



Coalition for a Sustainable Delta

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May 8, 2015

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Re: *Interim Science Action Agenda*

Dear Dr. Goodwin:

This letter is being submitted on behalf of the Coalition for a Sustainable Delta to provide comments on the 2015-2016 Draft List of High-Impact Science Actions. The Coalition for a Sustainable Delta (Coalition) is a California nonprofit corporation comprised of agricultural, municipal, and industrial water users, as well as individuals in the San Joaquin Valley. The Coalition and its members depend on water from the Sacramento-San Joaquin Delta (Delta) for their continued livelihood. Individual Coalition members frequently use the Delta for environmental, aesthetic, and recreational purposes; thus, the economic and non-economic interests of the Coalition and its members are dependent on a healthy and sustainable Delta ecosystem. The Coalition is actively engaged in scientific endeavors, including collaborative science and adaptive management programs, as well as regulatory and litigation activities in efforts to contribute to a sustainable Delta.

As you know, the Coalition has provided comments on both the Delta Science Plan and the Interim Science Action Agenda (ISAA) as those documents were being developed. Many of those comments are relevant with respect to the Draft List of High-Impact Science Actions. In particular, we believe our comments on the ISAA are relevant and should be considered; as a consequence, we are submitting them as an attachment to this letter.

At the time of the ISAA, we expressed serious concern regarding the decision made to generate a laundry list of activities, but not to prioritize among actions. Since that time, four priority areas were identified as described in the Draft List of High-Impact Science Actions. However, the identified areas are too general and at the same time not parallel, so that the guidance they

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provide is minimal. "Science support for management of estuarine and migratory species" is so general an area of inquiry as to be meaningless as a tool to define appropriate science actions.

Stepping down from these four priority areas, the Draft List of High-Impact Science Actions document develops to categories of actions: rapid response science actions and longer-term science needs. These are summarized in Table 1 as actions A-I and in Table 2 as actions i-vi. We have three major concerns regarding these tables.

1. Whereas in some cases, the actions are detailed and specific, in others they are too vague. For example, whereas the action to conduct a peer review of the winter-run Chinook salmon life-cycle model meets this criterion, the action immediately below it to fund research identified by various efforts is unacceptably ambiguous. This may be remedied through the rigorous application of criteria to assess potential actions included in the Draft List of High-Impact Science Actions. In particular, each action should address a specific uncertainty or answer a specific question that must be addressed or answered to assure that conservation and restoration management actions undertaken are effective and efficient, and, in the case of the Table 1 actions, should be feasible to implement within the next two years. (Draft List of High-Impact Science Actions, p.3.)
2. The high-impact science actions must be management relevant. It is likely that this criterion may be most easily met by framing the action using one or more management-relevant hypotheses that can be investigated using data collection (or analysis of standing data sets) in experimental frameworks to address specific uncertainties. The importance of management relevance permeates the ISAA and Draft List of High-Impact Science Actions. (E.g., Draft List of High-Impact Science Actions, p.3 -- indicating an intent to focus on actions "that would provide best available science to managers and policymakers.") It is unclear how, for example, conducting a technical review of current reports concerning the drought would be management relevant, even if it provided enhanced insight on the effects of the drought.
3. Without any indicia of the scope, duration, and cost of the actions, it is not realistic to evaluate or prioritize them. As a consequence, it is imperative to provide at a minimum rough parameters, including time to completion for each intended action.

If the Delta Plan Interagency Implementation Committee addresses these concerns going forward, we are confident that this will benefit the Science Action Agenda and contribute to the production of scientific information to inform better management decisions. We appreciate the opportunity to comment on the Draft List of High-Impact Science Actions, and we look

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forward to continuing to work with the Delta Science Program to develop high quality science to inform decision-making in the Delta for the benefit of its native species and society at large.

Sincerely,

A handwritten signature in black ink, appearing to read 'William D. Phillimore', with a stylized flourish at the end.

William D. Phillimore

Encl.

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October 7, 2014

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Re: *Interim Science Action Agenda*

Dear Dr. Goodwin:

This letter is being submitted on behalf of the Coalition for a Sustainable Delta to provide comments on the *Draft Interim Science Action Agenda* (ISAA). The Coalition for a Sustainable Delta (Coalition) is a California nonprofit corporation comprised of agricultural, municipal, and industrial water users, as well as individuals in the San Joaquin Valley. The Coalition and its members depend on water from the Sacramento-San Joaquin Delta (Delta) for their continued livelihood. Individual Coalition members frequently use the Delta for environmental, aesthetic, and recreational purposes; thus, the economic and non-economic interests of the Coalition and its members are dependent on a healthy and sustainable Delta ecosystem. The Coalition is actively engaged in scientific endeavors, including collaborative science and adaptive management programs, as well as regulatory and litigation activities in efforts to contribute to a sustainable Delta.

