

Conflicts in Allocation of Wild Trout Resources: An Idaho Case History¹

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Abstract.--Fisheries resources are finite and conflicts may arise when several groups compete for the same resource. Diverse groups of anglers often derive different benefits and possess different preferences concerning the way a resource should be managed. This paper examines the conflict which arose when new regulations were proposed for reaches of Idaho's Big Wood River. One organized group of anglers lobbied for specific restrictive regulations. Another group of anglers responded and successfully challenged the new regulations in court. We describe factors contributing to the controversy and discuss aspects of the conflict that may be instructive for anglers and management agencies. We examine philosophical questions concerning future management of wild trout streams.

INTRODUCTION

Although effective wild trout management remains ecologically based, attitudes of resource users have assumed an increasing role in the management process. Modern fishery managers are faced with the challenge of allocating a limited and often shrinking resource to a wide variety of users. As Jackson (1989) observed, people who fish for trout may have the broadest range of individual differences of any known group of anglers. These diverse anglers derive different benefits and possess very different preferences concerning the way the resource should be managed (Orbach 1980, Voiland and Duttweiler 1984).

Conflicts may arise if decision makers fail to understand the effect of management decisions on diverse user groups. Few recreational activities create the emotional commitment and intensity found in trout fishing (Wingate 1988). In response to the question, If for some reason you could not go trout fishing, more than 25% of all Wisconsin stream anglers and nearly 40% of all members of Trout Unlimited answered that they would miss it more than all other activities (Jackson et. al 1988). Trout anglers also tend to be defensive of their right to practice preferred fishing methods. Peyton and Gigliotti (1988) observed that the extreme levels of specialization, intense feelings about fishing, and associated ethics of trout anglers on the Au Sable River cultivated an intolerance of alternative recreational choices.

Associated with the increased involvement of the public in the decision making process has been an increase in organized special interest groups. Organizations range from groups focused on restoring specific reaches of local rivers such as Friends of the Payette River, to national organizations such as Trout Unlimited and the Federation of Fly Fishers who are cosponsors of this Symposium. Gigliotti and Peyton (1993) suggest that as angling groups gain political influence, they sometimes use that influence to gain regulations favoring their interests and restricting entry of competing users.

The increase in politically active special interest groups provides added challenges to fisheries agencies charged with allocating limited wild trout resources. To avoid conflicts and public rejection of regulation proposals, it is important for managers to understand the extent to which organized angler groups represent all anglers using the resource (Gigliotti and Peyton 1993).

This paper describes the conflict which arose when the Idaho Fish and Game Commission attempted to implement new angling regulations on the Big Wood River. In Idaho, the ultimate decision-maker in any angling regulation-setting process is the Commission, six individuals politically appointed by the governor. The Commission's task is to weigh input from their biological staff, the Idaho Department of Fish and Game (IDFG), with public input to make sound resource decisions.

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A local angling group comprised primarily of fly anglers, the Friends of the Big Wood River (FBW), supported and lobbied for expansion of restrictive regulations including prohibition of bait. A less organized group of anglers comprised of bait, lure, and some fly anglers, opposed the more restrictive regulations and challenged them in court. We describe biological capabilities of the river and sociological aspects of the fishery and review factors contributing to the conflict. We discussed aspects of the dispute that may be instructive for fisheries managers and anglers.

STUDY AREA

The Big Wood River (BWR) is regarded as one of Idaho's most productive wild trout streams. From its origin near Galena Summit north of Ketchum, the river flows south-southwest 99 km⁴ to its confluence with Magic Reservoir. Thurow (1987) provides a detailed description of the study area including climate, geology, water quality and the unique endemic fish fauna in the drainage.

The BWR and tributaries comprise the largest complex of trout waters in south central Idaho. Silver Creek, an internationally renowned spring creek, is tributary to the BWR. The BWR contains a wild, self-sustaining population of rainbow trout *Oncorhynchus mykiss* and has a history of producing large trout in excess of 2.5 kg, with accurate records of fish exceeding 5 kg. Rainbow trout have provided a popular and valuable fishery since settlement of the drainage.

As the valley became settled, both agricultural and residential development of the floodplain altered the BWR drainage. Concurrent with the habitat disturbance was a large increase in the human population. From 1960 to 1992, the population of the upper Wood River valley increased by 225% as compared to a statewide increase of 60% (U.S. Department of Commerce 1994). As habitat disturbance and angler effort increased, the sport fishery in the drainage declined.

RESEARCH RESULTS

As a result of concerns about the status of the fishery, fisheries managers requested more information about fish populations in the drainage. In 1986 IDFG initiated an intensive research project on the BWR to gather information to guide future management. The research was designed to

evaluate the current status of trout populations, define factors limiting the population, and provide recommendations to improve the fishery. Research was conducted from 1986 to 1988 and evaluated both biological and sociological aspects of the fish population and fishery (Thurow 1990).

