

ARROYO

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Flow of Rivers and Streams Provides Rich Benefits, Raises Varied Concerns

Arizona's natural attractions include deserts, mountains and canyons. Although not as noticed, another important natural feature is the state's perennial streams. Segments of such rivers as the Gila, Salt, Verde, San Pedro and the Hassayampa flow year round and support fish populations, wildlife and water-based recreation as well as sustaining rich riparian ecosystems. A concern about maintaining perennial flow at some minimal level, with possible seasonal variations, is the central issue in the instream flow debate.

Instream flow is surface water freely flowing in a natural water course and at a level to preserve instream values. The value of preserving instream flow has been appreciated only recently. Previously Westerners were busy putting every drop of water to consumptive uses to support agriculture, industry and municipal development.

The following discussion focuses specifically on instream flow. An understanding of this issue, however, involves an awareness of related concerns, such as the condition of wetlands and riparian habitats. In fact, the three concerns--instream flows, wetlands and riparian habitats—are best understood as related, interdependent surface water issues. This discussion, however, concentrates mainly on instream flows to emphasize certain topics.



Photo: Jack Dykinga

Need for Instream Flow Protection

Usually thought of as desert and dry, Arizona is not without surface water flows. Such flows, in fact, are often a critical component of the state's desert biosystem. At one time, however, perennial streams were a more prominent geographical feature of the state than they are at present. Of the streams that flowed freely when the first non-Indian settlers arrived, an estimated one mile in seven now remains.

Riparian areas associated with instream flows have also suffered. The Arizona Nature Conservancy (ANC) says that 90 percent of the

state's riparian ecosystems have been lost during the last 100 years mainly due to human activities. Once common along major desert waterways in the state, cottonwood-willow gallery forests and mature mesquite bosque stands are rare throughout Arizona and the United States. The threat to the state's riparian areas also affects the wildlife that depends upon them.

Instream flows have diminished, and associated wetlands and riparian areas have declined for various reasons—most having to do with human activities. Chief among these are the impounding and diverting of river flows to support agricultural and municipal development.

Groundwater pumping has also claimed a toll. Pumping water from underlying aquifers has affected the flow of hydrologically connected surface streams, sometimes completely cutting them off. Climatic changes and overgrazing have also been identified as causing instream flow reduction. As a result many feel concern about the future of instream flow in Arizona

The Value of Instream Flows

Many advocate protecting instream flows because of a concern about the consequences that would result from a further reduction of flows. For example, they point out that of Arizona's 35 species of native fish, one is extinct, five are no longer found in the state, and 21 are either listed as endangered or are being considered for such a classification. Instream flow protection would preserve Arizona's fish, as well as its wildlife and riparian habitats.

The above argument generally reflects a defensive position. It warns of the consequences of a continued disregard of instream flow protection. Recently, however, a more assertive strategy has been developed that attempts to define instream flow as an asset with a particular value to the state's economy.

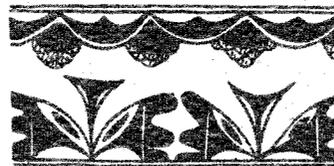
Professor Bonnie G. Colby of the University of Arizona's Department of Agricultural Economics has researched the economic benefits of instream flow. She found that such economic benefits—especially those that derive from recreational activities—often have a value comparable or greater than the financial advantages provided by some consumptive, offstream uses. For example, Colby emphasizes that free-flowing streams make significant economic contributions to various local communities, especially in important recreation and wildlife areas. She encourages water managers to consider the various economic benefits of instream flow, along with the more direct and easily documented benefits that come from uses related to offstream diversions, such as irrigation, mining and urban development.

The Arizona Nature Conservancy used this type of analysis when the city of Wickenburg objected to its instream flow application downstream on the Hassayampa River. The ANC described to Wickenburg officials the benefits its preserves provide to nearby towns and cities. For example, its Ramsey Canyon preserve brings about 30,000 people a year to Sierra Vista, and its Sonoita Creek sanctuary attracts about 20,000 people annually to Patagonia. Wickenburg subsequently dropped its objection to the ANC instream right application and now actively supports it.

