small gardens, and small hydroelectric projects.

The other instream flow protection mechanism sometimes used in basin planning is withdrawals. The Commission may withdraw water bodies from appropriation for any or all purposes (ORS 536.410). The withdrawal provision has had limited application in Oregon, but its use, especially for groundwater, is increasing as water problems in the state increase (Kreag 1992).

Oregon's basin planning process has the potential to be useful as a streamflow protection tool. The plans could also be used to identify areas which need streamflow protection and methods for protection. The most recently adopted basin plan is for the Willamette River basin (OWRC 1992). It recommends a number of steps to protect streamflows including restrictive classifica-

tions on appropriations during low-flow periods, and negotiations with federal agencies for storage releases to augment flows.

Oregon Water Management Program

In an effort to improve the effectiveness of water resources planning in Oregon, the process was revised in 1987. Revisions were based on existing legislation and were developed by the Water Resources Commission, the Strategic Water Management Group (SWMG), and interest groups (OWRD 1987). SWMG is composed of agency directors of the 12 natural resource agencies involved in water management and the governor's senior policy advisor for natural resources. The new planning process, approved by the Water Resources Commission in 1988, involves three steps: a biennial water management program, statewide water resources policies, and basin planning.

The biennial water management program includes a schedule of topics and basins for planning, priorities for projects, and a summary of the previous biennium and is submitted to the legislature (OWRD 1987). The 1991-93 program identified 11 water management priorities including water conservation, water allocation, water quality, and instream water resources (OWRC 1990).

The second component of the water management program is the development of statewide issue planning (OWRD 1987). The third step is basin planning which will continue as in the past, but will be directed by the biennial water management program and statewide policies. The statewide planning issues are policy statements on major water issues which are developed through agency cooperation and public participation. The policies provide guidance for water management decisions in the state (Kreag 1992). To date, the Commission has approved policies for conservation, groundwater management, hydroelectric power development, instream flow protection, interstate

cooperation, riparian area management on public lands, storage, and water allocation.

Oregon's instream flow protection policy was discussed on page 56. The primary goal of the policy is to establish instream flows on all water bodies with significant public benefits. The policy also advocates restoration of flows on streams where depletions have impaired public values. The implementing strategies which were approved for the policy include development of a water availability data base, encouraging conservation to increase streamflows, and exploration of means to restore depleted streamflows, including transfers of existing rights, watershed enhancement, and multipurpose storage projects.

Other policies in the water management program could benefit streamflows. Restoration of instream flows through improved water use efficiency is a stated purpose of the conservation policy. The implementing strategies for the conservation policy are more substantive than those for the instream flow policy. The strategies recommend administrative rule making for new allowable water rates and duties, requiring major water users to prepare water management plans, and establishing standards for efficient water use. A Conservation Advisory Committee was established to assist with implementation of the policy. Other implementing strategies include development of a subbasin test plan; encouraging funding, financial incentives and educational programs for conservation measures; and advocating conservation by public organizations. The conservation policy has the potential to improve water management in Oregon and possibly provide water which could be reallocated to streamflow protection.

The water allocation policy could protect remaining unappropriated waters in the state. The purpose of the policy is to prevent further overappropriation of surface and groundwater. It is based on recognition of a limited water supply and provides guidelines for the issuance of new water rights.

Under the policy, new water rights would be issued on an 80 percent exceedance standard, meaning that flows must be available 80 percent of the time in order for new rights to be issued. The 80 percent exceedance standard would generally exclude issuance of new water rights during the dry season. New water rights permits are issued subject to the 80 percent standard and basin programs will be revised to reflect the new policy (Kreag 1992). The policy will benefit instream flow protection by limiting the uses for which new applications can be filed where instream water rights have already been filed and by authorizing the Water Resources Commission to leave water unappropriated in some streams.

All of Oregon's water management policies appear to have the potential to improve water management. The policies offer guidance to the Water Resources Commission and WRD for water policy decisions. Many of the policies have substantive requirements which must be fulfilled. The conservation and allocation policies in particular have the potential to improve streamflow protection.

Conservation and Salvage Law

Another bill which was passed by the legislature in 1987 was Senate Bill 24, which provides incentives for water conservation (ORS 537.455-500). The law allows any water rights holder to conserve water and retain title to a percentage of the salvaged water. The remainder of the right is allocated to the state for instream flow protection. The provisions of the law were discussed on page 54.

Implementation of the law has been hindered by confusion over its language. To date no proposals for conservation have been approved and few have been submitted. Conservation is defined as a reduction of water which

was "irretrievably lost". Defining and quantifying "irretrievable loss" has been difficult. Both water users and instream flow proponents agree that the law needs to be clarified. Attempts were made to amend the law in 1991, but the amendments were included in a complicated water bill which did not pass. Several proposals to amend the act will be introduced in the 1993 legislature (Patrino 1992).

The Oregon conservation law is a step in the right direction for water management. It provides incentives to conserve by allowing rights holders to benefit from use or transfer of salvaged water and attempts to resolve past inequities by allocating a portion to streamflow protection. If the law can be amended to clarify its intent and relieve the concerns of rights holders and if its use can be actively promoted, the law could become a valuable tool for streamflow enhancement.

Oregon's Scenic Waterways

In 1970 the voters of Oregon passed a ballot initiative establishing the state Scenic Waterway Program which protects the free-flowing qualities of some Oregon streams (ORS 390.805-865). Currently one lake and segments of 17 waterways are protected. The Scenic Waterways law states that on designated waterways, the highest and best uses of water are recreation and fish and wildlife protection (ORS 390.385). A 1988 court decision ruled that the Water Resources Commission must protect adequate flows for those purposes before issuing new water rights (*Diack v. City of Portland*, 1988). Thus instream flows are protected by waterway designations. In order to protect the scenic waterways, WRD, in cooperation with Parks and DFW, has quantified the flows needed to protect instream values for all Scenic Waterways, and the recommended flows have been approved by the Commission. No efforts have been

made to file for instream water rights for those flows, but the Scenic Waterways Act and the subsequent Diack decision have the effect of protecting instream flows in Scenic Waterways from future appropriations.

Summary of Other Protection in Oregon

Oregon has a diverse management regime for streamflow protection. Each of the programs described can be used to improve streamflow protection and supplement the instream water rights program. The regime contains many innovations for instream flow protection, but there have been many problems with implementing the program. Those problems have prevented the establishment of a protection program which adequately protects flows for instream values. In spite of the innovations protected streamflows are still junior in priority to most offstream uses and therefore go unprotected during dry periods. Protected flows are especially inadequate to protect fish species. The problems with the program have generated proposals to improve instream flow protection. Those proposals are discussed in the following section.

Proposals to Improve Streamflow Protection

The proposals for streamflow protection have come from several different interests in the state, including state agencies, interest groups, and legislative committees. The five most actively pursued proposals are evaluated below.

WaterWatch's Ballot Initiative

WaterWatch of Oregon is a unique environmental group with a mission of protecting instream flows. The group is a major player in Oregon water management decisions. WaterWatch was actively involved in the 1987 legislative session and was the major proponent of instream water rights and the conservation and salvage law. The group continues to champion improvements to

streamflow protection. In 1990 WaterWatch proposed a draft of a ballot initiative for review by an interim legislative committee. It hoped that the initiative would become a bill to be considered in the 1991 legislative session, but it was prepared to place the bill on a statewide ballot if no legislative action was taken.

The intent of the draft initiative was to legislatively establish the public trust doctrine with respect to streamflows in Oregon (WaterWatch 1990). In addition to the public trust aspect, discussed in Chapter 2, the initiative contained many provisions for increasing instream flow protection. It would have required elimination of waste, fees on water users, basin plans to restore streamflows, annual reporting of water use, a 20-year review of existing water rights for waste and allocation of wasted water to streamflows, and a deadline for agencies to file for instream water rights.

Some aspects of the proposal were included in a 1991 bill, but not the public trust component. WaterWatch has not actively promoted the initiative to date, but may propose it in 1994 if no satisfactory legislation is passed in 1993 (Patrino 1992). The possibility is viewed as a threat by water users who see it as a taking without compensation (Lombard 1991, Moon 1991). Their opposition has led to increased protests of instream water rights applications and proposals to restrict instream flow protection. Some water users are concerned that DFW is filing for instream water rights with the intention that all water rights will be junior to instream water rights under provisions of the initiative (McAuliffe 1991). Concern over WaterWatch's initiative was one reason Water for Life filed the lawsuit challenging public involvement aspects of instream water rights applications.

