

## ***Evolution of a Value-Based Process for Protecting Instream Flow<sup>1</sup>***

*by Daniel P. Muller,  
Supervisory Physical Scientist,  
and James L. Fogg,  
Hydrologist,  
BLM, National Applied  
Resource Sciences Center*

### **Background**

Protection of instream flows is a relatively recent development in the western United States. Traditionally, the water on these arid and semiarid lands was used for agriculture, municipal, and industrial purposes, and water rights were granted to the first person to divert water and put it to a beneficial use under the doctrine of prior appropriation. This, in turn, led to overappropriation of major rivers and streams, construction of storage facilities for surface waters, and large-scale development of ground-water supplies. More recently, western streams and their associated riparian corridors have been increasingly recognized for a number of other values, such as the variety of habitats, resource uses, and human activities they support. The doctrine of prior appropriation makes allocation of streamflow to support these values difficult. However, instream flow protection for non-traditional uses has more recently been recognized through either legislation or administrative rules by the States. Case law has also served to recognize and protect instream uses. Identification of stream-related resource values and quantification of

flows needed to support those values, though, remains problematic.

### **The Value-Based Process**

Jackson et al. (1989) proposed a comprehensive, interdisciplinary process to establish relationships between water-dependent resource values and flows, and to incorporate legal, technical, and administrative aspects of water management. The value-based approach differed from previous approaches in that it emphasized the assessment process more than specific quantification methods. Flow protection strategies were developed from the quantified instream flow needs to provide practical, legally effective, and comprehensive water management recommendations.

The value-based process consists of six basic steps:

1. Preliminary assessment and study design
2. Description of flow-dependent values
3. Description and quantification of hydrology and geomorphology
4. Description of the effects of flows on resource values
5. Identification of minimum flows to protect values
6. Development of a strategy to protect flows

### **Evolution of the Process**

Over the past 10 years, BLM has applied the value-based process on approximately a dozen rivers. The basic step-by-step approach has worked well for less complex assessments of river management

situations. However, when it is applied to increasingly complex river management situations such as those involving storage, inter-basin diversions, interstate compacts, and international treaties, some adjustments to the basic approach are required. In these complex situations, the process has evolved from a step-by-step approach that focuses on the assessment of resource values and their flow dependency into a trichotomous process in which the legal/institutional analyses and the hydrologic characterization are more extensive and occur concurrently with, and frequently overshadow, the assessment of flow-dependent resources. For example, on large rivers with significant storage projects in place, the legal/institutional analyses may actually include several supporting kinds of analyses (e.g., historical, geographical, and managerial) that must be completed before the hydrologic analyses can even occur. Similarly, for desert streams of the arid southwest, hydrologic characterization may include detailed ground-water investigations to support not only the assessment of flow-dependent resources, but also elaborate flow-protection strategies linking ground-water and surface-water management. Thus, whereas the resource assessment identifies flows needed to support resource values, the hydrologic characterization and legal/institutional analyses identify both the physical and institutional limits that will influence management decisions.

### **Integration of Analyses**

The goal of the trichotomous process is to integrate legal/institutional, hydrologic, and resource value analyses throughout the process. The final analysis, however,

<sup>1</sup>A more comprehensive version of this article appears in: Olsen, Darren S and John P. Potyondy (eds.). 1999. Wildland Hydrology. American Water Resources Association Symposium Proceedings, June 30-July 2, 1999, Bozeman, MT. pp. 261-266.

is the point at which water needs and constraints and opportunities are blended into flow recommendations and water management considerations (Figure 1).

Figure 1 shows each step in the overall process: analysis identifies resource values and quantifies related water needs, as well as describes the physical and institutional setting of the river; evaluation reduces results from analyses; and findings addresses legal and practical solutions to meeting instream flow needs.

BLM has used the value-based process, both as it was proposed and as it has evolved, to identify instream flow needs and flow protection strategies on rivers in Alaska, Arizona, Colorado, New Mexico, and Utah. On several of these streams, Federal reserved water rights, State-appropriative water rights, or other flow protection mechanisms have been successfully implemented.

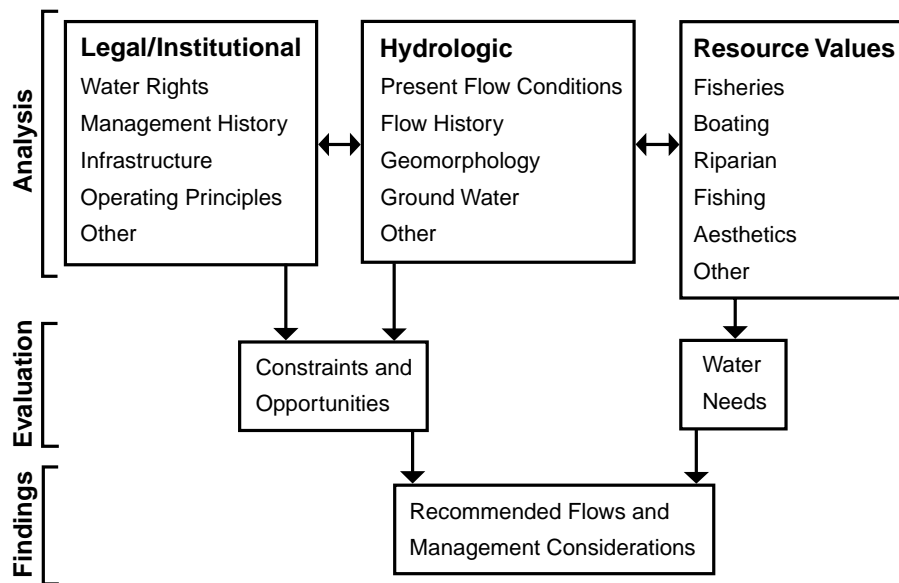
### References

Jackson, W.L., B. Shelby, A. Martinez, and B.P. Van Haveren.

1989. An Interdisciplinary Process for Protecting Instream Flows. *Journal of Soil and Water Conservation* 44(2):120-126.

### Contact:

Jim Fogg, BLM  
 NARSC, RS-130  
 P.O. Box 25047  
 Denver, CO 80225-0047  
 phone (303) 236-0539  
 fax (303) 236-3508  
 email jfogg@blm.gov



**Figure 1.** Instream flow needs assessment process for complex river management situations.



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