

Draft Workshop Summary

Public Workshop #1

Problem Definition

August 9, 1995



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Section 1 Introduction

This report summarizes the results of the first public workshop conducted by the CALFED Bay-Delta Program. The workshop was held August 3, 1995 at the Red Lion Hotel in Sacramento, California. Approximately 125 people attended the day-long event. The session was the first of a series of workshops planned to assist developing collaborative solutions to Bay-Delta problems through an open, inclusive process.

The workshop discussion focused on the problems in the Bay-Delta system that should be addressed by the CALFED Bay-Delta Program. Future workshops will address the program objectives, causes of the problems identified, potential actions to accomplish the objectives, development of comprehensive alternatives, and evaluation and refinement of solution alternatives.

Workshop Format

Lester Snow, program Executive Director, opened the workshop with a brief overview of the purpose and structure of the Bay-Delta Program. He highlighted the steps to develop a lasting, collaborative solution to problems of the Bay-Delta system and the role of the public in those steps. He also presented initial concepts for the geographic scope of the solution-finding process. He explained that the problem set focuses on the geographic boundaries of the Delta and Suisun Marsh and the solution set may include actions in the Bay or ocean, throughout the watershed, or in areas served by water from the Delta.

Dick Daniel, program Assistant Director, provided an introduction to the workshop purpose and topic. He highlighted four key elements of examining and solving problems in the Bay-Delta system: problems, objectives, causes, and actions. He explained that while many people view the Bay-Delta problem in terms of causes of problems or actions that should be taken, the focus of the workshop was to identify the underlying problems to be addressed. Future workshops will discuss objectives, causes, and actions in more detail. He noted that initial thinking about problems in the Bay-Delta system has focused on four resource areas: water quality, ecosystem quality, water supply reliability, and system vulnerability.

The workshop was conducted in a large group discussion to allow for participants to hear and discuss problems and concerns. Approximately ninety minutes was dedicated to each of the four resource areas. Comments were recorded by the program staff on flipcharts.

Five categories were established for recording comments on flipcharts:

- Problems associated with the resource area
- Causes of problems
- Actions to address problems
- Objectives to be accomplished
- Other comments and concerns

Discussion was facilitated to focus on developing a more detailed understanding of problems to be addressed. Program staff probed with participants for additional detail and definition of problems. Causes, actions, and objectives were recorded as they were identified, but these areas were not developed in detail during the workshop.

Section 2 of this summary includes the initial interpretation and synthesis of problems identified at the workshop.

Section 2
Draft Summary of Key Issues

This section summarizes the key problems and issues identified during the public workshop. CALFED Program staff have reviewed the information provided at the public workshop. Staff have summarized and synthesized the information. Staff also reviewed the suggested problems to determine if they are more appropriately listed as causes or actions. Some comments have been recategorized accordingly.

**WATER QUALITY
PROBLEMS**

Water quality in the Delta is insufficient to meet the beneficial uses of Delta water.

Municipal & Industrial (M&I)

The quality of water from the Delta is insufficient for municipal and industrial uses.

Uncertainty related to drinking water standards.

- Uncertainty about how clean is clean enough for drinking water
- Uncertainty about what disinfection by-products are of concern
- Lack of scientific understanding of risks and causes of problems
- Uncertainty over threat from trace radionucleides
- Uncertainty over threat from asbestos

Water quality standards cannot be met on a consistent basis and may not adequately cover all constituents of concern.

- Salinity
- Pesticides
- Agricultural drainage (salts)
- Dioxins
- Treatment by-products
- Pathogens
- Coliform
- Cryptosporidium/giardia
- Taste/odor/aesthetics
- Turbidity (e.g., wind driven turbidity in South Delta)
- Toxics
- Contaminant accumulation in sediments (sediment toxicity)

The cost of meeting these standards is substantial

- Water cost to meet water quality needs

- Cost of treatment and disinfection for drinking water

Agriculture

The quality of water from the Delta is insufficient for agricultural uses.

