

Letter Snow, CALFED Bay-Delta Program  
19 September 1999  
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- oat: Cherokee Waterbed Group
- Southern California Waterbed Alliance
- Butte Environmental Council
- Berkeley Ecology Center
- Terrace Magazine
- Sonoma Zoology Center
- Urban Creeks Council
- Shasta-Tehama Bioregional Council
- Clean Water Action
- Environmental Water Caucus
- Anderson Valley Advertiser
- Pacific Institute for Development, Environment, and Security
- Alice Hillsbrand
- Californians and the Land
- Sierra Nevada Alliance
- Center for Political Ecology
- Friends of the River



LEAGUE OF WOMEN VOTERS OF CALIFORNIA

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September 21, 1999

Mr. Rick Brailenbach  
CALFED Bay-Delta Program  
1416 Ninth Street, Suite 1155  
Sacramento, CA 95814

RE: Comments on the Draft Programmatic EIS/EIR of June, 1999

Dear Mr. Brailenbach:

The League of Women Voters of California submits these comments on the Draft Programmatic EIS/EIR of June, 1999.

First, we would like to acknowledge the improvement over the March 1999 draft. An enormous amount of work has gone into producing this Draft PEIS/R. However, we believe much work remains before the Record of Decision (ROD).

Our first concern is restoration of the Bay-Delta Ecosystem. Increased freshwater flows to protect fish and wildlife and ensure water quality for humans and the environment, especially in dry years, are critical to this goal. CALFED needs to better articulate how these flows would be acquired and maintained. Methods of obtaining additional flows for the environment should be more thoroughly explored and scientific studies to better define the freshwater needs of the Estuary's fish and wetland resources should be an ongoing part of the program. Assurances for guaranteeing these freshwater flows should include limits on the amount of water to be exported through or around the Delta.

CALFED needs to meet its objectives for Ecosystem Restoration, Water Quality, Water Supply Reliability, and Levee Stability by placing primary emphasis on non-structural solutions first: ecosystem restoration, conservation, reclamation, reoperation of the existing system, pollution prevention, and drinking water treatment. These options will be the least damaging environmentally and should be optimized during the Phase I (Years 1-7) before the decision is made to build new or expanded surface storage, canals, or conveyances facilities. This phased decision-making approach should be followed instead of the current Preferred Alternative identified in the Draft PEIS/R.

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The EIS/EIR should provide a more complete discussion about the nature of the environmental review that will take place for future projects under the Program. A commitment should be made that a project-specific EIS/R will be prepared for each new facility. As part of this complete environmental documentation, CALFED needs to complete the work referenced as Phase II Report Commitments Before or at Time of ROD. These commitments include Draft Water Management Strategy; Record of Decision (ROD) Document (a); Comprehensive Monitoring and Research Program (CMARP) for Stage 1a actions; Site-specific NEPA/CEQA etc. for Stage 1a Actions.

- Additional Commitments by the time of ROD include:
  - Final Water Management Strategy
  - "Programmatic" economic analyses
  - Measures of success of WMS tools "fully defined"
  - Details of Environmental Water Account for implementation immediately in Stage 1
  - Linkages and assurances for new storage

- Government
  - Interim Governance Implementation
  - New Framework Agreement for Policy Team
  - New FACA Charter
  - New MOU on CALFED Program
  - Decision on Long Term Governance Structure

- Finance
  - Final Finance Plan
  - Cost allocation procedures and strategies
  - Specific allocation of benefits
  - Stage 1 cost estimates with cost-share, crediting policy, and Proposed Stage 1 financing strategy

- Regulatory Compliance
  - Programmatic ESA Section 7 Biological Opinion and State Fish and Game NCCP Determination
  - Programmatic Fish and Wildlife Coordination Report
  - CWA 404 Strategy MOA
  - State Board MOA on CWA 401 Certification, Strategy
  - CZMA Programmatic Consistency Determination.

Inconsistencies within the Draft Programmatic EIS/EIR and Appendices should be corrected. The correction of inconsistencies and the Report Commitments completed will need time for public review and comment. If the information significantly changes the draft preferred alternative, CALFED should reissue the Draft PEIS/R.

CALFED has several agency and stakeholder groups working to strengthen various aspects of the program, e.g., ecosystem restoration, agricultural and urban water use efficiency, and water quality, watershed, etc. We believe these efforts should continue and the results incorporated in documentation before the ROD. We would like to emphasize the importance of providing adequate funding to complete this work. CALFED should ensure that resources equivalent to those expended on the studies and preparatory work for new storage and conveyance facilities are available to complete the work on other program elements: ecosystem restoration; water use efficiency; transfers; watershed; CMARP, Water Transfers Clearinghouse, etc.

Work that remains to be done in the many program areas includes development of strategic plans, which include clear goals, measurable objectives, and performance standards at the level appropriate for a programmatic document. As part of the adaptive management embraced by CALFED, strategic plans for each program area should be in place, should integrate adequate elements of the Comprehensive Monitoring and Research Program (CMARP) and include methods of evaluating whether a program is achieving its goals and objectives. This planning process is important for all the common programs. For example, the Watershed Program should incorporate a system that ensures that all of the Estuary's local watersheds are covered by watershed plans and that these plans have restoration of the watershed resources as a primary objective. In all program areas, actions should be explicitly linked to expected results. Also, actions in all program areas should be linked quantitatively to CALFED objectives, e.g., urban water conservation in Southern California should be credited to water needed to protect the Bay-Delta ecosystem.

The Draft PEIS/R needs to better reflect the interrelationships of program elements. For example, the agricultural and urban water use efficiency programs and the watershed programs will produce water quality benefits, which should be quantified and integrated into the water quality program, and also will provide water supply reliability needs which should be credited to flow needs for the Bay-Delta. This integration of program elements and explicit linkage of actions to expected results should be completed before the ROD.

The Water Quality Program is a special concern. CALFED should broaden the Water Quality Program and establish the objective of improving water at the tap, not focus solely on water quality at the pumps. CALFED should put significant resources into achieving public health protection for water quality at the tap, using a cost effective combination of alternative source waters, source control, and treatment technologies. The resources should be equivalent to the resources expended in evaluating options for improving water quality at the pumps.

The Draft PEIS/R needs to establish an environmental baseline that includes full implementation of the Central Valley Project Improvement Act, the Clean Water Act, the Safe Drinking Water Act, the Endangered Species Act, and the State

Water Resources Control Board Bay-Delta Accord standards. CALFED incentives should provide benefits above this baseline. The Environmental baseline also should include the Trinity River Flow Decision and CALFED documentation should incorporate and be consistent with the NEPA/CEQA documentation on the Trinity River decision.

CALFED needs to strengthen the Environmental Justice and Tribal Trust Assets sections of the document. CALFED needs to analyze both urban and rural justice concerns. CALFED should prioritize funding and actions in low-income and communities of color, such as investments in community-based conservation programs. These programs have proved very successful in Southern California and should be encouraged throughout the CALFED solution area.

Completion of the Finance package is another particular concern. Broad based user fees also should be a part of the long term financing for the Ecosystem Restoration Program and other CALFED programs. A mix of public-private partnership funding would be appropriate for: 1) programs that will provide above-baseline ecosystem restoration benefits, 2) programs which will serve to reduce overall water use (e.g., conservation and demand management), and 3) programs which ensure that more end uses can be served without any increase in baseline depletions in the Bay-Delta system. We believe that aggressive investments in programs such as conservation and reclamation that reduce demand on the system can reap great benefits in water supply reliability, water quality, and ecosystem restoration, without further harm to the environment. Methods to assure that at least some of the water gained through conservation and reclamation is reserved for the environment should be addressed.

The levee program should be strengthened to address the widespread land subsidence in the Delta, the underlying cause of levee vulnerability.

CALFED should correct the No Action, 1995 baseline demand projections, which overstate current urban demand (an estimated 800,000 to 1.2 maf). LWVC has submitted extensive comments on the Department of Water Resources' Bulletin 150, which provided data for the baseline demand projections, which we believe are flawed. These comments are attached for the record.

The package of assurances is not coherent and should be packaged together so we can evaluate for balance and ability to implement. CALFED should treat governance, finances, ESA assurances and other assurances developed for each program as a whole. The Draft PEIS/R needs to place greater emphasis on how the planning elements are carried into implementation. This is especially true of the Ecosystem Restoration Program Plan, since restoration of the Estuary is LWVC's primary concern.

Finally, for the record, we would like these comments to incorporate two previous sets of comments submitted on the Draft Programmatic EIS/EIR of March 1998.

IA.7.14.1-1  
IA.7.14.3-1

IPF 5.0-1  
IPF 5.6-1

IPF 5.5-14

IPF 5.4.4-7

IPF 5.4.4-6

LS-23.5-2

IA-22-11  
CR10

IP-1.1-2

These comments are attached. (LWVC comments on Draft Programmatic EIR/EIS of March 1998 and LWVC as signatory to EWC Joint Comments on Draft EIS/EIR.) We also include LWVC Comments on Draft Bulletin 150-98 and the Blueprint for an Environmentally and Economically Sound CALFED Water Supply Reliability Program, for the record.

The League of Women Voters of California remains committed to working with the CALFED agencies to develop a long-term water management strategy for California that will protect and restore the Bay-Delta Ecosystem and provide water quality, water supply reliability, and levee stability benefits to the state.

Sincerely,

*Gail Dryden*  
Gail Dryden  
President

*Roberta Borgonovo*  
Roberta Borgonovo  
Water Director

Attachments: 7/1/98 LWVC Comments on Draft Programmatic EIR/EIS of March, 1998  
6/30/98 EWC Joint Comments on Draft EIS/EIR  
4/16/98 LWVC Comments on Draft Bulletin 150-98  
11/5/98 Blueprint for an Environmentally and Economically Sound CALFED Water Supply Reliability Program

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**CITY OF STOCKTON**

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September 22, 1999

Rick Breitenbach  
CALFED Bay-Delta Program  
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**COMMENTS OF THE CITY OF STOCKTON CONCERNING THE CALFED DRAFT PROGRAMMATIC EIS/EIR AND REVISED PHASE II REPORT**

Attached are the City's comments on the CALFED Draft Programmatic EIS/EIR And Revised Phase II Report.

The City of Stockton is partially within the legally defined Delta and takes great interest in the activities of CALFED and the resulting implementation plans. The City has for many years worked on its own and in concert with others to improve the quality of the San Joaquin River and Delta region and is generally supportive of the approach offered in the Phase II Report.

The City believes that CALFED's program can be even more effective if more emphasis is given to improvement of water quality of the San Joaquin River upstream of Vernalis, the development of a TMDL for Dissolved Oxygen, and in formulating alternatives to address the groundwater overdraft and lack of adequate water supplies for municipal uses in the Eastern San Joaquin Basin.

We appreciate the opportunity to provide input into this very important process for all of the citizens of California.

*Morris L. Allen*

MORRIS L. ALLEN  
DIRECTOR OF MUNICIPAL UTILITIES

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**COMMENTS OF THE CITY OF STOCKTON**

**CONCERNING THE CALFED DRAFT PROGRAMMATIC EIS/EIR AND REVISED PHASE II REPORT**

September 23, 1999

Submitted by Morris L. Allen  
Director of Municipal Utilities



THE LEAGUE OF WOMEN VOTERS OF CALIFORNIA

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RE: Draft Programmatic EIR/EIS of March, 1998

DIRECTORS

Dear Mr. Snow:

**Gail Dryden**  
Special Projects

The League of Women Voters of California (LWVC) is pleased to comment on the adequacy of the March, 1998, Draft Programmatic EIR/EIS (DEIS/EIR) for a long term Bay/Delta solution. We believe the DEIS/EIR is incomplete because of numerous technical, operational and economic gaps and because of the limited range and scope of alternatives covered. *In summary, the Draft does not present adequate information, even in a programmatic format, for choosing a preferred alternative at this time.*

**Anne Henderson**  
Legislative Director

**Fran Krezek**  
Voters Service North

**Emily Penfield**  
Voters Service South

**Margo Reeg**  
Program/Government

**Nina Sabrack**  
Communications

**Ramona Salisbury**  
Program/Natural Resources

The League wishes to thank you for extending the public comment period to July 1. We now understand that CALFED plans to prepare a revised draft by December, 1998, which will identify a preferred alternative, and will again seek public comments early in 1999 before finalizing the programmatic document. The League commends you for agreeing to prepare a second draft and for increasing your outreach efforts.

**Rosie Stephens**  
Member Services South

The League has three major recommendations which we request the DEIS/EIR and CALFED agencies seriously consider in the December document:

**Charlene E. Smith**  
Development

- Craft a fourth alternative based on a reoperation of the existing system with an emphasis on restoration, demand management and conservation which seeks to improve the water reliability and quality for both fisheries and wildlife and California's people.

**Pat Wadleigh**  
Member Services North

- Present a plan to implement the program in stages with increased, intensive monitoring, especially during the next phase, Stage I.

**Allyson Washburn**  
Program/Social Policy

- Analyze how to maximize the implementation of CALFED's common programs, known as the "soft path" approach, as a first step before making a final decision on the construction of expensive, new facilities.

STATE OFFICE

**Carolyn Collis**  
Office Administrator

**Diane Park**  
Development Manager  
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LWVC has signed the comprehensive document submitted by the Environmental Water Caucus (EWC). Its comments reflect a statewide, positive perspective about CALFED's core issues and in depth understanding of the deficiencies in the current draft. The following remarks amplify our three basic recommendations.

**Trudy Schafer**  
Program Director/Advocate

## ADDITIONAL ALTERNATIVES AND STORAGE CONCERNS

### *Alternatives*

Based on the documentation presented in the DEIS/EIR, CALFED should not search for a “silver bullet” solution—because it does not exist. Fisheries experts state that each of the three alternatives would result in some level of impact for species of concern and their lifestages. Because of the unknowns and uncertainties, CALFED must search beyond its present analysis and explore new alternatives in the revised draft, thoroughly examining the economic impacts and fiscal costs, the interrelationships among programs and a staged implementation approach that can meet CALFED’s solution principles.

- As stated in our recommendations, we think there is great merit in exploring to what extent the reoperation of the existing system would meet CALFED’s essential criteria for a viable solution and how reoperation would compare to other alternatives. The analysis should emphasize supply reliability, water quality improvements and environmental benefits achieved through adaptive management approaches and the implementation of the “soft path,” nonstructural common programs. If CALFED’s analysis is comprehensive, the results could shed light on many issues and expand information for choosing a preferred alternative.
- The three choices now presented in the DEIS/EIR seem too vague and narrow in scope. It is unclear how CALFED would integrate the common programs in each alternative, what the differences would be, and the degree to which efficiencies, reclamation, conjunctive use, demand side management and transfers could contribute toward achieving CALFED’s mission and goals. All of them should also include the development of standards in order to monitor results, provide assurances and provide milestones for program achievements.
- Along with researching “Alternative IV” (the reoperation alternative), other possibilities the second draft should explore include the feasibility of (the currently discussed) smaller versions of an isolated facility for Alternative III, and the reconfiguration of Alternative II to be more fish friendly with less entrainment. It is important to fill in technical gaps wherever possible, and to broaden the analyses of existing alternatives as stated above.

### *The Question of Storage*

CALFED presents the same amount or range of storage for all three alternatives. We realize the document is programmatic, however, the DEIS/EIR fails to present convincing evidence that additional offstream or onstream storage is essential to the success of any of the three proposals, or whether additional new surface storage will assist or harm environmental restoration.

Based on the DEIS/EIR, the League prefers no further increase in additional surface storage as part of a CALFED solution. Postponement of a decision seems the more prudent course. However, the League is not against off stream storage *per se*. One of our water positions encourages offstream storage and discourages additional onstream dams. Others stress stewardship of natural resources, an emphasis on nonstructural alternatives, and setting limits on the amount of water exported through or around the Delta. The League has examined water construction projects carefully in the past and will consider their desirability in the future in relation to all League positions, assessing the economic, social, and environmental costs and benefits of water projects.

- We question if “environmental water” (as described in the draft) that is placed in new reservoirs would actually provide net environmental benefits because of the impacts of building new storage

and the lack of a clear definition of the use or uses of “environmental water.” It seems probable that water management techniques could produce the same benefits, with less cost and less interference with restoration. This is a major League concern; we would like more answers since the programmatic EIS/EIR will be used as the focal point for implementation.

- By postponing surface storage decisions, CALFED can expand significantly its knowledge about technical, operational and ecosystem restoration. At the end of Stage I ( five to seven years), new scientific information—the result of increased monitoring—should reveal (1) the benefits received from reoperating the existing system, especially the impact on water quality (bromide issues), and if reoperation shows a need for new surface storage; (2) increased scientific knowledge about ecosystem restoration and fisheries enhancement; and (3) how the implementation of the common programs has worked to the benefit of all stakeholders.
- Also, CALFED must clearly acknowledge the damage incurred from past water development. The record over the last thirty years suggests that increasing exports correlates strongly with decreasing fisheries. The state’s storage capacity, including its share of Colorado River storage, now exceeds 60 million acre feet and depletes unimpaired runoff almost 50%.
- The revised draft should explore, to a much greater extent, the feasibility of examining other options for storage. Examples include additional measures to mitigate past damages from water storage development; additional operational and management changes, thus first maximizing improvements in what now exists; or the purchase of dams and reservoirs which, we understand, P G & E is planning to sell. The next draft, too, should analyze the changes in water flows on the San Joaquin River because of the recent court decision regarding contracts in the San Joaquin Valley. And greater emphasis must be given to developing conjunctive use storage throughout the CALFED watershed.

### **DEVELOPING AND MAXIMIZING “THE SOFT PATH”**

An alternative for maximizing the soft path approach has not received the attention it deserves in the current DEIS/EIR. The following are additional comments to those incorporated in the EWC paper.

#### *Conservation*

The League has a special interest in conservation, or water efficiencies. It is an important non-structural element which the League would like practiced statewide. Water is a resource and we are its stewards. While conservation may not be the total answer for a CALFED solution, it should be a top priority for CALFED and required as an essential first step. We request CALFED—and the DEIS/EIR—to examine the implementation of efficiencies throughout all parts of the CALFED watershed.

- Northern California should be required to reach its conservation potential as well as the Southern part of the state. Yet the DEIS/EIR ignores this possibility completely, discussing northern efficiencies primarily from the Bay Area. CALFED should explore the feasibility of requiring conservation for all areas under its jurisdiction. This would mean figuring out what incentives for land owners and agencies in the Northern Sacramento Valley would encourage—or make it possible to require—the implementation of BMPs or EWMPs in this area.
- The results would be beneficial not only locally but statewide and, we think, cost effective on a statewide basis. For example, increased water savings practiced statewide would result in more

streamflow for fisheries in tributaries, rivers and downstream areas, improved habitat in the upper or lower watersheds which the local areas advocate. Savings could augment groundwater supplies, be used for conjunctive use or environmental purposes, or provide relief in critically dry years.

- We think the DEIS/EIR and CALFED both vastly underestimate the potential for conservation in both the urban and agricultural sector as well as overestimating population growth. The draft figures seem to be based on what the League considers flawed assumptions from DWR's Bulletin 160-98. CALFED should provide its own supporting documentation along with its sources, and seek public comment before finalizing the environmental documentation. (LWVC has written to DWR and has attached a copy of its comments to this letter because of their relevancy.)
- The League is concerned with the disparity between efficiencies proposed for the urban and rural sectors and with the apparent acceptance of these differences by CALFED. League members have participated in both the CUWCC and AB 3616 process and now actively support the progress of the CUWCC. However, the LWVC did not sign the AB 3616 MOU because of its purely voluntary, planning approach. We think the MOU will do little to increase agricultural conservation. CALFED should recognize the AB 3616 MOU only as a starting point and require much greater compliance, adding EWMPs such as pricing reforms. Other issues such as cropping pattern changes and land retirement should be strongly encouraged, perhaps with incentives for landowners. We urge CALFED to take more of a leadership approach and advocate equitable implementation of efficiencies by both urban and rural sectors.

#### *Reclamation or Use of Recycled Water*

The League supports a more aggressive program component in all alternatives for the use of recycled water. We support the concept of a BMP for recycled water as suggested. But, overall, we think that reclamation's potential is minimized in the DEIR/EIS and in CALFED's implementation planning. Again, we urge CALFED to take a leadership role by offering to provide funding assistance where needed, and helping to establish specific goals and criteria.

#### *Fisheries and Habitat Restoration*

We are pleased with the development of the ERPP as recommended by the BDAC Ecosystem Restoration Workgroup. However, we agree with the DEIR/EIS that major unresolved technical issues exist regarding diversion effects on fisheries.