Finally, many say that aesthetic considerations are not to be neglected or underestimated. Although difficult to quantify and measure, the satisfaction derived from viewing the splendor and beauty of free-flowing water in a natural setting is said to be worth preserving.

Not everyone, however, is in favor of legally protecting instream flows. In fact, the issue has provoked some controversy. Some feel that sufficient stream flows remain in Arizona, with many unthreatened by upstream diversions. But the majority of those who are wary of an instream flow protection program seem concerned that such new arrangements may interfere with existing water rights. Consternation often results because most people think of consumptive uses when water is being reserved, even for instream uses.

Instream uses differ, however, in a very important way from other types of water rights recognized by the state. Most offstream uses are consumptive with water taken from a stream and used, but instream uses are nonconsumptive. This means that water remains in the stream.



San Ildefonso pottery design of clouds with raindrops over plants.

Since water supply is not affected by instream applications, downstream users benefit when an instream flow is protected upstream. In fact, instream protection and downstream use almost complement each other. The instream flow is protected to assure flowing water through a segment of riverbed, and this protection helps to assure that water will be available for a downstream use.

Objections do arise, however, even from those who are downstream from the proposed site of a protected instream flow. Sometimes the objections are the result of not understanding the effects of an instream use. For example, the ANC encountered several objections from downstream users when it applied for an instream flow right on Ramsey Creek. Most of the objections were withdrawn, however, when the benefits of the instream right were understood.

Others object to instream flow protection because they feel it may inhibit the ability of downstream water-right holders to market and transfer their water rights. This concern is discussed in a later section of the newsletter that addresses water marketing and transfers.

Finally, it should be noted that instream flow rights, if granted under appropriation strategies, are subject to the prior appropriation doctrine, as are all Arizona surface water rights. This means that water rights established earlier in time must be satisfied before the claims of later rights. A relatively recent concept, instream rights would have a later priority date and, therefore, would not threaten a holder of a prior established water right.

Instream Flow Rights in Arizona

Enacted in 1919, the Arizona surface water code determines how surface water rights are to be established in the state. According to the code, which is based on the doctrine of prior appropriation, a water user must divert water and put it to a beneficial use on land owned by the applicant to qualify for a water right.

The requirements addressed conditions that prevailed at the time

the statute was passed. Diversion was necessary to officially establish ownership of a water right, and beneficial use referred to "domestic, municipal, irrigation, stock watering, water power, and mining uses." No reference to instream rights was included as part of the surface water code.

Regulatory agencies interpreted the statute as they developed certain rules and regulations for the granting of surface water rights, and thereby helped to define the law's application. Meanwhile, further legislative action expanded the list of activities to be considered as beneficial uses. A 1941 legislative amendment to the water code added "wildlife, including fish" as a beneficial use, and in 1967 "recreation" was also recognized by the Legislature as a beneficial use.

The expanded definition of beneficial use advanced the recognition of instream rights, and made their establishment more feasible. The further requirement that water be diverted to establish that right, however, discouraged an effective instream rights program in the state. If, as the statute states, flow must be diverted from a stream to establish a water right, that diversion, by taking place, results in water becoming offstream and, therefore, no longer instream flow. It was a dilemma, if not a Catch-22 situation.

The dilemma was discussed, to some extent, by a court case. The Arizona Court of Appeals looked at instream rights and diversion when deciding *McClellan v. Jantzen* in 1976. Although the case did not directly address the diversion issue, the decision involved statements supporting the *in situ* use of surface water or, in other words, instream use without diversion.

The Arizona Department of Water Resources (ADWR) noted these developments—the expanded definition of beneficial use and the *McClellan* decision—when acting on an instream rights application from the ANC.

Arizona Department of Water Resources

In 1979 ANC applied for instream rights for two creeks on its preserves in southeastern Arizona. Its request was based on instream uses to support recreation and wildlife, without reference to a reservoir or a diversion of water. The application challenged ADWR to interpret the propriety of instream rights in Arizona.

