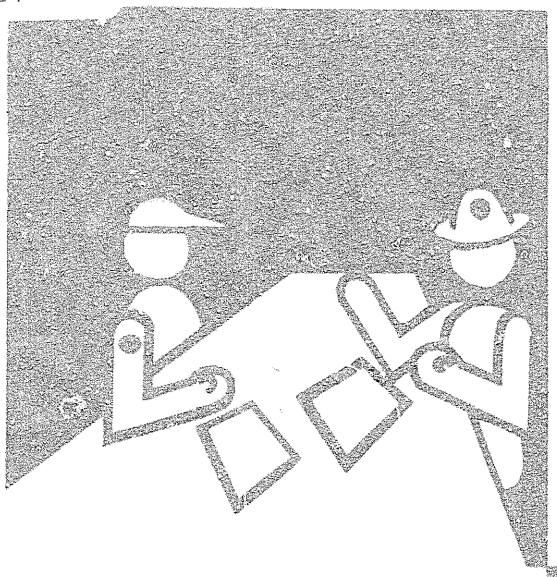

Elements In Negotiating Stream Flows Associated With Federal Projects

COOPERATIVE INSTREAM FLOW SERVICE GROUP

INSTREAM FLOW INFORMATION PAPER: NO. 9

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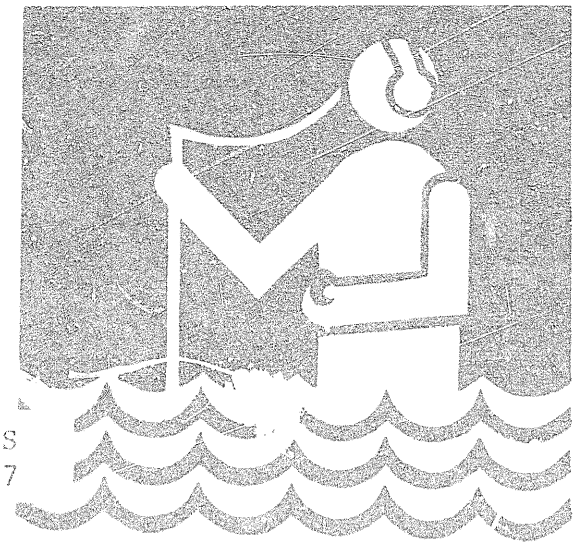
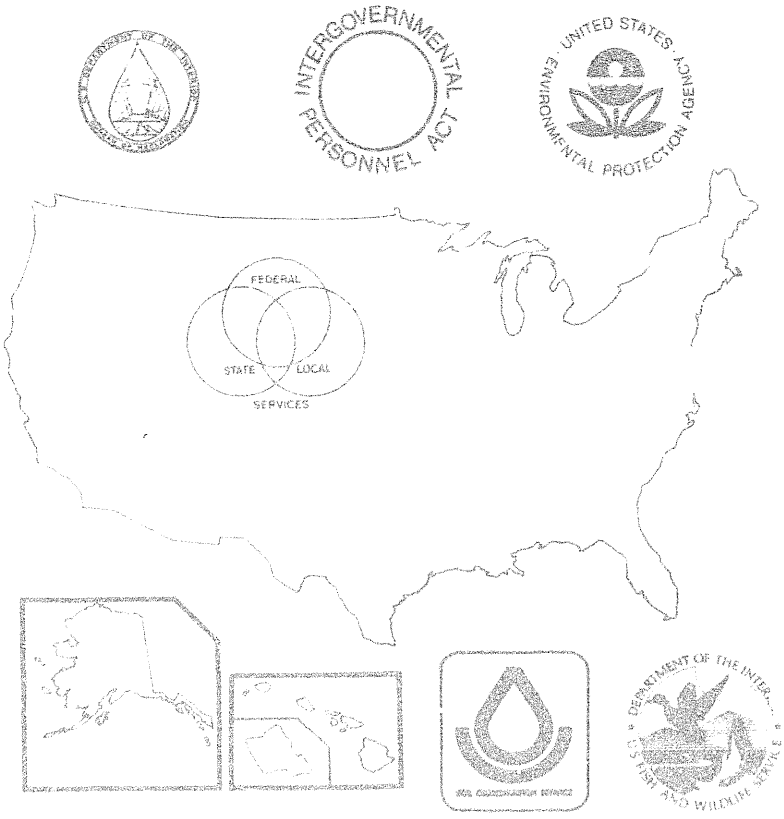


Cooperating Agencies:

Fish and Wildlife Service
Environmental Protection Agency
Bureau of Reclamation
Soil Conservation Service



The Cooperative Instream Flow Service Group (CIFSG), a portion of the Western Energy and Land Use Team, U.S. Fish and Wildlife Service, was formed in 1976. Primary funding was provided by the U.S. Environmental Protection Agency.

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The CIFSG, under the initiative and leadership of the U.S. Fish and Wildlife Service, functions as a multi-agency, multi-disciplinary program which is providing a focus for technology development on instream flow assessments. This multi-agency, multi-disciplinary approach is provided for by the Intergovernmental Personnel Act transfer of State personnel and details from other Federal agencies.

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August 1979

ELEMENTS IN NEGOTIATING STREAM FLOWS ASSOCIATED WITH FEDERAL PROJECTS

by

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PREFACE

This report incorporates ideas for use in negotiations intended to solve water resource planning problems and makes that information available to encourage discussion and exploration of the issues presented. The findings and suggestions in this report are a compilation of information received from three sources:

1. Interviews: We interviewed many people involved in water resource negotiations to learn what they considered were problems in present practices and their suggestions for change. We also talked with persons knowledgeable in the field of fishery biology.

2. Observations: We observed successful and unsuccessful negotiating sessions, over two years, which illustrated the problems and possibilities in negotiated problem solving.

3. Regulations and Statutes: Although we have not covered every applicable provision in our summary of relevant regulations and laws, those provisions included do illustrate some possibilities which can be explored further.

We would like to thank all the individuals who have taken time to meet with us, share their ideas, and help us in the development of ours.

TABLE OF CONTENTS

ABOUT THE AUTHORS

P. S. Wassenberg received her J.D. from Lewis and Clark Law School. She prepared this paper during an internship with the Cooperative Instream Flow Service Group (CIFSG). Stewart Olive is currently employed by the State of Wyoming. He prepared this paper while working on an M.A. in the Political Science Department at Colorado State University and on internship with the CIFSG. Janet L. DeMott is a U.S. Office of Education Fellow studying Natural Resource Administration. She prepared this paper while working on an M.A. in the Political Science Department at Colorado State University during an internship with the CIFSG. Clair B. Stalnaker is employed by the U.S. Fish and Wildlife Service as Leader of the CIFSG. A revised version of his article, "Instream Flow MYTHodologies and Water Management Uncertainty" (Idaho's Water, Idaho Water Resources Research Institute Newsletter, May 1979, Vol. 6, #2), is included to provide the readers and users of the information in this paper with background material and to encourage a broader understanding of instream water uses.

PART 1

MYTHS CONCERNING INSTREAM FLOWS: A BACKGROUND TO UNDERSTANDING INSTREAM USES

by

Clair B. Stalnaker

Instream flow requirements, often referred to as instream flow needs, refer to the amount of water flowing through a natural stream course that is needed to sustain the instream values at an acceptable level. Instream values refer to uses made of water in the stream channel and include maintenance of fish and wildlife populations, outdoor recreation activities, navigation, hydropower generation, waste assimilation (sometimes termed water quality), conveyance to downstream points of diversion, and ecosystem maintenance which includes recruitment of fresh water to the estuaries, riparian vegetation, and floodplain wetlands. Water requirements sufficient to maintain all of these uses at an acceptable level are the "instream flow requirements." Understandably, at a given location in a given stream system, only certain uses may be applicable. The instream flow requirements are based on the dominance of one use or, alternatively, on the resulting best combination of uses after trade-offs have been made within the instream use sector.

Legal protection for instream flow requirements is quite another matter which very much depends on water law doctrines, definitions of beneficial use, and other institutional constraints. These constraints are influenced by the amount of support available for ensuring that instream values are met.

Support for protected or guaranteed instream flows continues to grow, e.g., legislative action in California, Colorado, Idaho, Montana, Oregon, and Washington has recognized instream use as a beneficial use. President Carter's 1978 Water Policy Message made specific reference to water conservation and instream flows, promoting them as national goals. However, with this progress has come increasing confusion and misunderstanding among the various publics and water management and environmental resource agencies over definitions, criteria for establishing, and the means of protecting instream flows. The purpose of this commentary is to flush out some of the myths associated with instream flows and help the reader to better understand various instream flow related activities and issues.

The first and most important step in establishing an instream flow recommendation must be to describe the stream reach (segment) to which the flow applies, i.e., from point A on the river downstream to point B. This description of the reach is necessary to effectively reference demand to supply and thereby maintain some degree of certainty in the management and allocation of water among all users of the river.

MYTH 1. THE MINIMUM FLOW

The early pursuit of simplicity in the management of complex instream and out-of-stream water uses led to the minimum or "base" flow concept. This has led to the myth that a consistent methodology could be used to establish the desired minimum flow. However, a single flow figure is not practical. As water becomes fully appropriated to upstream use and storage, the minimum flow, if not violated, tends to become the average flow condition. This situation is manifested in a stepped or flat, fixed hydrograph throughout much of the year. Such persistent flows are often undesirable for both environmental protection and water management. On the one hand, the minimum flow is not flexible in the face of new or altered use conditions; while on the other hand, the minimum flow does not meet all the desired environmental needs. Moreover, recommenders of these fixed flows typically have been unable to determine the impacts of incremental decreases below the recommended minimum.

The difficulty arises, in part, because all uses for which flows are to be protected have not been identified. These may include navigation, hydropower generation, fish and wildlife, recreation, aesthetics, waste assimilation, and estuarine inflow. Most often overlooked are periodic high flows necessary to move bed load, flush sediments, and generally maintain the desired stream channel characteristics. These collectively have often been lumped together under the label of stream resource maintenance flows. This approach has also been misunderstood and at times misrepresented.

One such misinterpretation is that if all of the identifiable instream uses are considered, the result will be total allocation of stream flow to instream uses. Contrary to this interpretation, a considerable degree of compatibility exists among many instream uses and downstream delivery requirements for offstream uses. However, in order to deal with these compatible uses, the instream flow advocate and the water manager must be aware of both the timing and the magnitude of all demands placed on the stream. This should lead to identification of an instream flow requirement which will protect all complementary uses.

The protection of complementary uses requires an instream flow regime that will satisfy several instream uses at once (e.g., fisheries, recreation, waste assimilation, and channel maintenance), with consideration given to those instream uses having the highest needs at any given time (Figure 1). This can only be done by evaluating the several instream needs, taking into account the conflicting aspects as well as the complimentary features and the downstream delivery requirements for consumptive uses, and developing contingency plans for drought years. In short, this approach allows for a degree of flexibility not possible with the fixed minimum flow approach.