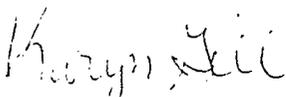
- CALFED has a unique opportunity now to focus on research and monitoring, resulting in adaptive management experiments which increase our understanding of fishery issues. An example is the indirect effects leading to mortality. The DEIS/EIR should examine which research projects should be undertaken and relate these to a better refinement of CALFED's assumptions regarding fisheries protection and restoration goals.
- The restoration goals appear far too meager for the North Bay east of Suisun Marsh as well as the analysis of the impacts of a CALFED alternative on the Bay itself. Since the Bay is an essential part of the Delta/Bay estuary, we question CALFED's cut off point for both restoration and analysis of outflows. We agree that the CALFED program is not charged with solving all California's water problems; however, it seems important for the revised draft to examine the total estuary rather than minimizing one of its largest areas. CALFED should understand the degree of outflow needed to maintain the Bay's health and ascertain what the preferred alternative's impact will be, if any.

- This fits in with another element that could benefit from greater DEIS/EIR analysis: the issue of Delta flow targets, especially flows required in critical years. Further examination should explore nonstructural options that can implement target environmental flows not dependent on water stored in newly constructed facilities. The analysis should also cover the amount of streamflow required for ecosystem objectives that (1) should be augmented now, or (2) should be preserved for future use.
- The League urges expansion of the implementation strategy for environmental water acquisition. A strategy would make more sense if an established environmental water right or water budget was formulated, based on the Endangered Species Act and requirements of other state and federal regulations. This issue should be explored in the revised draft. A water budget could be adaptive, in an equal manner with a budget for other stakeholders based on the water year. But a baseline should be established on the amount essential for habitat/fishery restoration, not only in the Bay/Delta but in its tributaries and streams. We urge CALFED to review this option as part of the final preferred alternative.
- While a number of programmatic streamflow actions for fishery enhancement are included, there is no separate analysis for Eastside tributaries. The DEIS/EIR has lumped these tributaries together with the San Joaquin watershed and appears to assume the impacts are the same. This seems an erroneous conclusion. The League urges CALFED to recognize the importance and special characteristics of the Eastside tributaries.

Because of their complexity, it is hard to write only a little about CALFED's alternatives as presented in the programmatic document. The League hopes to address other issues after review of the next draft, such as finances (water user pays, and fish/wildlife/flood control costs borne by the general taxpayer); assurances (require strong, binding environmental safeguards for any Delta transfer system); regulated transfers (review on a case by case basis in relation to LWVC positions); water quality (a primary emphasis along with conservation); and public participation (a basic League principle).

Like many organizations, the League wants the CALFED Program to succeed. Our members will continue watching the process closely and participate wherever we can. Thank you for this opportunity to express the League's point of view.

Sincerely,



Karyn Gill  
President

Enclosure

## Environmental Water Caucus

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June 30, 1998

Mr. Rick Breitenbach  
CALFED Bay/Delta Program  
1416 Ninth Street, Suite 1155  
Sacramento, CA 95814

Re: EWC Joint Comments on Draft EIS/EIR

Dear Mr. Breitenbach:

This letter represents the comments of the Environmental Water Caucus (EWC) on the CALFED Bay-Delta Draft Programmatic Environmental Impact Statement/Environmental Impact Report (DEIS/R). These comments reflect our global analysis of the DEIS/R and our vision for a positive Bay-Delta solution. Many members of the EWC also will be submitting more detailed comments on specific sections of the DEIS/R. This letter does not necessarily capture the full range of comments that will be submitted by each group, and should not be considered a substitute for careful consideration of all comments that our groups submit separately from this letter.

The CALFED program represents an extraordinary effort to seek protection for the Bay-Delta ecosystem and solutions for the many related issues. EWC recognizes the many accomplishments of the CALFED program and appreciates the hard work of the CALFED staff. At the same time, substantial work remains to be done before consensus can be reached on the selection of a preferred alternative. Our intent in submitting these comments is to provide constructive feedback and recommendations for modifying the proposed programs and environmental analysis so that a satisfactory outcome will be achieved for all. We look forward to working with you and your staff to answer remaining questions and proceed towards an acceptable solution.

### I. Overview

The bulk of our comments relate to specific concerns regarding the common programs and project alternatives. However, certain common concerns emerge across all program elements and are summarized here.

**1) The DEIS/R does not represent an adequate basis for decision making.** As further discussed below in the body of our comments, the analysis in the DEIS/R is incomplete. In particular, the DEIS/R contains numerous information gaps, lacks key technical and economic analyses, and fails to consider an appropriately wide range of alternatives. We are encouraged that CALFED has recognized the document's shortcomings and has agreed to provide further environmental documentation prior to reaching a final decision.

**2) The DEIS/R fails to fully articulate and analyze soft path approaches.** The position of the Environmental Water Caucus continues to be that California must first improve the efficiency of existing water use and the operation of existing facilities, through conservation, recycling, transfers, conjunctive use, and operational changes, before developing new water supply projects or other expensive new facilities.

We urge CALFED to look at how system reoperation, coupled with conservation and markets, can meet all of the program goals. Rather than rushing to build the next generation of unaffordable water projects (and asking the public to pay for them), CALFED should instead explore and implement any number of readily-available alternatives – such as water banking in existing facilities, acquisition of existing dams,<sup>1</sup> appropriately structured conjunctive use programs, water management benefits of wet meadow, floodplain, and riparian restoration, and a host of fiscal and market-based approaches – which can be used to promote improved water supply reliability and water use efficiency in a way that takes full advantage of California's already massively-plumbed waterscape. These are, we believe, the most cost-effective, flexible, and environmentally benign ways to achieve our common objectives over time. The DEIS/R fails entirely to establish that new storage is necessary to achieve CALFED's goals, nor does it include adequate analysis demonstrating that an isolated conveyance facility will benefit endangered native fishes or is necessary to meet water quality objectives.

**3) All program elements should have clear goals, measurable objectives, and performance standards at the level appropriate for a programmatic document.** As a programmatic document, the DEIS/R should contain specific goals and objectives for every program element. It will be necessary to develop these goals in order to monitor progress, to provide adequate assurances, and to develop criteria for phased decision-making.

While the strategic plan for the Ecosystem Restoration Program Plan (ERPP) lays out a path to develop goals and objectives for that program element, we strongly urge that these standards -- clear, measurable goals and objectives; the use of a strategic planning approach that relies on managing adaptively, testing hypotheses, and setting priorities; and independent scientific review - - be applied to all other major components of the long-term solution.

**4) All program elements should be subjected to independent expert review.** The ERPP has greatly benefited from such expert review and we strongly believe that all program elements, including water quality and water use efficiency, would benefit from a similar process. To date, CALFED has relied heavily on workgroups that are typically dominated by urban and agricultural water users to develop many of the common programs. Independent expert review would greatly increase the program's credibility.

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<sup>1</sup> For example, the Pacific Gas and Electric Company announced in mid-June that it will decide by this summer whether to sell or spin off to shareholders some 68 hydroelectric plants in California involving approximately 3.2 MAF of surface storage capacity with an estimated book value of \$1.2 billion.

**5) CALFED must better evaluate the interrelationships of program elements.** While the DEIS/R makes many references to the links between the various program elements, the impact analysis does not reflect these links. CALFED must do a more thorough analysis of the impacts of program links. For example, the water quality benefits of water use efficiency actions should be quantified. These links should be modeled so that impacts can be appropriately reflected in the DEIS/R, and monitored, so that feedback can be incorporated into later phases of the CALFED program. Where quantification is not currently possible, CALFED should outline a strategy to develop such information during the early phases of program implementation.

**6) The DEIS/R fails to establish a comprehensive environmental and financial baseline.** A more comprehensive accounting of all aspects of Bay-Delta water development is essential to clarify the starting point of the CALFED program and to monitor and evaluate the future impacts of the CALFED program. If it is to meet its own "durability" objective, a CALFED solution must include meaningful and comprehensive groundwater management, a finite water-depletion budget, comprehensive water metering, and a robust and protective ecosystem baseline, from which we can evaluate changes.

## **II. Common Programs**

### ***A. Ecosystem Restoration Program Plan***

The ERPP fails to provide an ecosystem restoration plan capable of meeting CALFED's program objectives. Most critically, it lacks clear performance goals and targets and a coherent plan for achieving such targets. We agree with the findings in the DEIS/R that there are major unresolved technical issues in the ERPP regarding diversion effects on fisheries and Delta flow patterns, and that a technical effort to address these issues is necessary. In addition to these issues, we raise the following concerns.

It is clear that the outstanding issues regarding diversion effects on fisheries cannot be resolved in the near term. It is just as clear, however, that a final CALFED decision cannot be made prior to resolution of these outstanding issues. Therefore, CALFED's technical effort should focus on developing a program of research, experimentation and assessment. Any final CALFED decision regarding water management and ecosystem restoration must be phased to allow full incorporation of the results of these technical analyses.

For instance, it is not possible to evaluate whether CALFED's habitat improvements can offset diversion effects unless, first, the Delta habitat restoration and management measures of the ERPP have been described in greater detail (in other words, a clearer picture of the "restored" Delta is available) and reviewed for consistency with the strategic plan when completed, and, second, on-the-ground implementation of the ERPP has been evaluated for actual performance.

It will be extremely difficult in the foreseeable future to assess the relative contribution of various habitat improvements and stressor reductions toward achieving endangered species recovery or other objectives. Given the complexity of the system and the level of uncertainty, the Program

should assume that a comprehensive approach -- one that includes significantly reducing diversion effects on fisheries, restoring habitat conditions and investigating the influence of other factors on fishery objectives -- is necessary.

The focus of the Program's technical effort to resolve this issue subsequent to the release of the DEIR has been on salmon, Delta smelt, and striped bass. EWC believes that CALFED should conduct a comprehensive evaluation of the effects of habitat improvements on all species directly impacted by entrainment or indirectly impacted by changed Delta flow patterns, including splittail and steelhead, in order to resolve this issue.

CALFED should expand its efforts in the following areas:

- Near term species protection is critical. CALFED should further examine how reoperation of the existing system incorporating operational flexibility, transfers, conjunctive use, improved instream spawning and attraction flows through acquisitions, etc., can assist in accomplishing this goal.
- The effects of contaminants on many species of concern are largely unknown. CALFED should commit serious effort to determining the effects of various contaminants such as mercury and selenium on the health of various species. Additional study is also needed on the impacts of these contaminants on seafood consumption safety.
- At this point it is not possible to quantify the benefits to species of concern (i.e., increase in food supply, less predator effects, filtering of toxics, etc) of shallow water habitat restoration in the Delta. CALFED should define "shallow water habitat", better describe its expectations for shallow water habitat restoration, and outline a series of sampling and monitoring protocols that will accompany restoration.
- The effects of exotic species on native species in the estuary are largely unknown. CALFED should further examine impacts associated with species-to-species and species-to-habitat interactions, as well as develop a plan to prevent future introductions.
- The recovery or restoration of fish species of concern is a critical component of the ERPP. However, CALFED has not made an attempt to define these terms. CALFED should determine, with the appropriate regulatory agencies, what is a large enough population to avoid "jeopardy" in contrast with "truly sustainable" populations given the inherent variability that exists on a range of levels. CALFED should use the Delta Native Fishes Recovery Team report in developing these estimates.
- Adaptive management is key to the successful restoration of the species of concern and of the ecosystem in general. CALFED should better define - in detail - how it foresees using the principles of adaptive management to provide near term species protection while moving towards long term ecosystem restoration.

CALFED should sponsor independent scientific review of its technical efforts to resolve these and other outstanding issues.

*Trinity River*

The DEIS/R, the Watershed Management Strategy, and the ERPP inappropriately omit the Trinity River Basin from maps which delineate the "problem", "solution", and even "study" areas for Program effort.<sup>2</sup> This omission is inconsistent with the March 13, 1998 consensus recommendation of the CALFED Ecosystem Roundtable to include the Trinity River basin in the ERPP project area.

The DEIS/R does not describe the impacts of the alternatives on the Trinity River Flow Decision required by Section 3406(b)(23) of the CVPIA. CALFED should remedy the deficiencies of this draft, by including the Trinity River basin on the appropriate maps, by evaluating the impacts of the alternatives on the Trinity River Flow Decision, and by improving the Environmental Justice and Indian Trust Assets sections of the document.

*Tulare Basin*

The Phase II Interim Report includes a map of the watershed for the Sacramento/San Joaquin Delta. The Ecosystem Restoration Program Plan should include, at a minimum, this entire area. This means adding a Tulare Basin Ecological Zone, which was historically and is currently hydrologically connected to the San Joaquin River.

*San Joaquin River*

The Ecosystem Restoration Program Plan inappropriately excludes the main stem of the San Joaquin River from consideration. Friant Dam blocks virtually the entire flow of the San Joaquin River, rendering large stretches of the river dry in most years. In average hydrologic years, no water from the upper San Joaquin reaches the Delta. The dewatering of the San Joaquin in the 1940's extirpated spring and fall runs of chinook salmon, steelhead, and other native fish from the San Joaquin river upstream of the Merced. It also caused the loss or degradation of thousands of acres of riparian forest and wetlands between Friant Dam and the Merced River including the remarkable wetlands of the San Luis National Wildlife Refuge complex and the Grasslands Ecological Reserve.

It will not be possible for CALFED to create an equitable and durable solution for restoring the Bay-Delta ecosystem while ignoring one of the major tributaries in that system. Any restoration program that continues to leave the San Joaquin system dry not only fails to meet the CALFED solution principles, but also misses the tremendous opportunity to create large amounts of habitat, creating benefits for salmon and other fish and wildlife. Ultimately, a restored ecosystem,

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<sup>2</sup> Due to massive diversions out of the Trinity River for more than thirty years, the Trinity River Basin is now artificially linked to the Bay/Delta. These diversions have caused extensive destruction of Trinity River resources and Tribal trust assets, including the chinook salmon fishery.

including a restored San Joaquin River, is the only way to provide long-term water supply reliability.

Furthermore, conditions on the San Joaquin River have led to deterioration of water quality in the Bay-Delta, due in part to increased salinity and other negative impacts of Friant Dam operations on the Bay-Delta. Restoring the San Joaquin could generate significant water quality improvements for drinking water, for the ecosystem, and for Delta farmers.

A recent decision by the federal Ninth Circuit Court of Appeals held that the federal government failed to adequately consider the impact of Friant Dam operations on endangered species. It also rejected the irrigators argument that the Central Valley Project Improvement Act preempts California State Fish and Game Code Section 5937 which requires that all dam operators to release sufficient water to maintain the fishery below the dam. In light of this ruling, CALFED must revise the ERPP to address restoration of the San Joaquin River.

### *B. Water Use Efficiency*

CALFED will not be able to develop a meaningful and effective water use efficiency program until it adequately defines efficiency in its broader sense.. Instead, CALFED invents its own definition of efficiency, saying "efficient water use is characterized by the implementation of local water management actions that increase the achievement of CALFED goals and objectives." (WUE Technical Appendix p. 2-1) While we support the notion of local water management actions that help achieve CALFED goals, that is certainly not synonymous with efficiency.

- We strongly urge CALFED to incorporate basic economic principles into its water use efficiency common program, and to subject the water use efficiency program to review by a panel of economists and other experts. The water use efficiency program will have no credibility until it reflects basic economic principles about supply, demand, and price.

The single most important thing that CALFED can do to promote efficiency is to refrain from including in the CALFED program any new subsidized water supply projects. Creating additional subsidized water reduces the incentive for water users to invest in efficiency improvements.

### *Conservation Potential*

CALFED vastly underestimates the potential for water conservation in both the urban and agricultural sectors. CALFED incorporates many of the flawed assumptions of DWR's Bulletin 160-98 into its projections about current water use and the potential for water use efficiency. Some of the problems carried over from Bulletin 160 include the following:

- DWR mischaracterizes current demand. Recent estimates by the California Research Bureau indicate that DWR overestimated urban demand by 1.6 MAF in the 1995 base year.
- Furthermore, as a result of this flawed baseline data, DWR has developed flawed projections of future demand. DWR past projections about water use have consistently exceeded actual use. Without an accurate baseline on current water use, or a reasonably accurate projection of

future demand, it is not possible to develop appropriate water supply reliability measures, or to accurately assess the costs and benefits of any proposed facilities or other water management actions.

- CALFED adopts from Bulletin 160 the assumption that full implementation of the urban Best Management Practices will generate 1.5 million acre feet of conserved water. However, neither Bulletin 160 nor the CALFED DEIS/R demonstrate how that estimate was generated. NEPA and CEQA require that CALFED provide all of the supporting information and assumptions necessary to evaluate the accuracy of that estimate.
- There appears to be a serious accounting error in Bulletin-160, that is carried forth into the CALFED estimates of water conservation potential. This error relates to whether conservation is credited as providing a reduction in the need for future supplies. We believe that the disparity with how inland vs. coastal conservation is counted may not be justified.<sup>3</sup> We request that CALFED carefully consider this issue and recalculate its estimates of conservation potential
- Similarly, it appears that CALFED adopted Bulletin 160's flawed assumptions regarding the potential for savings from agricultural water use efficiency. In particular, CALFED assumes that no savings can be achieved from changes in evapotranspiration (ET).

Changes in evaporation, such as changes that can be achieved from installation of drip irrigation or other micro-irrigation technologies, reduce the evaporation component of ET. This is a reduction in consumptive use, and should be included in CALFED's estimates of real water savings. Because agriculture uses such a large amount of water, a small reduction in the percentage of applied water lost to evaporation can yield tremendous water savings. Even if some of the reduction in evaporation is made up by increased transpiration, this increase is probably not one for one. CALFED should revise its analysis to reflect the potential water savings through reduction in the evaporation component of ET.

Additionally, the DEIS/R fails to address potential water savings associated with changes in the transpiration element of ET. CALFED has inappropriately excluded from the DEIS/R analysis these potential savings, such as those associated with land fallowing or crop shifting, even though the California Water Code considers these changes to be conserved water.

- Additionally, CALFED calculates the potential for improvements in agricultural water use efficiency based on an assumed existing level of 73% efficiency. There are several reasons to question this assumption. First, CALFED believed that it was adopting Bulletin 160

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<sup>3</sup> This issue, which has been raised with CALFED staff, is more fully described in the attached May 20, 1998 memorandum from the Pacific Institute entitled "Application of Applied Water/Real Water/New Water Distinction in Bulletin 160-98 and CALFED DEIR/DEIS." The memorandum explains that the distinction between "real" and "applied" water is only relevant in situations with fixed demand.

information by assuming existing efficiency of 73%. However, Bulletin 160 does not say that we have already achieved 73% efficiency. Instead, it sets 73% as the level of efficiency that will be reached by 2020. (Bulletin 160, p.4-36) Therefore, the existing level of efficiency according to Bulletin 160 is lower than 73%, and the corresponding potential for improvement is greater.

Second, DWR and CALFED's method for calculating existing efficiency is questionable. Those estimates are based on mobile lab analyses which can test only distribution uniformity. To calculate efficiency from distribution uniformity the lab technician must know the amount of water applied to the field (which is necessarily estimated in most cases due to lack of universal water measurement) and must know the amount of tailwater leaving the field (again, estimated). This technique obviously has a high margin of error.

EWC believes that in Phase 1 of its program CALFED must gather more accurate data on existing levels of agricultural water use efficiency.

- Bulletin 160 and CALFED treat supply and demand as independent quantities despite basic economic theory. Demand does not exist in a vacuum but rather is tied to willingness to pay a particular price for a particular good. Price, if allowed, will work as an equilibrating mechanism to balance supply and demand over time. The water use efficiency program inappropriately excludes consideration of pricing mechanisms to improve water use efficiency. Experience shows that water users will respond to price increases in a variety of ways, including investment in efficient technologies, more intensive water management, fallowing of marginal lands, changes in cropping patterns, etc.
- The cost estimates for conservation measures reflected in the DEIS/R appear to be far too high. CALFED should consult with a wider range of sources in developing these numbers, and also to revise the numbers to reflect that in many cases, such as in new construction, the additional or "marginal" cost of choosing efficient technologies or low water use landscaping is zero.

*Implementation and Assurance Issues*

Once CALFED has correctly calculated the potential for urban and agricultural water conservation, it is still left with the task of developing a program that will reach that potential. The common program described in the DEIS/R is inadequate to achieve that goal.

Urban Implementation

As CALFED knows, representatives of EWC and CUWA have been meeting to develop a joint proposal to CALFED on the urban water use efficiency element of the program. The goal of these discussions has been 1) to develop what would be considered the minimal requirements to meet the CALFED objective of providing a high base level of conservation, and 2) to develop a certification and enforcement program that would assure high levels of compliance.

