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## Delta Stewardship Council stresses over ‘stressors’ in draft EIR

At a recent meeting the members of the Delta Stewardship Council grappled with the issue of “stressors” in the Delta as they move toward formulating a Delta Plan.

Keeping in mind their co-equal goals of restoring the ecosystem and providing for a more reliable water supply for the state, and recognizing that the Delta will never be the tidal estuary it was when California became a state 161 years ago, the question of what should the Delta look like underscored the discourse.

The discussion of Delta stressors was scheduled in response to a request from Vice Chairman Randy Fiorini, who asked the lead scientist to give a report from the Delta Science Program to help the council understand the role of stressors in the Delta. The question applies to Chapters 5 and 6 of the Draft Delta Plan Programmatic Environmental Impact Report. The fifth draft of seven is in the review stage. Chapter 5 is titled “Restore the Delta.” Chapter 6 is “Improve Water Quality to Protect Human Health and the Environment.”

The Nov. 17-18 meeting was held at the Sheraton Grand Hotel in Sacramento. Five Council members were present on Nov. 17: Chairman Phil Isenberg, Vice Chairman Randy Fiorini, Gloria Gray, Felicia Marcus and Don Nottoli. Patrick Johnston and Hank Nordhoff were absent. Nordhoff joined the group on Nov. 18.

### **What is a stressor?**

In the field of biology, an environmental stressor refers to any physical or chemical change in the natural environment that impacts the growth, development, reproduction or physiology of organisms in that environment. Environmental stressors are dealt with through ecosystem management.

What to do in the short-term, the next five to 20 years, and what effect those actions will have in the long term might take a crystal ball. The Delta Stewardship Council does not have a crystal ball, but it does have something else to inform their decision-making: science.

According to the Delta Stewardship Council, “The Delta Science Program was established to develop scientific information and synthesis for the state of scientific knowledge on issues critical for managing the Bay-Delta system. That body of knowledge must be unbiased, relevant, authoritative, integrated across state and federal agencies, and communicated to Bay-Delta decision-makers, agency managers, stakeholders, the scientific community, and the public. The lead scientist is responsible for leading, overseeing, and guiding the Science Program.”

### **Lead scientist highlights stressors**

Clifford Dahm, Ph.D, who retired in July as lead scientist to return to his position as professor in the University of New Mexico’s Biology Department, returned to Sacramento for this meeting as the council completes arrangements for his successor.

Although Dahm declined to rank stressors in order of priority, he was willing to divulge the five he personally considers most important. He said:

- One is the issue of flow — not just the amount — it’s the timing, the duration, the rate of change. We need to improve flow conditions.
- Habitat issues. We need to get on with restoration.
- Contaminants. We need to reduce their lethality.
- Nutrients. We need to reduce the amount of nutrients in the water, especially nitrogen.
- Landscape connectivity — the landscape needs to be looked at not as a bunch of little pieces. We need to look at the land-water interface from a landscape perspective.

Zeroing in on the question of nutrients, Don Nottoli asked, “Can nutrients be too low?” Dahm answered, “Yes, the water can become sterile, not able to support life or maintain carrying capacity. It’s an example of a lot of things in the environment — too little is not good, too much is not good.”

### **Independent Science Board scientists address stressor issue**

On Friday, Nov. 18, Deputy Executive Officer Lauren Hastings, Ph.D, gathered together a team of four experts to discuss stressors with the council members. The scientists were Ellen Hanak, economist and senior policy fellow with Public Policy Institute of California, who specializes in natural resource and environmental management; Chris Foe, Central Valley Regional Water Quality Control Board staff environmental scientist; Carl Wilcox, Department of Fish and Game Bay Delta regional manager; and Bruce Herbold, Ph.D, fisheries biologist with U.S. Environmental Protection Agency.

Isenberg told the quartet that the council needs a starting point. There are over 200 agencies that have some level of responsibility in the Delta. Isenberg said he wants to cut across the agencies and finesse interest groups. He asked for answers to three questions: What needs to be done? In what order? What policy questions can be advised by science? Hastings reported that in response to a Senate legislative workshop request to prioritize stressors, the scientists had created four groups:

1. Legacy stressors, such as methyl mercury and channel modifications.
2. Globally determined stressors, such as climate change.
3. Anticipated stressors, such as sea level rise.
4. Current stressors that are human-induced.

#### *Environmental water management*

Hanak emphasized that the council cannot undo 160 years of water management, but that environmental management “needs to be as effective as other forms of management.” She reiterated that it is hard to get a coordinated vision of the Delta, but felt that the Delta Plan can help.