The initiative is a radical approach to instream flow protection, but there is some indication that it or a similar proposal could pass in Oregon. There may be enough support in urban areas to overcome the strength of the agricultural

lobby. A possible outcome of such an initiative was suggested by the response to a Portland City Club meeting featuring Tom Simmons of WaterWatch and Kip Lombard of the Oregon Water Resources Congress, a user group for irrigation district members. Most of the public questions and comments favored Simmons' view that agricultural water use had been subsidized too long at the expense of instream flows (Portland City Club 1990).

1991 Legislative Proposal

In 1991, Senate Bill 1163, sponsored by the Senate Water Policy Committee at WaterWatch's request was introduced in the legislature. The bill addressed many issues in water management, including sections to amend and clarify the conservation law, but its major focus was restructuring Oregon water law to favor instream flow protection over other uses (Oregon Legislative Assembly 1991). The bill required review of existing water permits every 20 years to identify waste, mandatory reductions in wasteful water use, and filing of instream water rights by the three state agencies on all streams by 2000 with a grandfathered priority date of 1991. The bill included changes to Oregon's transfer laws and required 50 percent of any transferred water to be converted to instream flows. The bill called for adoption of basin level streamflow restoration plans and citizen's action suits to enforce instream flow protection.

Senate Bill 1163 went through several revisions in the Senate Committee, but remained mostly intact. It passed the full Senate during the last days of the session, but was not heard in the House committee which had already been disbanded. WaterWatch plans to introduce a similar bill in the 1993 legislature (Russell 1992).

Equitable Streamflow Management Proposal

In 1992, Representative Chuck Norris, chair of the House Water Policy Committee, proposed the Equitable Streamflow Management plan. His goal was to minimize the controversy associated with streamflow restoration (Norris 1992). Hearings were held on the proposal, but development of a legislative draft was delayed pending development of the SWMG strategy which is discussed below. His proposal would create a streamflow management plan implemented at the basin level, revise the instream water rights application process to allow a five year period for determining the level of flows needed, and amend the conservation and salvage law (Oregon Legislative Assembly 1992). The proposal stresses incentives rather than punitive measures.

The proposal lacks many of the substantive provisions of Senate Bill 1163. It has few provisions for improving current levels of streamflow protection. The proposal is supported by water users and has conditional support from WRD and the DFW. WaterWatch finds the proposal inadequate (Hunter 1992). It is notable that the proposal is being heard in the more conservative House committee while Senate Bill 1163 was sponsored by the Senate committee.

Streamflow Restoration Program

A key component of the three proposed streamflow improvement measures is the establishment of a statewide restoration plan implemented by local basin committees. This component is the heart of the streamflow restoration program advocated by WRD. In 1990 WRD proposed the creation of a statewide restoration program with a coordinator in each of the 18 major drainage basins in the state. The job of the coordinator would be to work with locally based committees to identify solutions to streamflow problems. Water conservation, small storage projects, purchase of existing water rights, and

watershed improvements are among the suggested solutions. The premise of the program is that solutions to water problems can be found at the local level if a catalyst is provided for change. The basin level cooperative approach is intended to reduce controversy between diversionary users and proponents of instream flow protection (OWRD 1990a).

In 1990 WRD received approval and funds from the legislative Emergency Board to initiate the program. The process was begun by developing an inventory of streamflow needs around the state and establishing a pilot program in the John Day River basin. WRD planned to introduce legislation in 1991 to expand the plan to five basins. Those plans were cancelled with passage of Measure 5, but funds were allocated in 1991 to continue the John Day project and cooperatively fund a project with the Bureau of Reclamation on the Grande Ronde River basin.

A plan for restoration of the Middle Fork John Day subbasin was issued in 1991 (OWRD 1991b). The report identified possible actions for restoration of streamflows, taking an integrative approach and advocating the cooperation of local, state, and federal actions. While the plan has not yet been implemented, the process of developing the plan has been credited with changing the attitudes of local ranchers, making them more amenable to restoration efforts (Kreag 1992).

Watershed Management Strategy

The idea of basin level streamflow restoration was adopted and expanded by SWMG in 1992. SWMG developed a Watershed Management Strategy in cooperation with various interest groups. The strategy would involve all the state's natural resources agencies, not just WRD. It would identify watersheds with high priority problems and establish local watershed

councils in those areas to develop plans for watershed improvements (SWMG 1992). The strategy would rely on existing water management tools to implement the program. The focus of the strategy is on watershed restoration, not just streamflow restoration. Where instream flows are a critical issue the plans will emphasize streamflow restoration (Patrino 1992). The advantage expected from the watershed approach is that all interest groups will be brought together to develop the plan which will encourage cooperation to find mutually acceptable solutions to watershed problems. Representatives of state and federal agencies will participate in the councils, but their involvement will be as facilitators.

SWMG adopted the concept of the strategy in August 1992, but requested that it be drafted as a legislative bill for the 1993 session. It is anticipated that legislative approval will add credibility to the plan and provide a mechanism to impel agency cooperation (Patrino 1992).

Federal Streamflow Protection in Oregon

As discussed in Chapter 2, there are a number of ways federal actions can protect streamflows. Because over 50 percent of the land in Oregon is controlled by the federal government, federal actions could have a significant impact on streamflow protection in the state. Four federal actions in particular could be used to protect flows or provide incentive for improved state protection—federal reserved rights, the Endangered Species Act, the Northwest Power Planning Council, and regulations on dam construction and operation.

Federal Reserve Rights

There are numerous federal reservations in Oregon for which reserved rights might be claimed for instream flows. There are 13 national forests con-

taining 34 wilderness areas, four resource-based national parks and monuments, one national grassland, 12 onshore wildlife refuges, and 44 Wild and Scenic Rivers. To date, the federal government has made no effort to claim reserved rights for any of those areas although it has acquired state water rights for some lands.

There are eight federally recognized Indian tribes in Oregon. Four of those tribes have reservation lands—the Burns Paiute, Siletz, Warm Springs, and Umatilla. None of these tribes has requested rights to protect streamflows (Kreag 1992). A 1989 bill gave WRD authority to negotiate with the Warm Springs tribes for water rights. The Department is proposing that the authority be extended to all tribes. Becky Kreag, Deputy Director of WRD, believes that both the department and the tribes want to avoid the contentiousness of reserved rights and predicts that Indian water demands will be resolved through negotiations or by projects such as on the Umatilla River where transfers of water from the Columbia River will restore river flows (Kreag 1992).

Endangered Species Act

The Endangered Species Act could play a major role in streamflow protection in Oregon because there are many fish species which are or could be listed as threatened or endangered. A number of salmonid runs in the Columbia River drainage have suffered mainly due to dam construction and there are many resident species in peril in the drier parts of Oregon because of low streamflows. The Endangered Species Act and its state counterpart have already given the DFW incentive to apply for instream water rights to protect fish species. Federal efforts to protect listed species have so far been limited to modification of water project operations, but as the problem intensifies additional flow maintenance strategies may be required.

Protection of two federally endangered species, the Lost River sucker and the shortnose sucker, have caused the Bureau of Reclamation to reduce irrigation allotments from the Southern Oregon Klamath Project (The Oregonian 1992, B4). Listings of Columbia River salmonids could have an even greater impact on project operations and streamflow protection in Oregon. In 1991 five Snake River salmonids were proposed for listing. One species was declared endangered in November 1991 and two were listed as threatened in April 1992 (Harrison 1992, 25-26). Most of the attention directed at protecting the listed species has focused on the impact of major dams on the fish. However, irrigation diversions have been cited as contributing to the decline of Columbia River salmon and have had a major effect on fish in the Umatilla, John Day, McKenzie, Deschutes, Hood, and Santiam River basins in Oregon (NPPC 1986, 98). Recovery plans for anadromous fish species are likely to include maintenance of streamflows to protect habitat as well as to improve fish passage. The Endangered Species Act has not yet been used to modify vested water rights to maintain flows, but flows could be designated as critical habitat for salmonids or the reduction of flows could be considered a taking of a listed species (Estes 1992, 1037-38). Either action would require modification of water rights to increase streamflows.

