



**DELTA STEWARDSHIP COUNCIL**  
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February 20, 2013

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TO: Dick Norgaard, Chair, Delta Independent Science Board (ISB)

FROM: Dan Ray

RE: ISB's report on science programs that deal with habitat restoration

**Executive Officer**  
Christopher M. Knopp

I have spent a few hours looking over the ISB's draft report on science programs that deal with habitat restoration. This is a subject that interests me, in part because it ties to my past experience in Cal-FED and prior assignments on the Mississippi, Great Lakes, and the coast. So I've been pleased to watch the ISB organize to undertake its review in the way it has, pulling together observations about a wide variety of science-driven efforts that deal with habitat restoration in the Delta, including both agency and private initiatives. Delta watchers care about what the ISB says, so it's good to see this first in its series of reviews of Delta science programs starting on such solid footing. It provides a good foundation for the future. With that in mind, I wanted to offer a few suggestions for the ISB's consideration as it completes its draft.

Start with the Water Code 85280(3)'s charge to the ISB. What I read about independent peer review says best practice is that the reviewer is guided by a charge presented by those asking for the review. The ISB's charge comes from the best possible source – California law. Water Code Sec 85280(3) provides:

“The Delta Independent Science Board shall provide oversight of the scientific research, monitoring, and assessment programs that support adaptive management of the Delta...”

It is this provision that gives the ISB's report its authority – it is responding to the legislature's direction. The charge can serve as an organizing framework for the report, so that the ISB examines each of the types of programs listed (e.g., scientific research, monitoring, and assessment) and examines how well they support adaptive management of the Delta. In addition to linking the report's outline the Legislature's direction, this organization would also create an opening for the ISB to remark not just on the effectiveness of each of these three functions, but also about whether Delta activities reflect a proper balance among the three (for example, are our efforts in evaluation too limited in comparison to our efforts at monitoring?).

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*“Coequal goals” means the two goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place.”*

– CA Water Code §85054

Similarly, observations about issues that may be beyond this charge ought to be few and not emphasized. (An example might be the executive summary's Finding 4 about crediting, which at least in its current form seems to be about something other than research, monitoring, and assessment programs or adaptive management of the Delta.)

Scientific Research. To me an interesting thing about the Delta, in contrast to my experience on the Mississippi or on the American side of the Great Lakes, is how central university research has been to understanding both the issues that affect habitat restoration and to the training of the agency staff and policy makers who are responsible for the monitoring and assessment programs and for the design and funding decisions that will make restoration happen. Some of this university involvement is happenstance: how much less would we know about the Delta if Peter Moyle had taken a professorship in Texas, or Jeff Mount in Maryland? Some research, such as the studies forecasting how climate change may affect the Delta, result from initiatives independent of the Delta problem, but are key to supporting ecosystem restoration here. The CALFED science and ecosystem restoration program's helped focus some university research efforts with their PSPs targeting research issues that were key to reducing uncertainty about restoration prospects and outcomes. Today some of most promising restoration initiatives, like efforts to promote fish friendly farming in the Yolo Bypass, continue to carefully integrates university-based researchers in their efforts,

The ISB's report is largely silent on the value, organization, and scale of the university-based science efforts supporting adaptive management, and offers no recommendations on what could be done to make it more effective in supporting adaptive management of ecosystem restoration in the Delta. That seems like a missed opportunity, especially given the university affiliations of many ISB members. What more can be done to attract talented investigators, hitch rides on others research initiatives, or spark new investigations of key topics in ways to improve ecosystem restoration in the Delta?

This might also be a place to compare how well Delta restoration proposals are taking advantage of research findings that forecast climate changes' effects not just on water levels and flows, but also on other parameters that will affect the Delta ecosystem and the distribution of its fish and wildlife. I was struck by the February 2013 *Estuary News*' reports about the many new tools available to help those working on Bay area ecosystems anticipate how climate change will affect their success and wondered if we are fully using these tools here. Maybe the USGS' presentations to the ISB can provide a point of comparison.

Other sections of the report, such as those related to syntheses of research findings relevant to restoration, and modeling, might also be reported under a broad heading of scientific research.

Monitoring, The report does note the importance of monitoring restoration projects' outcomes and makes observations about factors assessing monitoring in several sections of the report (adaptive management and monitoring; capacities of state agencies). Can these observations be pulled together under a single heading?

Also, having looked at a variety of restoration actions, what can the ISB tell us about what we can expect monitoring of these sites to tell us about restoration outcomes, so that we can adapt our management of restoration projects to achieve the results we hope, begin to understand why we are not being as successful as forecast (if that is the case), or even understand when we might begin to see outcomes that could help us understand these issues? We have both individual restoration sites with outcome monitoring at a local scale (e.g., Hill Slough, Blacklock, Liberty Island) and big complexes with multiple restoration sites (Yolo Bypass, Cosumnes Reserve) that may approach a scale where we would hope to see system level responses. Does the ISB have any observations about how well outcomes of the pilot scale projects, like Blacklock or Liberty Island, are being shared to improve design and management of subsequent restorations? Are we organizing both our monitoring and our restoration actions to understand the responses of larger efforts, at the scale of the Yolo Bypass and Cosumnes Reserve, which will ultimately determine our success or failure? It feels like we aren't, but I would love to hear from the ISB's experts. In nearby oceans, it seems monitoring programs can detect both local and system level responses to management decisions, like changes in commercial fishing rules or establishment of marine reserves (see for example, [http://www.mercurynews.com/science/ci\\_22675397/californias-new-no-fishing-zones-appear-be-working?source=rss](http://www.mercurynews.com/science/ci_22675397/californias-new-no-fishing-zones-appear-be-working?source=rss)). On the other hand, it seems monitoring in the Delta and its tribs isn't detecting population level responses to the billions invested, for example, in actions to restore salmonid habitats or manage diversions to protect smelt, and we don't know if the fault is in the restoration efforts or the monitoring or the scale and duration of our effort. What can the ISB's experience in other regions, like Puget Sound, the Columbia River, or Chesapeake Bay, tell us about how we can put together a monitoring program that is effective at many scales in anticipation of expanded efforts to the restore habitats needed to recover at-risk fish and wildlife.