The Existing Trout Population

Research results illustrated that the BWR sustained an excellent wild trout population. In the most productive areas, summer densities of age 2 and older trout exceeded 400 fish per km. More than 20% of the fish exceeded 300 mm and nearly 5% exceeded 400 mm.

The wild rainbow trout stock in the river had sufficient growth potential and longevity to produce large trout exceeding 500 mm. Growth rates in the most productive reaches of the BWR were comparable to rates in other productive Idaho streams including the Henry's Fork Snake River and Silver Creek.

Biological capabilities of the BWR differed among reaches. As a result of differences in stream productivity and habitat quality, trout populations were not evenly distributed spacially. Productive reaches supported more than three times the density of trout as less productive areas, regardless of the type of angling regulation. For example, an existing catch-and-release area supported less than one third the density of both age 2 and older trout and trout larger than 400 mm as compared to a more productive reach with higher habitat quality with a six fish limit.

Habitat quality profoundly effected fish abundance. We observed 8 to 10 times fewer trout in altered stream reaches as compared to reaches with complex habitat. Fish population density was positively correlated to the abundance of cover, particularly large woody debris.

Natural mortality rates in the BWR were very high. In the catch-and-release area, about 65% of the fish died of natural causes each year. Mortality estimates suggested that compensatory mortality was occurring in the drainage. As exploitation decreased in various river segments, natural mortality increased.

The Existing Sport Fishery

The BWR also sustained a very popular and quality sport fishery. Angler effort exceeded 60,000 hours, averaged more than 800 hours per km, and exceeded 2,000 hours per km in a few reaches. Catch rates averaged more than one trout per hour and more than 50% of the creel fish exceeded 300 mm.

⁴Metric units conversions: 1 km = 1.609 miles, 100 mm = 3.94 inches, 1 kg = 2.2 lbs.

A large proportion (65%) of the catch was voluntarily released. Anglers of all types released fish, regardless of their preferred angling method. Anglers released small trout and selectively harvested larger fish, especially those from 300 to 400 mm.

Most anglers used bait (46%) or flies (41%) and smaller proportions used lures or multiple methods. Angler types were not evenly distributed along the river. Bait anglers frequented certain reaches and fly anglers others. Most anglers (81%) that fished the BWR under the general statewide bag limit of 6 fish rated the fishing good to excellent. Although levels of satisfaction were high, most anglers (89%) said they would support more restrictive angling regulations if the regulations increased the abundance of large trout. Bait (88%), lure (100%), and fly (93%) anglers all favored more restrictive angling regulations.

Although anglers on the BWR favored more restrictive regulations, the opportunity to keep fish remained important for many. Nearly sixty percent of the anglers responded that the opportunity to keep fish was at least "somewhat important" as a reason to fish. Forty percent of the anglers said they would stop fishing the BWR if forced to release all trout.

While the quality of the BWR fishery had declined from historical levels, we documented a productive stock with adequate recruitment in most sections. The fishery was sustainable with existing levels of effort and harvest. With public support, fish managers had an opportunity to balance natural mortality with harvest to improve the population size structure.

CASE HISTORY

Widely disparate views of the most appropriate regulations for the BWR had been discussed among anglers for many seasons. The stream attracted a constituency of anglers who considered special regulations which limit harvest and the method of take as essential to quality fishing. Five commercial fishing guide services that employed more than 75 individual guides were licensed on the BWR and Silver Creek. Many of their clients fished exclusively with flies and preferred to release most of their catch.

The stream also attracted a constituency of anglers for whom the right to keep fish was essential. This second group was comprised of predominantly bait anglers but also included individuals who preferred to fish with lures and flies.

Polarization between the two angling groups was in place at the onset of the research project in 1986. Many proponents of special regulations blamed harvest-oriented anglers as the reason for the demise of historically better

fisheries. Many harvest oriented anglers labeled advocates of highly restrictive regulations as out-of-staters who sought to reserve waters for an elite few.

At the onset of the research program, the IDFG goal was to complete field research and a final report in 1989. Any proposals for regulation changes were targeted for the 1990 biennial regulation cycle. Although informed of this schedule, special regulation advocates pressed for immediate change. In 1988, two years into the research project, members of FBW met with IDFG staff to express concern over a second consecutive year of drought. FBW members feared overharvest of trout and sought an emergency regulation consisting of a slot limit with bait prohibited. IDFG staff responded that the ongoing research enabled them to evaluate the fish population and in the event of an emergency, immediate action would be taken.

Within one week of the meeting, members of FBW developed a petition outlining their concerns about the drought and the need for emergency regulations. A three page flyer soliciting supporting letters and containing a suggested list of points, was sent to a list of potential petition supporters. The closing statement of the flyer suggested that the drought was only part of the reason for the lobbying effort: "If you feel as we do, that the Big Wood River should be managed permanently as a wild trout fishery which protects fish in the 12" to 20" range, please indicate this in your letter."