MYTH 2. FISH FLOWS SATISFY ALL OTHER INSTREAM NEEDS

It has been commonly assumed that if a flow is adequate for fishery maintenance, all other instream uses will be protected. This assumption has developed as a result of experience gained on small western headwater trout streams where the fishery is rather simple (single fish species) and little demand exists for other instream uses. As demands on our water resources grow, there is a focus on instream flow concerns further down the watershed and on

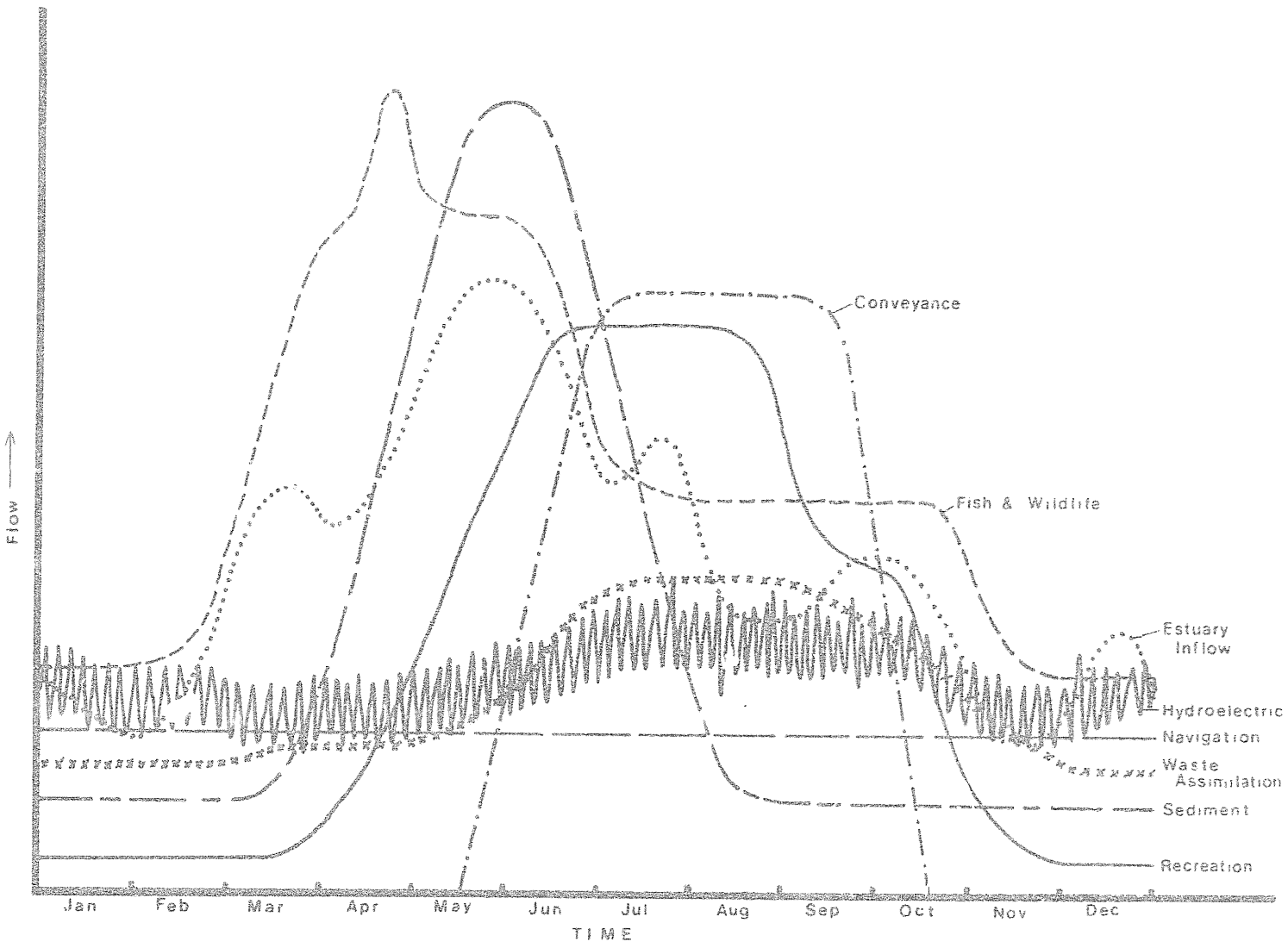

Figure 1: Hypothetical array of instream flow requirements for several instream uses.

midwestern and e st coast rivers. This means that more attention should be given to evaluating requirements of all legitimate instream uses. Collectively these flow requirements make up the total instream flow regime associated with a given stream reach and water yield condition. The more that is known about these situations, the more it is clear that fish flows may not satisfy all uses.

MYTHS 3 AND 4. FISH NEED ALL OF THE WATER

Two additional myths associated with fisheries must be dispelled before stream system management can approach any degree of certainty. These are: first (the myth often held by the environmental agencies), that maintenance of the fishery requires all of the water all of the time and second (the myth held by water development agencies), that maintenance of the fishery requires all of the water none of the time. In fact, maintenance of the fishery may require all of the water some of the time, and the timing of flow needs is a function of management decisions made regarding the desired level of fish production and yield. When such decisions are matched with variable water yield conditions, the instream requirement for all of the water may range from a short duration within a year to once in 50 years. Understanding this helps both the instream flow advocate and the water resource manager. These two vocations are usually staffed by persons from the aquatic ecology and hydrology disciplines, respectively. Professional training seems to make a difference in how the instream flow problem is perceived.

Aquatic ecology is primarily a descriptive science with a relatively recent and meager theoretical basis for system simulation and prediction. Consequently, the need for a validated and generally accepted ecosystem model, capable of accurate predictions of change in numbers and annual production of aquatic organisms, is often felt necessary before decisions can be made concerning water allocations and trade-offs. Such a model is not available, thus, the "safe" recommendation is for little or no change in the flow regime in order to protect the fishery (all of the water all of the time).

Hydrology as a profession, on the other hand, is very much oriented to predictions of water yield (watershed runoff) and the duration of stream flow events. Water planning and water resource management has been dominated by individuals educated in hydrology and hydraulic engineering. Early efforts to establish instream flow requirements were largely in response to hydrologic analyses depicting the natural variability in the amount of flow present in any given stream reach. From such analyses arose the concept of the 7-day Q_{10}, which is the lowest flow present for seven consecutive days during a 10 year period of record. This statistic has been offered as a "rule of thumb" for the "minimum" flow which would assure adequate water quality and should be protected from consumptive use. The implications of such an approach are quite subtle; eventually all stream flow could be allocated to out-of-stream uses except for the defined minimum. The dynamic nature of the fishery requirement and the long term recovery requirements of the stream biota after a severe drought (i.e., 1-in-10 year event) are often ignored in such a plan. In reality, stress conditions associated with the 1-in-10-year flow could become the norm during all but the wettest years. This is analogous to your doctor prescribing that an acceptable condition of your health is that which you experienced in your worst seven days during the last 10 years!

MYTH 5. WATER QUANTITY IS DIRECTLY RELATED TO NUMBERS OF FISH

The availability of flow records and predictive techniques for describing hydrologic events through a river basin led to the use of hydraulic simulation models for examining the impacts of altered flow regimes on the stream fishery habitat. Unfortunately, extensive use of the hydrologists' tools has led factions within the water planning community to the false hope that the aquatic ecologist should be able to quantify the gains or losses in terms of number of fish produced associated with any flow regime. In other words, the timing of stream flows (hydrograph and duration curves) and the distribution of the hydraulic characteristics (depth and velocity) throughout a stream reach should be sufficient to describe fish production.

Actually, there are four major components of a stream system which determine the productivity of a fishery. These are: (1) water quality; (2) watershed inputs in the form of sediments, particulate organic matter, and nutrients; (3) flow regime; and (4) physical habitat structure (channel form, substrate distribution, and riparian vegetation). Each of these components is interrelated with the others, and a detailed description of each will be necessary before correlation with fish production can be examined. Predictive models for fish production should be based on generally accepted models of the dynamic aspects of these four major components.

Considerable effort has been expended over the past two decades toward better understanding the relationships between fluctuating water levels in stream environments and fish populations. These efforts have thus far produced methods suitable for management analyses of changes in fish habitat only. That is, all methodologies available to date examine the relationship between stream flow and fish habitat. These methods generally fall into three categories. First are those related to a percentile of historic flows. Second are "threshold" methods keyed to critical cross sections of streams. The third category consists of various multiple transect approaches which usually focus on the microhabitat.

Many studies have documented the importance of such physical parameters as temperature, depth, velocity, and substrate in the microhabit specialization of stream fishes. Under conditions of suitable habitat structure and temperature, the distributions of depth and velocity are the dominant aspects of the flow regime which dictate fish species distributions and territorial behavior. In marginal habitats, temperature and chemical water quality may interact with other factors to determine distribution and abundance of stream fishes. The importance of substrate and cover cannot be overstated. But until physical scientists have developed predictive tools capable of describing changes in substrate, quantification of the stream flow and fish production relationships under changing conditions will not be possible.

What can be said is that fluctuating water levels are integral to ecosystems. Fishes and invertebrates have evolved as a result of these changing flow regimes. Thus, the flow requirements for maintaining any desired level of fish habitat structure in the stream channel must be dynamic and can only be protected by establishing instream flow regimes for: wet years, to provide sediment and bed load transport; average years, which establishes the base level of fish production; and dry years, which provides minimal survival conditions for "seed" stock necessary to replenish the stream reach. The

dynamic aspects of the stream habitat condition over seasons and years under changing water, sediment, and nutrient supply must be accounted for as well as possible.

MYTH 6. INSTREAM NEEDS WILL TAKE AWAY ALL WATER RIGHTS

The final misconception to be discussed relates to the often expressed concern of consumptive water users in the western U.S. that the emphasis and concern for instream flows is either not pertinent because "all of the water has been appropriated" or that the environmentalists are "trying to usurp existing water rights". Actually, the recognition and quantification of instream uses pose no real threat to existing water rights holders. Such action simply legitimizes those instream uses which have, on the basis of water availability, been in existence or provides a mechanism whereby new instream uses can be accommodated if water can be made available by increased storage, water rights transfers, or other means. State and Federal governing bodies are certainly cognizant of the valuable role western water development projects have played in U.S. history and will not allow existing systems to be destroyed.

Most major basins in the western U.S. capable of supporting large scale irrigation projects have been developed and future opportunities lie in "firming up" the water supply. In these emerging plans, instream uses must now be given equal consideration with out-of-stream uses during all phases of planning. Since instream uses are of a nonconsumptive nature, their major impact will be to influence the operation and design of delivery systems which are developed for out-of-stream use. On the other hand, having instream flow interest groups looking for water in late summer and early fall may assist water users in obtaining construction of additional storage reservoirs. Future impetus to utilize gravity distribution systems may conflict with the emerging national concern for instream uses. In other words, out-of-stream diversions may tend to be lower in the watershed, thereby allowing for maximum use of the stream flow within the natural stream channels. This may increase the cost of supplying water for new consumptive use due to more direct onsite pumping in lieu of upstream diversions and gravity delivery from storage reservoirs high in the watershed.