- Salinity levels are higher than optimal for agricultural use (in-Delta use and export use).
- Suspended sediments and silt are higher than optimal for agricultural use (in-Delta use and export use)..

Environment

The quality of water in the Delta is insufficient to support a diverse and productive environment.

Water contaminants are present at higher than acceptable levels.

- Pesticides
- Herbicides
- Dioxins
- Heavy metals
- Hydrocarbons
- Salinity (from agriculture drainage)

Water parameters are not optimal for ecosystem function.

- Temperature (too high)
- Dissolved oxygen (too low)
- Turbidity (match to organism needs)
- Nutrients (match to organism needs)
- Total organic carbon (too low)
- Salinity (ocean mixing)

Recreation

The quality of water in the Delta is insufficient for recreational uses.

Most drinking water quality problems are also problems for recreation.

Water constituents are undesirable for water contact recreation.

- Hydrocarbons
- Fecal coliform
- Pathogens
- Algal blooms
- Water hyacinth

Water contaminants are undesirable for non-contact recreation

- Heavy metals in fish (uptake in food chain)

WATER QUALITY CAUSES

Pollutant Causes

- Agriculture and water hyacinth control cause herbicide problem
- Outboard motor effluent causes hydrocarbon discharge
- Car/street runoff/air are hydrocarbon sources
- Lawns/gardens/golf courses etc. (non-agriculture) are source of pesticides/herbicides
- Agricultural drainage increases contaminants in Delta
- Natural runoff and wastewater contribute pollutants
- Toxic spills could contribute pollutants
- Contaminant accumulation in sediment (resuspension of contaminants)

Water Supply Causes

- Reduced water quantity contributes to water quality problems
- Diversion of water from Delta affects water quality (reduces dilution)
- Upstream water operational changes affect water quality
- Hydropower affects water temperature
- Too dependent on water from area of origin to meet water quality needs
- Water cost to meet water quality needs for the environment
- Overdrafting groundwater increases salinity intrusion into groundwater basins

Natural Constituents Causes

- Total organic carbon in Delta contributes to treatment by-products
- Salinity intrusion in Delta raises salinity in drinking water supplies
- Salts from agricultural drainage raises salinity in water supplies
- Sediments and silt south of Delta (plugs sprinklers)
- Wind driven sediments increase turbidity in South Delta
- Sediments bury fish eggs and silt up channels (habitat connections)
- Sediments affect navigation
- Algal blooms reduce dissolved oxygen
- Groundwater contamination of inland aquifers from salinity intrusion
- Net rate of salt accretion due to salinity intrusion

Other Causes

- Water quality regulations constrain actions
- Politics constrain actions

WATER QUALITY ACTIONS

- Watershed management improves water quality
- Reduce entitlement for water from Delta

WATER QUALITY OBJECTIVES

- Need to define what we are looking for as a preferred condition

ECOSYSTEM QUALITY PROBLEMS

The quality of the habitat types and abundance of species making up a diverse and productive ecosystem have declined.

Aquatic Habitat

Aquatic habitat in the Delta is insufficient to support a diverse and productive ecosystem.

The abundance of aquatic habitat is insufficient to support a diverse and productive ecosystem.

- Loss of intertidal wetland exchange areas
- Loss of small channels - fresh and saltwater habitat
- Reduction of estuarine habitat
- Reduction of critical habitats (e.g., spawning)

Water conditions in the Delta are insufficient to support diverse and productive aquatic habitat.

- Alteration of transport flows
- Alteration of size and location of mixing zone
- Reversal of natural flows
- Migration patterns altered by structures

The function of aquatic habitat is insufficient to support a diverse and productive ecosystem.

- Reduced biological productivity
- Decline in near-shore zooplankton
- Enhanced and unnatural predation

Wetland Habitat

Wetland habitat in the Delta is insufficient to support a diverse and productive ecosystem.