Northwest Power Planning Council

The Northwest Power Planning Council's role of improving fish and wildlife habitat in the Northwest could benefit streamflow protection in Oregon. Over 17,000 miles of the Council's protected area reaches are in Oregon. This action indirectly protects streamflows because it prevents hydroelectric dam construction. The Council is also a major player in the Endangered Species Act arena in the Northwest.

When the Snake River salmonids were proposed for Endangered Species Act listing, governors of the four member states requested that the Council take steps to protect and enhance the species even before their status was declared (Harrison 1992, 25). Recovery plans for the salmon are being included in amendments to the Council's Fish and Wildlife Program. The Program focuses on the three listed species, but is aimed at all fish stocks in the region. The Program will be the basis for the National Marine Fishery Service's endangered species recovery plans (NPPC 1992, 2). Most of the recovery efforts are concerned with reducing fatalities at hydroelectric dams and improving fish passage, but one phase of the recovery focuses on improving habitat for spawning and rearing (NPPC 1992).

Habitat protection includes maintenance of flows in tributary streams, but since the Council is prohibited from acquiring water rights by its authorizing act, streamflow protection requires cooperation with state agencies. The Council's recommendations for habitat improvements include advisory actions to protect or enhance streamflows regardless of its authority over the involved agencies (NPPC 1992, 5-6). The Council calls on the member states to enhance streamflows by expanding instream flow protection, enforcing flow protection conditions on existing water rights, denying new water rights which would harm salmonid habitat, and acquiring water for fish habitat through voluntary means. Where existing streamflow protection mechanisms are inadequate, legislative action is recommended (NPPC 1992, 105-107). The Council also encourages the states and involved federal agencies to improve water conservation to enhance flows. The Council's plan recommends cooperative study of water availability for salmon and development of cooperative water conservation demonstration projects in the region.

While the Council cannot require the involved agencies to comply with the plan, the seriousness of the salmon issue suggests that the states will cooperate with at least some of the Council's directives. One author believes the Council could be used to arbitrate the reallocation of water through transfers, purchases, conservation, and other measures to avoid curtailment of water rights (Estes 1992, 1030, 1065).

Federal Dam Operations

In addition to the dams that are part of the Columbia River system, there are numerous irrigation and flood control dams in Oregon. Operation of these dams and authorization for new dams are subject to the federal regulations discussed in Chapter 2 which can be used to protect streamflows. Relicensing of nonfederal power dams may result in releases to protect fish and other instream values. WRD will be involved in negotiations for dam relicensing and reauthorization and views the negotiations as an opportunity for improving streamflows in some areas of the state (Kreag 1992).

Summary of Federal Protection

All of the federal actions discussed could be used to improve streamflow protection in Oregon, but the Endangered Species Act and the related activities of the Northwest Power Planning Council are most likely to be used. As noted, the biggest role of federal efforts to protect streamflows could be to inspire state actions to prevent restrictive federal regulations. This is evident in Oregon where the subject of avoiding future Endangered Species Act listings is mentioned at most hearings on improving instream flow protection.

Summary of Instream Flow Protection in Oregon

Oregon has many elements in place for a comprehensive instream flow protection program. Its instream water rights program offers a proactive way to provide legal protection for instream flows. There are several other elements of Oregon's water management program which can be used to supplement the water rights program and potentially find ways to reallocate water to instream flows. Instream flow protection in the state benefits from an active group supporting instream flows and a Water Resources Department which advocates improved streamflow protection.

In spite of these positive aspects, instream flow protection in Oregon is considered inadequate by some interest groups. Their contention is credible in that numerous fish species in the state are threatened by low flows. Proposals to improve protection in the state offer the chance of improved protection, but are hampered by partisan politics and funding problems. The following chapter evaluates the existing and proposed protection measures using a model to identify means of improving the program to achieve comprehensive instream flow protection.

CHAPTER 5

POLICY ANALYSIS OF OREGON'S INSTREAM FLOW PROGRAM

Introduction

The research presented so far has been descriptive. Recommended protection strategies, important components of streamflow protection, and their use in western states have been summarized. That summary indicated that Oregon's protection program ranks high among other states. Yet the previous chapter demonstrated that actual streamflow protection in Oregon remains below its potential. The Oregon program, like many policies, suffers from an "implementation gap", an inconsistency between the goals of a conceived policy and the actions taken to implement that policy (Lowry 1985, 288). The factors involved in implementation gaps can be identified through policy analysis.

The purpose of this chapter is to identify the factors which have inhibited effective implementation of Oregon's streamflow protection program using a policy analysis model. Recommendations for improving the program are based on results of the policy analysis.

Selection and Refinement of the Analysis Model

As discussed in the literature review in Chapter 1 (p. 11), geographers have been active in the development and application of policy analysis models, especially in the field of water resources. Most of those models have been descriptive and have focused on policy development rather than implementation. A more prescriptive model is needed to identify ways to improve Oregon's instream flow protection program. Therefore, this researcher selected a model from the field of political science.

Ingram et al. (1984) and Mitchell (1987) have identified frameworks of factors which should be considered in implementation analysis. These are summarized in Table 4. The frameworks have the potential to be used both descriptively to identify the key factors in implementation and prescriptively to identify possible improvements (Mitchell 1987, 8-9). However, neither of the frameworks provide a standardized means for evaluating and comparing policies. For this reason, the policy analysis framework developed by Mazmanian and Sabatier was selected for this research.

Mazmanian and Sabatier represent a group of policy analysts who believe the implementation of policies is structured by statutory requirements, known as the top-down approach to implementation studies (Sabatier 1986). The framework they developed identifies the factors involved in the achievement of statutory objectives in three broad categories: 1) the tractability of the problem, 2) the ability of the statute to favorably structure implementation, and 3) the effect of nonstatutory variables on implementation (Mazmanian and Sabatier 1981, 6). Because of its focus on the multitude of factors influencing implementation, the framework was determined to be well-suited to evaluation of the problems of implementing streamflow protection. The original conceptual framework was later developed into a set of six conditions of effective policy implementation (See Table 5) (Sabatier and Mazmanian 1983, 8). The six conditions can serve as a checklist of factors to consider in evaluating policies. The conditions have been used by Sabatier and Mazmanian (1983) to evaluate the 1972 California Coastal Initiative and by Lowry (1985) to assess the Coastal Zone Management Act. Good (1992) put the conditions into a question format

Table 4. Frameworks of Implementation Analysis.

- I. Factors identified by Ingram, Mann, Weatherford, and Cortner
 1. Identification of the actors and their stakes in decision-making.
 2. Identification of the resources actors have to advance their interests:
 - a. Legal rules and arrangements
 - b. Economic power
 - c. Prevailing values and public opinion
 - d. Technical expertise and control of information
 - e. Control of organizational and administrative mechanisms
 - f. Political resources

- II. Factors identified by Mitchell
 1. Context
 - a. State of the natural environment
 - b. Prevailing ideologies
 - c. Economic conditions
 - d. Legal, administrative and financial arrangements
 2. Legitimation
 - a. Identify the objectives of pertinent agencies
 - b. Identify their responsibility, power, and authority
 - c. Identify the rules for conflict resolution between agencies
 3. Management functions
 4. Administrative structure
 5. Processes and mechanisms to facilitate conflict resolution
 6. Organizational culture and participant attitudes

Sources: Ingram et al. 1984 and Mitchell 1987.

Table 5. Mazmanian and Sabatier's six conditions of effective policy implementation.

1. The enabling legislation or other legal directive mandates policy objectives which are clear and consistent or at least provides substantive criteria for resolving conflict goals.
2. The enabling legislation incorporates a sound theory identifying the principal factors and causal linkages affecting policy objectives and gives implementing officials sufficient jurisdiction over target groups and other points of leverage to attain, at least potentially, the desired goals.
3. The enabling legislation structures the implementation process so as to maximize the probability that implementing officials and target groups will perform as desired. This involves assignment to sympathetic agencies with adequate hierarchical integration, supportive decision rules, sufficient financial resources, and adequate access to supporters.
4. The leaders of the implementing agency possess substantial managerial and political skill and are committed to statutory goals.
5. The program is actively supported by organized constituency groups and by a few key legislators (or a chief executive) throughout the implementation, with the courts being either neutral or supportive.
6. The relative priority of statutory objectives is not undermined over time by the emergency of conflicting public policies or by changes in relevant socioeconomic conditions which weaken the statute's causal theory or political support.