Drilling past the multiple sources of stress to the environment in the Delta, Nottoli asked, “Who’s a stressor? Who pays for the legacy or stresses caused by nature?” Hanak said a report on stressor fees and responsibility is due in late 2012. In the meantime, she recommended Jay Lund’s blog, “Multiple stressors—funding the Delta like a public sewer,” on [californiawaterblog.com](http://californiawaterblog.com). Lund is chairman of Environmental Engineering and director of Watershed Sciences at UC Davis.

#### *Contaminants*

Chris Foe, who has done considerable research on contaminants, described a series of questions that frame ongoing research. “What is the role of ammonia in suppressing diatom (a major group of algae and one of the most common types of phytoplankton) production?” What are the proper ranges for nitrogen and phosphorus?”

He said, “Scientifically defensible nutrient concentrations are not going to be available for two years.” The state and regional water boards should develop and adopt objectives for nutrients in the Delta and the Delta watersheds by 2014. The state board is developing nutrient end points for the Delta. We don’t have enough food production at the bottom of the food chain,” he said.

“There is more organic material in the Stockton ship channel than it can assimilate,” he said, pointing to ammonia from the Stockton treatment plant as the cause.

On a positive note, Foe mentioned, “We are getting pesticides under control.”

#### *Invasive species*

Carl Wilcox focused on predators and invasive species. Fish predators can be other fish, marine mammals, land animals, birds or humans. Native species prefer the shorelines provided by wetlands. Today’s predators like the modern habitat provided by riprap construction of levees.

Wilcox cautioned that large, long-lived fish can accumulate more methylmercury in their bodies, which is toxic to humans. “It is better to eat the smaller fish,” he said.

Once an invasive species is found, it is there. It cannot be eradicated. You have to work on controlling it, said Wilcox. Both the Quagga mussel, native to Japan, China and Korea, and the Corbula, or overbite, clam, native to the Caspian, Ural and Baltic seas, came to the Delta on ships’ ballasts. Quagga are able to adapt and colonize rapidly. Corbula are able to survive in polluted environments, low oxygen water, and varying levels of salinity. These intruders reduce the amount of available space for other species to grow and reproduce.

Hank Nordhoff asked, “What would happen if you stop trying to save native species and let the law of nature determine the survival of the fittest?” He honed in on the striped bass, which was introduced by the Fish and Game Commission in 1879 for sport fishing, and is now identified as an invasive species and predator partially responsible for the decline of Delta smelt and salmon populations. “They’ve been here over 100 years. Shouldn’t they be naturalized?” he asked.

#### *Fisheries*

Bruce Herbold pointed to a Public Policy Institute of California report five years ago that “brought people to the table.” The report painted a picture of the Delta in a serious plight. “The Delta would get lost sometime in the near future. It would get drastically rearranged. Either earthquakes or floods were going to take out some critical levees and we were

going to end up with a large body of water where there had not been a large body of water for at least 160 years. That's a problem because we've changed the geometry of that basin and it will become a series of little flower pots growing water hyacinth in it. As humans are wont to do, we think we can solve it all. We tend not to work on adaptation. We either try to solve the problem or deny the problem."

The Quagga are just one ridgeline over from our watershed, he said. In Northern California, there is not enough calcium in the water for them to grow shells. They won't be a problem. "In the south, we'll be up to our armpits in Quagga. The San Joaquin River is prime habitat for them. It is not good government to say, "We'll deal with it when it happens."

Invasive vegetation is another problem. "Fish screens designed in the 1950s don't work for a large part of the year because of aquatic vegetation that has invaded and sets up a hydrodynamic head that pretty much makes fish paste out of any fish that comes near them."

Corbula mussels, another unwelcome species, accumulate selenium, which creates toxic waste. "Keeping them out is not an effective strategy," Hersholt said.

Some species, like the Chinese mitten crab that was spotted in the Delta in 1996 prove not to be as serious a threat as first thought. "Some go through a boom-and-bust cycle. They come in, find something good, eat it all and all die or fall down to small levels."

Not all species that come into the Delta do well. Hersholt said, "People wanted to fish for channel catfish. When they were introduced, they didn't take. When the Friant and Shasta dams were built, they made the Delta a freshwater system all year round and the catfish population took off. Now it is a popular sport fish."

Hersholt concluded, "We need fish that are adapted to the California climate, whether they be striped bass or native. As we change the system, what is the fish community going to look like?"

"Predation is a natural selection process. Management has made it unnaturally worse. There is very little nature going on. There are a lot of human impacts. We need to deal with long-term problems. How do we deal with long-term drought, with climate change, a limited supply of water and growing demand? We can only adapt, we can't control."

At the close of the discussion, Randy Fiorini, who had requested the presentation, thanked the panel. "You backed the truck up to the council and unloaded a load of stuff. It's a wealth of information that we need to be able to process and make sense of it all as it applies to Chapters 5 and 6.

For more information, visit [deltacouncil.ca.gov](http://deltacouncil.ca.gov).

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