The ISAA should be revised to address the following comments, which are described in greater detail below.

- 1) In a time of limited resources and with multiple competing demands for support of science, prioritization of research, monitoring, and modeling is essential. Once the Delta Science Program undertakes the priority-setting exercise it described in its *Delta Science Plan*, it is incumbent on the Program to resolve the most contentious issues at the interface of water use and ecosystem and species protection as its very top priority.
- 2) The science agenda must be led by the information needs of the regulatory agencies by prioritizing data collection and analyses that can support decisions made under their

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authorizing legislation. In that context, the emerging Delta science agenda should be couched as explicit “management-based hypotheses,” not science actions areas.

- 3) Priority research, monitoring, and modeling should be evaluated for its ability to support the structured process leading to adaptive management and its implementation.
- 4) Data and findings that emerge from research, monitoring, and modeling funded by federal or state agencies should be available in user-accessible formats as they are collected and compiled to facilitate replication and allow for further study using emerging techniques and approaches.

The *Delta Science Plan* describes the Science Action Agenda as a document that “prioritizes and aligns near-term science actions to inform management actions and achieve the objectives of the Delta Science Plan.” *Delta Science Plan*, p. 3 (Dec. 30, 2013). It goes on to state that “[t]he Action Agenda identifies priorities for science activities ... to address decision-makers’ ‘grand challenges’ over a four-year period,” and “direct resources to the highest priority issues.” *Ibid.* at pp. 9, 11. Appendix C reinforces this focus of the Science Action Agenda: “The Action Agenda will contain prioritized science activities for addressing decision-makers’ grand challenges and other management issues on a four-year cycle.” *Ibid.* at App. C.

In our view, the Delta Science Plan provides *precisely the right focus* for the Science Action Agenda. The essential components of the Science Action Agenda are establishment of priorities and linkages between those priorities and (potential or actual) management actions, particularly those actions intended to address so-called grand challenges. Heretofore, these two essential components have been lacking as hundreds of millions of dollars have been spent on research without first establishing priorities (or even in spite of priorities established). Importantly, insufficient emphasis has been placed on the need to focus on science that informs better management of the system.

In part, this can be attributed to the patchwork institutional framework that overlays the Delta. A host of local, regional, state, and federal agencies have overlapping – and in some cases, conflicting – statutory mandates. This leads to fragmentation that undermines sound public policy. Daniel J. Fiorino, *Making Environmental Policy*, p.7 (1995). Bureaucracies have arisen within these agencies that seek to protect or expand their turf and tend to resist alternative paradigms, as well as new data, study approaches, and analytical tools. (Explanations of this behavior can be gleaned from Herbert Simon, *Administrative Behavior* (4th ed. 1997) and Thomas S. Kuhn, *The Structure of Scientific Revolutions* (3d ed. 1996).) This is one explanation, for example, for the fact that, whereas the first biological opinion issued for winter-run Chinook salmon after its emergency listing in 1993 called for the development of a life-cycle model, the National Marine Fisheries Service is only now (more than 20 years later) in the process of finalizing such a model.

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Unfortunately the ISAA arrives with the disclaimer that “[w]hile the full science action agenda will result in a prioritized list of areas for investment in science, the order of science action areas and actions in this interim document does not indicate priority.” ISAA, p. iii (Sept. 9, 2014). Accordingly, it is not at all clear how the ISAA meets the criterion of being “an important element of a Delta Science Program designed to meet the Delta Reform Act’s mandate that key decisions be based on the best available science.” Ibid. Rather the ISAA is an uncritical list of categories of inquiry and action areas that have appeared repeatedly in agency documents over the past two decades.