Source: Mazmanian and Sabatier, 1983.

and adapted them to apply to the multi-faceted management regime of Oregon's shoreline protection program.

The model framework has been criticized as being too cumbersome and too inclusive of inflexible factors (Ingram 1990, 467). Ingram advocates using a broad, flexible framework for analysis and she and Mitchell contend that resource policies are best evaluated in the context of their particular problems (Ingram 1990, 470-71; Mitchell 1990, 7). However, a framework that is flexible enough to apply to the characteristics of individual situations would not allow for comparisons between similar programs. One of the goals of this research is to develop a model that can be used to analyze and suggest improvements for instream flow programs in other western states. Therefore, the more standardized model of Mazmanian and Sabatier was used.

The model was modified somewhat, however, to fit the specific characteristics of instream flow protection. Some of the adaptations made by Good are used. His question format facilitates evaluation of the conditions and his version of the model is more applicable to policies with multiple components. The model used in this research retained five of Mazmanian and Sabatier's six major conditions and added a new condition.

Mazmanian and Sabatier's condition of adequate skills and commitment of implementing officials was eliminated from the framework since the condition is difficult to measure. For the purposes of this research, the discussion of assignment to sympathetic agencies under the policy structure condition adequately covered agency commitment.

The new condition encompasses some aspects of a variable Mazmanian and Sabatier included in the conceptual model—tractability of the problem. The variable included the extent of behavioral change required by the policy of target groups, the size of the target groups, and the diversity of their behavior. In

their discussion of the components of the conceptual model, Mazmanian and Sabatier state that too much importance should not be attached to the tractability variable (Mazmanian and Sabatier 1981, 9-10). They state that while some problems are easier to solve than others, the purpose of analysis is to improve the effectiveness of policies which address difficult problems. However, there are some aspects of the variable which have a significant effect on policy implementation. For that reason, a new condition incorporating those aspects was included in this model. The conditions considered in the evaluation of Oregon's streamflow protection policy are listed below. The first condition is new, the others are modified from Mazmanian and Sabatier.

1. What is the extent of the behavioral change required of target groups by implementation of the policies; what percentage of the population are the target groups; and what is the extent of their political power?

2. What are the individual and collective policy goals and objectives; are they clear and consistent, or if not consistent, are there at least means included for resolving conflicts among them?

3. Do the policies, individually and collectively, incorporate sound causal theories about what kinds of actions will result in achievement of the policy goals, and do they give implementing officials sufficient jurisdiction to achieve them?

4. Do the policies structure the implementation process in a way that strongly encourages implementing officials and target groups to behave as desired? Are the policies assigned to sympathetic agencies; are the implementing agencies hierarchically integrated; is there a means for coordinating the separate components of the policy; are adequate financial resources provided; and is there adequate access to support groups?

5. Are the policies, individually and collectively, actively supported by organized constituency groups and by key elected officials, with the courts being neutral or supportive?

6. Are the statutory objectives of the law still high priority, or have priorities changed over time due to the emergence of conflicting public priorities, or changes in socioeconomic conditions that weaken the policies' causal theory or support?

Application of the Framework

The modified policy analysis model was applied to all aspects of Oregon's instream flow management regime, which includes instream water rights, basin planning, statewide water management policies, the conservation and salvage law, and the scenic waterways program. All elements of the current management regime were considered together. Each question was applied to the program and answers were based on the review of the program in Chapter 4. The results of the analysis are discussed below.

Extent of Behavioral Change Required

The extent of behavioral change required of target groups by the policies and the size and relative political power of those groups will influence the effectiveness of policy implementation. Policies requiring major changes of target groups or those that are aimed at groups with significant political influence will be more difficult to implement. This is a particular problem with natural resources policies. Although they are usually directed at a small percentage of the population, the extent of behavioral change required is often high because it conflicts with values of the general population. For example, natural resources policies often affect private property rights. Such policies will

generate opposition from the target group and if that group has sufficient political influence, it may be able to hinder policy implementation.

Theoretically instream flow protection is directed at all water users, but in practice primarily irrigators are affected because they are responsible for most diversions and consumptive water use. In Oregon less than three percent of the population is involved in irrigated agriculture, however, that small percentage has traditionally had a disproportionate amount of influence with state government, as it has in the rest of the West. That influence has been declining as the populations of western states have become more urbanized and as more diverse interest groups have become involved in water issues.

Current Oregon streamflow protection policies would require relatively little change to existing behavior. By statute, existing water rights cannot be affected by any of the instream flow laws or policies. The only way existing water rights can be converted to instream flows is through purchase or donation or through the conservation and salvage statute. All of those actions require voluntary participation.

The instream flow management regime does have significant effects on future irrigation rights. Instream water rights in some cases leave no water available for future appropriations. Classifications, withdrawals, and the allocation policy also severely restrict future diversions. Many irrigators object to the policies and instream water rights on that basis. There is also concern that future implementation of the management regime will affect existing rights. In particular, there is concern that the conservation policy will be extended to require new rates and water duties and best management practices. These concerns have led irrigators to use their access to and influence with the political system to hinder implementation of the policies. The best example of this is Water for Life's protests of most instream water rights applications.

Policy Goals and Objectives

The premise behind Mazmanian and Sabatier's framework is their definition of effective implementation which is that the program has accomplished its stated goals. Therefore, they place considerable importance on the condition that policy goals and objectives be clear and consistent or have means for resolving inconsistencies. Later Sabatier criticized that emphasis, stating that policy goals are rarely clear, but often contain a multitude of partially conflicting objectives (Sabatier 1986, 29). There is, however, value in studying the goals of policies. Ingram (1990, 471-72) proposes that program goals be evaluated in terms of decision-making costs. She suggests that policy goals will only be clearly defined when there is substantial support for the policy and when it is clear that policy actions will result in predictable results. Legislators are likely to enact statutes with vague goals if the decision-making costs are high and defer the development of specific objectives to administrative agencies.

This situation is evident with streamflow protection in Oregon. Decision-making costs are high because of opposition generated by a traditionally strong lobby. The stated goal of the instream water rights statute is vague, stating only that the state declares that public uses of water are beneficial (ORS 537.334). The administrative actions taken to implement the water rights law and other water resources policies have developed more specific goals regarding instream flows. The administrative rules for instream water rights describe the rights as a "means of achieving equitable allocation of water between instream public uses and other uses of water" (OAR 690-77-015b). The goal of the Instream Flow Protection Policy is "to establish an instream water right on every stream, river and lake which can provide significant public benefits and develop means to restore flows where depleted" (OWRD 1990b). Other components of

the streamflow management regime also include objectives which support instream flow protection.

The goals developed by the implementing agencies are more specific than the goals of the instream water rights statute. However, there is no means provided for resolving conflicts among the policy goals or with other policies. None of the components of the regime indicate how streamflow protection is to be balanced with offstream water uses. This deficiency reflects again the high cost of decision-making for instream flow protection. It is more acceptable for the agencies to approve new instream water rights and develop methods for restoring flows, than to define a balance with offstream uses. Both statutory and administrative goals fail to address the real issue—the need to protect adequate streamflows to preserve instream values.

Adequate Causal Theory

In order for policies to achieve their goals, there needs to be an adequate causal theory behind the policies (Mazmanian and Sabatier 1981, 11). That is the linkages between required actions of the policies and achievement of policy goals must be understood and implementing officials must be granted sufficient jurisdiction over the linkages to make the changes required by the policy. The adequacy of the causal theory of Oregon's streamflow management regime depends on which objectives are considered—the stated administrative goals or the implied goal of adequately protecting instream values.

In general, the causal theory is adequate to achieve the stated goals. The acquisition of new instream water rights meets the statutory goal of recognizing instream uses as beneficial uses. Instream water rights also allow the establishment of protected flows on all waterways with significant public benefits, the stated goal of the Instream Flow Protection Policy. But because of the

priority date problem, those actions cannot achieve the implied goal of protecting instream values. The implementing agencies are not given adequate jurisdiction to acquire water rights with older priority dates which could restore flows and thus adequately protect instream values. The state could use two methods to acquire rights with older priority dates, conversion of purchased water rights and the conservation and salvage law. No funds have been provided for the former and the latter has not been implemented due to poorly defined provisions in the law. Most of the proposed revisions to the management regime have been attempts to address the lack of adequate jurisdiction to achieve streamflow protection. Their failure to pass to date is due to the controversy associated with the issue. Such measures generally would require too much behavioral change of the target group.