The abundance of wetland habitat is insufficient to support a diverse and productive ecosystem.

- Historic and continuing reduction of wetlands habitat
- Reduction of tule marshes
- Decline of saltwater marsh

Water conditions in the Delta are insufficient to support diverse and productive wetland habitat.

- Transformation of saltwater marsh to freshwater marsh

The function of wetland habitat is insufficient to support a diverse and productive ecosystem.

- Reduced biological productivity
- Reduction of native plant species

Terrestrial Habitat

Terrestrial habitat in the Delta is insufficient to support a diverse and productive ecosystem.

The abundance of terrestrial habitat is insufficient to support a diverse and productive ecosystem.

- Reduction of high quality terrestrial habitat
- Reduction of land uses which support terrestrial habitat

The function of terrestrial habitat is insufficient to support a diverse and productive ecosystem.

- Reduced biological productivity
- Reduced biological inputs from terrestrial habitat into the Delta
- Reduction of corridors to connect terrestrial habitats
- Increase in salts in San Joaquin Valley

Riparian Habitat

Riparian habitat in the Delta is insufficient to support a diverse and productive ecosystem.

The abundance of riparian habitat is insufficient to support a diverse and productive ecosystem.

- Loss of small Delta islands and associated habitat
- Loss of tall trees which provide cover and temperature control for aquatic habitat
- Reduction of land uses which support terrestrial habitat

The function of terrestrial habitat is insufficient to support a diverse and productive ecosystem.

- Reduced biological productivity
- Reduction of connectivity of riparian habitats

Species

Populations of certain species do not indicate a healthy and productive ecosystem.

Populations of desirable species have declined.

- Decline in aquatic species populations
 - salmon
 - Reduced survival of salmon as they pass through Delta
 - delta smelt
 - striped bass
 - starry flounder
 - green sturgeon
 - longfin smelt
 - splittail
 - bay shrimp
- Decline of neotropical migrant songbirds
- Several species are at risk of extinction

Populations of undesirable species have increased.

- asian clam
- water hyacinth
- non-native grasses

Natural Process

The natural processes of the Delta are insufficient to support a diverse and productive ecosystem.

The integrated functions of the habitats and species in the Delta are insufficient to support a diverse and productive ecosystem

- Insufficient nutrient transport
- Insufficient species transport
- Reduction in the diversity of habitats
 - Within specific habitat types
 - Mix of habitat types

The connections between habitat types have declined; habitat has become fragmented.

- Reduced connectivity of river systems
- Reduced connection between river systems and other habitat types
- Reduced connection between rivers and floodplains
- Reduced access to habitat by dependent species

The management of species and habitats is insufficient to support a diverse and productive ecosystem

- Increased dependence on human management
- Increased management for single species versus system management

ECOSYSTEM QUALITY CAUSES

Causes of Species Problems

- Ballast water releases bring exotic species
- Changes in habitat and other perturbations reduce species populations
- Structures cause enhanced predation
- Poaching reduces populations, must be considered in harvest regulations
- Unscreened diversions reduce fish populations
- Structures block migration
- Enhanced and unnatural predation reduces populations
- Limitation of critical habitat reduces populations
- Reverse flows confuse fish

Water-based Causes of Habitat Problems

- Changes in water flow and timing affect habitats
- Dredging alters aquatic habitat
- Boat wakes alter shallow water habitat
- Removal of woody debris and snags reduces protective cover
- Boat wakes disturb riparian habitat
- Channelization increases water flow
- Reversal of natural flows affects size and distribution of habitat
- Decreased residence time of water in the Delta reduces nutrient availability