ADWR decided to approve ANC's application. The agency recognized that the definition of beneficial use had evolved since the original statute to include recreation and wildlife. The primary issue confronting ADWR was whether diversion was necessary to reserve an instream right. ADWR, however, interpreted the *McClellan* decision as approving the *in situ* use of water. In allowing the application, ADWR decided that Arizona law, in fact, allows instream water to be appropriated for wildlife and recreational purposes without diversion.

These were the first two instream rights granted by Arizona. Of further significance is the fact that ADWR granted these rights to a private, nongovernment organization, ANC. Unlike Arizona, most states only grant instream rights to government agencies. In Arizona, however, private persons and organizations who seek instream rights can compete on equal terms with municipal, industrial and agricultural interests that seek water

rights for consumptive purposes. As a result, ANC was able to successfully apply for instream flow rights.

Some object to granting instream rights to private nongovernment entities. Instream rights are mainly established, they explain, to provide special benefits to the public for fish, wildlife and recreational purposes. They feel that government agencies are best able to assure that the public has access to the protected flows for these special beneficial uses. As a result, they believe that government agencies are the most appropriate entities to be granted instream flow rights.

Others believe that this attempt to exclude private, nongovernment organizations from applying for instream rights is a relic from an earlier era. At that time the debate over the stewardship of wildlife concerned the roles of federal and state government. No one then envisioned the establishment of a nonprofit group such as The Nature Conservancy that is dedicated to the welfare of wildlife. They, therefore, assert that the question of whether nongovernment organizations be allowed to apply for instream rights is moot.

Although applauding the granting of instream rights to ANC, some maintain that certain definitions now need to be carefully worked out. They believe it is essential that rules be established to distinguish between those organizations, such as ANC, whose commitment to environmental values is firmly demonstrated, and other private organizations or individuals whose instream flow rights, if granted, would not be as beneficial to the public.

Also of concern is the requirement that only organizations or individuals owning land through which water flows can apply for instream rights on that river or stream. This could significantly affect the operations of the Arizona Game and Fish Department. It is expected that this agency, which has the statutory authority to protect fish and wildlife, would actively seek instream rights. Having limited land holdings, however, the department would want to protect instream flow in areas it does not own. It would not

New Journal Calls for Instream Flow Papers

Rivers: Studies in the Science, Environmental Policy and Law of Instream Flow is a new quarterly journal scheduled to begin publication in late 1989. The journal offers a multidisciplinary forum for research and professional literature addressing the issues of instream flow. To submit manuscripts or request information, contact Susan E. Lamb, Editor, *Rivers*, 3024 Phoenix Drive, Fort Collins, CO 80525. (303) 226-6225.

be able to do this if land ownership was required.

This ruling, however, also affects the Wildlife Federation, the Audubon Society, the Sierra Club and other such organizations that might also want to establish instream rights on property they do not own. Questions arise: Should the Arizona Game and Fish Department be exempted from the ruling? Should any non-government organization also be granted an exemption from the ruling? Obviously these are questions that provoke much controversy.

ADWR Task Force

ANC's successful application encouraged other government and private organizations also to apply for instream flow rights to protect fish or wildlife and/or to provide recreational opportunities. ADWR, however, lacked established criteria to evaluate applications. Various policy, legal and technical considerations needed to be resolved.

As a result, ADWR organized a task force in December 1986 to help establish instream flow rules and to develop regulatory guidelines for processing applications for instream rights. Plans called for the task force to be made up of representatives from federal and state governments, universities and the private sector.

The task force consists of two technical subcommittees to provide ADWR with information to determine if requested flow rates on instream right applications are just and reasonable. The hydrologic subcommittee is to research methods to interpret historic flows in the absence of gauge records, and the biological subcommittee is to investigate methods to evaluate flow requirement quantities to maintain wildlife habitats. The biological subcommittee submitted a report to ADWR, and the hydrologic subcommittee's report is in progress.