I thought the suggestion that an objective and independent body, rather than the restoration agency, should be responsible for monitoring outcomes was unusual. I'm not aware of anywhere that is done in the valley, although I suppose one might think use of specialized subcontractors, such as PRBO's monitoring of birds at riparian restorations and SF Bay tidal marsh restorations or USGS' work at some Bay area marshes, is a half step in this direction. I would worry that separating monitoring functions from management and design functions would decrease learning by restoration agencies, while adding administrative complexity. If there are other big ecosystems around the US where the approach recommended by the ISB is employed, it'd be good to cite them,

with some reference to why they are superior to our current practices. Otherwise it'd seem to suffice to have independent peer review of results.

Assessment. This was where I looked hardest for some taste of the ISB's observations on how restoration outcomes are being assessed. Is assessment just not happening, or did the ISB hear some about this but not yet reflect it in the report?

Adaptive management. Another useful structure for the report, I think, would be to reflect on how Delta restoration projects are employing scientific research, monitoring, and assessment activities in each of the nine steps in the Delta Plan's adaptive management framework. This would both remind restoration practitioners and monitoring agencies about how the 9-step framework can be applied and ground the ISB's advice in its statutory charge. Did the projects and programs the ISB reviewed employ the framework? How many were at what step in those processes? Are there standout examples of projects doing a great job (or maybe not a great job) of using scientific research, monitoring, and assessment in one or more of these steps? Where can more be done to apply scientific research, monitoring, and assessment in these activities? My sense is that the report's recommendations regarding goals, connectivity, and modeling, among others, address these issues, but since they are not tied back to the 9-step framework, the recommendations are less powerful than they might be.

I also wonder if the ISB has observations about what the research and monitoring efforts it reviewed say our ability to move from pilot scale to full scale actions to restore ecosystems. Many seem to feel that experience on the Cosumnes and Sacramento and San Joaquin River floodplains can leave us confident about many aspects of our approaches to restoring riparian habitats, but that we are still feeling our way in restoring tidal marshes, managed floodplains like the Yolo Bypass, and other Delta habitats. Did the ISB learn anything that would suggest where can proceed with confidence (so that we can shift research and monitoring resources to where they are most needed) and where a more experimental approach is needed?

I also wonder if the ISB can offer advice on what kinds of restoration questions could most benefit from more carefully-designed pilot scale projects. Bay area efforts seem to be doing this well, using restoration of different baylands or salt ponds to experiment with varying approaches to restoration or to see how alternative management approaches affect birds, fish, water quality, or whatever. They also appear to be deliberately testing on a pilot scale potential approaches to adapting to sea level rise. Are we taking full advantage of opportunities in the Delta to do the same? Are we organizing our restoration efforts to ask these questions when restoration projects are prioritized, designed, and selected? Again, maybe the USGS' reports about the Bay area offer a point of comparison.

I'd also encourage the ISB to draw more strongly on their expertise about what is working in other regions in offering remarks about these issues. I was struck, for example, by their observations on the ambiguity about Delta restoration goals (Adaptive management step 2) and their relationship to individual projects' selection (Adaptive management step 4) and design (step 5). My Bay area friends say their *Goals Report* is among the keys to their progress in restoring SF Bay's baylands, so I accept the ISB's observation. And yet the Delta doesn't lack for restoration goals, as we have DFG's *ERP Conservation Strategy*, drawing on the prior experience with the CALFED *Multispecies Conservation Strategy* (MSCS) and its *ERP Strategic Plan*, and reinforced with specific targets for restoration set out in the various BIOPs, the joint venture's waterfowl management plan, etc. Is there something that experience elsewhere could tell us about best practices in linking such strategic documents to restoration projects at key steps in the adaptive management process, so we can take advantage of that experience to accelerate our progress here? This is an example of where the ISB's expertise could be employed to strengthen its general observations.

Recommendations to the Science Program and others. The ISB's recommendations suggest some of what ought to be done, but seldom who ought to do it. I can understand their hesitancy to suggest roles for agencies with whom they may be less familiar, but are there specific activities they would encourage the Delta Science Program to undertake? Roles for the Delta Plan implementation committee or for the Council staff advising project sponsors during early consultation on covered actions? Are there topics that need attention in the Delta Science Plan? The ISB knows you, the rest of the DSC program, and the Delta Plan well enough to suggest ways we ought to be responding to their recommendations, some of which could be encouraging those in other organizations to step up their game. I noted their hope the Science Program would receive long-term funding and more staff, but not a suggestion about how those resources could be used to respond to the reports' recommendation.

Review of the draft report. Will the agencies that participated in the review have an opportunity to review and comment on a draft of the report before it is made public? That seems to be the best practice for the Science Program and the NRC's reviews, and could avoid needless misunderstandings.

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