The lobbying effort was very effective, more than 1,000 signatures and 40 letters were sent to IDFG and the Commission. As a result of the lobbying, the Commission considered emergency regulations for the BWR at its May 1988 session. At Commission direction, IDFG staff developed a "monitoring program" in cooperation with FBW to monitor the effects of the drought. A sampling schedule was designed and parameters agreed upon as indicators of potential emergency conditions. IDFG results demonstrated that the population of wild trout in the river was equal to or greater than it had been prior to the drought in 1986. FBW agreed that no emergency existed.

Proponents of special regulations, however, continued to lobby for immediate changes in regulations. The efforts culminated at the October 1988 Commission meeting, when members of FBW and a Sun Valley fly shop owner were asked by the Commission to testify on the need for special regulations on the BWR and Silver Creek. The invited speakers requested elimination of bait angling on several miles of both streams and installation of expanded catch-and-release and a slot limit. IDFG staff responded to the Commission and cited the need to complete the current research program and obtain broad-based public input prior to implementing new regulations. The Commission directed

IDFG staff to implement new angling regulations on the BWR and Silver Creek by the general season opener in May, 1989, one year earlier than anticipated. News releases describing the Commission meeting generated negative responses from anglers who were not proponents of bait restrictions. A conflict was brewing.

Development of Regulation Options

In response to the Commission directive, IDFG staff summarized existing biological data to describe the dynamics of the wild trout population in the BWR. A simple modeling approach was used to evaluate the response of the existing trout population to various levels of angler exploitation under different angling regulations. Simulations were based on empirical estimates and best available literature. We used MOCPOP, a generalized population model designed to simulate age-structured populations in modeling exercises (Beamesderfer 1988). The model is an adaption of one presented by Taylor (1981) except that recruitment can be stock-dependent and described by Beverton-Holt or Ricker functions, or held constant (Ricker 1975). Inputs included size-specific exploitation, growth (von Bertalanffy coefficients), age-specific maturity, age-specific mortality, length-weight coefficients, and recruitment-function coefficients. A sensitivity analysis was used to describe the influence of key population parameters. Model outputs provided annual estimates of total numbers of trout of specific sizes and ages, total harvest, and yield under various regulation scenarios. Thurow (1990) provides a detailed description of the modeling approach.

We examined the response of the BWR population to eight regulations. We tested four slot limits which allowed harvest of fish less than or larger than specified lengths, three minimum size limits, and catch-and-release. Creel data was used to estimate the theoretical reduction in harvest from various bag limits. The effects of bait hooking mortality were tested under various restrictive regulations. Literature suggests that a mean of 25% of the trout hooked with bait and released die with a range of 5% to 60% (Wydoski 1977, Mongillo 1984). A "worst case scenario" was applied by assuming 60% of the trout caught and released with bait would die. We tested the sensitivity of the fish population to compensatory mortality (Ricker 1975) by varying conditional mortality with exploitation.

Because of differences in growth and mortality, results of population simulations varied between upper, less productive areas of the BWR and lower, more productive areas. Regulations had a minor influence on the total abundance of trout unless nearly all harvest was eliminated (Figure 1). Regulations had a major influence on the size structure of the

population, however. Catch-and-release regulations provided the largest predicted increase in percentages of trout larger than 300 mm and 400 mm. A 2-fish bag limit coupled with various size limits was effective in increasing the size structure of the population. Although the response of the population to regulations with bait allowed was reduced from that where bait was prohibited, the size structure of the population was still enhanced (Figure 2). If hooking mortality rates with bait proved less than the 60% mortality we modeled, the population response with bait would be improved.

8 inch Trout per Mile

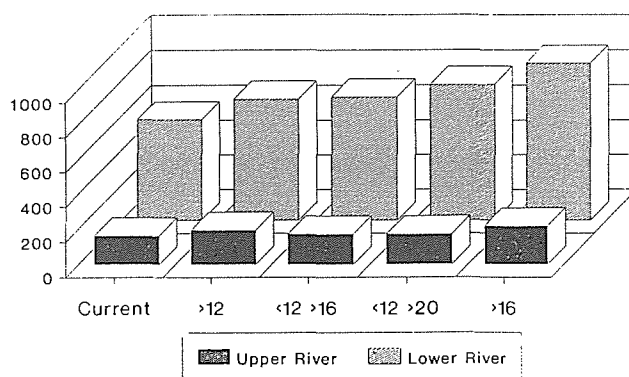


Figure 1. The predicted number of trout per mile larger than 203 mm (8 inches) resulting from varying size limits (in inches) on the Big Wood River, upper and lower reaches.