The work of the task force stalled when ADWR became involved with other regulatory tasks and responsibilities. The agency's chief priority is the implementation of the 1980 Groundwater Management Act. As a result, action has been delayed on the instream flow

issue. Recent progress, however, has been reported.

As of January 1989, ADWR had received 45 instream flow applications. The agency, however, has identified some important issues that need to be resolved prior to addressing many of the applications. These issues include the sever and transfer of an instream right; conversion of a consumptive use surface water right to an instream right and vice versa; reevaluation of the property ownership requirement for an instream right; and selection of acceptable measurement technique(s) for monitoring an instream right.

ADWR is currently processing an instream flow application for Ari-vaipa Creek submitted by the Bureau of Land Management, and the application is close to attaining permit status. ADWR is also working toward developing an application form specifically addressing instream right requests.

Quantification of Instream Flow

ADWR determined that, as instream flow rights are established, the amount of water to be appropriated must be quantified and justified. Although instream flow uses are non-consumptive—i.e., they do not involve pumping water from a streambed for an offstream use—it was deemed essential to quantify an instream right to assure that the amount of water requested was appropriate or justified for the intended use. This is the principal concern of the ADWR task force and its two subcommittees.

Various methods have been devised to determine the amount of flow needed to support various biological communities. This information is later used by states to help determine instream rights. Each state, however, confronts a different situation in regard to fish, wildlife

and recreational resources, as well as legal and administrative constraints. ADWR task force members reviewed the work done in other states to help identify the methodology most appropriate for Arizona.

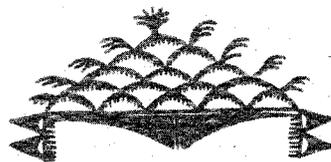
Categorizing the instream flow methodologies most prevalently used in other states into four groupings, the biological subcommittee evaluated each to determine its strengths and weaknesses, and its adaptability and applicability to Arizona conditions.

The subcommittee recommended that ADWR adopt a three-level prioritization process. Depending upon the particular situation, this process would assign a suitable instream methodology "based upon aquatic-related resource values and institutional considerations." This would allow flexibility, with the more comprehensive and thorough methods applied to the higher-priority instream flow requests.

Some have expressed concern that the subcommittee, by reviewing instream flow methodologies currently and successfully used elsewhere, focused mainly on techniques for fisheries protection. These methods are fairly well developed. Not as well developed, however, are methods to measure instream flow needs for other types of wildlife, as well as for plant maintenance and regeneration, recreation and aesthetics.

To measure such uses of instream flow is a complex task involving, at times, subjective judgments. For example, how much flow is needed to create the aesthetically-pleasing sound of running water? Some, therefore, are concerned that, despite the work of the subcommittee, information will not be adequate to evaluate instream flow for varied and beneficial uses.

Others are concerned that instream flow applicants may be required to quantify and justify their requests more strenuously than those who apply for water for other, more traditional beneficial uses. They claim that requests for water for agricultural and industrial uses have at least historically been granted readily, without a vigorous assessment to determine if the requested quantity is appropriate to the use.



Cloud cluster and rain lines in San Ildefonso pottery design.

Why, they ask, should instream flow requests be subject to a stricter criteria?

Need for Authorizing Legislation: Pros and Cons

Some expect that the process implemented by ADWR will basically settle the instream flow issue in Arizona. They believe that the agency correctly interpreted Arizona law as allowing instream flow rights and acted properly when granting such rights to ANC. Others, however, believe that further legislative action will be needed before instream rights can be effectively established in Arizona. Central to the debate is whether the diversion requirement is, in fact, legally settled, despite ADWR's actions.

Some maintain that it is indeed settled. They claim that Arizona statute never intended diversion as an absolute imperative to grant surface water rights. When the Legislature amended the surface water code in 1941 and 1962, it obviously did so without expecting that diversion was essential to establishing an instream right. The amendments approved appropriations for fish, wildlife and recreation, and these approved beneficial uses would be nonsensical if diversion was expected.

