



By Craig M. Pease

Mixing Smelt, Salmon, and People

In California's Sacramento-San Joaquin Delta, natural ecosystems and human institutions have become hopelessly intertwined. The delta is habitat for the endangered winter-run chinook salmon and threatened delta smelt, and it also provides drinking water for two-thirds of California's 38 million people. Natural processes (e.g. snowpack in the Sierras) and the management actions of government agencies and courts (administering a complex system of dams, canals, and levees) simultaneously control the water flows critical to both fish and people.

The entanglement of the natural and human greatly increases the complexity of managing the delta. This was brought home forcefully in two recent decisions from the Eastern District of California, one earlier this spring in the *Consolidated Salmonid Cases*, and one last fall in the *Delta Smelt Consolidated Cases*. Both disputes arose when the Bureau of Reclamation wanted to make management changes in the Central Valley Project, its sprawling hydrological system. But first, as required by the Endangered Species Act, it had to formally consult with the U.S. Fish and Wildlife Service (for the smelt) and National Marine Fisheries Service (for the salmon). The services' reviews found that the bureau's planned changes would jeopardize these fish and, as required by the ESA, they recommended reasonable and prudent alternatives to

mitigate the harm. Not surprisingly, these alternatives would restrict water withdrawals for human use.

Several California districts that purchase water from the bureau and supply it to municipalities and agricultural users sued, on the grounds that no environmental impact statement had been completed. They complained particularly of the lack of any analysis of the impact of the recommended reasonable and prudent alternatives on the human environment. In both cases, Judge Wanger ruled in favor of the water districts. The agencies started out focused on fish, but found that the law required them to look simultaneously at fish and human needs.

This web of natural and human processes has also ensnared science. In the delta, it is no longer sensible or even possible to study entirely natural phenomena (e.g. delta smelt distribution under natural water flow and salinity regimes). Rather, most relevant science is done against a backdrop of water flow regimes controlled simultaneously by natural processes and human institutions (e.g. effect on delta smelt of withdrawing a certain amount of water, from a certain location, at a particular time of the year). Science has merged with adaptive management, characterized succinctly by Kai Lee: "Policies are experiments; learn from them."

Strictly from the standpoint of science, adaptive management is eminently sensible. Both natural and human systems are hugely complex. It is impossible to know a priori what management options are best. But just how much management flexibility does the law allow, and in exactly what circumstances?

In the delta, the ability of the agencies to pursue adaptive management is limited both by standards on agency action imposed by environmental statutes and by binding enforceable provisions of water delivery contracts between the bureau and water districts. The case law

on both continues to evolve.

Especially instructive are two earlier cases, also in front of Judge Wanger, and also involving ESA consultations between the bureau and services over the impact on smelt and salmon of planned changes in the Central Valley Project. In 2007, in *NRDC v. Kempthorne*, the court ruled illegal the opened-ended reasonable and prudent alternative recommended by the Fish and Wildlife Service, whereby a team of scientists would periodically review delta smelt data and recommend management changes, but which provided no guarantees of any real and enforceable agency action if smelt numbers decreased. This was too much management flexibility. Then just a year later, in *Pacific Coast Federation of Fishermen's Associations v. Gutierrez*, a parallel case involving chinook salmon, the same court found that a reasonable and prudent alternative establishing fairly broad upper and lower bounds on permissible agency actions (e.g., on wa-

ter flow rates) passed muster, even though the bureau reserved some management flexibility within these bounds.

Alas, there is one critical, if somewhat ancillary point. In theory, increased management flexibility should lead to improved science, more knowledge, and better results. In practice, it often also opens the door to political influence on natural resource management. This all too frequently runs counter to good science.

As the natural and human worlds have become increasingly entangled, so to have science and law. Now scientists work, not surrounded by nature, but deep within human institutions. The evolving case law that sets limits on the decisionmaking flexibility of human institutions is having a wider impact on science than is commonly understood.

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