May 16, 2019

FLOW'S INTERACTION WITH NEW HABITAT: FINDING THE RIGHT COMBINATION

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When the Public Policy Institute of California in 2012 anonymously surveyed the state's top scientists engaged in California water, improving Delta habitat emerged as their top priority.

It wasn't based on years of their own research, because Delta restoration remains in its infancy. I think it was based on the fundamental ecological principle that habitat is dynamic and requires that all components interact and function as one unit. Since 95 percent of the original wetlands and floodplain was lost to human development, several important components of the dynamic habitat fish need have been removed, and now we have a non-functioning ecosystem for native species.

Habitat restoration is recreating that inherent magic in water's interaction with land to restore those critical functions. The shelter it provides. The food it creates. The opportunities it offers for spawning, resting and rearing.

For the fish we are all trying to protect, the right landscape is just as critical as the right flow, and how these interact with each other to restore the dynamic functions of the historical habitat is the question we need to answer. We should all be able to agree that this interface of land and water is the core of the solution. We need to work together to better understand and improve this interface both for the needs of native fisheries and a reliable California water supply.

We should be years ahead of where we are in terms of restoring native landscapes in the Delta, on upstream floodplains and in the tributaries. But habitat restoration can be as hard to achieve as water infrastructure.

First, there has been a steep learning curve and cultural change for all of us on the water agency side. Biological opinions from a decade ago have, for the first time, called for wide-scale restoration to maintain existing water operations. This has not been a core mission of water agencies until very recently. Now we are fully embracing it.

This isn't as easy as moving some dirt around. Habitat restoration projects have to mitigate for their own impacts. Permitting processes understandably have a keen eye for alterations of the status quo. A project in the Suisun Marsh that restores a property to a natural year-round wetland, for example, has had to mitigate for altering the previous managed landscape that flooded wetlands only during seasons that

promoted waterfowl. If a levee is breached to allow adjacent farmland to be once again reached by the tides, the loss of the farmland usually must be mitigated.

Yet we have been working through these challenges. And finally, habitat restoration of a historic scale is on the horizon.

State and federal agencies are poised to meet its commitment to providing 8,000 new acres of tidal wetlands (four projects were under construction in 2018; seven more are planned for 2019). The environmental review process is near completion for floodplain enhancements on the Yolo Bypass. This winter, a project constructed in 2018 to aid adult salmon passage in the Yolo Bypass also passed an adult green sturgeon. And perhaps most important, a new opportunity is emerging to advance habitat restoration beyond mitigation requirements via a series of proposed voluntary agreements to resolve the ongoing Bay Delta Water Quality Control Plan process before the State Water Resources Control Board.

As part of a package of at least $662 million to provide additional flows, restoration and science, these improvements to the land-water interface would include more channel habitat, more gravel for spawning and food production. Other projects include screening and consolidating diversions in the Cache Slough region and tidal wetland restoration in the Delta beyond what is already required, perhaps as much as 5,600 acres.

More food and shelter is particularly important upstream of the Sacramento-San Joaquin Delta. Migrating species such as salmon spend less than three weeks of their entire life cycle in the Delta. That is why the watershed approach to advancing restoration as part of these voluntary agreements is so important.

Habitat is the dynamic combination of many factors that together provide the needs for the fish that occupy it. No one factor alone will recover fish species. With 95 percent of the original habitat gone due to levees in and upstream of the Delta, it is no wonder that scientists identified this as a top priority. If we can take that leap of faith and search in a collaborative way for the right balance of landscape improvements and flow, we can make the most out of opportunities that are now before us.

This blog is part of a four-part series. Read the first and second in the series: Finally, a new path toward managing water, rivers and the Delta & Beyond the Pumps: Can We Study Flow Needs?

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