CONCLUSION

Water resource policy is a process of successive compromises toward some desired objective, given a variety of legal and institutional constraints. The objective itself continues to change with evolving social goals. Likewise, water management is a political and decisionmaking process which must allocate a finite resource among a growing number of uses. This intense competition for the allocation of water, coupled with public concern for environmental amenities, is the impetus behind the need for a greater understanding of instream flow uses in water resource administration. Instream flow advocates need to be much better informed about decisionmaking and administrative processes and the legal means available to protect stream flows.

The instream flow manager needs credible methodologies which provide quantification and mesh with administrative procedures. Because water management is so volatile, the water administrator operates in a negotiation mode and will frequently place less emphasis on a poorly quantified or poorly conceptualized instream flow request in order to make water available for other, more firmly quantified traditional uses. For its part, water management must recognize the dynamic nature of instream uses and develop contingency plans for various water supply conditions which can equitably distribute the losses among all uses, both instream and out-of-stream, during low water years. Achieving results such as these requires instream flow advocates to have negotiating skills.

Because the issues concerning water resource management are many and complex, operating effectively in a negotiation mode has become a vital part of instream flow protection. Part 2 explores aspects of negotiations which concern most water resource administrators. The goal of this second part is to provide a general discussion of elements of the negotiations process.

PART 2

NEGOTIATING INSTREAM FLOWS

by

P. S. Wassenberg, Stewart Olive, and Janet L. DeMott

INTRODUCTION

As the demands on our available supply of water have grown, water resource planning has become of greater interest to an increasing number of people. The increasing public interest and the decreasing amount of available water have aggravated the conflict surrounding water resource planning. Policymakers are forced to decide between consumptive and instream uses of the available water while under a great deal of pressure from various interest groups.

In recent years litigation over environmental issues has increased rapidly, adding to the time and expense involved in resource planning. This courtroom resolution of crucial planning problems has produced conflicting results, making the planning efforts of State and Federal agencies appear chaotic and irrational. Moreover, the absence of agreement between State and Federal governments about their respective roles in the management of water projects built with Federal funds has aggravated resource planning problems. The United States Supreme Court recently held in California v. United States that a State may place reasonable conditions on water right permits for water in Federal projects and may, within limits, control the distribution of water from such projects (California v. United States 11 ERC 1651 [1978]). Thus, it is necessary that State and Federal agencies cooperate in decisionmaking. A method to enable policymakers to arbitrate the claims of conflicting interests and accomodate diverse uses in the construction of water projects would be valuable.

Negotiation is the most obviously suitable method to accomodate the variety of conflicting interests involved in water resource development. Negotiations can allow resolution of conflicts between environment and development interests and between State and Federal governments. Although negotiation is widely accepted, it is clear from recent investigations that the basic elements of effective negotiations are poorly understood by water resource managers.

President Carter recently addressed the importance of resolving conflicts in the area of instream flow protection:

> Instream flow problems can occur where Federal or other water programs do not adequately consider the need to leave water in the stream, thereby jeopardizing recreation, water quality, aesthetics, and fish and wildlife habitat.

> The States have the principal responsibility for protection of instream flows . . . The Federal Government also has important responsibilities:
>
> --to reduce the extent to which Federal actions contribute to and exacerbate these problems;
> --to exercise existing Federal authority, consistent with State laws, to remedy these problems;
> --to cooperate affirmatively with States in developing programs to resolve these problems.
>
> [To further these policies, the President directed the Federal agencies to initiate the following actions:]
>
> In cooperation with the States, Federal agencies shall improve, where possible, the operation and management of existing water resources projects to protect instream uses. . . .
>
> In the planning stage, Federal agencies shall establish and provide for the streamflow necessary to maintain instream needs below proposed dams or other facilities. For existing water resources project legislation that now lacks provisions for maintaining instream flow, and where commitments and economic feasibility permit, Federal agencies, working in cooperation with the states, shall develop legislative amendments to correct this situation. . . . (Memorandum from President Carter to Water Resources Council, Attorney General. Tennessee Valley Authority, Advisory Council on Historic Preservation, 12 July 1978).

Consequently, any negotiation of water project planning problems should address the question of the scheduled release of water below dams or diversions for instream uses such as fish and wildlife protection, and recreation. This paper examines the use of negotiation as a tool to resolve conflicts over stream flows by examining several elements that affect the success of negotiating. These elements are: the choice of methodology; water rights coordination; public information; and interagency cooperation.

THE METHODOLOGY BEHIND THE RECOMMENDATION

Before a streamflow recommendation can be made, data must be collected; before the data can be collected the method of collection and analysis must be chosen. The methodology must allow its users to recommend the needed instream flow regime and to predict probable consequences of flow alterations. The methodology must also be understandable to those to whom the instream flow recommendations are being made. Understanding the recommendation will usually not be a problem since all parties involved have available scientific staff, but problems can arise especially if the methodology is not understood and clearly described by the recommending agency.

The methodology chosen will determine the terms used to describe the instream flow recommendation. The recommendation most typically has been for a minimum flow, that is, a flow which would never drop below a minimum level. Under such operating constraints, fluctuations, if they were to occur, would likely be unrelated to the needs of fish and wildlife. Thus, while minimum flow can be administered to provide a constant level in the stream, this flat flow could not accommodate the changing seasonal and life stage requirements of fish and wildlife. It also may fail to provide conditions needed for flushing and channel maintenance.

A streamflow may be set at the historic low flow level, which may be termed Q seven-ten (Q7-10), the lowest flow over a 7 day period within 10 years or the 7-day low flow sequence with a 10% chance of occurring in any one year. There is little biological justification for choosing an historic low flow as a basis for determining a streamflow. The historic low flow method in effect, takes the conditions existing during a period of critical stress and establishes those conditions as the norm. Stated another way, the historic low flow concept assumes that if populations survived a set of conditions which existed for seven days, they can survive that set indefinitely.

As negotiating tools, these flat flow recommendations (those that do not allow for temporal fluctuations) leave much to be desired. The principal problem is that the flat flow does not allow a negotiator to establish negotiating or flow-level alternatives. That is, if the negotiator has in mind only a minimum flow, there is limited room for negotiations; he or she would not know, for example, how to respond to alternative management options. This lack of flexibility leads to two problems. First, with a flat flow, the biologist does not know what is gained or lost under various alternatives. Second, because the flat flow is inflexible even where it is obvious that the resource is flexible, development interests feel justified in rejecting a so-called minimum flow in water-short years.

Streamflow levels may also be set according to a mean monthly or mean annual flow. The average flow is determined for the period of time chosen and water is released accordingly. This average flow may be released as a constant flow or it may be scheduled to meet the seasonal requirements of fish and wildlife, to maximize recreational benefits, or to meet the needs of other project purposes such as power generation and downstream delivery. In recommending these flow releases one may encounter some of the same problems mentioned above. Essentially there are too many alternative releases encompased in an average flow to allow negotiation over how the flow will be used.

In practice, flows established during a normal year are often adjusted downward during extended drought periods, thereby creating problems, especially when the flat flow was inadequate or barely adequate initially. For this reason it is essential that the negotiations include the specific course of action which will be followed in drought years. Even where a flat flow is agreed to, some settlement needs to be reached on how shortages are to be shared. A negotiator might, for example, agree to a 50% reduction for two consecutive water short years with the provision that in the third year a full complement of water be received for instream uses. This agreement should hold even if the third year is dry.

Perhaps the best type of streamflow to recommend is a flow regime. A flow regime is that set of flows which varies in both the quantity and timing of releases. Under a flow regime, the releases should vary to meet the seasonal or life-stage needs of the fish, and wildlife or recreational uses one wishes to manage.

The flow regime recommendation has several features which make it useful to the person(s) making the recommendation. First, it allows for more accurate identification of the management objectives. Second, it allows for the determination and understanding of all the periods of time which are critical for the use in question. For example, if fish passage is the major controlling factor in management then this can be specifically identified. Thus, in dry years or in designing project operating procedures, proper attention can be given to protecting this critical flow. Third, a flow regime allows the negotiations to address the project release schedule. That is, the persons recommending a flow regime can avail themselves of a wide variety of management options which would meet the requirements of the fish or recreation activity.

Fourth, a flow regime, because it varies with need, allows for more effective negotiation. With this type of recommendation, one knows where trade-offs can be made, which months or weeks are crucial, and which are not. If some of the newer methodologies are used (i.e., the IFG Incremental Method), one can display the impact of incremental changes in flow releases. With this knowledge, the recommenders of instream flow protection can move away from demands and take an effective role in true negotiations. For example, one might negotiate both an operating schedule and storage for instream purposes in both wet and dry years.

In addition, there are other considerations in using data. As demands for and conflicts over, the available water grow and data analysis becomes increasingly sophisticated, the importance of a reliable data base for decisionmaking becomes more apparent. For the latter reason, if the decisionmaking process includes negotiations, it is crucial that negotiators and their agencies maintain a good professional reputation for accurate, objective data analysis and collection.

In any event, the choice of methodology must be consistent with the context of the negotiations. Data are collected not as an end in themselves or as an effort to advance science. But data are collected in the context of applied science as a basis for a policy decision. Data should, therefore, provide a mechanism for the evaluation of alternative courses of action. Negotiators should be able to illustrate the effect an altered course of action will have on their use and set both upper and lower limits of flow alteration compatible with that use. Each negotiator must be sufficiently versed in the methodology used by their agency to determine those factors and should understand the reasoning benind the policy position of their agency.

The methodology should be carefully chosen and used because it answers the questions which arise in the negotiations and restricts the kinds of information that will be available. It is important to understand that any methodology makes assumptions about the physical world and is biased to a certain extent by the values of its developer and user. An agency representative at negotiations must understand both the practice of the chosen methodology and the theory behind its operation. Thus, understanding must be based

on a recognition of the assumptions of the methodology and its limitations. When a methodology is questioned during negotiations, its expositor should not attempt to make it appear flawless, but rather should admit its limitations while explaining its advantages over other possible choices and its suitability to the problems being discussed. Ideally, such discussions should take place with the development agency prior to actual data collection, thus making follow-through presentations and recommendations more understandable.

Negotiators should not limit their knowledge and understanding to those areas traditionally a part of their professional or agency concern. Indeed, the total situation must be fully understood. Perhaps the most important type of data collected is the amount of water available to the project. A resource cannot be fairly apportioned among competing uses by a group that does not know how much of that resource is available for use. If there are several projects on a stream, the effects of project interaction on the quantity of water available should be determined. Moreover, things like the water rights senior to project rights, the location of those rights, the amount of planned dead storage, and details of proposed project operation must be determined so that planners know how much water is legally available and how it is likely to be managed.