The DEIR reflects the ongoing communication between CALFED and this CUWA/EWC group, and we support the proposal as it is reflected in the DEIS/R. However, this joint proposal, which is based on more widespread implementation of the best management practices contained in the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) still leaves on the table a great deal of untapped conservation potential. While CUWA and EWC have agreed that fulfilling obligations under the MOU is an acceptable minimum level of conservation to obtain CALFED program benefits, this does not mean that CALFED should not seek further urban conservation. Rather, CALFED should identify the remaining conservation potential achievable ( e.g., by implementing BMPs above the levels specified in the MOU, or through implementation of additional conservation measures, especially those targeting outdoor water use) and develop a program to obtain those savings. CALFED should offer financial assistance to help meet those higher goals, and should incorporate those higher goals into the criteria for phased decision making.

Agricultural Implementation

CALFED has based its agricultural water use efficiency element on the MOU that emerged from AB 3616.<sup>4</sup> Regardless of whether fulfilling the requirements of the agricultural MOU are voluntary or mandatory, that program will not significantly improve the efficiency of California agriculture. The requirements of the MOU are not sufficiently rigorous as to require any real change in water use. Assuring implementation of an inadequate program is not the same thing as assuring efficient water use.

It is inaccurate for CALFED to state that the Agricultural MOU “provides a process for balanced review and endorsement of plans and implementation progress reports” (WUE p 2-11) when almost every environmental group which works on water issues has disapproved of the MOU as inadequate. This can hardly be called balanced process and certainly does not offer the level of assurance that CALFED has acknowledged is critically important to the water use efficiency program.

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<sup>4</sup> The Natural Heritage Institute is a signatory to the AB3616 agreement and does not concur with this section of the EWC comments.

Environmentalists were involved in the early stages of developing that MOU, but most left that process when it became apparent that the agricultural interests who were negotiating the MOU were not willing to adopt a program that would make real changes in water use efficiency, and indeed, were just looking for a public relations mechanism to give them cover in a process such as CALFED. We are extremely disappointed that CALFED essentially has ignored the almost universal lack of support for the AB3616 program among environmental stakeholders.

AB 3616 is a planning based program that only requires districts to consider various measures. Furthermore, the program completely ignores farm-level conservation which is where irrigation choices and cropping choices are made and where most of the water savings are likely to occur. For a more detailed explanation of our substantive concerns with the agricultural MOU, see the attached letter of April, 1997, which we include with these comments for the administrative record.

While we support the addition of measurement and pricing criteria as a precondition to receiving CALFED program benefits, as suggested in the DEIS/R, we do not believe that requirement alone will realize the full potential of improved efficiency. In addition to the measurement and volumetric pricing requirements, we recommend that CALFED develop clear goals, measurable objectives, and interim targets for the agricultural water use efficiency program. Additionally, CALFED should develop performance standards for each efficient water management practice, comparable to the standards contained in the urban MOU.

#### *Water Recycling*

Water recycling is one of the least controversial elements of the water use efficiency program. To assure that the levels of water recycling anticipated by the CALFED program will happen, CALFED funding assistance will be needed. EWC would be willing to support public-partnership financing for water recycling, given its potential benefits to the ecosystem by reducing demands on the system.

We support the concept of a water recycling BMP, as suggested in the DEIS/R. However, CALFED should not wait for the Urban Water Conservation Council to develop and adopt such a BMP. In the past the Council has failed to adopt a BMP because the individuals involved in the Council are not the same ones as the ones in recycling, and because the Council is already occupied with implementation of the existing BMPs. CALFED should not abdicate its responsibility for assuring that recycling is given adequate evaluation by water agencies, but should instead take a leadership role in developing this BMP. EWC is interested in working with CALFED and the other stakeholders to develop this BMP.

As with other program elements, CALFED should establish specific goals and objectives for water recycling. These targets should be included in the criteria for phased decision making. The amount of water recycling is easily measurable and lends itself well to development of a performance measure.

#### *Land Retirement*

The west side of the San Joaquin valley contains close to half a million acres of salinity impacted lands, many of which are also high in trace elements such as selenium. A variety of state and federal programs have authorized removing much of these lands from irrigated agriculture on a voluntary compensated basis. Despite the large amount of recent rhetoric about such voluntary land retirement programs, we have reason to believe that if the program is properly targeted to the lands with drainage problems, there would in fact be a high level of support throughout the state for a voluntary program to purchase those lands from willing sellers. Indeed, even while individuals claiming to represent San Joaquin Valley farmers were attacking the Bureau of Reclamation's land retirement program, many of those farmers were actually signing up for the voluntary program.

Voluntary, compensated retirement of marginal quality lands on the west side of the San Joaquin Valley is likely to have multiple benefits that could help meet the CALFED objectives in many areas, including water quality, water supply reliability, and ecosystem restoration. CALFED's preliminary analysis showed that a voluntary land retirement program could generate 1.5 million acre-feet of water at an average cost of \$150 per acre foot, which is significantly less than the cost of many other supply augmentation options under consideration. This preliminary analysis, and the more thorough evaluations which must follow it were inappropriately excluded from the DEIR. CALFED should continue to refine the analysis, including exploring mitigation of third party impacts, and should include this analysis in subsequent environmental documentation. Also, the water supply impacts of this land retirement proposal must be included when modeling system operations and water supply reliability.

#### *Impact Analysis*

Table 3-1 summarizing the environmental consequences of CALFED Bay-Delta Program Alternatives fails to recognize many of the benefits of water conservation programs. Specifically:

- The water quality benefits from improved water use efficiency, including reduced loads of pesticides, and trace elements such as selenium, salts, and sediment, are not included under the description of how the common programs benefit water quality.
- Under water supply and management the Table fails to include the ability of water use efficiency measures to improve water supply reliability.
- Under Agricultural Economics the analysis fails to indicate how water use efficiency measures can improve sustainability by enabling farmers to maintain the same level of economic productivity by maintaining or increasing yield even with a reduced water supply. Water use efficiency can also save costs on other inputs such as pesticides and fertilizers, by allowing more efficient applications, as well as saving on energy costs.
- Under agricultural social issues the analysis fails to account for jobs that may be created by more intensive irrigation water management.

These impacts should all be reflected in CALFED's impact analysis.

### *C. Water Quality*

The current Water Quality Common Program falls far short of articulating a comprehensive vision necessary to improve water quality in the Bay-Delta ecosystem and for beneficial uses of this water throughout California.

We support the recent process initiated by the Water Quality Technical Group to further refine program objectives and actions and the commitment to convene an expert review panel to address drinking water quality issues. Further work is needed to develop a more robust, grounded, and scientifically supported program.

#### *Drinking Water Quality*

EWC believes that safe drinking water is a critically important environmental and public health issue and we are committed to working with CALFED to determine the best way to meet current and proposed drinking water standards. We agree with the DEIS/R that "current health effects research and treatment technology information...do not now provide an adequate basis from which to project what the water quality parameters for drinking water standards, or what the treatment options to meet those standards, are likely to be over the next 5-10 years." (Phase II Interim Report p 137). CALFED should be phasing decisions over the next 5-10 years in order to evaluate how well the water quality program and related common programs perform.

Delta water quality meets current and proposed standards (expected in November 1998.) At least one water system which relies exclusively on Delta water, Contra Costa Water District (CCWD), is showing that currently available treatment technologies can be applied to larger water systems and prove a very effective way to protect drinking water quality for consumers. CCWD has total trihalomethane levels (~10ppm) that are well below even the most stringent standards (40ppm) expected for these byproducts in the next round of rulemaking by EPA. CCWD also performs quite well on limiting bromate formation in their treatment process. Their successful methods need to be evaluated for other delta water users.

Drinking water treatment technology is changing rapidly and becoming more affordable. Water systems will have to comply with any stricter standards set early in the next century years before any of the conveyance or storage options identified could be built. This means water systems will have to come up with system specific strategies to comply in the near-term. If urban water districts have no need for the engineered projects when they come on line, they may be unwilling to pay a share of the costs, leaving the taxpayers with enormous stranded assets. For all of these reasons it is premature to select a one-size-fits-all-engineering solution to improve export water quality.

#### *Enforcement*

CALFED should not limit itself to cooperative programs to meet water quality objectives. CALFED agencies have direct enforcement/ regulatory control over water quality including nonpoint source pollution. CALFED needs to use a complete toolbox for achieving water quality objectives.

CALFED must include full implementation of existing laws and programs as part of the baseline. As currently written, the Water Quality Program fails to identify the tools available to the government to enforce controls when voluntary programs prove ineffective. The next draft of the DEIS/R should identify relevant legislative and administrative authorities, particularly with respect to enforcement. For example, the Porter-Cologne Water Quality Control Act, Calif. Water Code 13000 et seq., gives the state the authority to regulate dischargers of nonpoint source pollution through the issuance of waste discharge requirements. In addition, the CZARA Section 6217 program also requires the state to implement and enforce measures to control polluted runoff.

The Program should include a discussion of available legislative and administrative tools, and identify clear, specific and automatic triggers for moving from voluntary implementation or incentives to the use of enforcement tools. This should include a program to track voluntary water quality improvement activities and results for a set period through mandatory reporting. If inadequate progress is achieved via voluntary compliance within that time period, or if reports on voluntary activities are not prepared, then the state should automatically move to regulatory enforcement of the action items.

#### *Coordination with Other Water Quality Programs*

The Water Quality Program should contain a process for coordinating implementation of CALFED Action Items with implementation of existing, related programs, such as the Coastal Nonpoint Pollution Control Program, established by the Coastal Zone Reauthorization Amendments of 1990 ("CZARA"), Section 6217 (16 U.S.C. § 1455b), to control polluted runoff. The State Water Board and the Coastal Commission, which jointly administer this program, have decided to implement it statewide.

Similarly, the State Water Board is mandated to control polluted runoff under Section 319 ("Nonpoint Source Management Programs") and Section 303(d) ("Total Maximum Daily Load" program) of the Clean Water Act. CALFED pollution runoff activities should be closely integrated with these related pollution runoff activities in order to maximize the effective use of limited funds. CALFED should insist that the State Board (and appropriate Regional Boards) establish TMDLs for parameters of concern in the Delta, and should include development and implementation of TMDL's as a benchmark in the staged decision-making process.

*Integration with Other Program Elements*

The water quality element must be better integrated with other program elements such as the ecosystem restoration and water use efficiency common programs. While integration of the various common program elements is a critical step in implementation of the CALFED program, little progress has been made in quantifying water quality benefits (or adverse impacts) from other common programs. The next draft should identify these interconnections more specifically and outline the research necessary to more fully evaluate potential impacts of proposed actions.

Absent a better understanding of how the ecosystem, water use efficiency, watershed management, and levee programs will affect delta water quality, it is premature to make a decision on conveyance. For instance it is not possible to quantify potential reductions in total organic carbon -- a significant drinking water treatment concern -- without integrating the impacts of all of the above programs. The same can be said for the quality of agricultural drainage return flows and reductions in pathogen loads.

The DEIS/R also does not adequately evaluate the impacts on delta water quality of changing the relative balance of Sacramento and San Joaquin waters in the Delta. Each of the conveyance alternatives as proposed could have dramatic consequences on loadings of various parameters of concern. The impacts of diverting or rechanneling substantial amounts of Sacramento River flows, barricades at Old River and other proposed approaches could dramatically alter contaminant loadings in the Delta such as selenium and pesticides. Dredging under the conveyance alternatives could unleash huge loads of metals like mercury and copper into the system with consequences for fish and human health alike.

*Data Gaps/Additional Research*

In other areas of the water quality program there are huge gaps in information that need to be closed prior to a decision being made on a preferred alternative. Further scientific investigation and analysis is needed about the most cost-effective way to achieve drinking water quality objectives and maximize public health protection without sacrificing the health of the Delta ecosystem. In addition to the scientific and regulatory uncertainties that were discussed earlier, many variable conditions face water systems that use water from the Delta. Also discussed earlier is the lack of quantifiable data available on source reduction efforts for TOC, pathogens, and agricultural drainage.

System to system differences in treatment approach, system size, quantity of Delta water/other water sources, quality of other water sources used, adequacy of source protection efforts within the system (at reservoirs) are just some of the variables that impact treated water quality. These must be addressed and solutions modeled for impact as well as cost.

The Water Quality Program currently focuses its bromide modeling on levels found at Clifton Court, but levels at San Luis due to bromide concentrated in agricultural return water may also be significant and have an adverse impact on water quality for many users. It is essential that CALFED develop a full understanding of the sources of bromide contamination in the Bay/Delta system so that recommended water quality actions address the real problems. Other sources of

bromide in the system and control strategies must be addressed in CALFED's subsequent environmental documentation.

Nutrient loading from agricultural drainage and other runoff into waters south of the Delta have not been adequately addressed for their contribution to degraded water quality. Under some alternatives we may be spending billions to start with a "cleaner" source only to continue to degrade it on its way to the end user. It may be more cost effective to focus on water quality improvements that can be made to water as it moves through the rest of the system rather than putting all of the investment in moving the delta intake.

We urge CALFED to dedicate the necessary resources to a basic research and comprehensive monitoring program in the Delta and its tributaries. This research and monitoring should be geared toward developing a better understanding of mass loading, spatial distribution, transport, fate, and synergistic effects of contaminants in the estuary and their impacts to biological life and human health. Contaminate issues include pesticides, selenium, mercury, nutrient loading, as well as sources of "unknown toxicity."

Finally, the USFWS/NMFS Section 7 draft biological opinion on the California Toxics Rule (CTR) states that the proposed numerical criteria in US EPA's CTR are not protective of aquatic life and pose significant threat to the recovery of endangered and threatened species. In so far as EPA's CTR criteria are incorporated into the CALFED program, they will not promote recovery of listed species.

#### ***D. Levee Stability***

The levee protection program as described in the DEIS/R continues to be one of the weakest elements of the Program, and we have been extremely disappointed with the lack of an adequate response to our previously expressed concerns. This program appears to be predicated on a number of questionable assumptions regarding the long-term sustainability of the Delta islands, and ignores basic issues regarding the environmental and economic factors associated with current Delta land use. Furthermore, we find little evidence of the integration between the levee protection program and the ERPP which is referred to in the DEIS/R.

The importance of these issues was acknowledged in the CALFED Bay-Delta Program Phase I Final Documentation Report (September 1996). In that report, the Program recognized the need for:

- "a risk-based benefit/cost analysis including consideration of converting land vulnerable to levee failure to areas of improved habitat" (p.31).
- "an expert panel to provide advice on long-term sustainability of Delta habitat and infrastructure" who will consider options including "a mix of actions that allow for the gradual, phased, large-scale restoration of leveed islands to a mixed mosaic of uses emphasizing high quality habitat" (p.39).

- an examination of "such factors as (1) the environmental and economic costs and benefits resulting from major conversion of land to environmental purposes; (2) the long-term sustainability of the Delta islands, given the economics of farming, the risks of permanent flooding from seismic and other causes, and the costs of levee maintenance repair and subsidence control..." (pp. 39-40).

The Program has utterly failed to develop a comprehensive evaluation of the long-term sustainability of current Delta land use. The Delta levee technical workteam effort sponsored by the Program is focused on maintenance of the existing levee system and is not adequate to develop this information. We strongly urge the Program to initiate the analyses identified in the Phase I report, including appropriate independent scientific review.

#### ***E. Watershed Management***

CALFED's draft watershed strategy is not a strategy -- it describes the intent to develop a watershed strategy based on an as-of-yet undefined process. The document does a reasonable job of describing the major issues, including accountability, implementation, and monitoring, but fails to establish a clear process for addressing these issues. The document also fails to describe how the watershed element will integrate with other elements, especially ecosystem restoration and water quality.

### **III. Project Alternatives**

CALFED has failed to examine a reasonable range of alternatives. The DEIS/R has looked only at structural options for addressing water management issues. In its next round of environmental review CALFED should consider an alternative that maintains the existing Delta configuration (with minor changes such as moving the Clifton Court intake to the northeast corner and installing more effective screen and bypass systems) but operates this configuration to maximize restoration potential. This should include modeling operation of a fish-friendly pumping schedule, delayed filling of San Luis Reservoir, flexible export/import ratios to decrease impacts during low flow periods, etc. These scenarios should also include expanded use of water transfers, conjunctive use, conservation and recycling to mitigate economic impacts, if any, of this operational regime.

Fishery sampling and monitoring programs have documented the long term decline of anadromous and estuarine fish in the Central Valley watershed which has coincided with increased water exports from the Delta. Impacts on fisheries include both direct entrainment effects as well as indirect effects. CALFED must better determine mortality associated with indirect effects of water export prior to increasing export capability in the Delta.

*A. Storage*

California already contains vast amounts of surface storage. Approximately 5,300 dams – roughly 2,000 "large" dams and another 3,300 "smaller" dams (below 25 feet in height or 50 AF of capacity) -- have been constructed throughout California during the last 50-100 years. Our statewide surface storage capacity (including California's apportioned share of Colorado River storage) already exceeds 60,000,000 acre feet.

California's dams – located on every major river but one throughout the entire Bay-Delta system - - have combined to cut off access to more than 80 percent of the historical spawning grounds and in-stream habitat for rearing and migrating salmon and other migratory and resident fish species. Similar statistics apply to the loss of floodplain and channel interactions, wetlands, and riparian habitat, from the construction of several thousand miles of levees, which provided habitat for fish and waterfowl, migratory birds, and thousands of other species. More than 90 percent of the Central Valley's riparian and wetland acreage has been lost due to the land and water development practices of the last 150 years.

During the last 30 years, Delta exports have grown from approximately 1.5 million AF/year to an average of 6.0 million AF/year, with a 1989 peak of 6.7 million AF. During this time, populations of longfin smelt, Delta smelt, striped bass, steelhead, and every run of chinook salmon except the hatchery-dominated fall-run have declined by 80-95 percent or more from their 1967 base. (Data are only sporadically available before that time.) The San Joaquin River's mainstem spring run chinook population went extinct in the early 1950's, following completion of Friant Dam.

Taken together, the combination of existing federal, state, and local water projects impound, regulate, divert, and ultimately deplete half of the runoff into the Bay-Delta system in an average year, and as much as 70 percent or more in drier years.

The DEIS/R contains little if any evidence demonstrating that additional surface storage is needed as part of the CALFED program. Certainly before we decide to build additional dams and reservoirs we should explore the opportunities for market based mechanisms and conservation strategies to yield similar benefits for water supply reliability.

Additional diversions to storage will create new environmental impacts, including increased potential for direct entrainment and indirect impacts. Creation of these reservoirs will, of course, have terrestrial impacts as well. CALFED has not only failed to fully assess these impacts, it has not disclosed the unit cost of developing this water and compared it to other alternatives. CALFED should evaluate these costs, including dry year figures, and compare them to the cost of water supplies developed through conservation, recycling, reclamation or transfers. The external costs of any new project must be internalized to reflect a better estimate of the "true" project costs.

Many of CALFED's studies incorporate options for "environmental storage" in new reservoirs at offstream locations both north of and south of the Delta. Water would be diverted to these reservoirs during periods of high flows and released back into the river to meet the ERPP pulse

flow targets. The DEIS/R contains little if any evidence that storage for environmental purposes would be possible or effective. There is no analysis of how or whether these hypothetical environmental benefits would offset the considerable environmental harm entailed in the diversion of even more water out of the system. As noted in the Phase II interim Report, "The validity and appropriate role for "the time value of water" concept in California water management have not been fully discussed within the stakeholder communities. Additional work remains to identify and resolve controversy related to the concept, determine specific parameters (flow rates and timing), and scientifically evaluate the potential effects of this approach. (Phase II Report p.33)

We question whether environmental storage is either the most cost-effective or environmentally sound approach to securing new water supplies for the environment.. Other means, including a water acquisition program, should be explored on a per-unit cost and environmental impact basis to obtain water supplies for the environment. As with other program elements, the acquisition of these water supplies should include appropriate protection for the source watersheds.

#### *Conjunctive Use*

To the extent that additional storage is ultimately found to be necessary for the CALFED program, EWC believes that CALFED should first maximize development of environmentally sensitive conjunctive use projects. Such programs would divert water to the groundwater basins most suitable for immediate storage and eventual extraction. It would then be extracted and used to supplement available surface water during drier years. This would be new water, not otherwise available to the system.

CALFED vastly underestimates the potential for groundwater storage. The currently unused aquifer space is certainly several times greater than the CALFED target of 750,000 AF. CALFED's own analysis shows that the groundwater storage potential at just three sites exceeds their target by 250,000 acre feet.