Percent Trout >16 inches with Bait

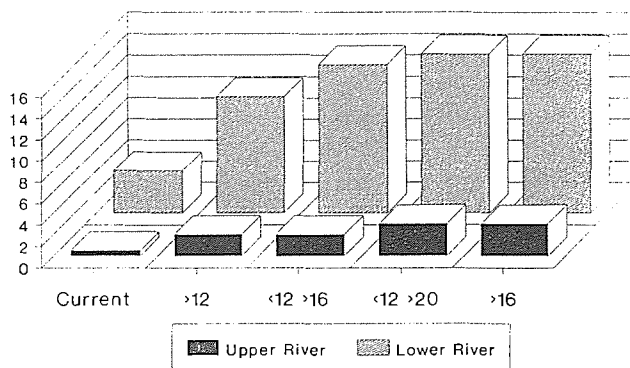


Figure 2. The predicted percent of the trout population larger than 406 mm (16 inches) resulting from varying size limits (in inches) on the Big Wood River, upper and lower reaches.

In January, IDFG staff scheduled a series of public meetings. Four public meeting locations were selected on the basis of residency of Idaho anglers who listed the BWR as a water they most frequently fished in response to a random

sample of license buyers (Reid 1989). IDFG made a concerted effort to publicize the meetings via news releases and radio spots. A discussion of potential proposals was included in most correspondence in an attempt to encourage participation of a broad cross section of anglers.

In response to the scheduling of public meetings, proponents of special regulations mounted a second, intensive lobbying effort directing letters to the Commission. More than 300 letters were received by the Commission requesting special regulations.

In March, IDFG staff finalized regulation options and held the four public meetings. At each meeting, IDFG described the biological potential of the river, its sport fishery, angler profiles, and angler opinions. Modeling results were presented to outline the predicted response of the trout populations to various regulation options. The public was given an opportunity to comment verbally or in writing. IDFG also solicited written comments from a random sample of anglers who had listed the Big Wood as a stream they fished most often. In an unprecedented public response to a local fishery, more than 3,000 comments were received on the proposals.

IDFG staff compiled the results of the comments and applied them in developing a preferred alternative. A majority of the commentators favored some change in the existing angling regulations. Most respondents to the mail survey and those testifying at the public meetings were divided between restrictions prohibiting bait or restrictions allowing bait (Figure 3). Few commentators preferred large increases in catch-and-release regulations. Unsolicited letters favored either no change or bait prohibitions.

Public Responses by Source
Big Wood River

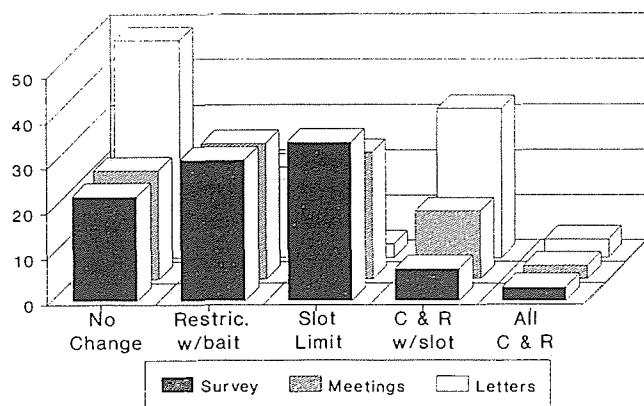


Figure 3. Public responses to proposals for new angling regulations on the Big Wood River, by public meeting attendees, a random mail survey, and unsolicited letters. Restric. w/bait = size and bag limits with bait allowed, Slot limit = with bait prohibited, C & R w/slot = combination of catch-and-release and slot limits with bait prohibited, All C & R = all catch-and-release.

IDFG staff utilized the results of the public hearings and established two goals for the preferred alternative: 1) to enhance the size structure of the wild trout population and 2) to maintain diverse angling experiences and displace as few anglers as possible. The preferred alternative considered both the biological capabilities of the river and the preferences of anglers. IDFG proposed zoning the BWR into reaches based on the biological potential and the existing distribution of anglers using different terminal gear. Four zones were selected: general regulations (6 fish bag limit and no size limit), a slot limit with bait allowed, a slot limit with bait prohibited, and adding approximately 6 km of catch-and-release. Highway bridges were selected as permanent landmarks.

The preferred alternative was presented to the IDFG Commission in April. Citing the complexity of the IDFG staff proposal, the Commission rejected it and approved a proposal which expanded catch-and-release on the BWR from 6 to 32 km. The Commission placed a slot limit on the remainder of the river that allowed bait and required single, barbless hooks.

Immediately following the Commission meeting, opponents of the expanded catch-and-release regulations began to organize and voice their opposition. What began in May 1989 as a local opposition group named the "Wood River and Silver Creek Sportsman's Association" soon evolved into a larger regional group renamed the "Idaho Sportfishing Association" (ISA). The group claimed 3,000-4,000 members and retained an attorney. Within weeks ISA submitted a petition to the Governor of Idaho with nearly 3,000 signatures opposing the new regulations.

On May 24, 1989, three days prior to the general angling season opener, ISA successfully filed a temporary restraining order to prevent the new regulations from being implemented. In the complaint, ISA charged the Commission with acting arbitrarily and capriciously and with not basing their decisions upon competent and substantive evidence. The complaint also charged the Commission with acting "in excess of the statutory authority and purposes" granted them. Judge Phillip Becker concurred and wrote "the Court finds the plaintiffs and others similarly situated will suffer irreparable harm if they are prohibited from fishing in those stretches of the Big Wood River and Silver Creek in which they have traditionally fished..". A June hearing was set to allow attorneys from both sides to present arguments concerning the filing of a preliminary injunction.

