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CHAPTER SIX

Supporting Science

In order for any environmental water project to be successful, sound scientific data must support its implementation. Key aspects of sound science include well understood and generally accepted biological, ecological, and physical process data. Sound science will greatly improve your likelihood of securing funding and political support for the project and will provide the baseline for ultimately evaluating the success of the project.

GATHERING SCIENTIFIC DATA



You should look to the water project agencies (BOR, DWR), the resource agencies (DFG, FWS, NMFS), and the U.S. Geological Survey (USGS) for assistance. More often than not, state and federal agencies may already have gathered a wealth of data and information relating to species of concern and hydrology in the system where your project is located.¹

As a general rule, this type of information exists in the public domain. For example, the USGS maintains gauging stations in many stream systems throughout the state that record fluctuations in instream flows. The data from these gauging stations often can be downloaded from the USGS's Web site.² Similarly, DWR maintains stream flow records and publishes bulletins on

water resources throughout the state. The DFG, FWS, and NMFS have data and information regarding the status, management, and restoration of various fish species, particularly those listed as threatened and endangered.

You also may want to hire a consultant who has regular contact with agency staff and who has a working knowledge of the resource issues you may confront with the proposed project. The consultant can provide analysis as to whether the proposed project will help meet the various agencies' objectives for a particular species or stream; help you determine what, if any, data gaps exist; and advise you on how to deal with the absence of information.

In some cases, consultation with resource agency biologists and engineers may be sufficient to get your project on the right footing. Agency biologists can provide a framework for understanding the biological needs of a particular species that may benefit from the water transfer and the resulting hydrology in the target stream. But you may find that you need to consult with a technical expert outside the agencies to make sense of the data or otherwise assist you in developing a project that is based on sound science.

FINDING AND USING SCIENTIFIC EXPERTS



Agency personnel who deal with consultants and experts on a regular basis may be able to recommend individuals with the appropriate experience and familiarity with a particular watershed. The SWRCB's Web site maintains a list of consulting engineers, many of whom can assist with hydrology and other issues.³ Your water rights attorney also may have various contacts with hydrologists and biologists who are qualified experts in their field.

In finding and hiring an expert, however, you will want to be sure that the individual is familiar with the watershed and geographical regions in question and possesses the necessary technical qualifications. Qualifications are particularly important if the environmental water acquisition will result in a transfer that requires the SWRCB's approval, as the individual may need to appear as an expert witness before the board. Sometimes the political nature of a project may discourage local consultants or experts from working on a project that is controversial. In those instances you will need to look outside the area for technical experts.

The nature of each project will dictate the number and type of experts you will need to assist in the design and evaluation phases. For example, if the water right in question will be used to enhance instream flows for fisheries, then a fisheries biologist will likely prove helpful in project development. In

addition, if the water right will be used to create, restore, or enhance wetlands, a wetlands scientist will be useful, and so on.

When hiring a scientific expert, make sure the individual is familiar with the watershed and geographical regions in question.

Biologists and ecologists can assist in evaluating current data to determine the status of existing habitats. They also can work with agency biologists and ecologists and other consultants to determine, for example, where instream flow enhancement is needed, provide input on the quantity and timing of the flow needed, as well as assist in developing a framework for evaluating the success of a project.

Understanding the hydrology of a basin is crucial to developing a sound plan. Although water law, in regard to water rights, provides for the orderly allocation and distribution of water, hydrology fluctuates from season to season, year to year, and region to region. Thus, evaluating a proposed environmental water acquisition within the context of the current and historic hydrology is essential to better understand the potential effects of a proposed transfer. The nature and extent of the hydrologic analysis will be dictated by the specifics of each proposed transfer.

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For example, a water right holder may possess the right to divert up to 20 cfs of water from a stream. The stream flow, however, may only exceed 20 cfs a few weeks a year, or once every few years. Additionally, the flow during the summer months may average only 7 cfs. This type of information will affect a decision about whether to acquire the water right, and it will also affect the valuation of the water right (see Chapter 10, "Valuing a Water Right").

Your understanding of the hydrology also is important when there are multiple water right holders in the same watershed. The water rights must be quantified and prioritized, then compared with the local hydrologic informa-



tion to determine the availability and distribution of the water on a monthly, seasonal, and annual basis. If stream flows tend to exhibit extreme temporal fluctuations, and the water right has a low priority in the watershed, then at various times there may not be any water available for diversion under that particular right. The analysis also will assist in determining the relationship of return flows in the stream system and how they affect the availability of water to downstream users.

Depending on the nature of the water right and the intended beneficial use of the acquired water, there may be a need for other scientific investigations. These include a determination of consumptive use, quantifying evapotranspiration rates, and evaluating the effects of a transfer on water quality.

MEASURING SUCCESS



This scientific information can help your project succeed, and it can also serve as a basis for measuring the success of your project once it is implemented. For example, if the purpose of the water right acquisition and transfer is to improve the spawning habitat for coho salmon in a particular stream, then the biological and hydrologic data regarding existing habitat conditions during a specified time period, as well as historic stream and fisheries data (the number of spawning adults), should form the basis for the acquisition. If the appropriate quantity of water is made available for the appropriate length of time during the target period, then the change in flow should provide you with information about the flow's benefit to the species in particular, and the ecosystem in general.

Ideally, based on the results of your project, similar actions would be taken on an annual basis to help build datasets that allow the assessment of these benefits and ultimately help measure the success of your initial plan.

1. Hydrology is the study of the properties and distribution of water, including the study and analysis of stream flows from precipitation and snow melt, springs, releases from storage reservoirs, and return flows to the stream, as well as instream losses from groundwater percolation, water diversions, and evaporation.
2. See United States Geological Survey Web site, <http://www.usgs.gov>.
3. See California State Water Resources Control Board, Business Information Contacts, available at <http://www.waterrights.ca.gov/wrinfo/contacts.htm>.