In our view, it is an abrogation of responsibility for the Delta Science Program to produce a Science Action Agenda that does not prioritize its actions. (An absence of vision and priority-setting was central among the shortcomings of CALFED that led the Little Hoover Commission to characterize it as muddled and bureaucratic, see *Still Imperiled, Still Important* (2005).) In a time of limited resources and multiple competing demands, prioritization is essential. And, once the Delta Science Program undertakes the priority-setting exercise it described in its own *Delta Science Plan*, it is then incumbent on the Program to put at the very top of the actions list the research, monitoring, and modeling necessary to resolve the most contentious issues at the interface of water use and ecosystem/species protection (i.e., informing decision-making regarding the efficacy of actual or potential water supply management actions). While listing 17 issue areas may not seem on its face to be an ineffective means of organizing an omnibus research agenda, it perpetuates an approach that has spent hundreds of millions of dollars on research, monitoring, and modeling actions, and activities that clearly are not priority investigations, while having left the ecological relationships asserted in numerous reports and regulatory documents unaddressed. The ISAA seems to portend another uninspired and inadequate approach to understanding the structure and function of complex and broken Delta ecosystems, when hypothesis-driven approaches are needed to bring pertinent scientific inquiry to the most pressing resource management challenges facing California. (The importance of such approaches, as distinguished from the vast majority of research underway in the Delta, is described in John R. Platt, *Strong Inference*, 146 *Science* 3642 (1964).)

Doubtless there is some marginal benefit to an omnibus laundry list of technical issue areas of concern to Delta resources managers, but the ISAA is not what was promised in the *Delta Science Plan*; and it fails as an intermediate step to a science agenda in service of ecosystem protection and societal use of the Delta by resolving the most immediate and pernicious questions that face Delta decision-makers. The appropriate alternative to the ISAA begins with the direction set out clearly in the *Delta Science Plan* – priority setting focused on informing management actions to address grand challenges. The Delta Science Program must be more than a mere clearinghouse for agency science projects; it must even be more than a vehicle for improved coordination among agencies with respect to such projects. To serve its function, the Delta Science Program through the Science Action Agenda cannot shy from honest appraisal of the *value of research* measured in terms of its ability to inform policy and management and

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thereby improve decision-making and the *quality of research* measured in terms of rigor and potential to resolve critical uncertainties.

The time has long since passed that science in the Delta is an egalitarian exercise, with each agency and interest group offering up a wish list of research activities. The science agenda must be led by the information needs of the regulatory agencies as they conduct analyses analogous to risk assessments under their authorizing legislation in support of decision-making and adaptive management. In that context, the emerging Delta science agenda should be couched as "management-based hypotheses," not science action areas. The "focused interview template" asks of agencies and stakeholder entities what are "the top five priority science actions your organization will undertake in the next two years." ISAA, App. C. The very rubric and approach being taken in the development of the Science Action Agenda seems off track at this earliest draft stage. The emerging science agenda instead should anticipate scientific investigations (research, monitoring, and modeling) that address the environmental stressors that will be the focus of conservation management actions, by (1) considering alternative management response scenarios, (2) organizing and treating prospective management actions as hypotheses to be tested with the best available data and analytical tools, and (3) using the "science" outcomes to inform operations models that can steer managers to effective, efficient, and accountable management responses to achieve the requisite co-equal goals of environmental stewardship and providing essential water to the State's millions of users.

We believe that research should be evaluated in the context of a structured process to adaptive management to facilitate assessment of its value and quality. Such a process is described in D.D. Murphy and P.S. Weiland, *Science and Structured Decision-Making: Fulfilling the Promise of Adaptive Management for Imperiled Species*, J. Env'tl. Studies and Sciences (2014). The authors describe in some detail the steps in the adaptive management process and highlight those steps that have the potential to be informed by scientific inquiry. They emphasize the importance of hypothesis testing as a means to assess alternative management actions.

Priority setting and a structured approach to evaluation are critically important in light of the limited resources now available to address myriad problems. We urge the Delta Science Program to develop and circulate a second draft ISAA based on the foregoing (and drawn largely from the *Delta Science Plan*). At the same time, we believe that, as priorities are developed, the Delta Science Program should emphasize the need to develop and evaluate a range of management actions -- together with an assessment of the costs and benefits of those actions -- to inform decision-makers and resource managers. We also believe the Delta Science Program should insist that data that emerges from research funded by federal or state agencies should be available in a user-friendly format as it is collected and organized in order to facilitate both replication and further study using emerging techniques and approaches.

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We appreciate the opportunity to comment on the *Interim Science Action Agenda*, and we look forward to continuing to work with the Delta Science Program to develop high quality science to inform decision-making in the Delta for the benefit of its native species and society at large.

Sincerely,

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