In June, the judge dissolved the temporary restraining order and issued a stay to the enactment of new regulations. The judge ordered the stay and gave the Commission until September to respond to the ISA complaint and demonstrate that it used proper findings of fact in arriving at the decision.

The judge also took under advisement a motion of intervention by FBW, the Henry's Fork Foundation, and the Nature Conservancy in support of the Commission ruling. In July, the judge denied the motion to intervene.

In August, the Commission modified its earlier court-blocked ruling. In its new decision, the Commission added 13 km of catch-and-release to the BWR. The new regulations were to be effective on October 1. In response, the ISA filed an amended complaint and successfully blocked enactment of the amended regulations. In January 1990, Judge Becker granted the ISA further hearing on the amended complaint.

In April 1990, after more than a year of litigation and just weeks prior to the angling season opener, a compromise was reached. The new regulations for the BWR maintained some areas with general angling regulations, added a new regulation with a slot limit and 2 fish bag limit allowing bait, and added 13 km of catch-and-release.

DISCUSSION

The controversy over angling regulations on the BWR is a classic example of the difficulty of allocating a finite resource among competing user groups. A number of factors contributed to the conflict and resulted in the legal challenge. Some of these factors may have been unique to the geographic area while others may be common to trout streams across the U. S. An examination of these factors may be instructive for anglers and fisheries management agencies.

Understanding User Groups

The polarization which developed between the two groups intensified the conflict and reduced the potential for reasonable compromise. Much of that polarization was unnecessary because angler interviews on the BWR and the statewide angler opinion survey illustrate many of the basic views of both groups were indistinguishable. Both groups were unfairly labeled and inaccurately described. Members of the FBW were labeled as fly only anglers who released all of their trout when many used flies and lures and occasionally killed trout. Members of ISA were labeled as bait anglers who harvested every trout hooked when members used flies, lures, and bait and many released a majority of the trout they caught. Anglers from both groups were willing to accept more restrictions on harvest if these regulations would increase the size of trout and both groups favored wild trout and believed protection and enhancement of wild trout should receive more emphasis. The major difference between the two groups was the right to fish with their preferred method and the right to harvest some trout. In a similar case

on Michigan's Au Sable River, extreme stereotypes were drawn yet the two groups of anglers were indistinguishable on all measured characteristics except two: where they lived, and whether they placed a priority on the right to harvest a fish (Peyton and Gigliotti 1988).

Fishery managers need information to assist them in understanding the impact of management decisions on user groups. In cases such as the BWR, where conservation of trout stocks is not at issue, optimum angling regulations can be based on the biological capabilities of the system and the social preferences of anglers. Management agencies need sociological information to help allocate finite resources among competing user groups and to understand the impact of management decisions on resource users (Orbach 1980). Research is needed to evaluate changes in angler participation and satisfaction after new regulations are implemented. While studies have demonstrated that catch-and-release and other restrictive regulations attract anglers (Hunt 1987, Wells 1987), little attention has been given to anglers that formerly fished waters with more liberal regulations. Important questions remain about the risks of displacing anglers and the fate of those displaced anglers.

Politics and Regulations

Members of FBW were much more organized and effective in lobbying for regulations that met their definition of quality fishing and restricted other types of trout anglers. FBW began its efforts in April 1988, more than a year before ISA was conceived. The group was well organized, established a large network of supporters to solicit support from, and focused its lobbying on the decision makers. Members of the group enthusiastically committed time and as Jackson (1989) observed, became almost evangelistic in bringing their desired regulations to the streams. Despite data to the contrary, FBW members lobbied that the fishery was in jeopardy and the only solution was to implement restrictive regulations that eliminated most bait angling. The group also emphasized that they had worked hard to acquire habitat and restore degraded areas in contrast to bait anglers who they depicted as not working to maintain habitat. FBW also argued that specialized fly anglers contributed substantial amounts of money to the local economy and that special regulations as they advocated would enhance the economic value of the fisheries resource. Members of organized groups as FBW may "capture" agencies and decision makers and exert a disproportionate amount of influence on the decision making process (Gigliotti and Peyton 1993).

Just as Gigliotti and Peyton (1993) observed on the Au Sable River, anglers on the BWR who opposed large

increases in catch-and-release regulations felt alienated from the decision making process. This group did not become organized until after the regulations had been approved. This may have been partially due to their belief that the public meetings provided ample opportunity to influence the decision. As Peyton (1987) observed, citizens who agree with a proposal may fail to take action. The group ultimately chose litigation as the only action available to counter the political influence of the more effective group (Gigliotti and Peyton 1993).