Many people have dismissed the potential to increase water system yield with groundwater banking with the argument that it is impossible to develop the recharge capacity to capture a significant amount of unused flood flows. This argument is based on the erroneous assumption that the only way to increase system yield is to build large new conveyance and groundwater storage infrastructure that can capture unused flood flows. Such infrastructure would have to handle very large volumes of water in short periods of time and would be clearly unfeasible. CALFED should explore different, non structural method of increasing system yield by delivering water in surface reservoirs, directly or indirectly, to groundwater reservoirs throughout the year, thereby freeing up space in existing reservoirs to capture a larger fraction of large flood flows when they do occur.

The absence of comprehensive groundwater management or even universal water measurement will hinder maximum conjunctive use. By failing to include such mechanisms in its DEIS/R CALFED has unnecessarily limited the potential of what is likely to be the most environmentally benign water storage option.

### *B. Conveyance*

Two principal reasons have been given for development of an isolated facility. First, it is argued that the canal would provide higher quality water for south-of-Delta consumptive use, a particular concern of urban agencies. Second, an isolated facility has also been promoted by some as at least a partial solution for Bay/Delta fisheries. In addition to these two reasons, there is clear but often downplayed potential for an isolated facility to be used to increase project yield and overall depletions.

#### *Conveyance and water quality*

As discussed above under water quality issues, we believe that there may be more cost-effective approaches to addressing drinking water concerns than constructing an isolated facility. CALFED's initial efforts to address water quality should evaluate the cost of meeting standards (2 or 3 distinct levels of protection should be evaluated due to the uncertainty of future standards) with or without an isolated facility.

Some of the means other than an isolated facility to address water quality issues that CALFED should consider include:

- Installation of a flexible barrier to separate higher quality water from lower quality water in the California aqueduct.
- Changes in the timing of filling San Luis Reservoir. It may be possible to obtain higher quality water by waiting for high flow events rather than filling the reservoir as early as possible. While this does create additional risk regarding water supply reliability, the trade offs of such an approach should be clarified and evaluated.
- Reoptimize the existing system.

#### *Fisheries*

There are many more "unknowns" regarding the relationships between hydrodynamic shifts in the estuary (as a result of export pumping) on the resultant direct and indirect effects on fish species of concern in particular, and the ecosystem in general, than there are "knowns." Though we have some ability to quantify the direct mortality of salmon and other species at the export facilities, we have limited understanding of indirect effects that lead to mortality.

An obvious gap in CALFED's analysis is its lack of species breadth. CALFED appears to be concerning itself only with Sacramento and San Joaquin salmon (winter run, spring run, fall run, late-fall run, and SJ fall run), Delta smelt, and striped bass while ignoring other important species including steelhead (now currently listed as threatened under FESA), splittail (proposed for listing as threatened under FESA), longfin smelt, and green and white sturgeon. Each of these species and lifestages within each, has in some cases very different habitat requirements and temporal and spatial distribution throughout the Central Valley watershed.

Given not only the level of uncertainty that exists and the limited scope of CALFED's diversion effects on fisheries analysis, and CALFED's failure to define its assumptions regarding fisheries protection and restoration goals, CALFED should not make a decision on how, or whether, the Delta should be reconfigured at this time. Instead, CALFED should focus its efforts on increasing

our understanding of the ecosystem and determining how the existing system could be reoperated to improve conditions for fisheries upstream of the Delta, downstream of the Delta, and within the Delta itself.

CALFED should use the first phase of program implementation 1) to focus research and develop and implement adaptive management experiments to help improve understanding of the causes of fish mortality, and to 2) refine system management to provide for increased species benefits. For example, great gains for fish protection may be achieved by shifting the timing and volume of diversions from the Delta and using releases from upstream storage to provide improved instream conditions and operational flexibility.

CALFED should not look for the "silver bullet" solution to fisheries protection in the Delta because it does not exist. Each of the Delta alternatives could potentially result in some level of benefit and impact for each of the species of concern, but none of the existing alternatives provides benefits for all species and lifestages. Rather CALFED should implement, monitor, and assess as many "ecosystem restoration" efforts as possible including flow/hydrograph restoration, shallow water habitat restoration, screening of diversions, riparian corridor restoration, improved interactions between floodplains and channels, sediment management, and watershed planning among them. In total, CALFED should aim to identify areas of uncertainty as far as fisheries protection is concerned, under current operational conditions, and then figure out how to address these knowledge gaps over the next 5-7 years while implementing common program elements.

### *C. Operations*

CALFED has established a policy that it will improve conditions for both water users and the environment. In this context, it has generally evaluated operational criteria consistent with the 1995 Water Quality Control Plan and limited implementation of the Department of the Interior's policy for implementation of Section 3406(b)(2) of the Central Valley Project Improvement Act. Any additional water, not specifically required to be dedicated toward environmental purposes under these or other laws, is treated as available to be developed, in spite of its benefits for the environment and in spite of the need for increased stream flow and Delta outflow identified in the ERPP itself.

CALFED's alternatives propose to develop this water in the following four ways:

- 1.) Expanding use of the State Water Project's additional export capacity. Current permits allow the SWP's Banks pumping plant to export 6600 cubic feet per second (cfs), with occasional wintertime exceptions. Several CALFED alternatives (1C, 2 and 3) would allow this amount to be increased to 10,300 cfs. The incremental yield generated by use of this additional capacity could be used to offset reductions in Delta exports at especially sensitive times, perhaps to offer timely protection to outmigrating spring-run. Instead, however, this additional capacity is operated solely to increase yield, with no benefit to the environment, and an unevaluated level of impact to fisheries.

- 2.) Allowing Central Valley Project demand to be met through use of the State Water Project's unused capacity. This use of a "joint point of diversion" has long been acknowledged as environmentally damaging. The State Water Resource Control Board's current Water Rights Order 95-6 recognizes this threat and allows use of a joint point of diversion only if it will benefit the environment and not result in a net increase to exports. All of the CALFED alternatives, however, would provide all benefits from use of a joint point of diversion to water users, and do not appear to evaluate environmental impacts.
- 3.) Assuming that diversions into an isolated facility do not count as Delta inflow (e.g., in studies such as 547-in part-, 551, 555 & 567). The Export/Inflow (E/I) ratio, as well as the X2 standard are the cornerstones of protection under the 1995 Water Quality Control Plan. The E/I ratio was incorporated within the Bay/Delta Accord with the full knowledge that it was, at least in part, a surrogate for other additional protection. Indeed, under the WQCP the E/I ratio is projected to be constraining more often than X2 (this diminished level of protection is shown in Figure 2, which compares the X2 performance of two studies, 529 and 551, with similar physical configuration but different assumptions regarding the E/I ratio).

Not counting diversions into an isolated facility as part of Delta inflow is essentially an accounting trick to allow an isolated facility to generate yield by circumventing existing standards. It should also be noted that the E/I ratio calculation is not accurate and is biased in terms of favoring an isolated facility. The ratio is calculated with exports being equal to the Delta inflow to Clifton Court Forebay for export at Tracy and Banks, while the actual amount of water diverted from the Delta also includes the North Bay Aqueduct, the Contra Costa Canal and diversions onto Delta islands. When water is diverted into an isolated facility resulting in less Delta inflow, these three "exports" not included in the calculation comprise a bigger piece of the inflow. Consequently, the reduction of inflow to the Delta increases the error in the calculation of the export/inflow ratio.

- 4.) Diversions to new storage, both offstream and off-aqueduct. Use of offstream storage to enhance Delta exports increases the potential for entrainment of fish. In fact, any additional point of diversion would double exposure of fish to these impacts.

Each of these methods of water development create environmental impacts that have not been fully documented or addressed in the DEIR. The WQCP together with CALFED's ERPP and CVPIA implementation may not offer the full range of protection necessary for full restoration of the ecosystem, especially if additional water is removed from the environment in any of these ways.

Furthermore, in at least some, and perhaps all, of CALFED's DWRSIM studies, the additional water needed to meet the ERPP flow targets is underestimated by about 50%. For example by our calculations, under Study 518 (No facilities, assumed acquisitions to meet ERPP targets, assumed permission for the CVP to use available SWP pumping capacity) DWRSIM's projections indicate that an annual average of 152 TAF of "add water" is used to meet otherwise unmet ERPP targets. Our calculations show that under this scenario an additional 157 TAF would be

required to fully implement the draft ERPP targets. We urge CALFED to revise its analyses to ensure that the full ERPP flow requirements are met under all scenarios, and to identify the potential sources for this water.

#### **IV. Assurances**

An assurances package is a basic element of the CALFED Program. While we recognize that absolute guarantees may not be attainable under all circumstances, an assurance package should provide a high degree of confidence that the program's substantive goals will be met.

The acceptability of other program elements, such as increased groundwater storage, will turn in part on the strength of the associated assurance mechanisms in the package. For example, a facility with no legal remedies or binding contracts associated with its operation is far less likely to pass muster than an adequately constrained facility. An ecosystem restoration program without long-term funding attached to it will fail to gain public confidence as well. For this reason, the assurance proposal cannot be prepared sequentially, after the substantive proposals have been completed, but rather must be fully integrated into the alternatives.

The draft EIS/R defines assurances as "mechanisms necessary to assure that the solution will be implemented and operated as agreed." However, what it provides to the public and decision makers is instead an "implementation strategy" -- an entirely different thing. Putting a program in place or on a schedule is not the equivalent of building into that program guarantees of performance. It is not difficult to imagine the ERPP being "implemented" with little ecosystem recovery actually occurring. Moreover, without a serious examination of assurance issues, the chances of successful implementation are minimal.

The draft EIS/R fails entirely to provide the public or decision makers with a sense of the options available to assure the program elements. The draft never asks the basic question: What do we need to do to ensure that the Ecosystem Restoration Program (or any other program) is fully implemented so as to achieve its substantive goals? The draft lists "tools," and "management structures," and "guidelines" for an assurance package, but it never sets forth the basic elements necessary to guarantee that the ecosystem restoration program will achieve its objectives.

For example, ecosystem restoration will not be achieved without a secure source of both water and funding. There is no discussion in the EIS/R of the alternatives available to achieve these assurances. The draft EIS/R fails as well to evaluate the potential environmental impacts associated with different assurances approaches. For example, using water transfers to assure the water necessary for the restoration program could result in very different environmental impacts than the dedication of water through an environmental water right.

It is revealing that neither the EIS/R nor the technical appendices deal directly with assurances but instead approach this issue through the more limited question of how to "implement" the program. However, the Implementation Strategy fails to identify, much less examine assurance issues but focuses instead on the "process" for obtaining public consensus. While consensus is

laudable and important, the CALFED agencies are still obligated to provide full and clear information to the public about assurance issues regardless of the work group's progress. The draft EIS/R even fails to mention the one assurance issue that enjoyed unanimous consensus; the notion that the Ecosystem Restoration Program should be implemented by a new entity.

The purpose of an assurance package should be to ensure program outcomes. For example, in the case of the Ecosystem Restoration Program and the Conservation Strategy, this means that the assurance package should have as its objective achievement of the performance standards established for the restoration efforts. Similarly, performance standards should be established for the other program elements, and the assurance package should be tied to achieving those goals.

For the ecosystem restoration element, the revised EIS/R should examine the package of assurance mechanisms listed below:

1. Strong ERPP with measurable performance standards
2. Legal mandates to achieve performance standards
3. Institution dedicated to program implementation with sufficient authority
4. Provision of environmental water
5. Secure, adequate, and pliable long-term funding for ecosystem restoration and water acquisition
6. Enforcement of baseline environmental statutes
7. Physical constraints on new water developments
8. Controls on water project operations
9. Phasing/linkages of program elements
10. Remedies in the event that program commitments are not fulfilled

## **V. Finance**

The position of the EWC is that water users, not the public, should pay for the costs of all water supplies developed for their benefit. In addition, given the tens of billions of dollars in public subsidies already provided for statewide water development in the past, and the massive environmental damage that is a direct result of such historic subsidy policies, no new or additional public subsidies should be provided for water development projects or programs that are meant to facilitate the depletion of additional water from the Bay/Delta system. One way or another, the longstanding practice of giving the public's water away for free must come to an end

There are elements of the CALFED program for which EWC would support public-private partnership funding. Specifically, we would support such funding for 1) programs that will provide above-baseline ecosystem restoration benefits., 2) programs which will serve to reduce overall water use (e.g., conservation and demand management), and 3) programs which ensure that more end uses can be served without any increase in baseline depletions (i.e., increased end-use efficiency investments, water recycling, etc.)

*Beneficiaries Pay*

According to the Phase II Draft, "[s]haring the costs of the Solution based on the benefits being created is the cornerstone principle of the CALFED Financial Strategy." (Implementation Strategy, page 15.) While EWC supports the basic notion that those who would benefit from newly developed supplies should pay the "true costs" associated therewith, the benefits-based approach is of ongoing concern in at least two fundamental respects.

- No Acknowledgment of How We Got Here The fundamental philosophy behind the benefits-based approach is that "costs will be paid for by the beneficiaries of the actions, as opposed to seeking payment from those who, over time, were responsible for causing the problems being experienced." This, in effect, means that the "playing field" is assumed to be level, all but sweeping under the rug nearly a century's worth of water development activities that have, by virtue of all but ignoring their associated environmental impacts, necessitated CALFED's programmatic efforts in the first place. Taken literally, this version of the benefits-based approach precludes any assessment whatsoever of, among others, a host of historic investments and subsidies biased substantially in favor of environmentally-damaging water development, prior unmet environmental mitigation obligations, the ongoing environmental costs of diversions, depletions, exports, impoundments, and pollution from existing facilities, or the related environmental costs of new water development.
- Problematic Definition of Ecosystem Benefits The second major concern relates to the definition of ecosystem benefits. One aspect of the problem is the need to distinguish between alleged "benefits" and much-needed "repairs." Another is the difficulty in quantifying any number of non-market benefits (and costs). But most egregious is the assertion that the environment needs new and/or bigger dams, or massive new isolated conveyance canals, in order to deal with problems that have arisen, above all, from the construction and operation of thousands of dams, thousands of miles of levees and canals, and literally billions of dollars in related water development investments.

The extreme consequences of a benefits-based approach so-defined would be (1) to preclude user-fee assessments or other forms of use-based funding to assist in implementing the CALFED ecosystem restoration program over time, and (2) to provide a thinly-veiled justification for public funds to underwrite a new round of water project development – funds that would, once again, serve to understate the true cost of new or expanded dams, diversions, and depletions – i.e., costs that most of the principal proponents of such facilities simply cannot afford.

The CALFED Phase II Draft identifies as an outstanding issue "whether or not any adjustment for past impacts is appropriate prior to using the benefits [based] approach." (Implementation Strategy, page 15.) EWC believes that these adjustments are critically important to ensure that CALFED develops and implements a truly "equitable" result over time – one that acknowledges the problems of the past and sends the right market price signals in the future.

A draft document currently under discussion in the BDAC Finance Workgroup -- *Beneficiaries Pay: Implications for Cost Allocation* -- goes a step beyond the Phase II Draft in attempting to sort-through and resolve these important outstanding issues. While it continues to discount the importance of better understanding how it is we got to where we are today, it proposes in lieu thereof a "forward looking" alternative that includes at least several promising features. These include (1) a proposed surcharge on all water users in the Bay-Delta system, the revenues of which will be used to assist in funding the CALFED common programs, (2) clarification that "the users of [storage and conveyance] facilities must pay the full cost of [these] facilities," (3) assurance that the share of any such facilities dedicated to ecosystem purposes will be treated as a mitigation cost for ongoing water development impacts (i.e., not charged to the public), and (4) assurance that, if public funds are provided for facility planning purposes, they will be cost-shared by user funds "up front" and reimbursed by the eventual contractors should such facilities be constructed.

There are, of course, many important details in this refinement that still need attention -- for example, the definition of "ongoing impacts" is currently limited to so-called "direct" impacts (e.g., entrainment), and does not appear to consider such factors as hydrograph alterations, loss of sediment, loss of upstream, riparian, and wetland habitat, water quality and temperature effects, evaporation, depletion, etc. However, on balance, it is clearly a step in the right direction, with one significant exception: we cannot, and should not, sweep the past under the rug.

A more comprehensive accounting of all aspects of Bay-Delta water development (i.e., investments, repayments, rebates, subsidies, mitigation and restoration outlays, etc.) is essential to inform CALFED's efforts to resolve the "financial baseline" issue, and would thus help to ensure an "equitable allocation of program costs" moving forward -- one that all might support.

*Recommendations*

CALFED should use the following approach as a basis for guiding the proposed use of public funds in the future to ensure an appropriate, equitable, and durable long-term result:

- The ecosystem restoration program (as well as other common programs) should be implemented through a combination of public and use-based funds, including the funds necessary to secure restorative ecosystem flows when and where needed through direct re-acquisition of water and habitat and acquisition of related interests;<sup>7</sup>
- Any new surface storage and conveyance facilities that are ultimately approved should be treated as new water projects and, if implemented, paid for in full – based on their full financial and ecosystem costs, and including an annual "rental charge" for depletion of the public's water -- by their direct beneficiaries (water and power users, floodplain residents, etc.), not by the public at large; and
- Any final dedications of new storage or conveyance capacity, yield, etc. to alleged "ecosystem" purposes should be treated as partial mitigation for the new and ongoing direct and indirect ecosystem impacts that are certain to accompany such facilities.

Above all, whatever CALFED does, it should ensure that, at long last, the true costs of developing and using the public's water -- financial, environmental, and otherwise, including both ongoing impacts and any "newly developed" supplies – are fully internalized in future water prices and paid for by the direct beneficiaries of those investments. To this end, any number of "conventional" cost allocation practices – low-interest, interest-free, and deferred repayment provisions, payment capacity waivers, purported recreational as well as fish and wildlife enhancements, non-reimbursable flood control benefits, and the like – must be discarded: the adverse environmental impacts associated with such policies and practices are well documented, and they simply have no place in the future implementation of a "balanced" CALFED solution.

**VI. No Action Alternative**

The No Action Alternative is critical in establishing the baseline from which the project alternatives will be evaluated. CALFED's No Action Alternative contains numerous flawed assumptions.

As discussed above, in a number of instances the No Action alternative relies on conclusions in DWR's Bulletin 160-93 or 160-98. Bulletin 160, however, is fundamentally flawed because it lacks basic economic criteria necessary to address the balance between supply and demand. (See

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<sup>7</sup> For these purposes, a broad-based set of watershed charges linked to diversions, depletions, exports, impoundments, and water quality degradation factors should be used to build upon the payments already required by existing law (e.g., the mitigation and restoration surcharges and increased revenues that fuel the CVPIA Restoration Fund).

the attached comments recently submitted by members of EWC to DWR concerning draft Bulletin 160-98.)

Because of its methodological flaws, Bulletin 160 consistently overestimates the demand for water in California and underestimates the ability of water conservation to address demand. Perhaps the most glaring instance of the No Action alternative's misplaced reliance on Bulletin 160 is the assumption of up to 1.2 million acre-feet of additional diversions. (See for example the DEIS/R p.2-6 and p. 6.1-11). CALFED's No Action alternative, as currently drafted, has incorporated these significant flaws. Therefore, we strongly urge you to reconsider your reliance on Bulletin 160.

The No Action alternative errs in assuming that there will be very little or no change between existing conditions and conditions in 2020, in numerous key instances, including but not limited to:

- The assumption of no new listings under the state and federal endangered species acts (notwithstanding the assumption of over one million acre feet of additional diversions; NMFS's proposed listing of the spring-run chinook salmon; the California candidate species status of the spring-run chinook salmon; NMFS's recent listing of the steelhead trout as a threatened species; and numerous pending petitions to list both aquatic and terrestrial species within the CALFED project area);
- The assumption that only 45,000 acres of drainage-impaired lands in the San Joaquin Valley will be retired, notwithstanding the findings of the "Rainbow Report," \$50 million in funding over the next five years for the CVPIA land retirement program; and roughly 30,000 acres in offers by willing sellers in just one year of the CVPIA land retirement program; and
- The assumption that Trinity River instream fishery releases will remain at 340,000 af, notwithstanding that this is the minimum amount established in § 3406(b)(22) of the CVPIA and that the Trinity River Flow Evaluation Study is considering flows ranging from 369,000-815,000 depending on water year type

The No Action alternative leaves many unanswered questions. For example, while it assumes the "dedication of 800,000 af" by 2020, it says nothing about how that water will be dedicated or whether populations of anadromous fish will be doubled by then, as required by federal law and by the narrative salmon standard in the Bay-Delta Accord. In addition, the No Action alternative fails to discuss what happens to the water associated with retired lands.