Land-based Causes of Habitat Problems

- Changes in upstream areas affects quality of Delta uses
- Changes in land use and land management in the Delta and upstream affect habitat quality
- Sediments and silts in the headwaters cause problems in Delta
- Changes in land use result in loss of habitat and reduced water quality
- Land uses that support habitat are threatened
- Design of Delta channels affects riparian habitat
- Loss of riparian habitat increases water temperature
- Riprap levees have caused the loss of riparian habitat and shade, raising water temperature
- Loss of escape cover reduces habitat quality
- Terrestrial habitats in Delta are dependent on levees

- Levees are habitat
- Subsidence makes it harder to restore habitat - land too low
- Agriculture-based wetlands contribute to other Delta problems (salts, herbicides) (asked as a question)
- Intrusion of exotic plant species into wetlands reduces habitat quality
- Displacement of desirable native species by undesired species affects ecosystem dynamics and habitat and reduces diversity
- Water diversions divert biological productivity
- Human management requires tradeoffs between habitats

Other Causes

- Regulatory system makes it difficult to recreate habitats

ECOSYSTEM QUALITY ACTIONS

- Need more shallow water rearing habitat upstream during low-flow conditions
- Dams are a surrogate for nature (sediment trap and temperature control)
- Harvest regulation must consider illegal harvest

ECOSYSTEM QUALITY OBJECTIVES

- Diversity of self-sustaining habitats in Delta
- Re-establish desirable natural communities
- Need to understand how system did work

OTHER ISSUES IDENTIFIED

- Funding for restoration is inadequate
- No funding source
- Many habitat changes occurred a long time ago
- Some habitat changes are more recent -- such as riprap

WATER SUPPLY PROBLEMS

The supply of water from the Delta is insufficient to meet the beneficial uses dependent on the Delta.

The Delta water supply quantity and timing do not meet short- and long-term expected demands.

- Agriculture
- Municipal/Industrial
- Environment

Delta water supplies are not reliable nor predictable.

- Agriculture
- Municipal/Industrial
- Environmental

Constraints on flexibility impede optimal water management.

WATER SUPPLY CAUSES

Causes of Predictability Problems

- Lack of understanding of system yield decreases reliability of predictions and forecasts
- Endangered Species Act fish take limits create uncertainty in modeling of water availability and predictability
- Premise that adequate Delta outflow was in the range of 1200 to 1500 cubic feet per second, advanced when CVP and SWP were developed, has led to unrealistic forecasts of water availability
- Lack of certainty about accretions and depletions in dry years reduces predictability
- Conservative estimate of available flow due to early forecast each year reduces water availability
- Lack of knowledge of water use patterns increases uncertainty
- Predicting need for water is difficult because there is incomplete understanding of how much water is diverted
- Inadequate understanding of how much, when, and where water is taken causes unpredictability

Causes of Flexibility Problems

- Inadequate and arcane legal system to deal with water rights constrains flexibility to meet water needs
- Competition for water occurs when users are at their peak demand, causing increased urgency and conflict
- The regulatory process for water transfer constrains transfers
- California water supply is not reliable due to regulatory climate
- The timing of water availability constrains transfers
- Uncertainty in area of origin statutes. Public trust doctrine.
- Dependence on water from Delta reduces flexibility

Causes of Water Supply Problems

- Wrong location for a diversion reduces export availability
- Lack of upstream and downstream storage reduces supply availability
- Design of system doesn't allow for separation of water for different uses
- Lack of ground water management contributes to water reliability problem
- Lack of conjunctive use contributes to water reliability problem
- Insufficient facilities to allow for ground water storage
- Inadequate use of water management techniques reduces available water
- Insufficient use of operational and management tools reduces water availability
- Insufficient or fluctuating water levels reduce ability to divert water
- Increasing demand results in inadequate supply
- Cropping patterns increase water needs

Other Causes

- Trying to meet water quality requirements of the Delta with water from a few rivers rather than all results in unfair use of water
- Cost of other sources of water (desalination) force continued look at surface and ground water
- Pricing of water does not maximize beneficial use
- The exotic zebra mussel will impair flow through fish screens