The public backlash generated by the regulations originally adopted by the Commission illustrates the risk of attempting to influence regulations through direct political lobbying. Subsequent to the controversy, two members of the Commission received large opposition to their reappointments. Petitions with nearly 10,000 signatures were submitted in opposition. Much of the testimony before the Senate Resources and Environment Committee, both for and against reappointment centered around the controversial angling regulations the two Commissioners voted for. Within one year, political pressure was successfully applied to add a Commission member from south central Idaho to better represent the views of people in that area.

At the same legislative session, a bill was introduced in the Idaho Senate to limit IDFG authority to enact regulations restricting angling methods. Although the bill remained in committee, it seized the attention of anglers, biologists and managers who recognized the risk of state legislatures dictating fisheries management programs.

Goal Setting

Specific goals need to be established for future fisheries management programs. The recent use of litigation to thwart implementation of special regulations should alert anglers and agencies that goals must be well defined and decisions to implement regulations must be based on facts. In both the BWR and Au Sable River case histories, the presiding judges initially agreed with plaintiffs that regulation implementation was "arbitrary and capricious". To avoid such litigation, it is imperative that goals are clearly established and biological and sociological data supports decisions.

Lewynsky (1986) suggested that continual elimination of bait anglers from special regulation fisheries may be the result of poor goal definition by regulating agencies. Should the goal of special regulations always be to maximize the numbers and size of large trout? Where continued viability of a stock is not an issue, goals for improving the fishery without achieving the "maximum" response may be more acceptable to a larger segment of the anglers. Future trout management will depend on our ability to give people what

they want to the extent that the resource can support it (Jackson 1988). Research will play a key role in providing accurate biological and sociological information to assist in setting goals. Once numeric goals have been established (e.g. 20% of the population exceeding 400 mm, catch rates of 1 fish/hr) simulations can be used to predict which management strategies can achieve the goal. Depending on several factors, bait restrictions may or may not prove necessary to achieve such goals.

Bait Restrictions

As more trout waters are closed to bait angling, displaced anglers may be compelled to contest restrictive regulations as they did on the BWR. Prior to the controversy over new regulations, the BWR was one of the few streams in south central Idaho where bait anglers could fish for large wild trout. Currently, more than 1800 miles of Idaho's finest trout streams are managed under restrictive regulations prohibiting bait. The state supports a large group of bait anglers. Eighty-seven percent of active Idaho anglers use bait (Sanyal and McLaughlin 1994) and 42% of active anglers prefer to use bait (Reid 1989).

Additional research is needed to evaluate bait hooking mortality. Supporters of special regulations and many biologists believe hooking mortality from bait is always unacceptable where size limits are implemented and a large portion of the catch must be released. Gear limitations are supported by literature that suggests hooking mortality is substantially reduced with artificial flies and lures (Wydoski 1977, Mongillo 1984). Depending on management goals and other factors however, hooking mortality from bait may be acceptable.

In recent years, several studies have appeared in the fisheries literature documenting the success of size limits or catch-and-release regulations without bait prohibited. In Idaho's South Fork Snake River, a slot limit without bait restrictions has resulted in an 80% increase in the abundance of Yellowstone cutthroat trout and a four-fold increase in the percent of trout larger than 406 mm (Thurrow et. al 1988). In Pennsylvania, a no harvest regulation was enacted without bait restrictions. Although bait anglers comprised 38% of the anglers, densities of trout increased and catch rates increased by six-fold (Carline et. al 1991). In Connecticut, catch rates more than doubled after a harvest ban without bait restrictions (Orciari and Phillips 1986, cited in Carline et. al 1991). Turner (1986) reported the use of a size limit without bait restrictions in Missouri's North Fork White River. Although 37% of the angler used bait, after six years, both catch rates and the fall abundance of trout more than doubled. On the Yellowstone River in Montana, the trout

population in two reaches with the same size limit responded similarly although one reach allowed bait and the other reach prohibited bait (personal communication, B. Shepard, Montana Department of Fish, Wildlife, and Parks, 1994).

Several factors including system productivity, natural mortality rates, the ratio of bait anglers, and the location of hooking may influence the importance of bait hooking mortality. In many Idaho streams, conditional natural mortality rates typically range from 30-65% for wild trout stocks (Schill 1991). Consequently many of the trout "saved" by bait restrictions in waters with high natural mortality will not survive and contribute to the next years fishery. Highly productive waters with fast growth rates may be inherently more resilient to hooking mortality. On the BWR, our simulations suggested that even with a "worst case scenario" of 60% bait hooking mortality and 60% participation by bait anglers, management goals for increasing the proportion of large wild trout could be attained. Our simulations on the BWR, and the studies cited above suggest that prohibition of bait angling in restricted harvest and no-harvest fisheries merits reexamination (Carline et. al 1991).

The successful use of restrictive regulations with bait would have widespread application to restoring wild trout fisheries. Such regulations might increase angler acceptance of restrictive regulations and could build support for wild trout management. To achieve the broadest base of support for special regulations, unnecessary restrictions should be avoided (Behnke 1989).

