Weaving Disparate Threads: CWA & ESA

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Water and environmental law in the United States, its individual states, and in the West has evolved into two distinct regulatory threads. The first is water quality. The second is associated with the preservation or rehabilitation of aquatic habitat and is often tied to the recovery of listed, threatened, or endangered species. These threads become entwined when regulatory requirements are applied to waters of the arid West as if they were indistinguishable from eastern, wetter environments. What conflicts have arisen between clean water and aquatic habitat in the arid West, why have they come about, and how can we begin to untangle them?

Two important federal environmental laws were enacted in the 1970s to address the growing problem of environmental degradation. The Clean Water Act (CWA) of 1972 established a goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. This overarching goal is waterbody-specific, and rather than trying to protect individual aquatic species, it focuses on protecting a community of species. The Endangered Species Act (ESA) of 1973 set forth the goal of protecting and recovering threatened and endangered species and the ecosystems upon which they depend. This effort is species-specific and covers both aquatic and terrestrial species.

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Data on Western Species Lacking

Under the CWA, state water quality standards and the method of implementing those standards provide the basis for protecting waterbodies and their aquatic communities. The U.S. Environmental Protection Agency uses aquatic toxicology research results to establish recommended chemical criteria for states to use when establishing water quality standards. This body of toxicological knowledge is fairly exhaustive for game fish species and common invertebrates; however, when applied to rare or specific species in the arid West, significant data gaps exist. Obtaining data for rare and protected species is very difficult. This data gap is even wider when one considers that much of the aquatic toxicological data are for species of warmwater or coldwater fisheries rather than the effluent-dependent, intermittent, and ephemeral waters common to the arid West.

Clean Water vs. Habitat Support

The conflict between clean water and aquatic habitats may seem contrived if you have never attempted to acquire state and federal discharge permits for aquatic habitat restoration. However, many public and private dischargers have had significant difficulties with the process when their objectives of habitat restoration focus on recovering the physical and hydrological functions of a

Success Story: Kino Environmental Restoration Project

The Kino Ecosystem Restoration Project is a joint effort of Pima County, Arizona and the U.S. Army Corps of Engineers (Corps) to restore the Tucson/Ajo Detention Basin, a 127-acre flood control project built by the Corps in 1966. Located in the southern part of Tucson, Arizona, the basin is part of a system that ultimately discharges stormwater to the Santa Cruz River. The county and the Corps designed and constructed an extensive restoration project that provides significant riparian habitat while simultaneously allowing the site to be used for its original mission: flood control.

The project was designed to commingle stormwater and reclaimed water, which raised Clean Water Act-related regulatory issues. However, through the cooperative efforts of state and federal regulatory agency staff, an innovative approach was developed to create a facility that not only recognizes habitat uses for reclaimed water in an urban environment, but provides basic protections as required under the Clean Water Act.

Although the project was not specifically designed to mitigate ESA effects, the habitat has net ecological benefit to several listed species in southern Arizona, including the Western burrowing owl (*Athene cunicularia hypugaea*). The project was determined to be an ideal relocation site for displaced burrowing owls that have lost their habitat due to development. The Arizona Game and Fish Department has installed numerous burrowing owl nesting tunnels and successfully introduced nearly 30 birds into the project.

stream or wetland rather than on meeting specific chemical water quality criteria.

Successful habitat restoration projects require a dependable source of water. In the arid West, often the only available water is treated effluent, captured urban runoff, or irrigation return flows. The quality of these waters may not be high, especially for constituents such as nutrients, conductivity, and pH. But rather than taking advantage of the available water and putting it to use in a habitat restoration effort, concerns over water quality requirements often grind a project to a halt.

Increasing water quality requirements can unintentionally result in habitat degradation. Consider a current treatment resulting in a specific community-level ecological status. With the intention of improving species richness and abundance, a regulator may require that treatment be increased. Additional treatment improves water quality, but also costs the discharger more and raises the value of the water to the human community. As a result, the wastewater is increasingly likely to be diverted away from the habitat to an economically more competitive use, such as to a golf course or for cooling water. That diversion further reduces the physical limitation of the ecosystem and degrades the original ecological metric. One wonders how many extirpated aquatic and riparian species in the Southwest have already lost this "wastewater war."

Photo: Nicole Rowan, CDM

Effluent-dependent reach of the Santa Cruz River downstream from Nogales, Arizona.

Finding Common Ground

There is hope. Individually, the CWA and ESA have inherent flexibility for crafting solutions to complex environmental problems. Examples of flexibility in practice include:

- The EPA developed a net ecological benefit concept in the early 1990s, recognizing that effluent-dependent waters may require an alternative water quality management approach. The foundation of this concept is understanding that ecological benefits, including restoration of habitat and ecosystem function, can be created from the discharge of treated wastewater to an otherwise dry riverbed.
- Adaptive management is a tool applied to situations where a direct implementation approach or the expected result of environmental protection activities is unclear. Used by both CWA and ESA practitioners, its value in arid aquatic ecosystems is obvious. The aquatic ecosystem, including its associated riparian habitat, can be managed systematically to maximize benefits of local or regional water resource management goals. Practices that yield the best environmental outcomes are pursued, while those yielding no results or negative results are phased out.
- Under the ESA, habitat conservation plans (HCPs) address impacts of private land development on ESA-protected species. The purpose of this mechanism is simple: to provide a means for economic development to continue while meeting ESA requirements. Where there are competing uses for urban water sources (from supporting aquatic habitat to golf course watering) an HCP-type process could be implemented so that regional water management decisions consider all possible water uses and values.

These examples represent performance-based, holistic management approaches to western water management. None can replace the minimum CWA or ESA regulatory requirements. Measures to protect ecosystems from toxic or bioaccumulative pollutants should probably remain inflexible. But this performance-based thinking allows regulators to move beyond generic, bright-line targets, where cost becomes supreme, to watershed management goals with greater holistic benefit.

In an arid environment, unnecessary loss of aquatic and riparian ecosystems is a tragedy. While it is critical for water to be of sufficient quality to protect resident species, it is increasingly apparent that a balance of interests must be struck. The cost of treatment must more precisely draw out a net ecological benefit. When water quality and quantity requirements are defined by inflexible interpretations of federal law, western ecosystems can snap. As water becomes more expensive, the need to fine-tune this tension will only intensify.

This article summarizes research completed as part of the Arid West Water Quality Research Project, an EPA-sponsored research effort led by Pima County (AZ) Wastewater Management Department. The full reports can be accessed at www.pima.gov/wwm/wqrp/index.htm. Contact Richard Meyerhoff at meyerhoffrd@cdm.com or Mark Murphy at mark.murphy@state.nm.us.