## **VII. CEQA/NEPA Compliance**

The draft EIS/R fails entirely to meet the legal requirements for a sufficient programmatic review under CEQA and NEPA. Programmatic EISs and EIRs have the same fundamental purpose as site specific EISs and EIRs: to inform the public and decision-makers of a program's environmental consequences before decisions are made. A programmatic EIS/R must provide the

basis for decision-makers to determine whether subsequent actions may have significant environmental effects. It should address the environmental effects of the proposed program specifically and comprehensively.

To the extent that the EIS/R omits relevant information, it effectively precludes the informed decision making that is the central objective of CEQA and NEPA. Thus, for example, the EIS/R must consider alternatives that would substantially avoid or reduce the adverse impacts of the program, even if such alternatives would impede to some degree the attainment of the project objectives. Similarly, the document must contain enough information about each alternative to allow meaningful evaluation and comparison of impacts.

Thus it is not sufficient for a programmatic EIS/R to merely provide general policy guidelines as to relevant environmental factors; it must ensure that decision-makers consider all of the specific and particular consequences of its actions and the alternatives available to them. This standard is particularly crucial at the programmatic analysis conducted in the programmatic review. CALFED may not defer analysis of key environmental impacts to the project specific stage. As the courts have found, "tiering is not a device for deferring identification of significant environmental impacts that the adoption of a specific [alternative] can be expected to cause." *Stanislaus Natural Heritage Project v County of Stanislaus*, 48 Cal. App. 4<sup>th</sup> 182 (1996). The adequacy of the environmental impact analysis in the CALFED EIS/R is all the more important since the agencies intend to use this document as the project specific environmental review for at least part of the program.

The draft EIS/R must be substantially revised and expanded to provide the public and decision-makers with the information necessary to make sound decisions about the CALFED Bay-Delta program.

### **VIII. Public Involvement**

The true stakeholders in the Bay/Delta program extend far beyond the interest groups identified as "stakeholders" by CALFED. While CALFED recently has made some progress in reaching this larger audience, we believe that CALFED still must improve its outreach to traditionally disenfranchised communities. In order to truly engage communities of color and low-income communities, CALFED must go beyond distributing written materials and media releases and commit to seeking out and facilitating broad involvement by providing translators to enable these groups to participate in CALFED, holding facilitated meetings, and co-sponsoring outreach with community organizations.

**IX. Conclusion**

In closing, we continue to believe that CALFED offers a tremendous opportunity to address the underlying problems that have brought the Bay/Delta ecosystem to its current degraded condition, and to craft a solution that restores this precious natural system. The questions that CALFED seeks to answer are complex. We urge you to take the time necessary to craft a durable solution, and to refrain from making any irrevocable commitment of resources until you can better answer the many questions we and others have raised about how the proposed solutions are likely to perform. Finally, we urge you to continue to rely on the public process, which is what gives the CALFED program its credibility.

Thank you for considering our comments.

Sincerely,

Ronnie Cohen  
Natural Resources Defense Council

Fishery Foundation of California

Jean Auer  
EWC

Martha Davis  
Mono Lake Committee

Gary Bobker  
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Attachment C  
1234

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April 16, 1998

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**Re: Comments on Draft Bulletin 160-98**

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**Allyson Washburn**  
Program/Social Policy

Dear Ms. Jones:

The League of Women Voters of California (LWVC) believes a planning document such as The California Water Plan Update: Bulletin 160-98 should be part of the state's process for managing water, one of its precious natural resources. Indeed, management and development of water resources in ways that benefit the environment are the main thrust of the LWVC water position. Accordingly, the League has participated in previous efforts on the part of the Department of Water Resources (DWR) to create a planning document for the management of this valuable resource. We acknowledge the considerable effort expended to produce the document, but we wish to comment on five major concerns which we believe create major flaws in draft Bulletin 160.

Because of these concerns, the League urges DWR to incorporate into this effort and all future efforts a review of the document by independent experts, including economists, to assist in revisions to the Bulletin. Unless there is time allotted and adequate expertise brought to bear in correcting the document, the League does not believe that its projections should be used in the CALFED process as a baseline for analyzing the three CALFED alternatives. We will notify CALFED of this concern but hope than an extension in DWR's and CALFED's comment period will allow enough time for adequate revisions.

Our objections to the Bulletin as presently drafted include the following:

- While the draft is full of useful data and information, the League agrees with the Environmental Defense Fund, Natural Resources Defense Council and other groups that it has a flawed methodology which leads to gross overestimations of the need for future water supplies and serious underestimations of the results of demand side management and future water efficiencies.

For example, the persistent groundwater overdraft in the Central Valley is included in DWR's "shortage" calculations. This is an error. Overdraft is a voluntary practice used by some segments of agriculture to farm at levels which we believe are not sustainable. One

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solution that DWR could promote is statewide standards for groundwater management with local, basin, or regional development and implementation of plans tailored to the carrying capacity and characteristics of each basin.

Alternately, DWR could acknowledge the influence of the price of water on the demand for water and develop a range of demand-price relationships that would link price with supply and demand projections. Such a planning tool was incorporated into the Central Valley Project Improvement Act's Draft Programmatic Environmental Impact Statement and can provide a useful guide to future water management decisions.

- We disagree with the draft's emphasis on structural solutions, which we perceive as the Bulletin's primary focus for addressing the state's water needs for the future. In line with its methodology and inflated projections, we think the Bulletin's recommendations rely too heavily on the construction of new onstream and offstream water facilities primarily from the Sacramento River Basin. The League urges DWR to rethink this emphasis and analyze to a greater extent less environmentally damaging nonstructural supply options.

As stated previously, the League's emphasis is on managing water in ways that are beneficial to the environment with emphasis on conservation. Our position strongly supports nonstructural alternatives such as conservation and conjunctive use and the increase in recycling of wastewater. The League could support new offstream storage which is environmentally compatible but would not support new additional onstream dams.

The draft Bulletin recommends for serious consideration in the Sacramento Valley 13 onstream projects, including Auburn Dam and the enlargement of Shasta Dam. Seven new offstream storage facilities are also included for north of the Delta. These recommendations are made despite the fact that the draft confirms that larger projects tend to produce greater impacts on the environment.

South of the Delta, only five sites are considered, including a new offstream reservoir on Los Banos Creek. The draft acknowledges that the Los Banos Creek site has the most potential negative environmental impacts, which would seem to cloud its future.

We think the storage proposed would place a heavy burden on the Sacramento Valley if implemented and also might ignore nonstructural possibilities both north and south of the Delta.

Another source of water supply reliability both for environmental purposes and for other beneficial uses is the PG&E reservoirs previously managed for power production but now being divested by the utility. The potential for including these existing reservoirs in the state's planning needs further exploration.

Given the League's emphasis on conservation and reclamation as a preferred means of meeting the state's water reliability needs, we believe Chapter 6 shows inadequate analyses of nonstructural options on the demand side of the equation and over reliance on the traditional engineering approach of developing more surface storage facilities on the supply side.

- The discussion of costs to construct these new storage facilities in the draft Bulletin is inadequate for meaningful public review, especially given the economic impact of constructing these proposed new

storage dams and reservoirs in order to meet the projected water supply needs. Since the Bulletin is a planning document, it is essential that DWR outline the economic pros and cons for its recommended new supply.

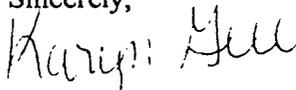
As we stated before, water supply and demand are closely related to price and subsidies, both of which can affect the demand for new supply. Yet, the Bulletin does not have comprehensive analyses of how price or subsidies could affect demand; whether stakeholders would be willing to pay for large reservoirs; who would be the beneficiaries; and what sector and/or what geographical area would be negatively impacted. We do realize that the Bulletin does discuss costs in several sectors (Appendix 4A, 6A, the tables in Appendix 7) and that a short description of financing methods is included at the end of Chapter 6. Nevertheless, we believe the economic analysis provided is woefully inadequate for the type of evaluation that is needed.

The lack of economic analysis is a primary reason why the League believes the Bulletin's projections lack credibility and why analysis by panel of independent experts could do much to improve the Bulletin as a planning tool. An independent panel could indicate areas where changes are warranted, which could serve the state and the public very well. Indeed, the public's right to know mandates accurate information upon which to base its judgment of the adequacy of the recommendations of the Bulletin.

- Another concern is the Bulletin's discussion of environmental water. We believe this approach is in error. Labeling water for the environment as a consumptive demand similar to that of that of agriculture and urban uses is a misinterpretation of the fact that water is a resource and we are stewards of that resource. Environmental water should be equally important with other beneficial uses and recognized as a public trust. In fact, the Bulletin should emphasize the fact that the environment once received 100% of the water and now receives only 46%, a loss of over half the natural flow to both agricultural and urban uses and a major reason for the decline of migratory fish populations and loss of wildlife habitat.
- Finally, and far from least, LWVC is always concerned with public participation and public information. We think the draft falls short on both points. We believe the public review period should have been longer and that more of a dialogue between the public and staff could have taken place at public hearings. Because the assumptions in the draft are not explained, much less discussed, we believe it is difficult for the public to properly evaluate the recommendations. What has been presented to the public at large is a mass of data, much of it interesting but much of it confusing because the draft lacks a comprehensive analysis of assumptions used. We urge your thoughtful review and revision of the present draft.

Thank you for considering our comments. Attached are specific comments from the League of Women Voters of the Bay Area.

Sincerely,



Karyn C. Gill  
President

## Comments on Bulletin 160-98 from the League of Women Voters of the Bay Area

Page 2-40 The discussion of Conservancies should include the State Coastal Conservancy which enables watershed acquisition, management, enhancement, restoration near the coast. BCDC and the Coastal Commission are permitting agencies.

Page 3-11 The discussion should be updated to reflect that 1998 has been the wettest winter.

Page 3-15 The discussion in the second from last paragraph: Does the calculation reflecting an increase in water supply without additional supply options reflect the amount (??) of CVP water required by the law to be allocated to fish and wildlife?

Page 3-90 While state law may require industries to pretreat industrial water prior to its discharge into municipal wastewater treatment plants, small industries do not seem to be uniformly regulated for various reasons. The discussion in the second from last paragraph should be expanded to include an overview of how industries are monitored by Regional Boards. Some (maybe all) have not gotten around to all of the industries.

Page 4-49 With regard to agriforestry, whether the research to date has demonstrated a build up of selenium, heavy metals or other constituents as salt levels increase in the soils? Also, what is the fate of the crops that are grown? Are the eucalyptus, salt grass and other crops that are grown harvested for commercial or other uses or simply harvested and dumped?

Page 4- 49 The water needs for fish, wildlife and the estuary do not seem to have been considered in this discussion.

Page 4-52 The discussion of environmental needs must be broadened to include needs of species other than endangered species and others in which there has been some court action. Native fish, migratory birds and water needed to maintain fresh to brackish wetland types in the San Francisco Estuary.

The discussion in paragraph three indicates that water for fishery and wetland restoration and enhancement would be acquired through the regulatory processes, and specifically by water transfers. We are not aware that CALFED has committed to this as a means of securing fresh water for the resources, nor is it certain that water that could be obtained from this means would be sufficient to sustain the aquatic resources. Other means of obtaining environmental water should be addressed.

Page 4-58 While the habitat restoration programs of CALFED would likely "help in the efficient management of water dedicated or acquired for environmental purposes," they will not likely be sufficient to maintain the estuary fish populations and fresh and brackish wetland resources. It should be recognized that adequate fresh water must be provided to assure the survival of these resources and the San Francisco Estuary as a whole.

Page 4-64 There are other populations of native fish that are declining including the other runs of Chinook Salmon, Sacramento Splittail and Longfin Smelt. These should also be recognized.

Page 4-65 Why are the only two efforts being conducted (or mentioned) to recover Winter-run Salmon artificial? What efforts are being made to protect, restore and/or maintain natural spawning habitats and breeding populations?

Page 4-68 The CVPIA discussion should indicate whether any water required by this law has actually been provided to fish and wildlife.

Page 4-69 The wetlands discussion should indicate how many wetlands are being lost annually in the state and in the specific regions of the state.

Page 6-2 The most obvious deficiency in the water management options evaluation is the failure to include water for the environment.

Page 10-3 The third paragraph acknowledges that the environmental water comes from legislative or regulatory actions. It is not recognized that fresh water is needed by the ecosystem for many other functions, i.e. to keep Suisun fresh/brackish; to flush out the South Bay, to maintain a mixing zone outside the Golden Gate. This is a major flaw.

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**BLUEPRINT FOR AN ENVIRONMENTALLY AND  
ECONOMICALLY SOUND CALFED WATER SUPPLY  
RELIABILITY PROGRAM**

November 5, 1998

**Save San Francisco Bay Association  
Natural Resources Defense Council  
The Bay Institute of San Francisco  
Environmental Defense Fund  
Natural Heritage Institute  
Sierra Club  
California Trout  
Public Officials for Water and Environmental Reform  
League of Women Voters of California  
Center for Marine Conservation  
Mono Lake Committee  
Clean Water Action  
California League of Conservation Voters  
California Sportfishing Protection Alliance  
Pacific Coast Federation of Fishermen's Associations  
Friends of the River  
Marin Conservation League  
Sierra Nevada Alliance  
Earth Island Institute**

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## INTRODUCTION AND SUMMARY

The mission of the CALFED Bay-Delta Program is to develop a comprehensive plan to restore the ecological health and improve management of water in the San Francisco Bay-Delta system for all beneficial uses. While CALFED has made substantial progress toward a program for restoring ecological health, it has struggled with developing a water supply reliability program and has confronted serious disagreements regarding the need for new surface storage facilities. The time has come to move forward with creative, viable solutions.

A viable CALFED solution must do more than restore the health of the Bay-Delta ecosystem. It must also improve the reliability of water supply for California's urban and agricultural economies. This blueprint articulates our assumptions and concerns, and outlines our recommendations for developing an affirmative program for improving water supply reliability.

We're committed to finding a CALFED solution that works for all of California.

### Our Assumptions:

- **Defining "reliability."** What matters is the economic utility of water, not solely how much is delivered or diverted from the Delta. CALFED has confused quantity with water reliability. CALFED should adopt the following definition of water supply reliability:

*Improving the predictability and availability of economic benefits derived from water while restoring ecosystem health in the Bay-Delta estuary and watershed.*

CALFED also should focus on providing water users with an economically and environmentally sound suite of dry year reliability strategies.

- **Let's be fair.** There are fundamental inequities in California water. Some water users pay a lot for the water they receive and others pay little or nothing. Some are contributing to Bay-Delta restoration, while others are not. Some meter their water use and prepare and implement conservation plans. Others do not. Some have very reliable water supplies. Others do not. While CALFED did not create these problems, it must address them.
- **Ecosystem restoration improves water supply reliability.** Restoration of the Bay-Delta ecosystem is the foundation of all efforts to improve water supply reliability. As long as species and habitats continue to decline and be degraded, we will continue to contend with regulatory uncertainty.

- **There is no “new” water.** There is a finite amount of water in the system. What some have called, “new” water is, in fact, further reallocation of water from the environment. The ecosystem has been depleted to the point where its resources are crashing. We can use our current supplies better, rather than trying to build our way out of our problems.
- **First, do no harm.** Any water supply reliability activities undertaken pursuant to a final CALFED decision should support full ecosystem recovery and should not cause further ecosystem degradation.
- **Price matters.** No one, especially the taxpayer, wants to pay more than needed to solve these problems. In addition, moving aggressively towards pricing that reflects the economic and environmental value of water will encourage efficient water use.

### **Our Concerns**

- **Baseline, Baseline, Baseline.** CALFED has not provided a clear and accurate picture of historic and current water supply, demand or use by any sector. Defining an accurate and comprehensive “baseline” is a critical issue not only for purposes of clear accounting, but because inaccurate claims and beliefs are driving policy decisions.
- **Dams or No Dams? Wrong Question.** Unfortunately, the past year has been characterized by a divisive preoccupation with arguments for and against the construction of new surface storage. The issue of surface storage has somehow become divorced from the key questions CALFED was created to answer: how best to restore the ecosystem and reliability of water supply and water quality. CALFED should begin its stage 1 program by implementing environmentally and economically sound water supply reliability tools, such as groundwater storage, transfers, conservation and reclamation, to produce near-term benefits and inform long-term decisions about water supply. Although we do not support CALFED’s current presumption regarding the need for new surface storage, we believe that surface storage should continue to be evaluated in light of the potential benefits of the water supply reliability tools described in this document.
- **“Let’s Get Better Together” Has Become Code For “If I Don’t Get Better, Neither Should You.”** This ‘quid pro quo’ philosophy ignores the fact that the interests do not come to the table as equal players – the ecosystem is on the verge of collapse, while the agricultural and economic sectors have continued to thrive.
- **More of the Same is Not the Answer.** The ecosystem has borne the brunt of conventional water development for more than a century. There is no better reason for looking for a new approach.

## Our Water Supply Reliability Program

This blueprint discusses a variety of water supply reliability tools. The table below summarizes a preliminary range of yield and storage which could be produced by these tools and which should be shared between the environment and consumptive water users.

**Table 1: Preliminary Summary of Potential Water Supply Reliability Strategies\***

	Strategy	Potential Yield (acre-feet)
<b>Demand side</b>	Irrigation efficiency	340,000-1,700,000
	Voluntary fallowing (dry year, rotational, permanent, etc.)	420,000-2,100,000
	Water acquisitions and transfers	Composite of irrigation efficiency, fallowing, groundwater and others.
	Full implementation of urban BMPs	1,500,000
	Improved landscaping requirements	520,000 -1,400,000
	More efficient washing machines	97,000-194,000
	Commercial ultra low flow toilets	200,000
	Existing residential indoor BMPs above MOU-specified levels	300,000
	Existing commercial, industrial and institutional BMPs above MOU-specified levels	350,000-650,000
	Reclamation and recycling	1,170,000-1,720,000
<b>Supply side</b>	Groundwater banking and management	900,000-1,000,000
	Delta reoperation	122,000-137,000
	Upper watershed restoration	No estimate available yet.
	Flood reservations	400,000-600,000 (Storage)

\* As discussed above, CALFED's water supply reliability program must provide water to support Bay-Delta ecosystem recovery. This will require substantial amounts of water. Improving Delta flow conditions in Stage 1 may require 123,000-372,000 acre-feet. Further improvements for upstream areas and Suisun Marsh will require additional water.

These preliminary figures are not additive. However, these tools offer the potential to go far beyond what CALFED has considered to date and could generate millions of acre feet of water for all users. They can form the basis for an environmentally and economically sound water supply reliability program. Section 3 discusses each of these strategies in greater detail.

This blueprint is focused primarily on tools to generate water supply reliability benefits. Further work needs to be done on programs to address water quality and other program objectives. However, it is clear that by developing a water reliability strategy by using above water supply tools, CALFED can help meet its other program goals. An approach which truly produces multiple beneficiaries is most likely to prove cost-effective.

## **Our Preliminary Recommendations**

We applaud CALFED's effort to begin identifying specific actions for Stage 1. However, the measures proposed in CALFED's draft preferred alternative document reflect a bias in favor of new surface storage and a tepid effort on alternative approaches. In contrast, we propose a set of Stage 1 actions in Section 4 that emphasizes:

- ◆ Maximizing conservation and recycling potential;
- ◆ Jumpstarting groundwater management and appropriate storage;
- ◆ Facilitating appropriate water transfers;
- ◆ Ensuring environmental water reliability;
- ◆ Improving the operation of existing dams and canals;
- ◆ Developing a comprehensive water supply/demand baseline ;
- ◆ Developing realistic modeling assumptions; and
- ◆ Pricing water to reflect its true economic and environmental value.

## **Our Commitment**

Our organizations are committed to fixing the environmental and water management problems in the Bay-Delta Estuary. We believe that CALFED's original approach – to address these problems in a broadly-supported, comprehensive package – is correct. We invite all stakeholders and public officials to join us in a productive dialogue to craft a solution that brings Californians together.