COOPERATION OF WATER RIGHT HOLDERS

After a project is built and the reservoir filled, water users will begin diverting water from the system. Persons holding water rights on the project stream should be contacted during preconstruction negotiations to obtain their agreement for a favorable placement of diversions for instream flow protection. Water users may agree to divert water as far downstream as possible from the impoundment or to trade among other users to allow a certain quantity to remain in the stream through a defined stretch. These arrangements will be easier to establish if the more senior right holders are furthest from the project. It will be very beneficial if water users can be convinced to divert water from the stream channel, using the channel for conveyance, rather than from the reservoir using conduits for conveyance. The general cooperation and support of local water users will, of course, make project planning much easier and more successful.

It should be ascertained whether there are Federal reserved rights, on the project stream that allow water use for instream purposes. These reserved rights could be Indian rights to water for fishing, National Park Service rights for recreation and fish and wildlife preservation, or rights held by other Federal entities. If these water rights exist on a stream and are sufficiently senior, the problems of protecting an instream flow right may be solved in a State which does not recognize such uses as beneficial. To be of the greatest use for flow protection, however, these rights should be quantified and secured under both State and Federal law.

PUBLIC INFORMATION

Federal water projects are, of course, constructed with public funds and therefore, the public should be kept fully informed by all agencies involved in project planning and negotiations. The public should be given sufficient information about the proposed project plan and agencies' recommendations to allow them to make reasoned determinations and expressions of their wishes when conflicts arise. Each agency should clearly explain its actions and position in the planning process.

DEVELOPING A SYSTEM OF COOPERATION AMONG AGENCIES

The emergence of conflict over water use below a Federal impoundment can require instant creation of a system for interagency negotiations. The format for these negotiations is often informally established during a crisis. All parties attempt to do their jobs and act responsibly in these unfamiliar circumstances, but it is easy to understand why such attempts can be less than productive and how unorganized interactions can, in fact, increase the adversary atmosphere existing among agencies. This is not a flaw in the negotiation as a tool but in the manner in which negotiations are organized. If negotiations are to be successful, they must be built on a foundation of interagency understanding, cooperation, and constructive information exchange. In other words, the instream flow advocate must be prepared to negotiate. This preparation can contribute substantially to the successful integration of recommendations from persons of different technical backgrounds, agencies, or perspectives.

The basis for a system of agency interaction and for negotiations should be established before a major conflict becomes the focus of attention and energy. This can culminate in the preparation of memoranda of understanding between agency directors outlining a format for information exchange and conflict resolution between their agencies. The terms of these memoranda can be general policy statements governing direction rather than dictating specific procedures. The specific procedures can be delineated in similar memoranda between corresponding field offices. When a problem arises, all personnel are then aware of the actions they are expected to take toward solving that problem and confusion over who has the authority to respond to whom, and in what manner, is avoided. However, these memoranda are useless unless viewed by agency personnel as the basis for day-to-day interaction and information and not as merely memos to be filed to maintain a record of position. Agency budgets should include funding to cover the establishment of such systems of agency interaction.

In most cases, arranging such a formal process is not possible. Environmental agencies,[1] however, should be prepared to conduct negotiations on an

[1]Although we have used the term environmental agencies to describe nonconstruction agencies, State and Federal, involved in planning and review of water projects, we do not mean to imply that these nonconstruction agencies we are not implying that construction agencies are anti- or non-environmental are the only ones concerned with protecting the environment. In other words, in nature or action We use the term environmental agency merely to differentiate construction and nonconstruction agencies in a way which would not make sentence structure awkward.

ad hoc basis. Preparation for such action is relatively straight forward. Essentially this entails three considerations: contacts, understanding other agency perspectives, and establishing achievable goals.

First, contacts in other agencies are essential. When representatives of environmental agencies have good working relationships with people in agencies which may oppose them in negotiations, two things are achieved: (1) greater understanding of project development and a new perspective on the conflict; and (2) ability to gain information about how various management options will be received. One should not forget to establish contacts with public representatives and water users because these people will also have impacts on negotiations and important views to consider.

Second, both environmental and development agencies need to use their contacts and other sources of information to increase their understanding of the processes surrounding a project. This knowledge is essential in the formulation of plans and water management options. The accuracy and utility of water management options depends on a comprehensive information base.

Third, agencies must establish goals which are achievable. Agencies need to know what values they wish to protect. The agencies also need to establish the range of protections and alternatives which would be satisfactory. Finally, within that range, negotiators must be able to estimate the effects of incremental changes. This estimation requires understanding of analytical techniques and project operation options. Much of this understanding depends on agency interactions.

For these reasons, it is crucial that environmental agencies become involved in project planning as early as possible. If expenditures or commitments to interested groups (i.e., municipalities, irrigation districts) are made dependent on a specific project plan, modification of that plan to include needed streamflow regimes can become difficult and the political complications of resource planning increased dramatically. The problems encountered will be sufficiently difficult and pressures sufficiently intense without unnecessary aggravation.

In addition, information sharing programs would be enhanced if each agency maintained an interdisciplinary staff. Each agency could then bring various areas of expertise to the planning process and convey that agency's perspective on the issues in the language of the disciplines involved. The interdisciplinary staff would increase the ease and productivity of inter-agency communications and reduce "translation" problems among disciplines. A diverse staff would also benefit intraagency operations because water resource planning problems seldom arrange themselves according to academic classifications. This diversification should include personnel trained in the applicable physical sciences and those trained in the social sciences. The interaction between human society and the physical world has created problems which require the attention of both physical and social scientists.

EXAMPLES OF PROPOSING INSTREAM RECOMMENDATIONS

Negotiations are conducted to mesh and resolve the differences in the variety of interests concerned. It is intended that as a result of negotiating everyone involved will benefit in some way. Here, cooperation, accuracy, and coordination should result in every participant receiving part or all of what he needs. Assuredly, working toward this type of result is much harder than the usual win-or-lose situations. In negotiations success requires in-depth knowledge of the entire situation, perseverence, and skill.

As recognition of instream flows as a beneficial use of water increases, and support for stream protection grows, the demands on water resource decisionmakers become increasingly complex. Protecting the level of streamflow necessary to preserve the instream values is obviously a difficult task. The nature of the task itself will vary from State to State and area to area which further complicates the negotiations process.

The purpose of negotiating should be to unite the efforts of the water project planners. Because negotiating is necessitated by conflicting interests, it is important to establish a positive atmosphere to minimize any possible problems. Maintaining a cooperative atmosphere throughout the project planning, negotiations, and construction will enhance the positive results to all those involved.

In the previous sections, the main considerations of negotiations between water resource planning agencies were discussed. From this material, the reader can gain a broad knowledge of the many major facets involved in negotiating instream flows from Federal water impoundments and then apply these considerations on a case-by-case basis.

The purpose of the following brief example cases is to demonstrate how a fishery manager might formulate an instream flow request for presentation to a water licensing or allocating authority. These examples are hypothetical cases that are intended to demonstrate the benefits which may be realized by using a comprehensive approach in negotiating for instream flows. The context of the recommendation is that an impoundment is proposed or in operation and a release will be made for the support of downstream fisheries. The question to be answered is how much should be released for this purpose?

The first example demonstrates a common negotiating situation. It is characterized by an incremental long term process which is fraught with frustration for the fisheries manager. The second example demonstrates the advantages to be gained from proper preparation and presentation of data. Even though the process remains incremental, frustration should be reduced and the negotiations smoother.

Part 1 of the Appendix is intended to serve as a checklist to aid field personnel in planning and developing their negotiations strategy. Part 2 of the Appendix may be used to evaluate the completeness and legal considerations of the water resource plans and recommendations. The questions in the Appendix will be applied to both hypothetical cases for comparative and evaluative purposes.

After reading the Zippy Project, use the Appendix (Part 1) to evaluate specific points. Follow the instructions to give the case a rating percentage. Individuals may wish to use the check list as an evaluative tool for negotiations they have encountered or plan to face.

EXAMPLE 1: THE ZIPPY PROJECT

Grain Creek is a tributary of the Clam River in a western State. Zippy Dam and Reservoir are currently under construction about 20 miles north of the city of Oz. This project was authorized by Congress in 1962. The reason for the project is primarily to protect the farming region in the Grain Creek drainage from flooding. Other authorized uses of the stored water are for irrigation, water supply, and recreation.

Flooding on Grain Creek, however, is the primary problem which Zippy Dam was designed to solve. In preparing its report to the House of Representatives' Committee on Public Works, the U.S. Army Corps of Engineers (CE) reported damages from floods as early as 1917. The CE estimated that the 1917 flood discharged 4,200 cubic feet per second (cfs) and caused $166,440 in damage, expressed in 1959 dollars. Attention to the authorization of the project was intensified as a result of a later flood in February of 1962. It was the history of flooding which prompted the project's development.

The range of altitude in the Grain Creek basin is from 4,700 feet (1,433 m) at Oz to over 7,000 feet (2,135 m) in the mountains upstream of the project. Average precipitation in the basin ranges from about 11 inches (28 cm) at Oz to about 21 inches (53 cm) in the mountains. Average snowfall is 128 inches (325 cm) in the upper basin. In short, the region has many of the characteristics of a high desert. Like many such semidesert areas, the basin experiences frequent fluctuations in temperature in excess of 30° F (16° C) in a day. In winter, this is the cause of the severe flooding.

In the February 1962 flood, the syndrome which had become typical for the Grain Creek drainage was evident. Typically, in February snow had fallen and the stream was frozen over. These conditions increased the problems of assimilation of flood flows. The channel capacity of the stream bed in the upper reaches is generally adequate to retain flood flows. However, as the stream reaches the Clam River plain, the gradient is reduced and the channel becomes inadequate to carry increased flows. Bankfull on Grain Creek is estimated at 700 cfs as it first enters the floodplain; but after its confluence with Sand Creek, the channel capacity varies from 100 cfs to 300 cfs. Even so, flows of about 400 cfs can be accommodated without noticeable damage. Some greater flood flows can be absorbed in late season by opening irrigation ditches to the excess flow, but in February the stream is frozen.

Indeed, for several days prior to 8 February 1962, the southern part of the State had experienced subfreezing temperatures and snowfall. Snow depth ranged from 2 inches (5 cm) at low elevations to 3 feet (1 m) in the mountains. On February 8 temperatures turned warmer, rising to as high as 50° F (10° C). These warmer temperatures were accompanied by rainfall at an elevation as high as 7,000 feet (2,135 m). The result was rain and snow melt running off over frozen ground at the higher elevations and saturated ground at lower elevations. Ice in the stream broke up, causing ice jams which

resulted in additional flooding. The flow reached 2,000 cfs at the mouth of Grain Creek Canyon and was estimated to be much greater downstream. Damages were estimated at $3,185,000, plus costs of emergency preparations in nearby communities amounting to $763,000.

In 1962 the CE estimated the average annual costs from flood damage to be $85,000, of which the project would prevent $76,400. These figures did not take into account economic change or economic development over time. With these changes considered, the annual flood control benefits would be $200,000. Total benefits for all uses would total $478,000. The project itself would cost, as estimated in 1962, $10,170,000. Based on a 100-year project life, the cost:benefit ratio, including costs of operation, was estimated to be 1.8.

