

Appendix C

Science Advisory Committee meeting summary

BACKGROUND – SAC MEETING

The following highlights from our discussion of the Pacific Institute Proposal are provided for your deliberations. There were three primary areas of comment – general considerations, general areas for focus and specific issues.

General Considerations

1. The purpose is not to support or reject the Pacific Institute proposal but rather to evaluate the information provided for the purpose of identifying scientific questions associated with the proposal.
2. The Salton Sea Science Office seeks input in the form of a document by the SAC that identifies primary areas where additional evaluations are needed (issues) and recommendations for obtaining those evaluations (i.e. workshops, specific experts or small groups to address specific issues or questions, etc.) to provide a basis for a scientific critique of the proposal.
3. Political and other non-scientific considerations associated with the proposal are not a focus for the Science Office in developing your response.

General Areas For Focus

The following subject areas were identified from the initial proposal discussion and should be considered as areas for general consideration:

1. Causes of fish and wildlife mortality
2. Nutrient reduction processes and amounts
3. Fishery (composition and biomass)
4. Feeding by fish eating birds
5. Recreation (types and compatibility with avifauna needs)
6. Economic development (types of activities and compatibility)
7. Salinity levels (what will they be and when achieved)
8. Monitoring program (who and what)
9. Physical processes (changes from current conditions)
10. Inflows (quality, volume)
11. Water circulation problems
12. Maintenance of shoreline conditions within impoundments
13. Degradation processes
14. Location of dikes relative to encompassing current areas of biological importance

Specific Issues

The following 9 issues and questions associated with those issues resulted from the general preliminary discussion that took place. These can be included, modified, added to, discarded or otherwise adjusted in the report to the Science Office.

1. Issue – Fishery Evaluations
Several questions need to be evaluated relative to the ability of the proposal to provide for a fishery within the impounded areas.
 - a) What species will the proposal impoundments sustain? The issue here is the life cycle needs of species.
 - b) What will be the biomass of the fishery relative to providing a food base for fish eating birds?

- c) Will the impoundments provide for the invasion of new species and if so will competition cause shifts in the species composition of the fishery?
- d) Will the current fish populations be able to adapt to the reduced salinity of the impounded waters?

2. Issue – Food base for birds

The basic issue is what type of changes in the food base for birds of the Sea will occur and how will those changes offset various species of birds.

Will there be qualitative (nutritional values) changes in the food base due to changes in the food chain? If so how will those changes impact the bird life?

Will there be quantitative difference in the food base? Will the food base be sufficient to provide for the bird populations currently present?

Will the foraging behaviors and strategies of birds presently using the Sea be accommodated by the habitat provided within the impoundments?

3. Issue – Disease considerations

Historically, classical type C avian botulism was a significant cause of bird mortality in the deltas of the New and Alamo Rivers. This situation no longer exists, perhaps because of increased salinity. Also, avian botulism was the only disease present for decades. This is no longer true.

- a) Will the impoundments revert to environmental conditions that facilitate the occurrence of classical type C avian botulism?
- b) Will the impoundments enhance or decrease the potential of bird losses from other diseases currently present?
- c) Will the impoundments provide an environment that enhances or decreases the potential for fish disease; either the pathogens currently known in fish such as the parasite *Amyloodinium* or the bacteria *Vibrio*, or provide for invasion of new pathogens from fish populations within the drains?

4. Issue – Main body of the Salton Sea

The degradation of the main body of the Sea will involve a continuum of change involving a large area. The outcomes from those changes need to be fully appreciated.

What will be the time sequence for the loss of the fishery and invertebrates currently fed upon by birds?

How long will it be before a new food base for birds such as brine flies and brine shrimp is available?

What outcomes are likely from the large mass of dead fish and algae that will occur?

How will the changing water chemistry affect algal growth and other biological processes within the discarded portion of the Sea?

5. Issue – Salinity levels within the impoundments.

The chemistry of the northern and southern wetlands will be different due to differences in the quality of input waters, the differences in sizes of these impoundments and volume of water flowing into them.

- a. What levels of salinity are wanted?
- b. Can the desired salinity level(s) be maintained?
- c. What are the time sequential changes that will occur in salinity as the impoundments are being created and after they have been completed?
- d. What are the biological impacts relative to item c?
- e. See disease issue

6. Issue - Recreation/economic development/economic impacts

The smaller sized area available for the activities stated to result in benefits from the proposed project raise a number of questions.

Are the stated use compatible activities with one another and with the level of disturbance tolerated by the species of birds currently using the Salton Sea?

Will bird concentrations within the smaller area available be such that they negatively impact water quality?

Will these impoundments become “contaminant sinks” that result in elevated wildlife body burdens of chemicals that are incompatible with recreational use of the fish and birds?

7. Issue - Flow rates/volume

The hydrology and dynamics of the impoundments will be different than that of the Salton Sea. Significant questions needing to be evaluated include:

- a. Sedimentation rates
- b. Contaminant loading
- c. Water retention time (turnover)
- d. Water temperature
- e. Circulation
- f. Invertebrate population (spatial distribution and abundance by time of year)
- g. Fish lifecycle needs
- h. Seasonal changes in salinity

8. Issue – Constructed Wetlands

The proposal calls for constructed wetlands for nutrient and selenium reduction to be built in conjunction with the impoundments.

- a. How many wetlands of what size and how far from the impoundments?
- b. What is the spacing between wetlands?
- c. How much water loss will occur as the water passes through those wetlands?
- d. Will the wetlands concentrate contaminants in a manner that they are biologically available to the fauna present?
- e. What nutrients are to be reduced?
- f. Are the wetlands permanent throughout the year or transient?
- g. How will these wetlands effect the species present and spatial distribution of numbers of those species?
- h. Are these wetlands to be used for recreation, if so what types and how compatible are those uses with current bird usage of the Salton Sea?

9. Issue – Constructed Wetlands

Among other questions that need to be explored the following were identified during our dialogue:

- a. What are the fate and transport patterns of selenium within both the constructed wetlands and impoundments?
- b. Will movement patterns of desert pupfish be altered in a manner that leads to genetic isolation?
- c. Will the impoundments result in habitat changes that enhance or suppress desert pupfish populations?

- d. What percentage of the snag habitat used by birds at the Salton Sea will be encompassed within the impoundments? Are there any biological impacts involved?

To assist with the evaluation, the University of Redlands Salton Sea Database Program will provide a map showing the geographic locations for the proposed enclosures. Because Mullet Island is an important nesting island the location of that island will be clearly shown on the map.

The highlights contained in this document were developed from the flip chart pages from our meeting. I have tried to capture the content of our discussion in outline form and hope that this document faithfully reflects that dialogue and places it in appropriate context. All adjustments are welcome.

Milton Friend