WATER SUPPLY ACTIONS

- More storage
- Water transfers (voluntary)
- Conjunctive use
- Groundwater recharge
- Change water prices
- Change crop patterns

WATER SUPPLY OBJECTIVES

- Greater fairness and equity in use of water to meet water quality requirements
- Flexibility of solutions
- Measure acceptable reliability
- Reduce conflict among users

OTHER ISSUES IDENTIFIED

- Two af/acre more evaporation from flooded islands than from evapotranspiration of agriculture
- Measure water consumer satisfaction (to identify when you're done)

SYSTEM VULNERABILITY PROBLEMS

Important functions of the Delta are vulnerable to upset or disaster.

Water supply functions of the Delta are vulnerable to upset or disaster.

- Delta is the vulnerable component of the water supply system.
- Water supply aqueducts cross the Delta

Delta infrastructure is vulnerable to upset or disaster.

- Roads and bridges
- Wells
- Power facilities
- Other pipelines
- Strengthening some levees transfers problem

Delta land use is vulnerable to upset or disaster.

Delta habitat is vulnerable to upset or disaster.

- High cost of failure with current land use (lack of knowledge of total cost of failure)

SYSTEM VULNERABILITY CAUSES

- Flood management and reduction of upstream floodplains affects Delta functions
- Levee failure would affect water quality
- Land uses affect levee stability
- Boat traffic (waves) erodes unarmored levee surfaces
- Uncoordinated releases upstream raise water levels against levees
- Extreme fluctuation and range of water levels reduces levee stability
- Subsidence in Delta reduces levee stability
- Rising mean sea level reduces levee stability
- Other upstream solutions may exacerbate Delta levee stability problems

SYSTEM VULNERABILITY ACTIONS

- Flood islands
- Disaster preparedness and contingency planning
- Form SWAT team to respond to emergencies
- Relocate valuable infrastructure that is at risk
- Setback levees - Nature Policy Plan example

- Plan for accretion of Delta soils
- Use clean sediment for levees and other actions
- Comprehensive management approach
- Engineered levees offer more protection
- Extreme high water creates need for riprap (stone protection)

OTHER ISSUES IDENTIFIED

- Unreliability of federal and state funding for flood protection/reclamation
- Regulatory constraints relating to levees
- Funding for levee construction/repairs
- Lack of understanding of levee structure (soil mechanics)
- Subsidence of certain islands is at a level where inorganic soils exist which are not susceptible to continuing decomposition.
- Can't fix part of levee problem, need to address 100%
- System is brittle - some points are more brittle or vulnerable
- There is a conflict between maintenance of levees and levee habitat
- There is a conflict between maintenance and habitat
- There is a conflict between recreation and levees
- Convert levees to habitat - making them more valuable to protect
- Financial structure in Delta not as solid as before -- banks not lending money as freely as before
- San Joaquin River flows fluctuating and impacting farmers in Valley

General Comments on Overall Process and Approach

- Delta is not broken; it is unravelled
- Think about how problems aggravate others
- If you focus only on those four problems may not have full scope
 - Need people as the cause and should link existing and potential uses to solutions
 - All users need to be involved
- The geographic limit of the problem set is too narrow; different from solution geographic limit
- Delta broken because some Delta functions depend on water from outside watershed
- Another way to "map" the problem - start with a phenomenon and look at causes
- Incorrect to say "the Delta is broken because of high levels of total organic carbon (TOC)"; TOC is not a problem in the Delta, but only when you treat Delta water for drinking
- The Delta is not meeting beneficial uses
- Another way to frame the problem: people have different sets of objectives; something which prevents them from attaining their objectives is a problem
- We don't understand very well how these problems work; we need adaptive management
- Beneficial uses of hydropower negatively affected by potential water quality changes
- Impacts of solutions on water supply outside Delta (upstream)
- Area of origin issues
- Think about the quality of water and sediments