When the project was authorized in 1962, there was very little mention of instream benefits or uses of water. Even though the project did provide for mitigation of fish and wildlife losses, no consideration was given by the U.S. Fish and Wildlife Service (FWS) to instream flows. Rather, that agency's attention was directed toward mitigation of wildlife losses by acquisition of land for game animals and waterfowl. Only the Public Health Service mentioned using part of the storage of Zippy Dam to provide waste dilution in conjunction with other projects. Moreover, none of the Corps of Engineers' cost: benefit analysis considered the instream use of water.

According to representatives of the FWS, the Zippy Dam project was first proposed in the 1950's. The Committees on Public Works, United States Senate and House of Representatives, adopted resolutions on 4 March 1952 and 19 March 1953, respectively, requesting an interim report on the project from the CE. As a result, much of the planning was accomplished before the passage of the Fish and Wildlife Coordination Act of 1958. The approved project provided for the mitigation of fish and wildlife losses resulting from filling the reservoir and management practices. One of the principal practices to be employed was the cessation of releases during periods of stream icing to reduce the effects of flooding. This practice would effectively eliminate most of the fish resource below the dam.

In the months which followed the authorization of the project, the CE offered to prepare a tailwater pool immediately below the dam so that fish could migrate upstream when the flow was cut off. As planning for the project developed, representatives of the FWS argued that the tailwater pool was unsatisfactory for the mitigation of fish losses on the stream below the dam. Agency representatives at a meeting described these exchanges as confrontations in which they continually said "no" until some additional practice was agreed on. This first round of negotiations apparently closed in 1967, when an agreement, which proved to be temporary -- was reached. Correspondence between the CE and the FWS indicates the outlines of an agreement as follows:

> The project plan includes development of a recreation site on Grain Creek in the Zippy Dam Tailwater area to provide angler access. However, the proposed zero downstream releases (December through February) will destroy trout habitat in the affected area of Grain Creek. To compensate for this loss of trout spawning and rearing area, and the attendant fishery, it would be necessary to: (1) construct a tailwater pool downstream from Zippy Dam designed to

sustain fish life during the zero release period; (2) reduce releases to zero gradually (over a week's time); and (3) stock 500 pounds of catchable-size rainbow trout annually in the tailwater pool over the life of the project. Some of these fish would be expected to move a mile or two downstream. Sudden reduction to zero releases would strand fish in the deeper portions of Grain Creek as the water recedes. With gradual reduction of downstream flows, many fish could move back upstream into the tailwater pond. It is assumed that sufficient water will seep from the dam to sustain fish in the pond during the critical December through February period.

In short, the discussion had progressed by 1967 from no provision for mitigation of fish losses below the dam to scheduled reduction in flow using a tailwater retaining pond.

Bob Jones of the U.S. Bureau of Reclamation (BR) recalled that the original authorization included a provision of 10 cfs as minimum flow release. In the correspondence which had been examined there was no mention at the time of authorization of any specific instream flows, nor was there mention of flow levels in 1967. Both R. Crick and C. Kuhn of the FWS recalled that the 10 cfs agreement was worked out after 1967. Crick remarked that after 1967 the CE's attitude began to change toward receptivity to the idea of minimum flows. At that point the Corps of Engineers "said it was thinking of 10 cfs." After the Corps had indicated the possibility of using some of the storage, which to this time had been reserved for flood control and irrigation for instream flows, the BR began to take an active interest in the negotiations. Because the flood control needs were well known and established, the 10 cfs would have to come from the storage for irrigation.

The BR was interested in this project because, on its completion, responsibility for operation of the impoundment and irrigation facilities would be transferred to them. The 10 cfs for irrigation would be drawn from the Bureau's storage because there was no storage set aside in the authorization for instream uses. Ten cfs was agreed to by the involved agencies. After this flow level was achieved, even though the agreement allowed reduction to zero when the temperature fell below 32 degrees (0° C), Crick stated that the FWS began "digging its feet in and became more demanding". The FWS asked the BR to check on the availability of water, arguing that 10 cfs was not enough. Crick indicated that the BR came up with the figure of 25 cfs. Kuhn commented that the FWS argued for a flow of 25 cfs with the provision that the flow would not be curtailed without agreement among the CE, Department of Fish and Game, and the FWS. All respondents concurred that this flow was agreed on and that there was a provision for future studies. There seems to be disagreement, however, about whether it was intended that the agreement would be adjusted after further study.

The situation became more complicated after 1969. At that point, the BR applied to the State for a water right for storage for irrigation. The State Water Board requested more information from the BR before a permit would be granted. According to several respondents, the BR provided the information in 1974, but at that time the Department of Water Resources (the successor of the Water Board) denied the application on the ground that irrigators in the area

were already using water inefficiently. The BR suggested irrigation of new lands, but this application was rejected because there was insufficient water for the proposed new lands.

The BR still had several options open to it in terms of use of the water for irrigation; downstream there were recognized water-short irrigation districts to which the water could be sent. But the delay in gaining approval for the irrigation project left the door open for continued bargaining about instream flows.

The key to the Zippy project was the Joint Operating Manual which had to be approved by all concerned agencies before the project could be successfully operated. The Operating Manual set forth policy guidelines, agreed to by all agencies involved in the project, for operating the project. All concerned agencies needed to agree on operating policies, thus, the transfer of the project from the CE to the BR depended on the completion of the manual. The agencies would not complete the transfer while there were major unsettled issues. The major outstanding issue remaining was the irrigation problem. The State wanted this issue settled before it would sign the Joint Operating Manual. In the interim, however, the FWS had requested that flows be released from the project on the following basis: 50 cfs from 1 October until 31 March and 120 cfs from 1 April until 30 September. Data collected by the CE indicated that these flows exceeded the average natural flow. One State official indicated that he felt that the FWS requested such high flows "to keep its options open."

Keeping its options open appeared to be one reason why the FWS was pursuing higher flows. The FWS perceived that the other agencies would attempt to close out further instream benefits unless a strong case was made. The FWS feared that the BR would be able to get all the water committed before further study could be accomplished. The major issue in this bargaining seemed to be time. As the project approached completion, pressures increased to complete the agreements. Even though agreements might be altered after the project was in operation as a result of a history of unexpected reservoir levels, the remaining months were significant. The pressure for completion was clear in the responses to the FWS request. At a meeting of Department of Water Resources, BR, and CE representatives, the decision was made to respond negatively to the new proposals. The BR responded that it had agreed to 25 cfs. Any significant change would constitute a new project purpose and would require reauthorization. The CE responded that the permit for storage "will be granted" at the flow rate of 25 cfs and that the CE could not agree to the requested flows unless an immediate and convincing need could be demonstrated.

Curiously, both of these responses left an opening for further negotiation. The BR would consider a minor adjustment, while the CE would reconsider on the basis of new evidence. The BR may provide room for further maneuvering, while CE attacks the FWS at its weak point. Both the BR and the CE must recognize that the Fish and Wildlife Coordination Act requires mitigation of adverse impacts, thus, if cause can be shown, they have to respond. But it is precisely the lack of data, and an acceptable method for analyzing it, that face fish and wildlife-type agencies.

One government official remarked that the Department of Water Resources was using the water rights issue as a lever to promote planning among the

Federal agencies. Historically, the State had only a minor voice in such instream flow determinations. The State's involvement seemed to be an attempt to begin asserting recently gained influence. The official previously mentioned indicated that his department had prepared a list of 34 streams or reaches of streams in the State on which flows have been set in the manner described for the Zippy project. Even with legislation that allowed a State agency to establish flows administratively, State agencies must become active in the bargaining as new projects are approved. If they do not become involved, Federal agencies will continue, as in the past, setting flows for the State's water.

Summary

After evaluating the Zippy case (using the Appendix), it is easy to see that the agencies did not cooperate in the development or establishment of the instream flow. Each agency appears to be pursuing its own interests. Although the agencies were willing to dicker about flow levels, there was no coordination of interests, data, or approach. The environmental agencies apparently missed opportunities to create alliances or generate agreement on basic principles. Therefore, operating schedules, flow regimes, and other options were not considered. In negotiating for streamflows, it is essential to build a system of cooperation and mutual understanding on which the agencies may proceed. That is, a pattern and process must be established so that some uncertainty is reduced. In this case, matters were greatly complicated because of the lack of a mutually agreeable process. Futhermore, the FWS could have enhanced its position if its expertise were put to better use.

The second hypothetical example represents an ideal negotiating situation. It must be recognized that no case of agency negotiations will ever fit an ideal model. However, by making the right contacts and taking a comprehensive approach by addressing all aspects, the likeliness of favorable results for all those involved is greatly increased. The improvements in planning, coordination, and results in the second example case are due to the improved negotiation strategies.

EXAMPLE 2: THE DOWL PROJECT

Dowl Dam was constructed on Little Fish Creek in 1964. Located about 16 km above the mouth of the creek in a deep canyon, the Dowl Reservoir provides water for the irrigation of farm lands in the Bear Valley. Little Fish Creek, a main tributary of the Roaring Bear River in Bear Valley, originates in the mid regions of the Gray Mountains and drops steeply to the valley. The creek drains steep mountain canyons and rocky hills with sparse vegetation in an area with semidesert conditions.

The dam was originally built to contain water for irrigation purposes in the semiarid valley. Bear Valley has an agricultural economy with about 20,000 acres (8,100 ha) of land under irrigation at this time and requiring about 69,000 acre feet of water per year. Before Dowl Dam and Reservoir were constructed, the farms suffered from a lack of water late in the growing season each year. After construction, the dam solved the problem of inadequate water supply. However, irrigation was the only originally authorized use of the stored water.

In the upper regions of Little Fish Creek, the channel capacity is adequate to retain flood flows, but when the gradient lessens as the creek reaches Bear Valley and the floodplain, the channel cannot contain the increased floodflow. Bankfull on Little Fish Creek is estimated to be 900 cfs. However, as history has proven, the 1 in 5 year flood discharge is 1,260 cfs and the 1 in 10 year discharge is 1,530 cfs. The reservoir cannot contain these peak amounts of water and farmers are unable to protect their crops from these unpredictable floods caused by fast melting snow and rain in the early spring. In 1 out of 3 years the planting of crops is delayed because of flooding. To remedy the flooding situation, the BR plans to amend the project authorization to include flood storage. To accomplish flood protection for the valley, an addition will have to be made to raise the dam and increase its storage capacity.

Early in July 1978, the FWS was contacted by Ann Evans, a representative of the Bureau of Reclamation. Ms. Evans was making informal phone calls to several State and Federal agencies to outline the details to amend the purposes of the Dowl Project. She asked for comments from the necessary agencies and the cooperation of all other interested agencies. The planning would culminate in a legislative proposal to Congress. The initial contact was followed by an official memo which explained more about the proposed reauthorization and requested a response from each agency that wished to participate in the planning process. A statement regarding the BR's plans and reasons was also released to the media.