## SECTION I: OBJECTIVES FOR WATER SUPPLY RELIABILITY

### A. CALFED Has Failed to Adequately Define Water Supply Reliability

CALFED currently defines its water supply reliability objective as:

Reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system. This strategy seeks to: reduce the mismatch between supply and beneficial uses through a variety of actions; reduce the impacts of water diversion on the Bay-Delta system; and increase the flexibility to store and transport water. (Phase II interim report)

This objective is impossible to measure, in sharp contrast with the intense efforts to quantify the goals of the ecosystem restoration program and to develop measurable targets. In addition, the current CALFED approach to water supply reliability fails to:

- **Recognize that the price of water has an effect on both the demand for water and the supply of water.** As the cost of developing additional water supplies increases, demand for water will decrease and other sources of water (e.g. transfers and conservation) will become even more competitive. CALFED has not adequately integrated core economic principles and analysis into its water supply reliability planning.
- **Establish a level playing field between strategies focused on supply and demand.** If increased storage is itself an objective, the demand side strategies, no matter how successful, are doomed to be inadequate. CALFED has assumed a very limited approach to demand-side management, overstated future demand (see Section II), and then concluded that new reservoirs are "necessary" to meet the reliability goal. Indeed, CALFED has gone so far as to identify increased storage as a specific program objective, rather than identifying storage as a means (on a par with conservation and other options) for attaining the reliability goal, thus creating an inherent bias.
- **Integrate the role of the environment in determining water supply reliability.** Healthy aquatic ecosystems require water supplies of adequate quantity, quality and timing. CALFED's definition of reliability fails to reflect these needs. Nor does it reflect the increased water supply reliability that would accrue to water users once the ecosystem has achieved a level of health and sustainability. By ignoring environmental requirements, and the reliability implications of environmental degradation, CALFED's reliability objective biases the program in favor of strategies which are the least compatible with ecosystem health.

## **B. CALFED Should Redefine Its Water Supply Reliability Goals**

CALFED's water supply reliability program must contribute to the long term health of the urban, agricultural and fishing industries which depend on the Bay-Delta, as well as the environment. It is our view that **water supply reliability is more accurately defined as improving the predictability and availability of economic benefits derived from water, while restoring ecosystem health in the Bay-Delta estuary and watershed.** We propose to shift CALFED's reliability objective from its limited focus on increasing absolute amounts of water available for consumptive use to increasing the predictability of benefits. More water is only one of many ways to achieve such predictability. In fact, during the 1987-1992 drought, maximizing water deliveries resulted in drained reservoirs, devastated fisheries and decreased predictability. Our definition of water supply reliability includes three major component objectives:

### **1. Improve the long term economic benefits of water supply to sectors of the California economy dependent on Bay-Delta water supplies.**

CALFED should recognize the ability of individual water users to utilize both supply- and demand-side strategies. Supply alone fails to provide predictability of benefits and fails as an adequate measure of reliability. For example, growers can adapt to lower dry year contract supplies through conservation and water transfers. By providing a range of viable water reliability strategies, CALFED could help maintain the long-term profitability of a given grower, even if dry year contract deliveries remain unchanged. The bottom line for agricultural, municipal and industrial users is not unit of water delivered, but rather the benefits derived.<sup>1</sup>

Measuring economic benefits by sector will provide a valuable indication of the true value of water supplies. Such an approach will also adjust for regional variances. Finally, we recognize that tying the water supply reliability objective to economic benefits is complex, since a variety of factors affect economic well being (e.g. interest rates and market conditions). However, this is no different than CALFED's proposals for measuring ecosystem health, which is similarly dependent upon factors outside the control of the CALFED program.

### **2. Improve predictability of water availability to individual water users and districts in dry years.**

A program focus on assuring long term economic productivity will go a long way toward ensuring the adequacy of water reliability. However, we recognize that it may not be fully adequate to address water needs during particularly dry years. Under the current water management regime, the next drought is likely to result in further ecosystem

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<sup>1</sup> We believe that this economically-oriented objective incorporates the provision of adequate supplies for basic indoor domestic water use. Moreover, adequate drinking water supplies are not a limiting factor in achieving water supply reliability.

degradation and unpredictability for consumptive water users. CALFED should attempt to increase the predictability of water availability during dry years. Volume of contract deliveries alone is inadequate to measure dry year predictability.

The limits of using contract deliveries as a measure of success is amply demonstrated by the continued productivity of Central Valley agriculture during the 1987-1992 drought, despite reductions in contract deliveries. CALFED should adopt an objective that focuses on water availability to individual water users and districts, rather than the current focus on water contract deliveries to regions. Such dry year strategies could include dry year supplies from conjunctive use programs, water transfers, voluntary fallowing, conservation, purchased storage in existing surface reservoirs and more, in addition to contract deliveries. Strategies to increase the predictability of dry year supplies should not be designed to prevent any change in water use during dry years. Rather, they should be designed to reduce dry year impacts and provide options for water users. In the context of these options, we expect that some individual water users and districts will choose to enter dry year water markets as sellers and others as purchasers. Encouraging well-informed decisions by water users among a variety of options is perhaps CALFED's best strategy to promote efficient water use and reduce impacts during times of shortage.

In practical terms, there is a major difference between solutions that improve dry year benefits and those that improve average year benefits. For instance, water transfers designed to increase reliability in dry years (e.g. dry year options) can help keep agricultural land in production. These same market strategies can be used to increase long term supplies, through voluntary agricultural land retirement. Whatever the merits of retiring a given piece of agricultural land, tools targeted at average supplies and dry year reliability have very different effects.

As discussed in section 3, many strategies could provide increased predictability in dry years. As CALFED further develops these strategies, it should develop an approach that provides adequate evaluation and measurement of the access which individual water users and districts have to strategies to improve reliability during dry years.

### **3. Assure that the water supply reliability program actively promotes CALFED's ecosystem restoration goals.**

It is essential that CALFED recognize the water supply reliability benefits of achieving its ecosystem restoration objectives. The recovery of endangered species, for example, would dramatically increase the predictability of water supplies. In addition, CALFED's water supply reliability program must support -- rather than compete with -- the flow improvements necessary to achieve the ecosystem restoration objectives. In short, CALFED's water supply reliability program must do more than simply reduce environmental impacts (as stated in the current CALFED definition). It must be fully integrated with the ecosystem restoration program. Such an approach will better serve both the environment and water users.

This has significant ramifications for the water supply reliability objective. For example, increasing operational flexibility for consumptive uses without also using that flexibility to meet the objectives of the ecosystem restoration program is likely to result in further environmental degradation, thereby reducing reliability. CALFED's water supply reliability program must provide reliability for the environment, not merely for water users. It is now widely accepted that the attainment of water supply reliability and ecosystem restoration are inextricably linked; this linkage must be formally recognized in the objectives that guide CALFED.

CALFED can evaluate progress towards this reliability objective by measuring specific contributions to the attainment of objectives for endangered species recovery, desired annual hydrograph, in-stream flow improvements, and other components of the CALFED ecosystem restoration program. Attainment of these objectives will result in increased reliability for all water users.

It is important to note, however, that unpredictability of water supplies which results from slow progress in attaining ecosystem restoration goals should not be used as a rationale for reducing ecosystem restoration funding, or for constructing new surface storage facilities which could result in further ecosystem damage.

## SECTION II: WATER SUPPLY IN CONTEXT

CALFED's water supply reliability program is being driven in part by flawed notions about what current and future demand for consumptive use of water is and will be, and concern that environmental protections have had substantial impacts on agricultural and urban water users. Indeed, CALFED appears to be taking seriously claims that these relatively modest protections have caused actual water shortages. The purpose of this section is to provide historic context for current and projected water demand, and to provide an alternative perspective of the "water costs" associated with environmental protections by using actual Delta export data.

### A. Historical Overview

In California's Central Valley watershed, developed water use has steadily increased over the last 150 years and has substantially reduced instream flows. In the San Francisco Bay/Delta the impacts of this development have been exacerbated by the export of much of the remaining freshwater inflow to the San Joaquin Valley, the Tulare basin and the Los Angeles basin. As these exports have increased over the last 30 years, the fishery populations have plummeted. Many aquatic species now qualify for Endangered Species Act (ESA) protections. Figure 1 summarizes the concurrent decline of fish populations along with increased Delta exports from 1967-1996.<sup>2</sup>

Over the 20-year period from 1975-1994, water users south of the Delta exported about 4.6 million acre-feet (AF) on average. However, exports steadily increased over this time frame reaching a record high of 6.1 million AF in 1989, notwithstanding a series of very dry years in the late 1980s and early 1990s. Indeed, total Delta outflow was less than 35 percent of estimated unimpaired flows for four straight years 1988-1991.<sup>3</sup>

State and federal governments began to consider and implement environmental protections under the CVPIA, the federal and state clean water acts and endangered species statues in the early 1990s. Various studies have been generated purporting to demonstrate that these limited environmental protections have had, and will have in the future, enormous water supply impacts. Recent claims have been over 2 million acre feet per year.

However, it is essential that the CALFED solution be based on clear and accurate information. Close analysis reveals that the water supply impacts of environmental protection are relatively modest -- certainly no more than the water users felt was reasonable when they signed the Bay-Delta Accord four years ago. We base this conclusion on the tables 2 and 3 of this section. These tables analyze the impact on Delta

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<sup>2</sup> DWR's DAYFLOW database is the source of all Delta export and outflow values in this Appendix. CDFG's data for fish passage at Red Bluff are used for population values for salmonids and steelhead. Midwater trawl data is used for population values for Delta smelt, longfin smelt and striped bass.

<sup>3</sup> Unimpaired flow data provided by DWR.

exports of environmental protections against two different baselines: actual exports and a modeled projection of exports assuming a 1995 level of demand and the D-1485 standards.

The water supply "impacts" of environmental protections are correctly characterized as "the loss of historic supplies to consumptive users." Thus, the best way to define the baseline for determining such impacts is actual historic export levels.<sup>4</sup> Comparing projected operations under environmental protections with exports that have actually taken place provides the most realistic assessment of potential impacts. Nevertheless, we have included here analyses of water supply impacts associated with environmental protections using both historic (actual) data and DWR's projected future definition of baseline. We have compared these two baselines with the same regulatory regime -- the current environmental protections afforded by the CVPIA, the 1995 Water Quality Control Plan and ESA criteria. Results of this comparison are illustrated in tables 2 and 3.

Table 2  
Delta Export Comparison  
Baseline: Actual Exports  
(all values in TAF)

Period	Baseline: Actual Exports	Current Regulatory Conditions: Projected Exports under ESA, WQCP, CVPIA (DWRSIM Study 549new)	
	Average	Average	Difference from Actual
October 1975 - September 1994	4596	5297	701
June 1986 - September 1992	4979	4328	-651

Table 3  
Delta Export Comparison  
Baseline: DWRSIM D1485 Study  
(all values in TAF)

Period	Baseline: Projected Exports Under D1485 (DWRSIM Study 693)	Current Regulatory Conditions: Projected Exports under ESA, WQCP, CVPIA (DWRSIM Study 549new)	
	Average	Average	Difference from Actual
October 1975 - September 1994	5843	5297	-547
June 1986 - September 1992	5257	4328	-929

<sup>4</sup> South of Delta deliveries are sometimes used to estimate impacts in place of Delta exports.

Table 2 looks at projected levels of export under the current environmental protections compared with actual historic exports. Historic annual exports from the Delta were about 4.6 million AF on average (1975-1994). The current relatively limited environmental protections have not resulted in major adverse impacts on historic levels of export. On the contrary, with current environmental protections in place, under a repeat of the 1975-1994 conditions, Delta exports would be about 5.3 million AF -- or about 700,000 AF more per year than the water users actually exported on average.

Nor is it the case that current environmental protections would result in unreasonable impacts during prolonged drought periods. Table 2 demonstrates that during the most recent prolonged drought period (June 1986-September 1992), actual Delta exports were about 4.97 million AF. During a repeat of these conditions, with the current environmental protections in place, south of Delta exports would be about 4.3 million, or a decrease in annual average exports of about 650 TAF. While this is not an insignificant amount, it is well below estimates of the water costs associated with environmental protections. Even more significantly, it is well below what the water users themselves determined was "reasonable" when they signed the Bay-Delta Accord four years ago.

Table 3 looks at these water costs using a different baseline -- an entirely hypothetical modeling projection that does not reflect exports ever provided to south of Delta exporters. As discussed above, DWR has assessed the "impact" of environmental protections using a baseline that assumes a 1995 level of demand and the D-1485 standards. (We emphasize that we are aware of no justification or support for the notion that this level of demand somehow represents an absolute entitlement such that any level of export below this level counts as an "impact".) Nevertheless, even under this questionable baseline, projected water costs of current environmental protections is far below many water user claims. On average, DWR's study demonstrates that under its hypothetical baseline Delta exports would be about 5.8 MAF annually. With environmental protections in place, projected exports would decrease by about 547 TAF - - or less than 10%. In a repeat of a lengthy drought, exports could decrease from 5.2 MAF to 4.3 MAF, or about 929 TAF.

We do not discount the significance of this drought period estimate. However, this worst case scenario is again well below the highly inflated claims that are routinely employed in the CALFED process to justify immediate construction of new dams and surface reservoirs -- and again below the level of impact the water users agreed to in signing the Bay-Delta Accord. It is worth noting that the environmental criteria reflected in these DWR studies include a broader range of protections than those used for purposes of the Bay-Delta Accord "impact" modeling. Thus, it now appears that the combined water supply impact of the ESA, CVPIA and Water Quality Control Plan protections is somewhat less than the anticipated water costs of the Bay-Delta Accord alone. If nothing else, this fact indicates that CALFED must use great caution in premising its water supply

reliability program on modeled projections and any such studies must receive careful and comprehensive review.

Additionally, it is critical to acknowledge that the limited water supply impacts of current (critically needed) environmental protections have not resulted in water shortages. When subsidized water has been less than fully available, the water users have been able to avail themselves of water on the open market. For example, during the drought of the late 1980's and early 1990's, Westlands Water District secured additional water supplies through many of the water supply reliability tools analyzed in Section 3, including water transfers and improved water conservation practices. Over the five year period from 1990 to 1994, despite reductions in the amount of federally subsidized water it received, Westlands was able to adapt and maintain very productive crop yields and gross crop values. Given the existence of adequate tools that we propose, water users will have substantially improved access to water.

In other words, even in dry years, the water users have not lost water supply -- they have simply experienced reductions in water subsidies. As discussed further in section 2, this is appropriate public policy because it will encourage more efficient use of water. A healthy and appropriate water transfer market, as well as the other tools discussed in Section 3 will mean that what the water users may lose in subsidies they will more than make up in increased reliability.

Finally, not every reduction in water supply, or the availability of subsidized water, can be laid at the door of environmental protection. Under California's appropriative rights system, in some years drier weather alone will trigger shortages for those districts that have the most junior status, even though other more senior water users will receive full contract supplies.

### **B. Overestimating Current and Future Demand**

The assumptions used by CALFED to estimate urban water demand are based on questionable projections from DWR's Bulletin 160-98 which dramatically overestimate current and projected demands for consumptive use, and underestimate savings from current and projected water conservation strategies. Among the program's faulty assumptions:

- Current water demand is overstated by up to 1.2 million acre-feet. Demand projections for 2020 are based on this inaccurate baseline.
- Errors in forecasting methodology underestimate water availability by hundreds of thousands of acre-feet.
- 2020 urban demand is overstated by an additional one million acre feet because of the failure to include all applied water reductions as reductions in future demand.

In light of these problems, CALFED should also reevaluate its assumptions regarding agricultural water demand before proceeding with further analysis. In all cases, demand responsiveness to price, must be fully integrated into the supply/demand assessment, upon which CALFED's assessments are based.

Figure 1(a)  
 Historic Delta Exports and Fish Populations  
 (population data available only since 1967)

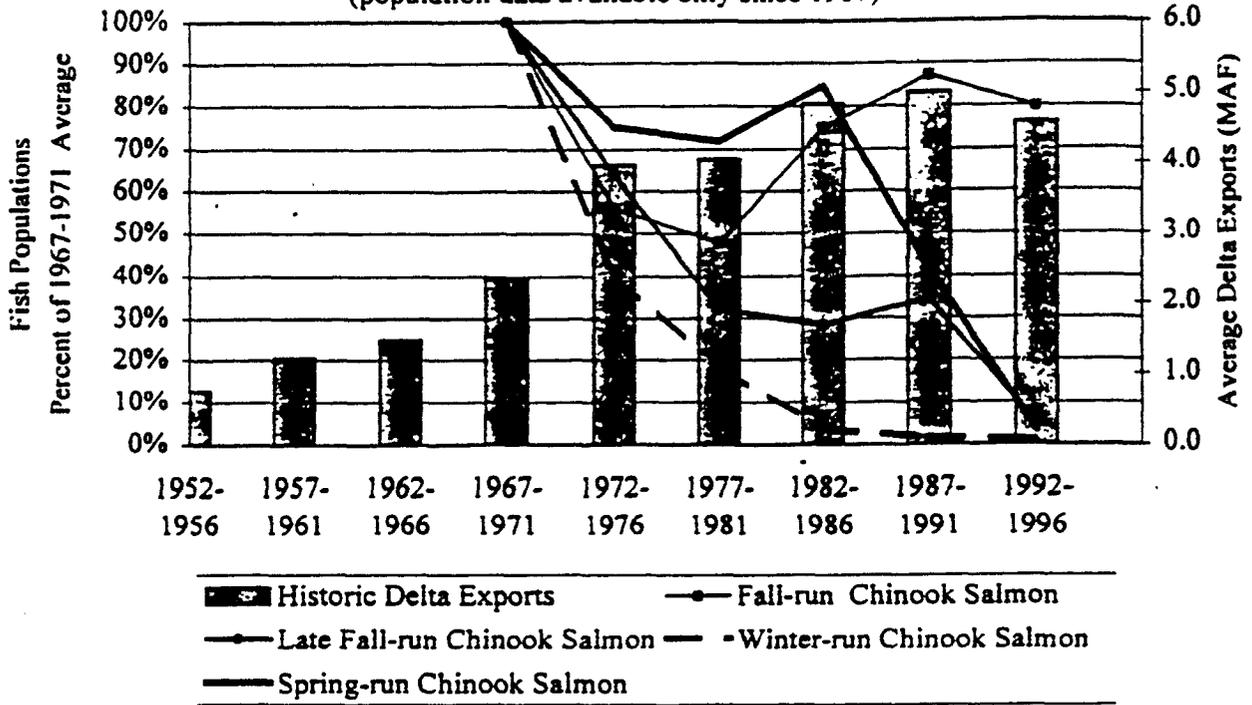
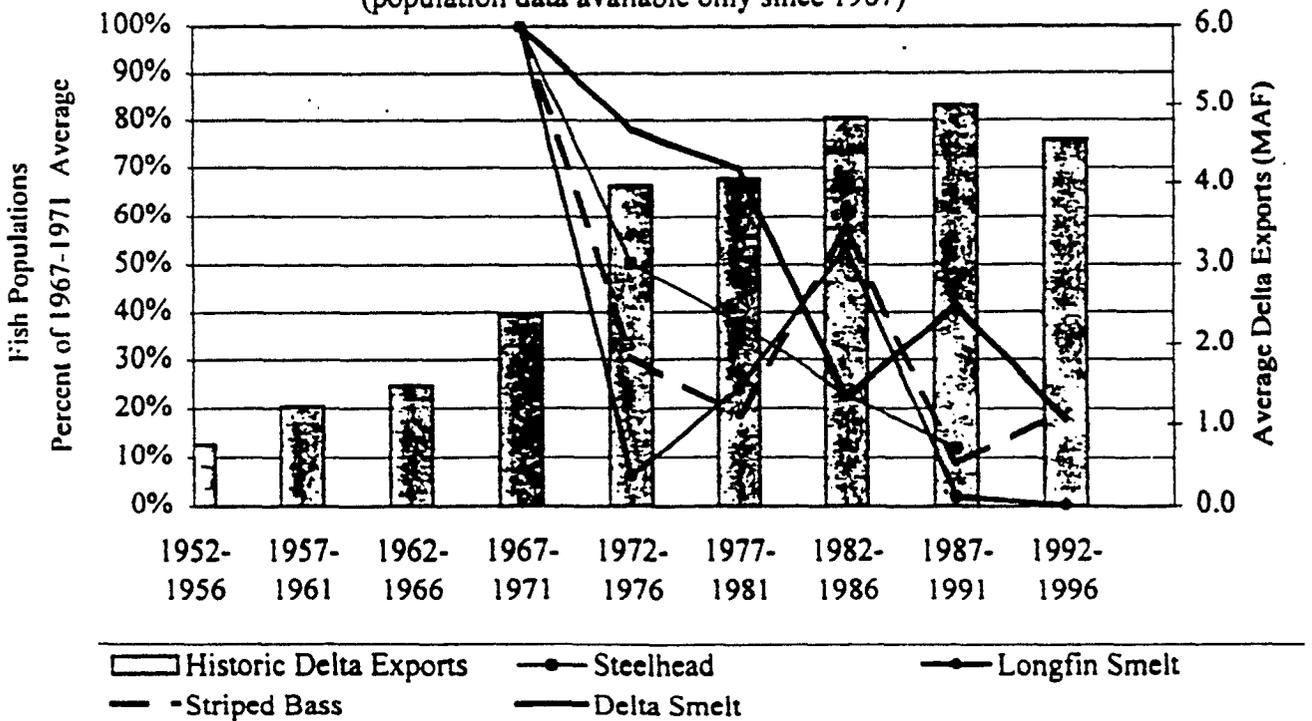


Figure 1(b)  
 Historic Delta Exports and Fish Populations  
 (population data available only since 1967)



### SECTION III: ACHIEVING WATER SUPPLY RELIABILITY WITHOUT NEW DAMS

CALFED has not adequately analyzed the potential for alternatives to new dams and surface reservoirs to provide water supply reliability. This section initiates a fuller discussion of these options. The analysis below is preliminary and is based on the limited data available to our organizations. The figures provided are a rough approximation of the water supply that could be saved or made available through "soft path" means and other approaches compatible with ecosystem restoration.