Further, they say that the *McClellan v. Jantzen* decision approved the concept of an *in situ* appropriation. In other words, the court ruled that the appropriation of water without diversion was legal. And in reference to this decision, ADWR granted instream rights to the ANC. Further legislative action is seen, therefore, as unnecessary, and, in fact, potentially counterproductive.

Some are concerned that if instream flow were to be addressed by the Legislature, the gains already achieved might be jeopardized. They fear that resulting legislation would not be as supportive of instream flows as the arrangement that now prevails. As expressed by a proponent of this view, "If it ain't broke, don't fix it."

Others are concerned that authorizing legislation is, in fact, needed, if Arizona is to have a

successful instream flow program. They say that the Arizona Legislature has not specifically defined what constitutes an instream flow right. They point out that of the 19 prior appropriation states that required diversion to establish a water right, only three—Arizona, New Mexico and Nevada—have not passed legislation to protect instream flow.

(Recently the Nevada Supreme Court ruled legislation is not needed in that state to authorize instream rights, and that diversion is not necessary to establish such rights.)

They further feel that the *McClellan v. Jantzen* case did not resolve the diversion question. The language in the case that supported instream flow, they say, was dicta and

Additional Information

Various documents are available that provide information about instream flow in Arizona:

Arizona Rivers, Streams, and Wetlands Study

This study, also called the *SCORP Report*, resulted from a 1987 Arizona State Parks Board initiative to update the Arizona State Comprehensive Outdoor Recreation Plan. The study does not specifically address instream flow but, instead, evaluates the recreational and environmental value of the state's streams and wetlands. For information about the report contact: Tanna Thornburg, Arizona State Parks, 800 W. Washington, Suite 415, Phoenix, AZ 85007. (602) 542-1996.

Instream Flow: Rights and Priorities

This volume contains the proceedings of the Arizona Section of the American Water Resources Association symposium conducted in Tucson on Oct. 30, 1987. Copies are available from the Arizona Section, American Water Resources Association, 845 N. Park Ave., Tucson, AZ 85719, c/o Ms. Dale Wright. (602) 621-1955. \$12.

The Economic Value of Instream Flows—Can Instream Values Compete in the Market for Water Rights? by Bonnie Colby

This paper summarizes recent studies on instream flow values in the West; discusses the relationship between water marketing and instream flow protection; and suggests policies to enhance the economic contributions of free-flowing waters. Copies are available from: Department of Agricultural Economics, Economics Building, College of Agriculture, University of Arizona, Tucson, AZ 85721. (602) 621-6241.

Riparian Resource Report

This report is the result of a 15-month project of the Commission on the Arizona Environment to assess many of the issues and controversies that affect the management and future of riparian habitats in the state. Major riparian issues are identified, including the need to consider the relationship between instream flows and the condition of riparian habitats. Recommendations to the Arizona Legislature are also included. Copies are available from the Commission on the Arizona Environment, 1645 W. Jefferson, Suite 416, Phoenix, AZ 85007. (602) 255-2102. \$10, plus \$2 for handling.

was not central to resolving the question raised by the case. These statements, therefore, have no precedential value and may not hold up in subsequent cases. As a result, it is felt that the instream flows issue needs stronger legal backing than what is provided by the questionable and limited support of *McClellan v. Jantzen*.

Also, some state that the official acceptance of instream rights is limited, and whatever gains have been achieved are certainly not significant enough to justify concern that legislation might disrupt them. Even the granting of instream permits to ANC, which is seen by some as a significant accomplishment, is viewed by others less enthusiastically. They say that it was a noncontroversial application and that more complex instream flow situations will be more challenging and thus more difficult to resolve without guiding legislation.

Persons on both sides of the question, however, generally agree that no organized constituency exists to advocate instream flow legislation.