The FWS responded quickly and put their personnel to work on the project background. Mr. Mark Sails, leader in developing the instream flow proposal for the FWS, was directed to negotiate with the BR. His objective was to determine a streamflow regime which would optimize the benefits to fish and wildlife resources within the operational constraints of the dam and reservoir. After researching the present and intended water uses, the FWS contacted the BR and explained it would take one to six months to develop a streamflow recommendation, depending on the starting date and rate of change of discharge. After receiving methodology and time estimates for developing a recommendation from each agency, Ms. Evans set a meeting date for agency representatives six months in advance (January 1979).

The research determined that the peak flooding occurred during June, strategically disasterous for a critical growing stage of the crops. Historically, there had always been a streamflow (though not an authorized purpose) due to return flows, dam seepage, and other means. During the summer months, the channel flow was only 5 cfs, which is tragic for the fishery habitat.

Existing reservoir storage consists of 100,000 acre feet (AF) of active storage, a 25,000 AF conservation pool, and 5,000 AF in dead storage. With a 1 in 2 year inflow of 93,000 AF/year and base flow of 22 cfs during March and April, the excess storage required to contain a 1 in 10 year flood event is 45,400 AF.

Several proposals and alternatives were developed to present to the BR. By the time of the multiagency meeting in January, several streamflow regimes

had been developed. The optimal recommendation described a flow regime which would regulate an average yearly flood flow and utilize a small amount of the new flood storage space.

When the involved agency representatives met in January, Mr. Sails presented the FWS proposal. He began by presenting fishery habitat management alternatives. The optimal plan, which he recommended, would redistribute the released flood flows in June and protect the spawning stages of the brown and rainbow trout present in the stream.

Under the existing project operation, flow from the dam remains at 5 cfs for 10 months of the year. Then, when the peak flooding occurs in June, 335 cfs are released; 50 cfs are released in July. Water storage is kept near capacity (100,000 AF). The water is released when the spring floods occur and maximum storage is reached. The extreme changes in stream flow severely damage the fishery habitat.

The FWS recommended that the existing levels of stored water for irrigation purposes remain as they are. Since the added storage capacity will be for control of floods, the FWS recommended that the flood release of 335 cfs in June and 50 cfs in July be redistributed over the 12-month period. Part of the flood flow will be stored in the reservoir for fishery purposes until needed and released in time for the spring floods. Mr. Sails proposed that the flow be kept at a level of 25 cfs each month, with a 33 cfs release in November for brown trout spawning, a flushing flow of 325 cfs for 10 days in April to increase flood control capabilities, and a 50 cfs release for rainbow trout spawning in May. Along with the proposal, a recommended plan for water allocation during drought years was presented.

On hearing this proposal, Mr. Richard Wills, representing the State Department of Water Resources, protested that 25 cfs was altogether too much water. He reminded those attending that there were several new applications for irrigation use of the new storage. The applicants intended to open new irrigated lands to farm or increase the amount of water applied to existing croplands. Applications for the water greatly exceeded the amount that would be left if an instream flow was allowed. Mr. Wills felt that agriculture was more important than fisheries. He recommended that all the flood flow be stored and used for irrigation.

In the discussion that followed, Mr. Sails pointed out that the stream flow recommendation does not use the entire amount of flood flow being released. There would be about 7,500 AF left that could be used for irrigation. This leaves room for irrigation of approximately 2,500 new acres of farmland or more water for existing farms. The fact was pointed out that nearly all irrigable lands are already being farmed. Mr. Ken Sanders, of the State Department of Lands, expressed thoughts that existing amounts of irrigation water were adequate. He suggested that more efficient water management, instead of more water, could increase productivity for the farmers.

The representative of the Bear Valley Farming Association was against the instream flow proposal because it would keep water away from the farming industry of the area. He presented figures showing the possible monetary gains

to the farmers if they could use the water to produce more crops. In response, Mr. Sails showed the figures he had calculated that depicted the monetary benefits of maintaining the fishery for the communities and area surrounding the project. The community benefits would be considerably higher than those of the farmers.

The State Department of Parks and Recreation representative, Bill Jackson, supported the FWS proposal. He agreed that the creation of a stable fishery habitat would allow beneficial recreational opportunities for the area. However, recreation was not a use intended to be included in the reauthorization of project purposes. This statement stimulated more discussion.

Nothing had been decided by the end of the meeting. The only thing that everyone agreed on was the date for the second meeting. The representatives exchanged data and information on their water requirements and decided to meet again in two months. All representatives were to report back to their agencies, reevaluate the situation and new information, and develop new proposals or alternatives.

At the second interagency meeting, held in March, the representatives were more at ease. In the interim they had been in contact with each other, hoping to coordinate their efforts and refine their plans. Most had made only minor alterations in their proposals, but the changes reflected consideration of the information exchanged at the first meeting. After all the recommendations were presented and discussed, Ms. Evans thanked the agencies for their participation and accepted the written comments from each. She explained that the decision on the matter would be arbitrated and announced within 60 days.

In mid-May the BR announced its decision and formal proposal for altering the Dowl project. After considering the new water applications, present and potential irrigation needs, recreation, socioeconomic, and other factors, the BR included instream flows in its new project purposes. In consideration of other water needs, the flow would be 23 cfs for 10 months of the year, except for 33 cfs in November and 50 cfs in May for spawning needs. The other water would go to irrigation needs. The flushing flow in April would be contingent on adequate snowpack and other water supply prediction measures taken throughout the year. The original drought-years allocation plan was included, and recreation was also determined to be a project purpose. All these considerations were included in the project operations manual. And, on review, all the agencies agreed that the final plan was something that they could live with.

Summary

Respond to the questions in Part I of the Appendix that apply to the Dowl Project. Then compare the results for both the example cases.

The results of the negotiation efforts in the Dowl case appear to be greatly improved over those of the Zippy Project. Notice the effects of using improved negotiation strategies and a comprehensive approach. In the Dowl Project, a comprehensive instream flow plan was presented by a unified group and, after negotiating, the resultant plan was operative and widely accepted by parties involved.

The following section discusses the legal aspects and requirements affecting instream flow recommendations that must be considered to ensure a truly comprehensive approach.

LEGAL REQUIREMENTS: STATUTES AND REGULATIONS

The General Comment Procedure

Several Federal statutes and regulations contain provisions which require Federal construction agencies to seek comments on proposed project construction plans from other State and Federal agencies. These agencies are asked to assess the environmental costs and benefits of the project as planned and to recommend ways in which economic costs can be minimized and benefits enhanced. The construction agency either incorporates the recommendations into the plan or refuses to do so. If the recommendations are not incorporated, they are appended to the proposal that goes to Congress for authorization. Comments are also required for the licensing of non-Federal water projects which generate hydroelectric power. The comments are treated in much the same way and may result in restrictions on project operation. These restrictions, or conditions, may be imposed in the process of Federal Energy Regulatory Commissions (FERC) licensing of a non-Federal project.

The preparation of comments also serves as a basis for beginning negotiations among agencies if they have not already begun. The commenting agencies are interested in having as many of their recommendations as possible incorporated as project features. Construction agencies are, of course, interested in minimizing the adverse comments forwarded to Congress and in keeping project costs at a level that makes the project economically justifiable. Successful negotiations should produce an agreement, among the involved agencies by which recommendations will be implemented and to what extent they will be implemented under varying circumstances.

To the best of their ability, each agency must determine what its position will be towards construction of the proposed project. Each agency must also decide whether the project is already environmentally sound, can be modified to meet environmental requirements, or whether it is so unavoidably damaging that it should not be authorized. This decision should be made in light of the agencies' regional objectives and stating analysis of pertinent data.

Any decision will take longer if information has to be collected each time a project is proposed (however, this is usually the case). It would be advantageous if an agency compiled and maintained a catalog of regional planning information. Funds and personnel must be available to the agency for this task. The benefits derived would definitely justify these expenditures. Agency efficiency would increase, the quality of information available for decisionmakers would rise, and costly delays in the planning process would be reduced. Construction agencies could assist in this effort by promptly transfering investigation funds to environmental agencies as authorized by law.

Before forwarding recommendations to the construction agency, all the agencies involved in a project should discuss their findings and recommendations with each other. Ideally, all the agencies will agree on the actions

which should be taken. The likelihood of harmful errors or omissions passing unnoticed decreases as the number of persons reviewing the recommendations increases. This trend makes it possible to present a comprehensive, accurate recommendation in which the construction agency can place confidence. A construction agency is more likely to act upon information it considers reliable, and the agreement of several agencies can be considered a good indication of reliability.

Moreover, the position of the commenting agencies will appear stronger during negotiations when they are united behind a definite set of recommendations. If agencies of a common perspective cannot agree, it is unrealistic to expect them to obtain agreement from an agency of differing perspective. This is true because it is easier to deal with low levels of complexity. Construction agencies will find it easier to negotiate when presented a uniform set of recommendations. Negotiating over two opinions is less demanding than negotiating several recommendations which differ among themselves.

The recommendation made by an agency is the first formal statement of its position on the proposed project, its first "offer" in the negotiations; as such, it should be a comprehensive, forceful, self-explanatory statement of the environmental problems and possibilities of the project. The course of action suggested in a recommendation should be reasonable, considering the amount of water available and the competing demands for its use. In addition, proposed operating procedures to effectuate the recommendation should be noted. At later stages compromises may be made, but an agency cannot merely say that a certain flow is required. They must also suggest a way of managing the available water to maximize project benefits and minimize costs. The agency's recommendation should implicitly suggest a feasible manner in which trade-offs may be made.

While the initial recommendation should not say "We need protection level A, but will accept lesser protection level B", the recommendation should suggest alternative plans for project operation that would accomplish a favorable percentage of project purposes. Suggested details of the project operations manual should be included in the recommendations and be a major focus of negotiations. Negotiating agencies must determine the instream flow quantity to be released, the scheduling of releases, detail such physical characteristics as water quality and temperature, and establish the source from which water is to be taken to meet the instream flow recommendation.

Projects are usually built to accomodate the project area's growing water supply requirements. The reservoir will be designed with the capacity to hold water to satisfy present needs and additional capacity to hold more water to satisfy needs as they grow. Often, however, reservoirs are filled to near maximum capacity before there are demands for that increased amount of water. Incremental filling (i.e., filling the reservoir in proportion to existing demands) is a possibility that should be explored during negotiations because it would allow a temporary increase in the amount of flow released from the impoundment. Incremental filling is not a permanent solution to the environmental problems of a project but a way of supplementing instream flow needs before the agreed long term solution is implemented. Moreover, long-term use of the water for environmental purposes may lead to an opportunity for reauthorization of uses if expected demands do not materialize.

Methods of protecting the habitat of fish and wildlife during project constuction should be suggested and agreed on by the agencies. Stream habitat disruptions should be minimized. Construction agencies are now required to construct environmental features of a project at the same time and rate as they construct the other features (memorandum from President Carter to all Department heads, 12 July 1978). This prevents environmental features from being left out when project costs exceed funds authorized and economizing becomes necessary.