Structure of the Policy

A major hypothesis of the Mazmanian and Sabatier framework is that the structure of policies can substantially influence effective implementation (Mazmanian and Sabatier 1981, 10). Policies which are carefully constructed to facilitate implementation can overcome opposition generated by major changes to target group behavior. Different aspects of effective policy structure are discussed below.

Assignment to Sympathetic Agencies

A key component of effective policy implementation is the performance of implementing agencies. Agencies which are committed to a program are more likely to achieve its objectives. Therefore, assigning programs to sympathetic agencies is important. The Oregon instream flow program is under the jurisdiction of four agencies, all of which have mandates sympathetic to the concept of

instream flow protection. This is most obvious with the Department of Fish and Wildlife (DFW) whose primary mission is to protect fish and wildlife. The agency views protection of streamflows as an important aspect of fish management, especially for the protection of threatened and endangered species. The Water Resources Department's (WRD) traditional role in water management has been the issuance of offstream water rights, but the agency has become sympathetic to instream flow protection. It has responded to public demands for improved management of non-diversionary uses of water and considers instream flow protection a priority (Kreag 1992). This is evidenced by the new policies the agency has adopted which support instream flow protection. The Departments of Environmental Quality (DEQ) and State Parks and Recreation (Parks) also have mandates making them sympathetic to streamflow protection. They have cited the lack of resources for not applying for instream water rights, but DFW and WRD have implemented their programs without increased funds. This indicates that DEQ's and Parks' lack of participation is partly due to a low priority for instream flow protection in those agencies.

Hierarchical Integration of Agencies

The amount of agency integration provided by policies influences the compliance of implementing agencies. One of the problems with agency compliance is the number of veto-points in policy implementation; that is the number of times an actor can impede the achievement of policy goals. The instream water rights program is not well integrated. No agency alone can obtain a right. If DFW, DEQ, or Parks do not apply for rights to protect the instream values under their jurisdiction, no other agency or outside interests can force them to do so. WRD approves and manages the water rights, but cannot itself apply for

them. The three agencies which apply for water rights are in turn dependent on WRD to approve the applications.

Administrative rules encourage cooperation between the agencies, but there is no requirement for cooperation. So far the lack of integration among the agencies has not been a major roadblock to instream flow protection for fisheries values, perhaps because both WRD and DFW are sympathetic to the issue. However, DEQ's and Parks' lack of resources to request instream water rights has meant that water quality and recreational and aesthetic values have not been protected to the extent possible under the instream flow program and illustrates the seriousness of veto-points in the streamflow protection program.

Other aspects of the management regime are better integrated since they are primarily under the jurisdiction of WRD. Three components of the regime have requirements which create veto-points which can impair implementation. The conservation and salvage law requires voluntary participation, therefore it cannot be applied comprehensively. The Scenic Waterways program is administered by Parks, but the Water Resources Commission is responsible for its streamflow protection aspect. However, designation of new waterways requires actions by the governor and legislature. In the past, ballot initiatives have been employed to overcome the lack of action by those two parties.

Means for Coordinating Separate Components

The implementation of policies which are composed of several separate components would benefit from a means for coordinating those components. Oregon's streamflow management regime lacks a well-defined mechanism for coordination. The Instream Flow Protection Policy could serve that role and it does provide some direction. WRD's State Water Policies are binding on other agencies, but they are primarily the province of that department. The Instream

Flow Policy directs WRD to work with other agencies to improve streamflow protection, but makes no substantive requirements of those agencies. The Strategic Water Management Group (SWMG) plays a role in coordinating water management in Oregon, but has not actively promoted streamflow protection until recently. Its evolving watershed management strategy may provide a tool for coordinating instream flow protection.

Adequate Financial Resources

The allocation of funds is crucial to the implementation of policies which place new requirements on implementing agencies. As discussed in the previous chapter, no funds were allocated for the instream water rights law and funds are limited for all state programs in Oregon. This has affected the information collection for DFW's instream water rights applications and has led, in part, to the backlog of applications at WRD. The lack of funds has restricted instream water rights applications from DEQ and Parks. There are also no funds available for the agencies to purchase existing water rights for conversion to instream water rights.

Adequate Access to Support Groups

Some of the conflicts which arise in policy implementation can be reduced if interest groups are provided with adequate access to implementation proceedings. This can be provided through public hearings, comment periods, and participation in policy development. Oregon's streamflow program rates high in this area. Agency proceedings are open to the public. Public hearings accompany all agency decisions. Interest groups are often involved in developing policies, including those of the State Water Policies. The proceedings are open to both supporters and opponents of the policies, allowing both views to

be heard. The revised administrative rules for instream water rights provide more opportunities for opponents to protest applications, but limits the grounds for those protests.

Support by Constituency Groups and Elected Officials

The role of Oregon's major streamflow protection constituency group, WaterWatch, was discussed in Chapter 4. The group has played a vital role in improving streamflow protection and is actively involved in policy implementation. Members of the group are present at all Water Resources Commission meetings, WRD public hearings, and are members of advisory groups. Such a constituency group devoted to instream flow issues appears to be unique to Oregon. Fishery groups, including Oregon Trout and the Oregon Wildlife Federation, have also been active in advocating instream flow protection.

Support for streamflow protection from elected officials is mixed. The governor considers natural resources management a priority and proposed an expanded budget for WRD which would improve implementation of streamflow protection programs. There is currently no active proponent for streamflow protection in the legislature. Senator Dick Springer played a key role in introducing Senate Bill 1163 in the 1991 legislature, but is now involved in other issues. Representative Chuck Norris introduced the Equitable Streamflow Management Proposal, but is primarily concerned with protecting the rights of irrigators. Without a strong proponent in the legislature, it is doubtful that innovative streamflow programs will be enacted. The ruling in the Diack decision indicates that the courts might be sympathetic to instream flow protection.

Continued Priority of the Policies

Changing public priorities and socio-economic conditions can affect the importance of policies over time. Two major changes, one positive and one negative, have occurred since the instream water rights statute, the major component of the management regime, was enacted. The negative change was passage of Measure 5 which has reduced funding for all state agencies. The priority of streamflow protection has remained high, however, and some new components have been added to the management regime since passage of the initiative. This is due, in part, to the other change. The recent listing of fish species under the Endangered Species Act has increased the priority of protecting streamflows.

Policy Analysis Summary

Oregon's instream flow management regime meets some of the six conditions of the framework, but is less than adequate for other conditions. The management regime has the support of constituency groups and the implied support of elected officials. Their support, pressure from the Endangered Species Act, and a concerned public have kept streamflow protection a priority. Currently the amount of behavioral change required of target groups is small and directed at a small percentage of the population. The political strength of the target group has slowed implementation, but has not seriously impeded it.

There are three conditions of effective implementation which Oregon's streamflow management regime does not meet and those three conditions are the reasons streamflows are not adequately protected. First, the structure of the policies is not conducive to effective implementation. While the implementing agencies are sympathetic to streamflow protection and have adequate access to support groups, there is a lack of integration between the agencies and a lack

of coordination between the separate components of the management regime. Both of these shortcomings have delayed approval of new instream water rights and the development of means to restore flows. The shortage of funding has been a major impediment to implementation.

The other two major problems with Oregon's streamflow management regime are the implementation gap between its policy goals and the causal theory behind its implementation actions. The stated policy goals are vague, reflecting the high decision-costs of enacting the policies. The goals fail to address the true problem of streamflow protection—finding a way to maintain adequate flows to protect instream values. Even if it can be assumed that the true goal is implied, the implementing agencies have inadequate jurisdiction to achieve the goal. The goal requires a means of maintaining flows even where there are diversionary rights with earlier priority dates. The Oregon streamflow management regime does not provide adequate means to do this.

Policy Analysis of Proposed Changes

As discussed in Chapter 4, several interests have proposed changes to the regime to improve protection. There have been five major proposed changes to instream flow protection in Oregon: WaterWatch's ballot initiative, the 1991 legislative proposal, Equitable Streamflow Management, WRD's Streamflow Restoration Plan, and SWMG's Watershed Management Strategy. All of the proposals except the ballot initiative contain the common element of statewide and/or basin level management plans. Those proposals are considered together. The other components of Senate Bill 1163 and the WaterWatch initiative are considered separately. The proposals are evaluated in terms of the policy analysis framework, but are evaluated only for those conditions they would change.