Instream Flow Protection Strategies

Arizona's present course of action would indicate that the state is committed to preserving its instream flows by permitting appropriations for instream rights. As discussed, this strategy involves declaring instream uses as beneficial and recognizing a justification for not requiring a diversion. Other strategies exist, however, to protect instream flows.

Some states, usually through legislative action, require their water regulatory agencies to deny new appropriations of surface water that are not in the public interest. This becomes relevant to instream flows when their preservation is seen to be in the public interest, as is the trend in many states.

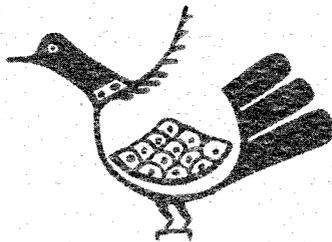
Some believe that this could be a suitable strategy for Arizona since state statute enjoins ADWR to refuse an application found to be "against the interest and welfare of the public." Others believe, however, that this language needs further clarification, possibly through legislative action, before it could be

usefully applied to instream flow situations.

Some indicate that the "public trust doctrine" might provide protection to instream flows. Applied earlier in U.S. history to protect public interest in navigation, commerce and fisheries, the public trust doctrine has been recently interpreted by courts in some states to protect fish, wildlife, and recreation. This recent interpretation of the doctrine requires a state agency to consider the gain and advantages to the public over private interests when regulating the allocation and use of natural resources. For example, the recreational or wildlife advantages of instream flow could be determined to be of greater benefit to the public than diverting water for a municipal use.

A development of common law, the public trust doctrine antedates the prior appropriation system. As a result, some view this doctrine as a method to alleviate some adverse consequences of prior appropriation, such as its disruption of instream flows. The public trust doctrine, although enforced in some states, is unrecognized in Arizona case law and, as a result, its potential application in the state is uncertain.

A state could also protect instream flows by declaring certain water courses as removed and unavailable for some or all forms of appropriations. For example, the scenic or recreational value of a stream or river might be recognized and action taken to preserve it for future instream uses. As a result, the instream flow would be withdrawn or reserved from consumptive purposes.



Bird design with cloud cluster for San Ildefonso water jar.

Federal Role

Generally, instream flow is a state concern, with limited protection provided by the federal government. Much of the federal protection of instream flows depends upon a recognition of reserved water rights. In effect, this means that, if the federal government reserved lands for purposes that require instream flow protection, U.S. law grants water rights in such flows to the federal agencies managing those lands.

Various federal agencies are concerned with public lands, and each agency's involvement with instream flow is different. For example, the Bureau of Land Management does not have reserved land. The agency, therefore, does not have reserved water rights and is totally dependent on state law for instream rights, unless Congress creates a unique reserve. The U.S. Forest Service, however, manages reserved land but the U.S. Supreme Court rejected its claim to implied reserved instream flows, on grounds that maintenance of aquatic and riparian ecosystems was not a primary purpose of the original reservation of land from the public domain.

National Parks and the U.S. Fish and Wildlife Service refuges do have reserved water rights and could claim federal protection for instream flows on their lands. In Arizona, however, most parks and monuments have access only to groundwater and springs. The obvious exception is Grand Canyon National Park and the Colorado River. The flow of the Colorado River through the Grand Canyon, however, has not been adjudicated. And, no wildlife refuges in the state are on streams. As a result of the above, very little federal activity is evident in the state to protect instream flows.

Instream Flow Protection and Water Marketing

Water marketing, or the sale and leasing of water rights, has become a policy issue and may become a

major water management tool. As demand for water grows, supplies become increasingly scarce and competition for limited supplies occurs. Market transfers of water from low-valued uses to higher-valued ones can be expected if legal institutions permit and encourage such transfers.

Some see this development as a threat to instream flows. They believe water marketing, in effect, encourages the diversion of instream flows to municipal and industrial uses. In the absence of policy, water managers might interpret the benefits derived from urban economic growth and development as outweighing the values that come from instream flows. As a result, instream flow diversion might be justified as good marketing or economic strategy, as water is being moved from a lower-to higher-valued use.