Habitat Issues

Although a compromise was finally attained, the controversy over regulations diverted attention from habitat protection and restoration, the real issue threatening the long term viability of the BWR fish populations. Human induced changes, especially since 1940, have extensively altered channel morphology, instream habitat, and riparian vegetative communities. Most disturbance has been associated with residential and agricultural development of floodplain areas, attempts to control flooding, and road and bridge construction. Studies conducted on the BWR in 1967 and 1968 found more than 22% of the channel had been physically altered (Irizarry 1969). Although legislation restricts activities in stream channels, extensive alterations of all types continue today. Our research documented over 8 times more trout in unaltered reaches supporting complex habitat as compared to altered reaches. Concurrent with floodplain development has been extensive diversion of water for agricultural and domestic uses. Had the energy, time, and finances used during the regulation controversy

been applied to protect and restore habitat by strengthening county zoning ordinances, creating protected river corridors, or obtaining water rights, the long term persistence of the fishery would have benefited.

CONCLUSION

Conflicts over wild trout resources could increase in the future as a growing human population with more leisure time competes for dwindling natural resources. Case histories as we observed on the BWR and the Au Sable River raise some important philosophical questions concerning our attempts to manage for the necessary level of diversity (Peyton and Gigliotti 1988):

1. Are agencies responsible for representing less specialized and unorganized anglers who do not effectively lobby for their preferences?
2. How important are the preferences and ethics of traditional user groups in determining management programs?
3. To what degree should agencies consider economics in allocating resources among anglers?
4. Will departments and the public accept the degree of complication necessary to balance the resource and public needs?

These questions must be addressed if resources are to be equitably allocated among user groups. If agencies are unable to mediate conflicts in allocation, the courts and perhaps State Legislative bodies will ultimately decide the fate of wild trout resources.

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growth in the West will continue to place increased demands on the region's natural resources.

This significant population growth has not been matched with comparable growth in trout anglers. Angler numbers for trout, salmon and steelhead have increased slightly during the past decade. This has happened in spite of the droughts and severe habitat problems in many areas. There were about 9.1 million trout anglers in 1991 according to the Fish and Wildlife Service's National Survey of Fishing, Hunting and Wildlife Associated Recreation report. Adding salmon and steelhead anglers results in a combined total of about 10 million. Trout, salmon, and steelhead anglers accounted for over 110 million days fishing in 1991 and spent about \$5.3 billion in local economies.

Most of the growth in trout angling has come from a dramatic increase in fly fishing. About 44% of all trout anglers now fish with a fly and spend 27 million days (or about one-third of their fishing days) casting bugs. Fly anglers spend about \$1.3 billion annually on their trout fishing.

Trout fishing is no longer a sport practiced predominantly by rural residents. The vast majority of trout anglers now come from the cities. Further, the contemporary fly angler has a relatively short history of fishing. Most new fly fishing buffs started fishing during their 30's and 40's, and surprisingly, a relatively large percentage, about 35%, are female. Waders are no longer being designed only for men with stumpy legs and big feet.

THE PUBLIC INTEREST IN WILD TROUT

Trout anglers, both new and old, are the primary constituents for wild trout. Yet we note that only a small percentage, much less than 10 percent, belong to any type of organized fishing or conservation organization. River-related organizations have recently begun to use endangered fish and decimated fish habitat as a means to accomplish their primary goal of protecting free-flowing and scenic river corridors. This turn of events is much-needed. We can use the help from any quarter. The members of these organizations are predominantly urban-based and will help expand the constituency for protecting and enhancing wild trout populations.

As the nation's population continues to grow and

rapidly expand in the west, impacts associated with population growth, industrial and commercial development, agriculture, grazing, mining, and even sport fishing will continue to alter the face of the landscape as public and private land managers respond to special interests and the political will of state and federal politicians who supposedly represent the "public interest."

But, is it in the public interest to allow our watersheds to become so degraded that fish and other wildlife become extirpated? Is it in the public interest to allow special interests to dictate natural resource use and management policy as has occurred for over a century? Is it in the public interest to favor short-term interests for a few over the long-term interests of the many? I think not!

COMPETITORS

Fish and fish habitat are but two concerns across a broad landscape with literally hundreds of other constituent groups vying for recognition and attention; from loggers, mountain bikers, developers and ranchers to fly anglers. The interests of fish, and those who care about them, are but one constituent group. Frequently, the folks within this broad constituent group cannot agree on a course of action to protect and enhance fisheries resources. Further, even when fish constituents are united, they face a formidable array of well-heeled and politically-connected interests constantly trying to undo or counter advances made to protect fish and fish habitats. Conservation is being flanked by small property owners wrapped up in land battles; the building, mining, logging and farming industries; and conservatives seeking to limit the sphere of government influence as a matter of principle.