This analysis is not a definitive or exhaustive discussion, but should provide the CALFED Policy Group and staff with a starting point. Clearly a thorough investigation of the issues raised in this section must be conducted before CALFED commits itself any further to a "presumption" that new surface reservoirs are required to attain the water supply reliability objective. We have not, for example, performed an economic analysis of these alternatives. We continue to urge CALFED to complete such an analysis before making decisions regarding the need for new storage and conveyance projects. We believe that the results of this analysis will demonstrate that the strategies outlined below provide the basis for an environmentally and economically sound water supply reliability program. We further believe relying on the diverse mix of water management tools discussed below will reduce system vulnerability, as well as reduce the risk that CALFED will create stranded assets by constructing expensive facilities to which cheaper alternatives exist.

In the future, we will present our recommendations for the CALFED water quality and system vulnerability programs. The measures discussed below will comprise one part of our water quality recommendations, as we believe that implementation of these measures, such as improved agricultural irrigation efficiency, voluntary land retirement, watershed restoration and water reclamation, can offer substantial water quality benefits. In addition, as we have previously recommended, implementation of measures to address Delta subsidence can reduce system vulnerability and improve water supply reliability.

The discussion below is divided into four subsections. First, we discuss the need for a foundation of baseline information and appropriate financing tools for a water supply reliability program. Second, we discuss demand strategies to better utilize existing developed water supplies. Third, we address "supply side" strategies which could be conditioned to provide water supply benefits for urban and agricultural water users, as well as the environment. Fourth, we discuss some of the flow-related ecosystem requirements which the water supply reliability program must address. We believe that implementation of the CALFED water supply reliability program, particularly the "supply side" strategies discussed below, must be formally linked with assurances that ecosystem flow and other requirements will be provided. Specifically, the environment should benefit directly from the implementation of each water supply reliability tool discussed below. We propose the following package of potential strategies:

## **A. A Water Supply Reliability Foundation**

A solid foundation of reliable information and financing is a key to the ultimate success of the CALFED water supply reliability program.

### **1. Developing a Baseline and a Water Budget**

CALFED should develop and implement a comprehensive budget for use of the Bay-Delta's waters. Exports and diversions from the system have increased over time, and, the total amount of withdrawals and depletions has not been adequately measured. Such a budget would provide the comprehensive information needed to make well-informed decisions. It could also promote ecosystem restoration and sustainable economic use. Such a budget will require an accurate and comprehensive water use measurement and reporting program.

### **2. Modeling Assumptions**

The modeling for CALFED's "no action" alternative assumes that the CVP and the SWP will make full deliveries of contracted supplies in the future. As discussed above, such deliveries would be inconsistent with existing law (e.g. ESA, CWA, CVPIA), CALFED's ecosystem restoration goals and "no redirected impacts" principle. By building these increased deliveries into the "no action" alternative, the modeling masks the potential environmental impacts of CALFED's water supply reliability alternatives. Correcting this assumption is essential for CALFED to weigh accurately the benefits and impacts of a final CALFED package. In addition, correcting this assumption is essential to comply with CALFED's commitment not to balance the state water budget on the back of the Delta.

### **3. Financing and Pricing**

Past water pricing policies have consistently understated the "true cost" of water development through financial subsidies and by failing to assign economic cost to ecosystem destruction. These policies have combined to inflate expectations, create a perception of shortages and encourage environmentally damaging water development.

To avoid such problems in the future, CALFED should adopt a comprehensive pricing strategy that ensures that all water supply alternatives incorporate in full their associated economic and environmental costs. In particular, direct beneficiaries should pay the full planning and construction cost of any new storage or conveyance facilities.

In addition, CALFED's financing package must address the unmet mitigation obligations of water users. This should include, for example, a set of surcharges on water use and development in the Bay-Delta system to assist in ecosystem restoration and the dedication of a share of any new water supply facilities to ecosystem restoration.

## B. Demand-Related Strategies

### 1. Agricultural Water Conservation

Improve irrigation efficiency. Agriculture uses over 80% of the developed water supply in California. Relatively small changes in agricultural demand can yield tremendous quantities of water. For example, a small reduction in the percentage of applied water lost to evaporation by switching to more efficient technology, or by improved irrigation scheduling, can yield significant water savings.

Evaporative losses are irretrievable and a non-productive use of water. Flood irrigation is estimated to lose 20 to 30 percent to evaporation from open water surfaces and transpiration by weeds.<sup>5</sup> Evaporation losses from sprinkler systems, which are currently used on approximately 35 percent of the irrigated acreage in California,<sup>6</sup> are estimated to be as high as 9 percent, while micro-irrigation systems are estimated to have minimal evaporative losses.<sup>7</sup> Overall, a one to five percent reduction in agricultural demand due to reduction in evaporative losses or other changes in water use could generate 340,000 - 1,700,000 acre-feet.<sup>8</sup> These changes in irrigation practices could also have a substantial positive impact on water quality by reducing surface runoff and subsurface drainage.<sup>9</sup>

Increase use of market-based incentives. A voluntary program of compensated dry year fallowing of agricultural lands (dry year options) could generate a substantial dry year water supply. For example, dry year fallowing of 5 to 15 percent of the land currently used to grow alfalfa, pasture forage, and cotton in the Central Valley and Colorado River regions could potentially generate 400,000 to 1.2 million acre-feet in those years.<sup>10</sup> These reductions are based on evapotranspiration rates and constitute reduction in consumptive use. Reductions in the volume of applied water are even greater, yielding additional environmental benefits. The CVPIA Least Cost Yield study reached similar conclusions, finding that 1.24 million acre feet of non-CVP consumptive use could become available through voluntary land fallowing "capped" at 20 percent of existing use in the Central Valley. Estimated costs range from \$55 to \$255 per acre foot.<sup>11</sup> The same report found that 300,000 acre-feet could be made available within the CVP service area. Applying

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<sup>5</sup> Peter Gleick et al, *Review of the CALFED Water Use Efficiency Program Technical Appendix* (Pacific Institute for Studies in Development, Environment and Security, Oakland: 1998) p. 20.

<sup>6</sup> David Sunding, et al., "The Costs of Reallocating Water From Agriculture," University of California, Berkeley, 1994.

<sup>7</sup> Greg Young and Steve Hatchett, "On- farm Irrigation System Management," Technical Memorandum, June 6, 1994, p. 3-2.

<sup>8</sup> Based on 1995 average year agricultural water use, as reported in Bulletin 160-98, p. 1-20.

<sup>9</sup> Ronnie Cohen and Jennifer Curtis, *Agricultural Solutions: Improving Water Quality in California Through Water Conservation and Pesticide Reduction* (NRDC, San Francisco: 1998).

<sup>10</sup> This estimate was derived based on crop acreage by region from Bulletin 160-98, and average crop ET by region from Bulletin 160-93. The actual yield of dry year options must be adjusted to consider irrigation prior to the exercise of an option and potential dry year supply shortages.

<sup>11</sup> CVPIA Least Cost Yield Program, 1995.

the same methodology to the consumptively used portion of the Imperial Irrigation District's water supply would produce another 600,000 acre feet, for a total of up to 2,140,000 acre-feet. A reasonable minimum estimate of dry year fallowing can be obtained from the 1991 drought water bank. In that year, 420,000 acre-feet of "no irrigation" contracts (exclusive of "groundwater exchange and multiple response") were signed by DWR.<sup>12</sup>

Voluntary, compensated retirement of marginal quality lands on the west side of the San Joaquin Valley will have multiple benefits that could help meet the CALFED objectives in many areas, including water quality, water supply reliability, and ecosystem restoration. CALFED's preliminary analysis showed that a voluntary program of compensated land retirement could generate as much as 1.5 million acre-feet of water at an average cost of \$150 per acre foot. This cost is significantly less than the projected costs of many other water supply augmentation options currently under consideration.

The 1990 joint federal-state "Rainbow Report" forecast that, by 2040, 460,000 acres of San Joaquin Valley lands would be significantly drainage impaired.<sup>13</sup> It recommended a suite of actions, including land retirement, in its drainage management plan. Even assuming the full accomplishment of the other measures, such as conservation and reduction of deep percolation, the Rainbow Report recommended that 75,000 acres be retired from willing sellers. Assuming an average allocation of 2.5 acre-feet per acre, and assuming that .5 acre-feet per acre is necessary for subsequent land management activities, retiring this amount of land from willing sellers could generate 150,000 acre-feet of water. Voluntary retirement of 75,000 acres is projected to occur pursuant to the CVPIA, even in the absence of a CALFED solution. Voluntary land retirement above this amount can further contribute to the CALFED solution.

These figures are preliminary only, and provided here for illustrative purposes. The degree to which market-based voluntary dry year fallowing and voluntary land retirement should be implemented, and under what conditions, deserves far more exhaustive analysis than CALFED has undertaken to date. CALFED must conduct a serious examination of these options.

## 2. Urban Water Conservation

The urban element of the CALFED water use efficiency program is based largely on full implementation of the Memorandum of Understanding Regarding Urban Water Conservation (MOU) – which is expected to generate 1.5 million acre feet of demand reduction by 2020.<sup>14</sup> While the CALFED documents recognize that implementation of

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<sup>12</sup> "California's 1991 Drought Water Bank: Economic Impacts in Selling Regions," (Rand, 1993).

<sup>13</sup> San Joaquin Valley Drainage Program, 1990. *Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley*, U.S. Department of Interior and California Resources Agency, Sacramento, California.

<sup>14</sup> Department of Water Resources, Bulletin 160-98: The California Water Plan Update, (Sacramento: 1998) p.4-16.

the MOU should comprise the "floor" or base level of conservation, rather than a ceiling, the CALFED program makes little effort to quantify, let alone pursue, the substantial conservation savings that exist above the level to be obtained by full implementation of the MOU. Some of the available savings are described below.

Promote low water use landscaping and more efficient irrigation. Landscaping represents 30 to 60 percent of urban water use water use.<sup>15</sup> According to CALFED, urban water use amounts to 8.7 million acre-feet. Total water use for landscape purposes therefore ranges from 2.6 to 5.2 million acre feet. Landscape water audits, timers, and xeriscape could reduce landscape water use by approximately 10 to 15 percent. Greywater systems or rain cisterns can conserve much or all of landscape water use in individual applications. Statewide, a 20% reduction in landscape water use would yield 520,000-1,400,000 acre-feet.<sup>16</sup> Because the Urban MOU targets a limited number of customers for landscape water audits, even full implementation of the MOU will generate only a small portion of these total potential savings from landscape conservation.

Retrofit homes with more efficient washing machines. Replacing 50 to 100 percent of the average washing machines in use in 1995 with currently available horizontal axis washing machines could generate 97,000 to 194,000 acre-feet.<sup>17</sup> Future savings could increase further as even more efficient models come on the market. Because a BMP for horizontal axis washing machines was only recently added to the MOU, these potential savings are not yet reflected CALFED's estimates of potential urban water conservation savings.

Retrofit businesses and institutions with commercial Ultra Low Flow Toilets (ULFTs). According to a 1997 study by the Urban Water Conservation Council, savings from commercial ULFT retrofits ranged from 16 to 57 gallons per day (gpd), with wholesale establishments saving 57 gpd, and food stores and restaurants saving approximately 48 gpd.<sup>18</sup> Statewide savings from retrofits could yield 200,000 acre-feet, assuming that 5 million retrofits occur with average savings of 35 gpd.

Implement existing BMPs for residential indoor use at levels above MOU specifications. A substantial additional increment of cost-effective conservation is achievable by implementing existing BMPs above the levels specified in the Urban Water Conservation MOU. For example, potential savings from 4 indoor residential measures alone (ULFTs,

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<sup>15</sup> DWR Bulletin 160-93 notes that residential outdoor use ranges from 30 to 60% (p. 153) DWR Bulletin 166-4, *Urban Water Use in California*, notes that urban seasonal water use ranges from 26% to 58%. (p.24) Bulletin 166-4 notes that while some seasonal water use is not due to landscape use, this is offset by the fact that some landscape water use occurs year round. Therefore, seasonal use is a reasonable approximation for landscape use.

<sup>16</sup> Benefits to the Delta may be somewhat lower than that since some portion of applied landscape water may return to the system for future use.

<sup>17</sup> Gleick, et al., Appendix B.

<sup>18</sup> Hagler Bailly Services, Inc., *The CII ULFT Savings Study*, (San Francisco: 1997) Sponsored by the California Urban Water Conservation Council

showerheads, faucet aerators, and leak detection) could yield over 300,000 acre-feet.<sup>19</sup>

Implement existing BMPs for commercial, industrial and institutional water use at levels above MOU specifications. Additional savings are also possible from commercial, institutional, and industrial (CII) water conservation efforts above MOU specified levels. CII use represents almost 40% of urban water use, or almost 3.5 million acre feet. Recent studies estimate potential cost-effective savings of 20 to 30%,<sup>20</sup> which corresponds to statewide savings of 700,000 to 1 million acre feet. Full implementation of the CII BMP should capture 350,000 acre feet, leaving at least 350,000 to 650,000 of cost-effective savings available.

### **3. Water Acquisitions and Transfers**

California already has an enormous developed water supply, much of which is currently used in a highly inefficient manner. In addition, California's rigid and inflexible system for allocating available supplies according to seniority exacerbates water management problems in the over-allocated Bay-Delta system. Thus, relatively small periodic "shortfalls" can, and do, fall disproportionately on particular users. In such a seniority-based system, where the marginal cost of developing "new" supplies is high and the marginal benefit of the least productive water uses is low, voluntary transfers between consumptive users offer potentially significant economic and water supply reliability benefits to individual water users and the state as a whole. They can also be used to address our over-allocation problem directly, and to provide a cost-effective and flexible suite of approaches for helping to secure and sustain improved ecosystem flows. Finally, transfers have the potential to provide significant near-term and dry year benefits, making them particularly appropriate for a major effort in CALFED's Stage 1.

Many other demand side strategies discussed in this section offer the potential for real water savings. However, water users will resist more stringent regulatory requirements to achieve these savings, and taxpayers are likely to resist a new generation of water development subsidies. Market-oriented transfers offer an important third path to encourage increasingly efficient use of our existing water supplies.

If transfers are conducted in an irresponsible manner, they have the potential to harm local communities and the environment, both in the Delta and in upstream regions. A variety of mechanisms can assure adequate protection for all legitimate interests and ensure that proposed transfers and acquisitions make sense as part of a more comprehensive and sustainable long-term water management framework. A full discussion of relevant assurance mechanisms is beyond the scope of this document, and will be addressed subsequently. However, measures which will be needed to facilitate the development of a more active market include:

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<sup>19</sup> Gleick et al., p.35.

<sup>20</sup> Gleick et al., p. 32, citing J. Sweeten and B. Chaput, (1997), "Identifying the Conservation Opportunities in the Commercial, Industrial, and Institutional Sector"; U.S. EPA, (1997) "Study of Potential Water Efficiency Improvements in Commercial Businesses".

- Comprehensive metering and/or equivalent measurement of "flows" of surface and groundwater into and out of the Bay-Delta system;
- A robust and comprehensive regulatory/operational surface water baseline sufficient to protect all affected public trust resources;
- A comprehensive set of basin-specific sustained yield groundwater management programs which fully protect groundwater and related aquatic and terrestrial ecosystems;
- A system for converting the above baseline and any permanently acquired ecosystem supplies into a system of permanent ecosystem rights, and for securing and tracking acquired "temporary" supplies;
- Secure and sufficient ecosystem funding;
- A proactive water transfers clearinghouse, including use of a statewide electronic bulletin board and other mechanisms;
- Strategies to facilitate meaningful community involvement;
- Water use and transfer mitigation surcharges to fund mitigation and retraining programs for members of affected local economies; and
- The adoption of measures to resolve disputes between water users, retailers and wholesalers (such as direct buy-back programs, thresholds for out-of-area transfers, or other means).

With these protections in place, an expanded market between consumptive users would allow "water short" agricultural and urban areas to purchase water from "water rich" agricultural areas, encouraging overall water use efficiency. Such a market could also induce source regions to more effectively and sustainably manage their groundwater basins for multiple benefits. But perhaps the greatest incentive to further development of a consumptive-use water transfer market would be the elimination of all subsidies for any "new" water development.

A primary objective of a more flexible, market-oriented approach to allocating available supplies should be to "re-acquire" developed water supplies to improve ecosystem protections. A voluntary, willing-seller environmental "re-acquisition" program would augment existing regulatory requirements (CVPIA, ESA and 1995 WQCP). It would also help match long-term restoration needs with variable geographic, biological and hydrological conditions by securing water rights and supplies to improve instream flows and Delta outflows.

Transfers and acquisitions should be implemented in ways which assure that there is no net increase in baseline diversions or consumption. In addition, CALFED's Stage 1 efforts should focus on facilitating increased "south-to-south" water transfer opportunities for consumptive use (including Colorado River region transfers) as well as Valley-wide ecosystem acquisitions. Subject to the above conditions, water transfers originating in upstream (above export) areas would be allowed, but limitations on through-Delta conveyance, necessary carriage water premiums, and the lesser amounts of developed water potentially available for transfer from above-export sources combine to suggest that "north to Golden Gate" acquisitions are a more cost-effective and likely result.

The primary mechanisms for acquiring environmental supplies and developing an active consumptive use water market include:

Direct acquisition of instream water rights: Water rights would be purchased from willing sellers and permanently transferred to environmental uses.

Re-operation of stored water: The purchase of stored water in existing hydropower reservoirs could be used to improve fishery flows and for riparian restoration and other ecosystem improvements. Such purchases of stored water are not appropriate for consumptive uses, except as discussed below in Section III C 2(b) of this document.

Conservation-related investments: The water conserved through investments in improved conveyance efficiency, water saving irrigation technology, crop-mix changes, and other conservation-related investments should be shared between instream acquisitions and consumptive uses.

Voluntary land fallowing and land retirement: A huge water market could be created by transferring the consumptively used portion of water applied to some irrigated lands to the environment and other consumptive users. A mixture of drought options, short- and long-term leases, rotational fallowing, opportunistic ("spot") acquisitions, and permanent retirement, could result in millions of acre-feet of water savings per year in the Central Valley alone, as discussed above.

Groundwater transfers to instream/ecosystem use: Reducing surface water diversions during critical periods by relying on sustainable groundwater supplies could produce significant amounts of water for instream/ecosystem use.

Groundwater transfers to consumptive use: These transfers could become a significant source of consumptive use transfers over time, but should be strictly limited to previously banked groundwater supplies until shown to comply with a fully-protective, sustained-yield groundwater management plan.

The amount of water potentially available through the use of acquisitions and transfers is

discussed elsewhere in this section (e.g. groundwater, voluntary fallowing and land retirement, and agricultural conservation).

#### **4. Wastewater Reclamation and Recycling**

By the year 2020, according to CALFED, over 3 million acre-feet of wastewater will be generated annually by urban coastal areas. CALFED estimates that under a "no action" scenario California will recycle approximately half of this and generate 1.17 million acre-feet of reusable water<sup>21</sup>. Implementation of the CALFED water recycling program could generate from zero up to an additional 550,000 acre-feet in new supply, for total of up to 1,720,000 acre-feet in recycled supply.

Recycled water may be among the more expensive soft path alternatives. However, it offers important secondary benefits, including water quality benefits, and deferred or avoided costs for new or expanded wastewater treatment plants. Water reclamation is also one of the least controversial supply reliability measures.

While CALFED has identified the potential for creating up to 1.7 million acre feet of recycled water, it has not adopted that figure as an objective. Indeed, CALFED recognizes that the amount of new recycled water to be generated as a result of the CALFED program may only be zero.

#### **C. Supply-Related Strategies**

The strategies discussed in this section address the supply side of the water management equation. The environmental community has expressed grave concern about some of these measures because of the potential for additional serious impacts on an already devastated ecosystem. However, as part of a balanced CALFED water supply reliability program which also assures environmental water supply reliability (see Section III below), we believe that the measures identified below may have merit.