Statewide and Basin Management Plans

The idea of statewide and basin management plans to improve instream flow protection was first formally proposed by WRD in 1990. The idea was incorporated in Senate Bill 1163 and the Equitable Streamflow Management Proposal. SWMG's Watershed Management Strategy is an expansion of the concept.

In addition to hoping that local watershed plans will identify instream flow needs and creative means for restoring flows, proponents of the concept see it as a means for reducing conflicts with offstream water users. They believe that if local users are involved in plan development and implementation, they will be less likely to oppose proposed actions. Local councils most likely will identify restoration strategies which require minimal behavioral changes of the target group.

The management plans could be a useful tool for clarifying the goals of the instream flow management regime. Since the aim of most of the proposals is to restore flows, their goal statements are less ambiguous than those in the management regime. The goals of WRD's proposal are to meet the regional goal promoted by the Northwest Power Planning Council of doubling salmonid runs and to meet instream and out-of-stream water needs (OWRD 1990a). Senate Bill 1163 contains the least ambiguous goal, making streamflow restoration a priority of the state. The goal of SWMG's strategy is to "implement a consistent and integrated process to guide watershed-based resource planning and management to protect, enhance and restore the state's watershed ecosystems" (OSWVG 1992). All of those goal statements, especially the last two, come closer to the true goal of providing adequate flows to protect instream values than does the management regime. The major goal of the Equitable

Streamflow Management proposal, to recognize the public benefits of low cost agricultural products as well as instream flow values, however, would add to the confusion over balancing instream and diversionary uses.

Of the four management plan proposals, only Senate Bill 1163 would improve the causal theory behind implementing actions. Aspects of the bill would provide means for acquiring water rights with early priority dates. The Equitable Streamflow Management Proposal would be a slight improvement because it would amend the conservation and salvage law. The management plans themselves would not add new means for acquiring rights with early priority dates, but would rely on committees to identify more creative uses of existing mechanisms.

The management plans would improve the policy structure of the management regime. All the proposed plans would provide a means for coordinating the separate components of the regime. The proposals which require a statewide plan would most improve coordination, but even the local committees would be a benefit to coordination. The Watershed Management Strategy and Senate Bill 1163 would both improve hierarchical integration of the regime. In both proposals SWMG would coordinate the plans. Since it coordinates the activities of all agencies involved in water management, coordination of streamflow protection should be improved. All of the management plan proposals would be dependent on existing funds and legislative allocations.

Unless the plans are designed properly, they could impede the adequacy of the last three conditions of the framework, areas where the existing regime is relatively strong. If the basin level plans are left to the control of local committees, the commitment of the implementing agencies will be lost. While local citizens may object to agency involvement, instream flow protection is not a local issue and the plans need to be coordinated and advised by agency per-

sonnel. Constituency groups also need to be involved in plan development and implementation. All of the proposals would involve agencies and constituency groups to some extent and the temptation to eliminate their involvement should be avoided even if it would mean less opposition from user groups. Agency involvement is needed to insure that the plans to restore flows remain a priority and are not relegated to a local issue.

WaterWatch's Initiative Proposal

The ballot initiative proposed by WaterWatch of Oregon would make the most drastic changes to the streamflow management regime. The initiative would require significant behavioral changes of the target group. Those changes would impose costs on water users, reduce the amount of their water rights, and in the case of legislating the public trust, would alter the priority of their rights. The initiative provides no compensation or other mechanisms to reduce the financial burden of its requirements. The proposed behavioral changes have already generated considerable opposition from the target group and have caused them to become more actively involved in contesting instream water rights applications.

The initiative would make improvements to the policy structure of the management regime. The three agencies which can apply for instream water rights would be required to do so by a specified date, overcoming some of the hierarchical integration problem. The statewide and basin watershed plans would coordinate separate components of the regime and also improve agency integration. Some funding would be provided through user fees.

The goal of the initiative is clearly defined—to protect "a sufficient quantity and quality of water for streamflows for public uses in all rivers and streams" (WaterWatch 1990). It also would improve the causal theory behind goal

achievement. The initiative would establish the means for acquiring water rights with early enough priority dates to protect flows.

1991 Legislative Proposal

The legislative bill introduced in 1991, Senate Bill 1163, contained many of the provisions of WaterWatch's initiative, but did not involve the public trust doctrine. This bill, like the initiative, would have required substantial behavioral changes. Because it was presented in the legislative forum, it was more subject to debate than the initiative would have been. As a result of water users' influence with the legislature, many of the more controversial aspects of the bill were changed, such as a 20-year review of all water rights and the required use of best management practices. Ultimately the bill failed because it was not allowed to be heard in the House Water Policy Committee.

The bill would have made improvements to the structure of the program. Like the initiative it would have required agencies to file for instream water rights. SWMG's role as a coordinator of the streamflow restoration plans would have improved integration of the agencies. The bill contained no funding source, however, and none was likely to have been provided by the legislature had it passed.

As discussed above the bill's goal of making streamflow restoration a state priority would have been an improvement. The causal theory of the actions to achieve that goal were weakened by compromises, but still provided more substantive measures than the existing program. Several new mechanisms were provided for acquiring water rights with early priority dates and converting them to instream water rights.

Summary of Proposed Changes

Most of the proposals to enhance streamflow protection would improve implementation to some extent by modifying some of the conditions for effective implementation. The management plans would help define goals and improve policy structure. WaterWatch's initiative and Senate Bill 1163 also included provisions to improve the causal theory of the policy by expanding the jurisdiction to reallocate water rights to streamflows. Both proposals require substantial changes of the target group and therefore would be difficult to enact. The modifications to Senate Bill 1163 in the Senate Committee and the refusal of the House Committee to hear the bill are indicative of the problems of enacting major changes to western water law. Proposals to improve instream flow protection need to adequately address the conditions for effective implementation yet heed the concerns of water users. The following section discusses the potential for improving streamflow protection in Oregon.

Recommendations for Improving Instream Flow Protection in Oregon

The policy analysis identified three conditions of effective implementation in which Oregon's streamflow management regime is deficient. First, the structure of the program is inadequate. Second, the stated policy goals do not address the true problem of instream flow protection. And third, the implementing actions of the regime lack the causal theory to adequately protect streamflows. Any attempts to improve instream flow protection need to address those three conditions, especially the last two. But as the analysis of the proposed changes indicated, amendments to streamflow protection will need to consider the extent of behavioral change imposed on target groups. Their opposition could lead to weakening of the existing program. The following recommenda-

tions to improve protection are based on the results of the policy analysis and this writer's observations of the water management process in Oregon. Recommendations are made for the three conditions of effective implementation needing improvement and for means of minimizing impacts on water users.

Recommendations for Improving Policy Structure

Improvements to the structure of the program should be relatively easy to implement. Administrative actions have already made advances in this area and additional alterations could be made without legislative action. There are three areas of policy structure which need to be addressed: 1) hierarchical integration between implementing agencies, 2) a mechanism for coordinating the separate components of the program, and 3) funding for implementation.

Hierarchical integration between agencies and coordination of the separate components of the program could be enhanced by a strategy similar to the one proposed by SWMG. A management plan directed at instream flow protection should be able to effectively coordinate the separate components of the regime and improve agency integration. SWMG is the logical actor for coordinating the management regime because of its existing mandate to coordinate the water management activities of all state agencies. Local basin plans could also serve as a mechanism for improving coordination of the policy. The plans could identify components of the regime which would provide the most effective protection in the basin. The proposed watershed management strategy would do much to improve the conditions of watersheds in the state, but in order for streamflows to benefit from the strategy, they need to be made a priority within the strategy. The proposed SWMG strategy could be implemented without legislative action. However, since some of the members of SWMG are heads of agencies whose traditional missions have not promoted watershed and stream-

flow management, the strategy would benefit from legislative action directing all member agencies to comply with the strategy.

Legislative action would also be required for further improvements to hierarchical integration. Agencies could be required to file for instream water rights on all streams by a specified date as proposed in the ballot initiative and Senate Bill 1163. This would force DEQ and Parks to file for instream water rights. Without additional funding, however, the agencies would find it difficult to fulfill the requirement.