Recent state and federal court decisions have upheld individual property owner's rights and are redefining "takings" and compensation under the ESA. For the second year, there will be no major environmental legislation passed by the Congress. Mining and grazing reforms are languishing, elevating the EPA to Cabinet-level status is on the back burner, and the Magnusson Fisheries Conservation Act reauthorization is pitifully mired down. In the face of this, there are over 20 bills before congress which would expand or protect private landowner rights from "takings" under current legislation. The Clinton administration is sending mixed messages on the environment and appears to have taken a purely

defensive stance on most issues. With the prospect of extensive changes in the Congress this fall, and with numerous gubernatorial changes as well, the next few years appear to be an uncertain period for the environment.

Logging, mining, agriculture and development interests have their roots firmly planted in legislation and the political process. The Western congressional delegation is not likely to change appreciably in its stance on water rights, range, forestry and agriculture issues. We have witnessed their positions on range and mining reform. Industry has a firm hold on decision making and decision makers. Their organizations are some of the most powerful in the country.

Likewise, entrenched bureaucracies have programs and personnel whose missions support the status quo. Some of these are legislatively mandated, others are regulatory. The actions of the Bonneville Power Administration (BPA) and Forest Service are examples. BPA has been sweeping salmon issues under the dam for decades. Its reluctance to become part of the process for generating solutions has only recently been transformed by the Endangered Species Act and the listing of several runs of salmon as endangered or threatened. Recent Forest Service decisions on instream flows for fish and aquatic life in the intermountain region have sided with water user-wishes and against legal mandates and forest plans dictating protection.

CHANGE AND CONFLICT

Fisheries and other conservation organizations are striving to change the culture of state and federal agencies and the will of politicians. But the social and economic forces at work in states and nationally are well-entrenched and formidable. The greater environmental consciousness of Americans and the shifting of population from rural to urban areas in the West are slowly beginning to have effects on the body politic. In other words, we may have a large constituency for wild trout, but we have been unable to adequately harness the political and economic capabilities of this constituency to work on behalf of wild trout and fisheries in general. In Washington, DC there are few fisheries conservation organizations and of those that exist, the number of issues that can be tackled in the short or long term are extremely limited. Local and regional organizations do not fare much better.

As we have seen recently, wild trout and wild trout habitat are not only besieged by development, agricultural,

and industrial and municipal interests, but by traditional supporters of trout conservation. Anglers are at odds with each other over several issues. Some of these program constituents feel management objectives should focus on natural systems and natural system production. Stocking is seen by some factions as a severe detriment to wild trout populations. Other anglers argue that while restoration of natural systems is a laudable goal, it is impossible to accomplish. Further, some systems are generally low in productivity and without active management to enhance productivity, the benefits derived from wild trout streams would be severely curtailed. Other anglers advocate supplemental stocking of local fish reared and grown out in hatcheries. Still others are quibbling over the role of endangered species and the value of razorback suckers versus trout.

Coming up with common-sense solutions, that are scientifically based, is the challenge of trout fishery managers. In some areas, the national Endangered Species Act and local derivations, also conflicts with wild trout management. The mandates from these laws, and attendant regulations, often focuses the attention of new constituencies on wild trout management, particularly when wild trout management adversely affects the recovery effort of an endangered species dear to their hearts. Common sense and logical reasoning is often lost by agencies, organizations, and individuals in the ensuing debate and process over balancing the needs of a single species or all species with the legitimate desires of the public.

A NEED FOR ACTION

For wild trout to flourish in the 21st Century, the fisheries and conservation communities will need to become much more organized and cooperative in their efforts to protect and enhance fish populations and fish habitat. A broader network of organizations needs to be developed and a mechanism for timely coordination on issues devised. There also must be a concerted effort by fisheries agencies to better educate the urban public about the value of fisheries and fish habitat and the implications of various agricultural, forestry, development, and water-related issues on those values. While these recommendations are being practiced now, a much better job needs to be done in utilizing the meager resources available for competing in the natural resource conservation, use and management arena. Ways need to

be devised for the disenfranchised conservation-oriented public to have their viewpoints expressed to national, state and local elected officials. The will of the public also needs elevating so agency policy makers will know that they will be held accountable for their actions or inactions. It is incumbent upon all of us assembled here to initiate and facilitate the partnerships among individuals, agencies, and organizations to ensure that the changing social, political, and economic structure fosters an environment that allows wild trout to flourish in the 21st century.

In conclusion, I would like to leave you with two thoughts. First, attendees at this meeting and countless others need to be commended for the hard work and great progress on wild trout management. If you step back and look at the record from Wild Trout I through what we have heard here at Wild Trout V, you should be rightfully

impressed by: the sophistication and results of the research that has been conducted over the past 20 years; at the changes in management that have protected and enhanced wild trout populations; and yes, at the political gains we have made.

My second thought reflects a very real concern that we are going to be beaten in the political arena where top notch science and management programs often count for little. The ESA has been view as the safety net for the environment. We were wrong in this assumption. It is the courts which are holding the bottom line on the environment. It is truly a grim state of affairs when we have to sue agencies to uphold the laws of the land. We are deteriorating to where we are managing by suits. This is clearly not acceptable.