After initial agreement is reached by negotiations, the agencies should agree on methods of monitoring project operation to ensure compliance with their agreement on streamflows. Monitoring equipment should be installed at appropriate points and persons designated to check the instruments and make reports on their findings. The costs of stream flow monitoring should be included as project construction and operation costs. If the agreement is breached, the resulting losses should be mitigated by the agency responsible. It should be made clear that if such breaches are not rectified, legal remedy will be sought.

An agency will obviously consider some of their recommendations more important for the protection of the environment than others. The construction agency should be informed which recommendations should receive priority because it is unlikely all can be effectuated. Severe problems will arise if an environmental agency makes 10 recommendations and the construction agency agrees to implement 1 through 9 without being aware that number 10 is considered the most important. The construction agency will think that it has been more than accommodating, while the environmental agency may be put in the position of insisting that they receive all they requested and thus appear unreasonable. Recommendations on priorities will also help agency negotiators know which points are open to compromise and which are not. Such a priority list might be closely held or widely circulated depending on the nature of the problem.

Although the recommendations should be as specific and comprehensive as possible, they cannot anticipate every eventuality. Agencies must make it clear that their recommendations are made on the basis of available information and existing physical conditions and may need to be modified if conditions change or new information is discovered. The negotiated solution should also be flexible enough to allow for such changes or discoveries. This caveat is not, however, a substitute for thorough research and comment preparation. A method of renegotiation should be agreed on in case serious problems or disputes arise at a later time.

COMMENT REQUIREMENTS: SPECIFIC STATUTES AND REGULATIONS

The Fish and Wildlife Coordination Act

In 1934, Congress passed the Fish and Wildlife Coordination Act (16 U.S.C.§661-666 [1976]), which was amended in 1958. The purpose of the Act is "to provide that wildlife conservation shall receive equal consideration and be coordinated with other features of water resource development

programs. . . ." (16 U.S.C. §661 [1976]). The Act requires that any Federal agency or permittee planning to control or modify any stream or body of water first consult with the FWS and the State wildlife agency(s) to prevent damage to and, when possible, improve the fish and wildlife in the project area. The consulted agencies conduct studies on the proposal and suggest measures for the protection and enhancement of fish and wildife. This report is sent to the construction agency and appended to their request to Congress for authorization.

The construction agency must give the recommendations full consideration and include in the project plan those which it considers justifiable. Funds are sometimes authorized from project appropriation for the comment procedure and the implementation of recommendations. The construction agency is most usually empowered to acquire land and water rights needed to implement comment recommendations. Implemented recommendations must, however, be consistent with the primary project purposes. Fish and wildlife preservation can be a primary project purpose.

If the construction agency modifies its project plan, the commenting agencies should modify their reports under the Act to ensure that Congress receives accurate environmental information with which to make its authorization decision. It is important to note that for the first time regulations are being developed to insure effective implementation of this act.

NEPA, CEQ, and the EIS

Congress passed the National Environmental Policy Act (NEPA) in 1969 establishing the Council on Environmental Quality (CEQ) and creating the Environmental Impact Statement (EIS) (42 U.S.C. §4341 [1970]). The CEQ has developed guidelines for preparation of the EIS under NEPA (40 D.F.R. 1500 [1973]). The objective of these guidelines is:

> [To require] agencies to build into their decision-making process, beginning at the earliest possible point, an appropriate and careful consideration of the environmental aspects of proposed action in order that adverse environmental effects may be avoided or minimized and environmental quality previously lost may be restored.

Federal agencies are required to prepare a draft EIS on any proposed action likely to significantly affect the quality of the environment. That draft must be circulated among interested State and Federal agencies (including the EPA) and made available to the public for comment. While preparing these comments, agencies must assess the probable environmental impact of the proposed project and should contrast those impacts with those likely for reasonable alternatives to the proposed action. The regulations do not require that the commenting agencies suggest reasonable alternatives to the proposed action, but such suggestions would be important to illustrate the feasibility of implementing the recommendations to the construction agencies. Commenting agencies have at least 45 days in which to prepare comments on the draft EIS and may receive reasonable extensions when necessary.

Interagency cooperation during the preparation of the draft EIS is not required, but would be advantageous. The technical expertise of a fish and wildlife agency, for example, could aid construction agencies in the preparation of a project plan that would be more environmentally sound and thus receive increasing favorable response from commentors. The cooperation would also aid in the preparation of a truly comprehensive EIS. A comprehensive EIS may require a longer time to prepare, thereby increasing initial costs, but would probably reduce overall expenditures of time and money by omitting errors and by decreasing the adjustments necessary after comments on the draft are received.

The construction agency prepares a final EIS after comments are received. The final EIS must contain the details of all "opposing professional views and responsible opinion" not discussed in the draft, a review of the environmental assessment of the project in light of these views, and the construction agency's response to the issues raised. All comments are attached to the final EIS and circulated to interested agencies. The draft EIS, comments, and final EIS are then forwarded to the regional EPA office and made available to the President. These documents also accompany any request for project authorization to Congress.

It is important to make sure the project EIS reflects any changes in the plan made during negotiations, accurately reflects the construction agency's final course of action, and is up to date. The project planning procedure and preauthorization can take several years. The EIS may need updating by the time the project comes before Congress for actual authorization. If revision becomes necessary, agency personnel should notify the construction agency and, if necessary, independently inform Congress of the need for reexamination.

Water Resources Council (WRC) Principles and Standards

The WRC was established by the 1965 Water Resources Planning Act to implement the National water policy and encourage sound management of land and water resources (42 U.S.C. §196[illegible] 1970]). In 1973 the WRC issued Principles and Standards for Planning Water and Land Resources (38 C.F.R. 24778 [1973]). The Principles provide a broad policy framework and conceptual basis for cooperative resource planning by State, Federal, and private groups. The Standards are designed to coordinate the preparation and evaluation of alternative development plans.

These Principles and Standards apply to all Federal or Federally assisted water projects. All Federal agencies must follow the Principles and Standards in establishing agency programs and proposing individual water projects. A construction agency proposing a project must develop a set of alternative project plans to accomplish environmental quality and economic development objectives. The plans should evaluate the project's probable contributions or adverse effects on these objectives. Explicit recognition must be given to the possibility of diverting a portion of the Nation's resources from production of market goods to the attainment of environmental objectives. From the group of alternative plans, the planning organization selects a recommended plan which becomes the core of the Planning Report.

At the beginning and throughout the planning process the responsible planning organization must consult with interested State and Federal agencies and local groups to obtain information about the needs and problems of the project area. The water resource base of the area must be identified and inventoried. After the various alternative plans are produced and the construction agency chooses its recommended plan, the recommended and alternative plans are forwarded to the interested agencies and private groups for comment. The comments are collected, revisions to the plan made, and the recommended and alternative plans and comments are forwarded to the WRC, the Office of Management and Budget, and then to Congress for consideration.

A plan which is not implemented within a reasonable time must be reviewed prior to any action to determine whether it still achieves the desired objectives and whether any alternatives previously unevaluated should be considered. Negotiations can and should begin among the agencies at the initiation of planning and continue until the documents are fowarded to Congress. The WRC is authorized to review problems that obstruct interagency coordination and cooperation.

404 Permits

The Federal Water Pollution Control Act (FWPCA), Section 404, requires any person or agency planning to discharge dredge or fill material into waters of the United States to apply for a permit from the U.S. Corps of Engineers (33 U.S.C. §1344 [1976]). Construction of a dam by a Federal agency requires such a permit unless information on the effects of the proposed discharge has been included in the project EIS submitted to Congress and Congress has authorized the project.

If a permit is required, the Secretary of the Interior is asked to comment on the application for the permit. The FWS then comments on the desirability of granting the permit. This opportunity for comment is somewhat limited because the provisions of the FWPCA cannot be used as means of accomplishing goals unrelated to pollution control (33 U.S.C.A. §1251(g) [1977]). If a permit under this Act required maintenance of a stream flow it would have to be based on water quality needs. However, the legal relationship of water quantity to water quality has not been determined under the FWPCA so this possibility should be explored and perhaps developed further.

OTHER STATUTORY REQUIREMENTS

The Endangered Species Act

The Federal Endangered Species Act (16 U.S.C. 1531 et seq. [1976]) was enacted to ensure conservation to "the extent practicable, the various species of fish and wildlife and plants facing extinction" (id., §1531). The Act requires that all Federal agencies use their authority in furtherance of that purpose. Federal agencies are prohibited from taking any action that may jeopardize the existence of an endangered or threatened species or modify the critical habitat of such a species.

Water projects can significantly affect both protected species and their habitats. Litigation to ensure that species are protected from damage caused

by project development has been plentiful. Constant litigation of the issue may lead to results that neither environmental nor construction agencies wish to see, i.e., the legislative crippling of the Act and wasteful interruption and delays in construction of projects. Thus, it would be wise to solve endangered species problems during the consultations required by the Act (16 U.S.C. §1536) and reach an agreement which will protect the species and allow for project construction and operation. This negotiation must take place early in the planning process or as soon as the protected species is discovered in the proposed project area.

The decision in California v. United States (California v. United States 11 ERC 1651 [1978]) may require that Federal construction agencies also abide by State endangered species acts as a condition of receiving a permit to appropriate water for the project from the State water resource agency (Calif. Fish and Game Code §1601 et seq.; Col. Rev. Stat. §33-5-101 et seq.).

Project Authorizing Legislation

The terms of the particular piece of Congressional legislation which authorizes the construction of a specific water project will determine the legal limitations on that project's operation. With new projects it is important for agencies involved in the planning process to make every effort to pursuade Congress to draft the legislation to reflect the terms of the interagency agreement reached in negotiations.

The project authorizing legislation can also provide opportunities for the addition of a guaranteed streamflow for fish, wildlife, and recreational purposes to existing, operating projects. If the project legislation authorized use of project water for these purposes, agencies should investigate to determine whether there is any uncommitted or unused water in the reservoir that might be made available for instream flows. Project water is often leased to groups for a period of years and may, at the end of that period, become available for instream uses. The project legislation will determine the amount of discretion a project manager may exercise in project operation. The extent of this discretion is important if the project manager is given the authority to determine the possible uses for water which is unallocated or becomes available when a lease expires or previous uses are abandoned.

Although nearly all modern water projects are multipurpose projects, many older projects are still operating under legislation which limits the use of project water to irrigation, municipal and industrial supply, and power generating purposes. Environmental and construction agencies must then seek to persuade Congress to pass amendatory legislation allowing instream uses of water in these projects. The President's water policy directives, however, may give considerable impetus for alternative operation of these types of projects. Construction and environmental agencies may also cooperatively plan and design project proposals for water projects serving primarily fish, wildlife, and recreational needs and submit these proposals to Congress for authorization.