Further, certain water marketing transactions could have an adverse effect on instream flow. For example, flow would be significantly affected if a downstream right were transferred to an upstream user. In effect this would mean that water previously diverted for use downstream at point B would now be diverted upstream at point A. As a result, the water that previously flowed between points A and B would be diminished.

This concern would be addressed, however, if ADWR, which approves surface water transfers in the state, considered instream flow when evaluating transfer applications. Some believe this would assure due consideration of the value of maintaining instream flow. Others, however, indicate that such a strategy would unduly complicate the water transfer process and interfere with a profitable use of water.

If, however, an instream right was protected by an appropriated right, then clearly ADWR would be obliged to deny any transfers that adversely affected that flow. By law transfers cannot interfere with an established water right.

Water marketing might also provide a strategy to help protect instream flow. Previously established water rights might be purchased or transferred, as well as new

rights appropriated, to assure instream flow for recreational, fish and wildlife, and aesthetic purposes.

Water marketing is a mixed blessing to advocates of instream protection. As discussed, water marketing might serve as a justification to divert instream flows. At the same time, however, water marketing may provide a strategy to help protect these flows. Undoubtedly the situation will provoke legal conflicts between those seeking to transfer stream flows for consumptive purposes and those committed to preserving instream flow.

Instream Flow and Possible Legislative Action

Instream flow is not a major topic of interest in the Legislature and is not expected to be the central focus of any legislative action this session. The issue lacks an organized and forceful constituency. Water marketing and transfer, however, is of major concern to many legislators, with some lawmakers supporting legislation to address the adverse effects of water transfer activities on rural areas of origin. Such legislation may affect instream flow.

The reduced flow of rivers and streams, which might result from water pumped or diverted for transfer, is one of the concerns of rural interests. As a result, any legislation passed to control the negative impacts of water transfers would, more than likely, include protection of flows in certain rivers and streams. Instream flow then is a shared concern of rural interests, who seek to protect community resources, and environmentalists or conservationists, who have a broad interest in various wildlife and environmental issues at the state and national level.

Various legislative options regarding water transfers are being discussed, some with possible effects on instream flow. One proposal would declare a moratorium on all transfers of water. Each water transfer application would then be reviewed individually to determine its potential impact to an area of origin, including its effects on instream flows.

Another proposal involves identifying which basins in the state would be off limits to water transfers and which would be open to transfer activities. Twenty-seven basins have been identified to be off limits because they are either too remote or too environmentally sensitive for water transfers. The remaining 13 basins would be open to transfers. Within these basins, however, conservation zones are being identified to include surface water, wetlands or riparian features that are essential to the support of endangered species or habitats. Instream flows would have to be maintained along these identified conservation zones.

Many stress the importance of considering both surface water and groundwater in proposals that discuss interbasin transfers of water since the two types of water are often hydrologically connected. For example, the flow within the conservation zones described by the above proposal could be depleted by excessive groundwater pumping. As a result, the proposal requires that those who apply to transfer groundwater demonstrate that their activities would not cause environmental damage, including depletion of instream flows.

Conclusion

The topic of instream flow raises various questions: Should instream flow be preserved and protected? What is the best method to protect instream flow? Which areas should be protected, and at what cost? What purposes justify the protection of instream flow? To what extent should instream flow be protected?

The answers to such questions will help define Arizona's policy toward instream flow. The questions, however, are complex, with debate sometimes occurring between those seeking to protect instream flow and others who want to use such flow as a consumptive water supply. Another debate further complicates the situation as opinions differ about the best method to respond to many instream flow concerns—whether through adminis-

trative or legislative action.

Although questions remain to be answered about instream flow in Arizona, many feel that a significant accomplishment has already been achieved. They believe that instream flow, although a relatively recent concern, is firmly recognized as an important use of water. Instream flow needs are now to be considered along with other water uses as Arizona manages its limited water supplies.

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The ideas and opinions expressed in the newsletter, however, do not necessarily reflect the views of any of the above people.

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