Another way to improve protection for all instream values would be to allow private parties to file for instream water rights. This is the only area in which Oregon did not earn the highest rating on the program evaluation (Table 3). Private appropriations would avoid the veto points of agencies with inadequate funding and other priorities than streamflow protection.

Providing additional funding to implementing agencies could be the most difficult structural improvement to achieve. Solutions to Oregon's budget problems are unlikely to be forthcoming. While WRD fared better than most agencies in the governor's proposed budget, it is uncertain it will pass or that the priority given to WRD will continue. WRD could levy additional fees and designate a portion of the revenue to fund instream flow programs. Since fees provide only a small portion of the department's budget, increased fees would provide little additional money for streamflow protection. Establishing new fees would require legislative action which is unlikely in the present anti-tax atmosphere.

Improving policy structure will improve implementation of the management regime, however, improvements to the policy goals and the causal theory of the program's implementing actions will also be needed to provide adequate streamflow protection. Those improvements will be more difficult to achieve because they will require more behavioral changes of the target group.

Recommendations for Improving Policy Goals

Oregon's instream flow management regime lacks a policy goal which recognizes that water rights need to be reallocated to streamflows in order to provide adequate protection for instream values. Agencies have already developed more specific goals than the legislature. But they need to go a step further and develop a goal addressing streamflow restoration which will apply to all agencies and aspects of the regime. Statewide restoration plans such as the streamflow restoration plans and SWMG's strategy are likely vehicles for the policy goal. The policy goal should provide guidance to decision makers on balancing instream flow needs with other water uses. In order to reduce opposition a compromise policy goal might have to include a provision that streamflow restoration be accomplished by means which minimize impacts on existing water rights. However, streamflow restoration should be made a priority if instream values are to be effectively protected.

Recommendations for Improving Implementing Actions

The most difficult aspect of enhancing streamflow protection in Oregon will be to improve the implementing actions of the regime and expand the jurisdiction to reallocate water rights to instream flows. This dissertation has presented several ways that water rights could be reallocated to streamflow protection. Following are some suggestions for how those strategies could be implemented in Oregon. The recommendations include ways to improve existing means to reallocate water rights and new means which need to be enacted.

Expansion of Existing Actions

The first step that should be taken to expand jurisdiction to reallocate water rights is to enhance implementation of existing programs. The conserva-

tion and salvage law has been cited by several researchers as an innovative strategy for reallocating water, however, unless it is amended so that it can be implemented it will remain a useless tool. Amendments should be easy to enact because they are favored by most interest groups. Once amended, participation in the program should be actively promoted.

The purchase of water rights for conversion to instream water rights is the other existing method for reallocating water rights. It has not been utilized in part because agencies were given no funds for the purchases. It is doubtful that agencies will be granted such funds, but the law grants private entities the same opportunity. Agencies could encourage conservation groups to purchase water rights where streamflows are seriously depleted.

Enactment of New Actions

Amendments to existing strategies would improve streamflow protection in isolated areas where rights holders are willing to develop conservation plans or sell water rights. They will not, however, be adequate to protect streamflows and additional mechanisms will be needed to reallocate water rights to instream flows. This will require legislative changes to Oregon's water law. Some aspects of changes to existing water law will be easier to enact than others and those should be pursued first.

Water conservation should be actively promoted. The existing conservation policy is a good start and it should be aggressively pursued. In promoting conservation, it should be emphasized that conserved water can be reallocated to new diversionary water uses as well as to instream flows.

Monitoring and enforcement of water rights should be improved. This will require additional funding for the watermaster program. Existing water use reporting and measurement requirements should be expanded to cover all

water users. Currently only governmental entities are required to file annual reports of water use (ORS 537.099). While the definition of governmental entity includes irrigation districts, many water users are excluded from the requirement. Since water measurements are not required, the reports are often not very accurate. Required water use reporting and measurement could provide WRD with valuable information on how much water is being used in what areas and update ownership records to improve enforcement. Abandoned water rights could be identified and possibly allocated to instream flows.

Oregon needs to develop a more active water marketing system. Currently transfers are limited by statutes and administrative procedures restricting marketing. State officials are just beginning to explore the possibilities for water marketing. The latest suggestion of the task force studying marketing options is to experiment with a temporary program utilizing short-term leases rather than outright sales. Such a system could be useful during critical periods, but a more open market system with provisions to protect the public interest would be more likely to benefit streamflows and other aspects of water allocation. Water marketing can provide incentives for water conservation and allocate water to new uses in overappropriated areas.

Means to Minimize Impacts on Water Users

Most of the recommended improvements to Oregon's streamflow protection program would require substantial behavioral changes of the target group. This is especially true of the actions to expand jurisdiction to reallocate water rights to instream flows. Those changes will undoubtedly generate opposition from traditional water users. Their political influence could force reductions in existing protection if far reaching changes are proposed. The threat of opposition should not prevent amendments to strengthen instream flow protection,

since only such changes will achieve protection for streamflows. However, the impact of the actions on water users should not be ignored. Not only will opposition complicate enacting changes, but there are equity considerations. Many supporters of streamflow protection contend that existing allocation of water to primarily offstream uses is inequitable. That inequity should not be resolved by mechanisms which would place unfair burdens on water users who have acquired their water rights legally.

There are ways to improve streamflow protection while limiting the impacts on water users. In particular, plans to reallocate water rights should limit the impact on private property rights. Methods of reallocation should focus initially on voluntary means and progress to more regulatory means when and where they are needed.

Water conservation should be encouraged through financial incentives rather than mandated. The conservation and salvage law is one means of providing incentives. Tax credits and loans could also be provided to irrigators who install conservation measures. There is precedence for this in Oregon where tax credits are given for installation of devices to reduce energy consumption and water pollution and where there is a loan fund for water development projects. Water marketing is arguably the most equitable means to reallocate water rights. An expanded water marketing system would encourage conservation and help reallocate water to new uses including instream flow protection.

Retroactive application of the public trust doctrine should be avoided. The doctrine could be used to strengthen public interest evaluation of new water rights applications and water rights transfers, but using it to predate the priority of instream water rights unfairly impacts water users. The alienation of water users caused by WaterWatch's proposed initiative has hampered stream-

flow protection in Oregon and exemplifies why the public trust doctrine should only be used as a last resort.

The creation of basin committees to develop plans for streamflow restoration is a strategy which could improve instream flow protection with limited impacts on water users. The committees could reduce the confrontational aspects of streamflow protection by involving local residents in identifying flows needing restoration and the means to restore them. Their solutions are likely to be more creative and less threatening than those dictated by state agencies. In addition, streamflow protection plans generated at a local level are more apt to provide comprehensive protection because protection needs will be identified and provided for.

Summary

Proponents of instream flow protection are promoting expanded streamflow protection in Oregon. Endangered Species Act listings in the region emphasize the need for additional protection. Those catalysts make it probable that Oregon's streamflow management regime will be amended. The amendments will most likely be achieved through administrative actions, but legislative action may also occur in response to increasing pressures.

Changes to Oregon's instream flow policy should incorporate alterations of the policy structure to facilitate implementation, a definitive policy goal, and expansion of the jurisdiction to reallocate water rights to streamflow protection. A policy which intends to restore flows to levels adequate to protect instream values will require changes of irrigators. Steps should be taken to reduce the impacts on water users in order to reduce their opposition and to insure an equitable allocation of water in the state.

CHAPTER 6

SUMMARY AND CONCLUSIONS

Summary of the Research

This dissertation has presented an assessment of the status of instream flow protection in the West and an analysis of protection implementation in Oregon. This chapter summarizes the results of the research and concludes with recommendations for improving streamflow protection in the West.