State Laws and Instream Uses

Since the Supreme Court's decision in California v. United States, (California v. United States 11 ERC 1651 [1978]), State water laws will probably have a great effect on the operation of Federal water projects. In the majority of Western States, this will aid environmental agencies in establishing instream flows below Federal impoundments because the majority recognize instream flow uses as beneficial and, therefore, protectable (Dewsnup, R. and Jensen, D. State Laws and Instream Flows, FWS/OBS-77/27, March 1977). It is crucial that State water planning and allocation agencies be involved in project negotiations with State and Federal agencies. This will ensure that agreed on streamflows will be established in a form protectable under State laws. Some States, for example, allow the State water resource agency to hold instream flow rights and any projected water right for instream flows in those States might have to be retained by that State agency. The State water agency should consent to the negotiated agreement on flows and be willing to use its authority to carry out the agreement.

If the State in which a proposed project will be located does not recognize instream flow uses as beneficial, the situation becomes much more difficult. Negotiators not only need to arrive at an agreement for a guaranteed flow, but must also devise a way under the State's legal system to protect that flow. Court cases following in the wake of California v. United States will clarify this matter, but at this time two suggestions will be made. A State benefits greatly from having a water project within its territory and should, therefore, be willing to agree to reasonable conditions for its development. One such condition could be protection of a guaranteed flow below the impoundment. Second, the supremacy clause of the United States Constitution requires that Congressional legislation on a point will override contrary State laws on the same point. Therefore, it seems that a State would have to recognize an instream flow below a Federal project if that flow was required under a Federal law, such as the Endangered Species Act (16 U.S.C. 1531 et seq. [1976]), or by the project authorizing legislation passed by Congress. Cooperation between State and Federal agencies should produce a myriad of ways in which this particular problem can be handled.

SUMMARY

This report introduces and discusses many of the elements involved in negotiations. When negotiating to establish an instream flow from a given Federal water project, the relevant elements are not only complex, but they also vary from case to case. The most useful strategy and methods are often implied from the social and political issues surrounding the particular situation. When preparing to negotiate an instream flow, the negotiator must consider every element, evaluate the utility of each, and integrate the appropriate ones into a comprehensive and forceful recommendation.

The elements presented in this paper are intended to stimulate the reader to take a comprehensive approach to negotiation situations and to aid in successful negotiation of comprehensive instream flow recommendations. The first element affecting successful negotiations is the negotiator's

familiarity with the background, purpose, and past operation of the water project. With this information he can develop, for the future, an alternative use plan which is comprehensive and compatible with all user needs. Second, a negotiator must understand instream flow uses. He must be aware of and understand, the prevalent attitudes, concepts, and misconceptions regarding instream flows that he will have to deal with. This awareness is necessary because to effectively handle obstacles to his goal he must be able to identify and understand them. With this knowledge he will be able to avoid possible problems and prepare a proposal that is more likely to be accepted.

Also vital to successful negotiations is the positive interaction of the agencies involved. To encourage positive interaction, a system of cooperation must be established. This requires that contact and interaction begin long before the parties reach the negotiating table. Allowing for the needs and methodologies of the other agencies will encourage the development of a comprehensive and acceptable instream flow plan. The fourth important element is to consider all legal aspects affecting instream flows and the particular case being negotiated. Investigation of statutes and regulations can lend support to negotiation positions and uncover avenues for new recommendations. Other important areas affecting successful negotiations include: comprehensiveness of the instream flow proposal, an adequate data base for decision-making, the needs and interests of non-Federal agencies and groups, the existence of public support, and the cooperation of water rights holders.

A negotiator should be able to extract from the wide range of points discussed in this paper those which are useful in formulating the comprehensive approach required for each particular need. It is hoped that the measures, tactics, and issues presented will be useful to negotiators and encourage the discovery and exploration of new elements in negotiating instream flows.

APPENDIX

NEGOTIATING STREAM FLOWS BELOW FEDERAL IMPOUNDMENTS: CASE EVALUATION CHECKLIST

developed by Janet L. DeMott

There are two parts to this appendix. Part 1 is designed to aid field personnel and water resource planners in planning and developing their negotiations strategy and water project plan. Part 2 is to evaluate the proposals and recommendations that are formulated. These two parts may be combined or used separately as a checklist in developing a comprehensive approach and an aid in negotiating instream flows.

The individual case ratings percentage can be used as an index of comprehensiveness of negotiations for a single case or to compare with other cases. For a single case, the closer the percentage is to 100% the better, however, it must be acknowledged that in reality there may never exist a case that will rate 100%.

INSTRUCTIONS: Check either the "Yes" or "No" column beside the questions applicable to the case. When completed, total all the questions you answered. Then total all questions you answered "Yes". Determine the percentage of the comprehensive value of the case by dividing the number answered "Yes" by the total questions answered.

PART 1
WATER PROJECT PLANNING

GENERAL	YES	NO
1. Can litigation of this case be avoided?		
2. Is arbitration a viable and acceptable alternative?		
3. Have the State and Federal governments and agencies agreed on their respective roles in the management of water projects built with Federal funds?		
4. Do all the cooperating agencies represent a unified group?		
5. Did the construction plans provide for a stream flow necessary to maintain instream needs below the proposed dam or facilities?		
6. If there is no legislation on the existing project to maintain an instream flow, can legislative amendments be developed to correct the situation?		
7. Has the question of scheduled releases been addressed?		

THE PROPOSAL	YES	NO

Does the proposal determine (specify):

1. The instream flow quantity to be released?

2. Scheduling of the releases?

3. The detailed physical characteristics of the flow (e.g., water quality, temperature,)?

4. The source from which the water is to be taken?

5. Accommodations for the growth in water supply requirements in the area?

6. Does the recommendation include a specific plan?

7a. If there is a plan for drought years, does it include an agreement on sharing shortages?

7b. Has it been determined who decides how shortages are shared?

8. Is the data base on which decisions are made accurate and adequate?

DEVELOPING THE RECOMMENDATION	YES	NO
1. Was a system of cooperation established among the agencies?		
2. Was the system of cooperation attempted at the beginning or before negotiations began?		
3. Were negotiations organized in a manner conducive to positive agency interactions and results?		
4. Did everyone have a clear understanding of the planning processes and the time required by the other agencies involved?		
5. Were all involved environmental agencies and interest groups included in project planning?		
6. Was an interdisciplinary staff approach used?		
7. Does the methodology of data collection and analysis allow users to recommend the needed instream flow regime?		
8. Did the data users predict probable consequences of flow alternatives?		
9. Was the data understandable to those receiving the recommendation?		
10. Did the chosen methodology describe terms which would describe a flow regime?		

COOPERATION OF WATER RIGHT HOLDERS AND PUBLIC INFORMATION	YES	NO
1. Were water users contacted and informed during project negotiations?		
2. Was every attempt made to educate and gain support of the local water rights holders?		
3. Are there Federal reserve rights on the project waters which allow water use for instream purposes?		
4. Are there State reservation rights for instream flows?		
5. Was the public kept sufficiently informed by the agencies involved in project planning and negotiations?		
6. Did all the agencies involved clearly explain their actions and positions in the planning process?		

PART 2
RECOMMENDATION EVALUATION

LEGAL REQUIREMENTS--STATUTES AND REGULATIONS AFFECTING THE RECOMMENDATION	YES	NO
COMMENT REQUIREMENTS		
1. Were comments of various State and Federal agencies incorporated into the plan?		
2. Has each agency determined and conveyed its position on construction of the new project?		
3. Was there a central point or catalog of regional planning information?		
4. Did all the agencies discuss findings and recommendations with each other before presenting their plan to the construction agency?		
5. a. If the answer to item 4 is yes, was the recommendation comprehensive?		
b. Were the agencies united (in their position)?		
c. Was the recommendation forceful?		
d. Was it self-explanatory?		
6. Did the proposal include operating procedures to effectuate the recommendation?		
7. Did the proposal suggest a feasible manner in which trade-offs and compromises could be made?		
8. Did the proposal make a positive and forceful recommendation for a specific water flow?		
9. Did the recommendation suggest alternative plans for project operation that were capable of accomplishing a favorable percentage of the project purposes?		
10. Did the proposal suggest methods of protecting fish and wildlife habitats during the project construction?		
11. Were provisions or methods agreed on for monitoring project operation to ensure compliance with their agreement on stream flows?		

	YES	NO
12. Were any provisions specified concerning:		
a. Monitoring equipment?		
b. Where it was to be placed?		
c. Who would bear the cost?		
d. Legal remedies for noncompliance?		
13. Were recommendations ranked by priority?		
14. Was the recommendation flexible enough to be modified as new information becomes available?		

SPECIFIC STATUTES: FISH & WILDLIFE COORDINATION ACT	YES	NO
1. Were fish and wildlife conservation given equal consideration and coordination with other features of the water resource development program?		
2. Did all fish and wildlife agencies contribute in preparing the project plan?		
3. Is the EIS comprehensive and complete?		
4. Have WRC principles and standards been adhered to?		
5. Have proper alternatives been proposed?		
6. Were all the proper permits acquired?		
7. Did the proposal further the purpose of the Endangerd Species Act?		
8. Did it abide by State Endangered Species Acts?		
9. Were efforts made to persuade or convince Congress to draft authorizing legislation that will reflect the terms of the negotiated interagency agreement?		
10. Does the project authorizing legislation provide any opportunities for the addition or guarantee of stream flows to existing projects?		
11. Has uncommitted or unused water in the reservoir been considered for instream flows?		
12. Have future availability of leased waters or new sources of water been considered for instream uses?		
13. Have attempts been made to persuade Congress to amend legislation on older single-purpose projects to allow instream uses?		
14. Is the proposal protectable under State laws?		

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The Biological Services Program was established within the U.S. Fish and Wildlife Service to supply scientific information and methodologies on key environmental issues which have an impact on fish and wildlife resources and their supporting ecosystems. The mission of the Program is as follows:

1. To strengthen the Fish and Wildlife Service in its role as a primary source of information on natural fish and wildlife resources, particularly with respect to environmental impact assessment.

2. To gather, analyze, and present information that will aid decisionmakers in the identification and resolution of problems associated with major land and water use changes.

3. To provide better ecological information and evaluation for Department of the Interior development programs, such as those relating to energy development.

Information developed by the Biological Services Program is intended for use in the planning and decisionmaking process to prevent or minimize the impact of development on fish and wildlife. Biological Services research activities and technical assistance services are based on an analysis of the issues, the decisionmakers involved and their information needs, and an evaluation of the state-of-the-art to identify information gaps and determine priorities. This is a strategy to assure that the products produced and disseminated will be timely and useful.

Biological Services projects have been initiated in the following areas:

Coal extraction and conversion

Power plants

Geothermal, mineral, and oil shale development

Water resource analysis, including stream alterations and western water allocation

Coastal ecosystems and Outer Continental Shelf development.

Systems and inventory, including National Wetlands Inventory, habitat classification and analysis, and information transfer

The Program consists of the Office of Biological Services in Washington, D.C., which is responsible for overall planning and management; National Teams which provide the Program's central scientific and technical expertise, and which arrange for contracting of Biological Services studies with States, universities, consulting firms, and others; Regional staff who provide a link to problems at the operating level; and staff at certain Fish and Wildlife Service research facilities who conduct inhouse research studies.

U. S. Department of the Interior

Fish and Wildlife Service

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.