Although legal protection has been granted to instream flow protection in almost every western state, actual protection of flows remains inadequate due to conflicts with traditional water laws and values. In response, researchers have recommended strategies to reallocate water rights to streamflow protection. Those strategies have been incorporated to a limited extent in some state programs. The use of water market transfers for instream flows has been limited because of legal obstacles, but its use promises to increase as water rights holders are faced with involuntary means of reallocation. Improving the efficiency of current water uses and applying the salvaged water to streamflow needs appears to be a reasonable strategy. However, water laws in most states appear to prevent reallocation of salvaged water by requiring that the full amount of water rights be used offstream or abandoned to the state. While comprehensive water resources planning could identify areas needing streamflow protection and the means for increasing flows in those areas, few western states have ongoing, comprehensive water planning which actively promotes instream flow protection. The public trust doctrine has been extolled by some as a solution to the perceived inequitable allocation of water primarily to offstream uses, but it remains largely the subject of debate in law reviews. Cali-

California is the only state which has reallocated water rights to streamflow protection as a result of public trust doctrine rulings. The threat of the doctrine's application is taken seriously by most water users. All of the proposed strategies offer the potential to assign earlier priority dates to instream flows and will probably be increasingly applied to streamflow protection as pressures to protect flows multiply.

The type of streamflow protection program utilized by a state influences how much protection instream flows are given relative to other water uses and how easily reallocation strategies can be applied. Among the important components of a protection program are: granting water rights status to streamflows, the recognition of a broad range of instream values, allowing several interests to appropriate water for instream flows, allowing appropriation above the minimum level, and administrative procedures which encourage public participation and reviews. The instream flow programs in Alaska, Idaho, Montana, and Oregon have included the most positive components. Influential interest groups in those states have demanded instream flow protection and in all four states proposals have been made recently to strengthen protection. Other states include few positive elements and are less aggressive in pursuing streamflow protection because there is less pressure to do so in those states.

Oregon has a long history of protecting instream flows and currently has one of the most aggressive streamflow protection programs in the West. In addition to allowing water to be appropriated for instream water rights, Oregon has other policies which support streamflow protection. In spite of the extensive program, streamflows in some parts of the state are seriously depleted and aquatic species are threatened by low flows. Several proposals have been made to improve the instream flow regime. They include a range of strategies

from local planning committees to using the public trust doctrine to predate the priority of instream water rights.

A policy analysis model was applied to Oregon's instream flow management regime and to proposals made to improve the regime in order to determine what conditions of effective implementation were not met. The analysis showed that the regime was strong in the area of public support, but deficient in policy structure, policy goals, and adequate jurisdiction for implementation. Some of the proposals to improve the regime would address many of the deficiencies, but would incur additional problems by seriously impacting water users. Recommendations were made for ways to resolve the deficiencies while reducing impacts on water users. The recommendations suggest reliance on administrative actions to strengthen policy structure and goals and actions to expand the jurisdiction to reallocate flows. The state should rely on voluntary actions as much as possible and should provide incentives to reduce financial impacts.

Oregon is unique among western states in the comprehensiveness of its instream flow protection efforts. Its program is already more aggressive than others and it appears likely the program will soon be strengthened. The extent of Oregon's instream flow policy reflects conditions in the state which demand intensive protection. The state is noted for its fisheries and water-based recreation. Both have suffered from stream withdrawals causing constituency groups to demand streamflow protection. WaterWatch has been a key player in streamflow protection. The Water Resources Department, traditionally an allocator of offstream water rights, has heeded public demand and supports instream flow protection. Over all this, the threat of federal intervention into state water rights through the Endangered Species Act has led water users to work

with the state and streamflow proponents to find acceptable ways to increase streamflow protection.

Most other western states have not experienced the pressures to protect streamflows that have been evident in Oregon. Oregon's instream flow protection regime should not serve as a role model for instream flow protection in other western states because streamflow programs should reflect the conditions and values of each state in order to be effective. However, there are lessons that other states can learn from Oregon's experience.

Recommendations for Other Western States

The streamflow protection needs of every state are different, but each will need to include basic conditions of effective implementation. One of the goals of the dissertation was to develop a policy analysis model to identify the factors of effective streamflow protection. The model developed by Mazmanian and Sabatier and modified for this research is such a model. It was used descriptively to identify problems with the existing policy and proposed changes to it. Researchers would find it useful to identify the impediments to effective implementation of existing policies in other western states. It could also be used prescriptively to develop new streamflow protection policies.

The model cannot suggest specific improvements for streamflow protection, but it can identify aspects of the program, such as policy goals and structure, where improvement efforts should be focused. Any analysis model applied to natural resources protection policies should include an analysis of the impact of the policy on target groups, such as the one included in the policy framework used in this research.

The evaluation of key components of state streamflow protection programs in Chapter 3 could also be useful to those interested in improving

instream flow protection. Existing programs could be compared to determine which components would fit the circumstances of specific states.

Many states may find that they, like Oregon, need to incorporate strategies for reallocating flows for depleted streams. Again the strategies chosen by a state will depend on its physical and hydrological characteristics as well as the political and demographic climate in the state. Most states will need to make changes to their water law system to facilitate implementation of the chosen strategies. All of the recommended strategies can be used to enhance other aspects of water resources management, not just instream flows.

While active water markets have been established in the Southwest and Colorado, many western states have no structure to promote marketing, especially of water rights for instream flows. The legal obstacles to marketing should be removed, but provisions should be made to prevent or compensate for third-party effects. The impediments to conservation should be removed and policies adopted to encourage efficient use of water. Many western states have no effective water resources planning. As pressures increase to allocate water to new uses, including streamflow protection, planning will become an increasingly important tool to identify which and to what extent competing uses of water should be allowed and how public interests may be protected. Involvement of local citizens in the planning process could reduce the confrontational aspects of streamflow protection. Application of the public trust doctrine to retroactively protect instream flows should be avoided except in cases where no other viable means exist to protect critical areas. However, states should follow the example of Idaho and use the doctrine to strengthen public interest criteria for evaluating water rights applications and transfers. This will facilitate streamflow protection, insure protection of externalities in water transfers, and specify which public values are to be identified and protected in water planning.

It is unlikely that any one strategy will solve the streamflow reallocation problems of a state. However, the strategies could be used in combination to fit the needs of a state and improve instream flow protection and other aspects of water allocation.

Part of the impetus for improving instream flow protection in Oregon comes from the potential of federal intervention through the Endangered Species Act. Other states are likely to face similar pressures as more aquatic species are listed. In addition, other federal actions may influence streamflow protection efforts in the West. Some, like the Endangered Species Act and reserved rights, may serve as catalysts to inspire additional protection while others, like relicensing of nonfederal dams, may provide new opportunities for protection. In all cases western states would be well advised to cooperate with federal actions thereby reducing the probability of involuntary reallocation of water rights. Actions taken by the Northwest Power Planning Council in response to the listing of Columbia River salmonids could serve as an example of cooperative action.

This research has identified several options for improving streamflow protection in the West. The model used to evaluate policy implementation in Oregon is a useful method for identifying needed improvements to existing programs. The comparison of the components of streamflow protection programs could be useful to identify the strategies included in effective programs.

States seeking to improve instream flow protection may choose to model their programs after existing programs, but will need to modify them to fit specific conditions in order to gain support from constituency groups, administering agencies, and legislators. Programs which fit the needs of individual states may generate less opposition from established offstream water users.

Conclusions

Protection of instream flows is a complex environmental problem. Like many natural resource issues it involves conflicts between traditional values of resource utilization and relatively new values of resource preservation. At the heart of the issue is the direct conflict between streamflow protection and the traditional exercise of western water law. Although instream flow protection has been granted legal recognition in all but two western states, instream values receive little protection because priority is based on the date a right was acquired, not on the value of its use. Currently advocates of public values are beginning to demand reallocation of water rights to protect instream flows. This is especially evident in Oregon where an increasingly urbanized population and pressure from the Endangered Species Act are impelling the state to improve implementation of an already extensive program. At the same time, pressures of economic growth are demanding additional water for offstream uses. Caught in the middle are traditional, independent irrigators who fear for their way of life.

This dissertation recommends strategies to improve instream flow protection programs in Oregon and the West. Throughout the recommendations, the need to consider the impact of programs on water users was stressed. The impacts should be considered not just because of the opposition resulting from controversial policies, but also because of equity considerations. The farmers and ranchers who are dependent on irrigation acquired their water rights within the legal system. Reallocation of water rights to instream flow protection without adequate compensation would perpetuate the inequity of water allocation.

Solutions to the problem of instream flow protection will require innovative programs. They will require a combination of the recommended strategies

which address all aspects of water allocation in order to avoid exacerbating the conflicts. It is unlikely that such programs will be developed solely by state legislators or agencies. Equitable solutions will necessitate involvement of all interests in water allocation. The local basin plan proposals in Oregon are one way to involve the different interest groups and develop equitable solutions.

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