##### **1. Groundwater Banking and Conjunctive Use**

It is broadly recognized by CALFED, and among most stakeholders, that making better use of California's substantial groundwater resources offers potentially significant and cost-effective near- and long-term water supply reliability benefits for all.

Crafting and implementing an ambitious array of well-regulated groundwater storage and conjunctive management programs designed to achieve this potential should be the "supply side" focus and priority of an integrated and cost-effective Stage 1 water supply

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<sup>21</sup> Reclamation is the exception to the "no new water" rule discussed in the introduction, as it actually does create "new" water. CALFED defines "new" water generated by reclamation as that which would otherwise be lost to consumptive use. Currently, some "unreclaimed" waste water is returned to streams and reused by downstream users. (CALFED EIR/EIS Water Use Efficiency Water Use Efficiency Component p. 1.4)

reliability strategy. As discussed further in section III B 3, necessary protections and assurances will include comprehensive groundwater monitoring as well as basin-specific sustained-yield management. Developing the institutional and legal arrangements needed to protect recharged groundwater supplies for later withdrawal is a necessary condition to successful groundwater development that would also greatly increase the incentives for implementing such programs.

The potential for groundwater banking varies according to many factors, including (1) aquifer storage capacities, (2) the relationship between groundwater levels and ecosystem needs, (3) the use of groundwater pumping to support local economic activities, (4) the source of water to be banked, and (5) the ability to convey water both to and from a particular recharge site.

Such programs will require the development of local conveyance systems, active recharge sites, extraction wells, and other local infrastructure. Nevertheless, they can be implemented in ways that provide enhanced reliability benefits for all sectors without adding pressure to an already-oversubscribed Bay-Delta system if (1) they are based on a truly comprehensive management regime, and (2) are structured to look beyond so-called "surplus" water – water which may be available for diversion or export after an improved ecosystem baseline is firmly in place – to include a diversity of alternative sources (transferred and acquired supplies, "self-savings" derived from baseline allocations, drawdowns of existing reservoir supplies, etc.).

A reservoir drawdown program illustrates the potential. In many years, a portion of the water scheduled to be carried over in existing surface reservoirs could be released and stored in aquifers through percolation or injection, or supplied directly to users otherwise dependent on groundwater (so called "in lieu" recharge). During the ensuing rainy season, these reservoirs would be able to capture additional surface runoff, thereby replacing the water previously released for storage in a groundwater bank. (In the event that "refill" did not occur, previously banked supplies and/or previously-agreed upon risk-compensation payments could be used to help to make ends meet.) While this approach is not without potential complications, studies indicate that it could result in as much as 1 million acre-feet of additional "yield" becoming available, even after factoring in the need to meet instream flow, temperature criteria, and other environmental and water management constraints.<sup>22</sup>

Other studies demonstrate that these and related programs are both cost effective and dramatic in their potential to address California's water management needs. For example, the CVPIA Least Cost Yield Plan estimates that active groundwater recharge programs could produce approximately 940,000 acre feet of yield per year, with costs ranging from as little as \$60-\$120 per acre foot. While these costs can be expected to increase as "market-based" or "self saving" source-water elements are included, they continue to show great promise in comparison other supply-oriented alternatives.

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<sup>22</sup> NHI, 1998. An Environmentally Optimal Solution: A Response to the CALFED Bay Delta Program.

## 2. Changing the Operation of Existing Reservoirs.

Throughout California, more than 4,000 existing dams and reservoirs involving more than 60 million acre feet of combined storage capacity are operated according to rules and criteria that have developed in piecemeal fashion over the course of many decades. As the preceding section suggests, relatively modest changes in operations that are coordinated and integrated with other CALFED options can do much to improve water supply reliability for all beneficial uses. Before rushing to build costly new dams and reservoirs, a comprehensive re-assessment of integrated re-operation opportunities is needed in at least the following areas:

(a) Floodway Restoration and Changes in Flood Reservation: Operators of most major Central Valley reservoirs currently set aside reservoir capacity to capture flood flows in order to protect downstream property and lives. This flood reservation, in effect, reduces potential annual carryover storage of water supplies by requiring that a certain amount of reservoir space be kept empty.

Total downstream flood protection is the sum of vacated storage behind the dam and the amount of water that can be released in any given period of high runoff. Annual carryover storage -- and thus water supply reliability -- could be significantly increased if dam operators were allowed, in appropriate circumstances, to decrease the total flood reservation space behind the dam. There are three basic, and often necessarily integrated, approaches to responsibly increasing water storage and subsequent yield, without compromising important flood control functions:

- Develop more sophisticated reservoir rule curves that incorporate forecast-based release operations and integrated reservoir operations. Such operations would allow both conditional encroachment of existing flood control reservations as well as encourage larger temporary reservations as meteorological conditions dictate.
- Increase dam outlet capacity where outlet constraints limit effective use of downstream floodways and reservoir flood control reservations.
- Increase floodway capacity and the ability to safely inundate floodplains if floodways prove insufficient to handle foreseeable flood flows.

In this context, floodway and floodplain capacity restoration would include: wider floodways; purchase of land or easements on lands that would flood by design; increased protection where needed, such as localized ring levees, for sensitive infrastructure or communities; and other options for getting, and/or keeping, people "out of harm's way."

Increasing the frequency and size of moderate flood events, concurrently with other actions to restore floodways is already a central part of the CALFED ecosystem

restoration program. In addition to facilitating the attainment of ecosystem objectives, this approach would provide the added water supply reliability benefit of augmenting storage in existing reservoirs. It is important to note that this approach would not affect the size or frequency of large floods, as it would not reduce the total flood reservation.

CALFED should evaluate the potential for increasing annual carryover storage by increasing allowable controlled releases from Central Valley dams as floodways are restored, thereby reducing the amount of reservation necessary behind each dam. For example, analysis of operations at Friant Dam indicate that alterations in the flood reservation regime could increase carryover storage on the San Joaquin River by approximately 5 to 10 percent.<sup>23</sup> Assuming that altering the flood reservation regime at other major terminal reservoirs could increase storage by 2-3 percent, this measure could increase annual storage in the Central Valley by a minimum of 400,000 to 600,000 acre feet. The actual increase in the amount of water captured and stored from this operational change can only be estimated through additional site-specific modeling analyses. However, a comparable small percentage increase in available carryover storage at most major reservoirs has the potential to significantly improve water supply reliability Valley-wide, particularly in dry years following wet years.

(b) Reoperating Hydropower Reservoirs: The non-consumptive water storage rights in existing hydropower reservoirs (up to 3.2 million acre-feet of combined capacity) can potentially be purchased and utilized for a variety of reliability purposes. For example, a portion of the flood-reservation burden discussed above could be transferred to acquired hydropower storage capacity. Upstream hydro-storage capacity could also be used to re-regulate acquired instream supplies, including acquired storage rights, ensuring that purchased flow improvements are available when and where needed. The purchase and transfer of non-consumptive storage rights to consumptive purposes may be appropriate for upstream (area of origin) communities if implemented in conjunction with environmentally restorative actions and if offset by equivalent reductions in exports of "surplus" water (i.e., water surplus to the needs of area of origin communities and ecosystem resources.) Given the scope and direction of the electric utility industry restructuring currently underway, a comprehensive evaluation of all such opportunities should be a critical focus of CALFED's Stage 1 efforts.

(c) Environmental Water Banking. It has been a long-standing practice in the federal CVP to "reschedule" allocated water from one year to the next. Such informal "banking" of unused allocations has never been available to ecosystem resources, even though it was affirmatively authorized "for drought protection and other purposes" in conjunction with the dedication of ecosystem supplies under the 1992 CVPIA (section 3408(d)). One need look no farther than across the Sierra Nevada crest to see how the Truckee River Operating Agreement is using reservoir banking and a market-based acquisition program to facilitate improvements for all involved. Developing and implementing similar programs throughout the Central Valley should be another focus of CALFED's Stage 1

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<sup>23</sup> NHI, 1998. An Environmentally Optimal Alternative: A Response to the CALFED Bay Delta Program.

efforts.

### **3. Restore Upper Watersheds**

Watershed restoration to increase water infiltration and retention will increase surface and groundwater yields in dry seasons and years, particularly in undammed watersheds. Watershed restoration would provide the added benefits of improving ecosystem conditions and attenuating flood peaks. Loss of existing reservoir storage capacity from sedimentation due to erosion in the upper watersheds could also be stemmed through commitment to a significant and well-funded watershed restoration program. Although measurable water supply benefits from watershed restoration will take several years to accrue, they could prove to be particularly valuable in the event of prolonged drought or a shift in the rain to snow ratio resulting from predicted global warming. At this time, there is not enough information or analysis to calculate the magnitude of increased yields from watershed restoration, but the promise of this approach warrants more examination of this approach.

### **4. Changes in Delta Operations**

We recognize that certain changes in Delta operations and construction of certain facilities could provide increased supplies for consumptive uses of water. However, such reoperations and facilities could also exacerbate ecosystem harm. We support the approach that is now being developed by the DEFT and "No Name" groups to integrate fully planning for water supply flexibility tools with increased environmental protections in the Delta. There appears to be reason for optimism that water supply reliability for consumptive uses can be increased while promoting ecosystem health.

CALFED's proposal to explore modifications that would provide greater operational flexibility including use of joint point of diversion, relaxation of COE criteria to allow increased SWP pumping capacity and construction of an intertie between the California Aqueduct and the Delta-Mendota Canal should be evaluated only within the framework of new criteria for biological protection. Otherwise, the use of these tools and facilities could potentially undermine CALFED's ecosystem restoration objectives and off-set biological benefits to fish species of concern (i.e., chinook salmon, steelhead trout, Delta smelt, and striped bass, and others). Assessment of these tools should not be limited to effects within the Delta, but should also include the expected effects of changes in reservoir operation on instream flows and riparian corridors.

In our view, implementation of the operational flexibility measures under consideration by CALFED should be bound by the following express conditions:

- (a) All baseline regulatory requirements (the 1995 WQCP, the CVPIA and current ESA protections) are implemented in full;
- (b) All additional biological protections proposed for Stage 1 by EWC (see below) and

required for future compliance with state and federal environmental laws be implemented in full; and

(c) Assurances are in place guaranteeing that operational changes will conform with the criteria listed in 1 and 2 above and will enable the public to enforce these conditions.<sup>24</sup>

#### **D. Flow-Related Ecosystem Needs**

As discussed in Section 1, CALFED's water supply reliability program must do more than provide reliability for consumptive use -- it must also provide reliability for the environment. This reaches beyond mitigation for adverse impacts related to consumptive use of water and to the affirmative requirements of the ecosystem restoration program.

Restoring the Bay-Delta ecosystem, both upstream and in the Delta, will require water, as clearly indicated by the ERPP and DEFT discussions. That water must be provided by CALFED through its water supply reliability and other program elements. We believe the evidence demonstrates that CALFED can craft a program which provides significant water supply reliability benefits for both ecosystem restoration and urban and agricultural water users. Given the level of impacts from existing diversions, the long-term ecosystem needs are substantial. While it develops specific measures to meet these long-term needs, CALFED should begin by meeting the most urgent ecosystem needs during Stage 1 by implementing the actions outlined below.

**1. Delta Flow-Related Improvements:** Improvements in Delta operations are currently under discussion in the DEFT group. While these discussions continue to progress, our initial recommendation is that CALFED should implement the following biological protections in the Delta. These criteria represent ecosystem protection measures above and beyond the current level of protection provided by the 1995 WQCP, full implementation of the CVPIA and current ESA protections. Additional restrictions on exports during periods of significant biological concern are necessary given the status of many estuarine dependent species that are either listed or proposed for listing under the state or federal ESA's.

- **April and May:** Operations should be adjusted to provide increased Delta inflow from the San Joaquin River, and decreased exports, as specified in the VAMP study, during the entire months of April and May to provide increased protection of outmigrating San Joaquin chinook salmon and Delta smelt.
- **November through January:** Operations should be adjusted during the fall months to achieve a reduced export/inflow ratio (55% in November and 45% in December and

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<sup>24</sup> For example, it may be necessary to establish a mechanism to bank a pre-determined amount of water (a portion of the yield of water supply tools such as joint point, groundwater storage, transfers and land retirement) to be called upon as necessary to reduce Delta exports and allow resource agencies to directly respond to biological problems at the export facilities.

January) to provide increased protection for spring run yearlings, and fall- and late-fall run fry emigrating through the Delta.

- February and March: Operations should be adjusted to provide increased Delta outflow in February and March, in dry years, to achieve X2 protection consistent with a 1962 level of development. This would provide an increase in protection for most estuarine and anadromous fish, particularly Delta smelt.

Potential impacts to Suisun Marsh from changes in Delta flow patterns have not been adequately evaluated or addressed. CALFED should develop and implement additional measures to protect and restore the biological diversity of Suisun Marsh.

**2. Upstream Flow-Related Benefits:** The ERPP, the AFRP and endangered species recovery plans all call for improved flow conditions in upstream areas, north and south of the Delta. CALFED should continue to develop and implement these flow improvements during Stage 1, to provide improved habitat for species of concern and to achieve other CALFED ecosystem restoration goals.

**3. Cap on Depletions and Diversions:** We have elsewhere discussed the need for a state water budget. Establishing and implementing such a budget will require an adequate baseline, accurate measurement, a clear accounting methodology and, in our view, a cap on average annual diversions and depletions from the Bay-Delta system. Such a cap would offset capability to divert large amounts of water in wet years, with badly needed protections in dry years. This cap should be no higher than and, by the end of stage 1, should be lower than current levels.

## **SECTION IV: REVISED STAGE 1 ACTIONS FOR WATER SUPPLY RELIABILITY**

Below are a limited set of preliminary recommendations intended to respond to the proposed Stage 1 recommendations in the August version of the draft "Developing a Preferred Alternative" document. As indicated below, some of these actions should be completed prior to Stage 1.

### **A. A Foundation for Water Supply Reliability**

1. Prior to Stage I, CALFED should establish measurable objectives for each element of the water supply reliability program, including water conservation, recycling, and transfers.
2. Develop a water budget for the Bay-Delta system, including establishment of a registry of instream flows and more comprehensive measurement of withdrawals, depletions, diversions and exports for consumptive use.
3. Prior to Stage 1, develop realistic and accurate modeling assumptions regarding baseline water deliveries in the CALFED no action alternative.
4. Implement a surcharge on water use in the Bay-Delta system to fund the ecosystem restoration program.
5. Create a finance strategy to incorporate the full environmental and economic costs of water supply reliability strategies.

### **B. Demand Benefits**

1. Measure all agricultural and urban water use.
2. Implement certification and enforcement program to ensure full implementation of the urban water conservation BMP's.
3. Capture conservation savings above full implementation of the Urban MOU. This should include implementation of the BMP's at a level that would capture all cost-effective savings, as well as implementation of cost-effective measures not yet included in the MOU.
4. Prior to Stage 1, develop performance standards for agricultural water use efficiency to measure progress towards program objectives, and an enforcement program comparable to the one proposed for urban water use.
5. Develop loan, grant and cost-sharing programs to increase local participation in urban and agricultural water conservation strategies.

6. Design and implement research programs/pilot programs to address remaining areas of uncertainty in water use efficiency. For example, conduct research on the relationship between evaporation and transpiration, and the potential for reducing irrecoverable losses through reductions in evaporation.
7. Prior to Stage 1, complete CALFED's economic marginal cost analysis of water management alternatives. Ensure that secondary benefits of "soft path" alternatives, including water quality, flood management, avoided drinking water and waste water treatment and capital costs, energy savings, etc. are fully reflected in this analysis.
8. Identify and then develop a program and plan to address legal and institutional barriers to water transfers, and improve use of existing infrastructure for transfers, as appropriate.
9. Develop and implement an appropriate set of assurances to provide protection to the environment and local economies from water transfers.
10. Encourage "south to south" transfers to meet consumptive use needs and "north-to-Golden Gate" and storage transfers to meet environmental needs.
11. Establish, fund and implement an environmental water acquisition program with at least an annual budget of \$100 million to endow a drought year reserve fund and help meet long-term ecosystem restoration objectives. Performance measures to indicate successful implementation, in amounts of water, or the like, should be established prior to the initiation of Phase I and linked to other program elements.
12. Develop proposals for an institutionalized groundwater bank to facilitate transfers (see related recommendations below).
13. Develop best management practices for water recycling, including full evaluation of recycling opportunities, regional water recycling targets, and performance standards.
14. Develop loan, grant and cost-sharing programs to increase local participation in recycling strategies. Such programs should encourage regional efforts.

**C. Supply Benefits**

1. Develop an implementation framework for a comprehensive and properly regulated groundwater banking and conjunctive use program, including measurement of groundwater; designation of sustainable yield (maximum allowable while preserving aquifer capacity, ecological benefits and other values) for each groundwater basin; feasibility and cost studies; pilot projects; criteria for evaluation, permitting and operation of specific projects; statutory changes to address barriers to implementation; and construction of recharge, pumping and conveyance infrastructure. CALFED

should also develop loan, grant and cost-sharing programs to increase local participation in groundwater strategies.

2. Investigate and implement reservoir reoperation to utilize expanded floodways for all major reservoirs in the Central Valley.
3. Investigate and, as appropriate, implement the Delta reoperation strategies identified in Section III C, subject to the express environmental conditions set forth in Section III C and D. Develop appropriate assurance mechanisms.
4. Complete least cost and equivalency analyses, and develop willingness to pay formulas for potential new or expanded surface storage facilities. Require water users to pay the full planning costs for any such studies.

**D. Flow Related Ecosystem Benefits**

1. Implement the Delta flow improvement measures discussed in Section III D.
2. Develop and implement flow-related improvements for Suisun Marsh, upstream, riparian and floodplain restoration.
3. Develop and implement an environmental water banking program in groundwater and existing surface storage facilities, as authorized by the CVPIA.
4. Establish a cap on average annual withdrawals, depletions and diversions from the Bay Delta system which is no higher than current levels.

## APPENDIX 1: PRELIMINARY MODELING RESULTS OF POTENTIAL CHANGES IN DELTA OPERATIONS

This appendix compares preliminary modeling projections of both export availability and ecosystem protection under our recommended Delta operating criteria to other management scenarios. These scenarios include:

1. Actual operations since 1975 (using information from the Dayflow database).
2. Projected operations complying with ESA requirements, the 1995 Water Quality Control Plan, and Interior's interim criteria for implementation of the CVPIA (DWR's DWRSIM study 549new).
3. Projected operations complying with the protective criteria described in Section 3 in addition to those described under (2) above (EWC DWRSIM study EBSSN-5).
4. Projected operations complying with the protective criteria described in Section 3 and including use of the joint point of diversion, the Interim South Delta Plan, and an intertie between the Delta Mendota and California aqueducts (EWC DWRSIM study EBSSN-6).

Table A1-1 compares total Delta exports under these scenarios for three periods, (1) the recent dry period from June 1986 until September 1992, (2) recent water years 1975-1994, and (3) the historic hydrology from 1922 until 1994. For the exports projected under studies EBSSN-5 and EBSSN-6, no assumption is made as to how this water is distributed after leaving the Delta for any of its possible uses, including delivery to export project urban and agricultural contractors, wildlife refuges or water bank to be used for environmental purposes. Figure A1-1 summarizes average Delta exports by month under each of the modeling studies.

Table A1-1 shows that, under the water management criteria recommended by EWC for implementation by CALFED in stage 1, average annual Delta exports are projected to be 395,000 acre-feet higher than those which actually took place under the recent historical hydrologic conditions from 1975 to 1994. It is not possible to compare actual to projected exports for the entire historic hydrology, since the Delta exports projects were not developed until the 1950s and 1960s. During a repeat of the very dry conditions between 1986 and 1992, which led to the most recent sharp decline in fisheries, however, average Delta exports under the EWC criteria are projected to be 774,000 acre-feet less than what actually occurred.

Preliminary modeling results suggest that the additional flows in the San Joaquin River can be achieved by allowing water to flow through tributary reservoirs during the April-May period. The average total flow increase of 52 TAF in April and May is offset, through reservoir reoperation, by a flow reduction of 49 TAF in other months. As a result of this reoperation, very little, if any, reduction in consumptive use would be required.

Figure A1-2 shows the projected average Delta inflow from the San Joaquin River during the April-May outmigration period for fall run salmon under each of the studies outlined above and compares these values to unimpaired flow estimates. Figure A1-3 shows the projected end-of-year storages for San Joaquin tributary reservoirs under each scenario. It is assumed that no releases from Friant Dam are made for fishery objectives.

Figure A1-4 shows how total exports would change under each of the modeling scenarios in December. In study EBSSN-5, exports would be curtailed in many years to protect winter-run and spring-run salmon. Study EBSSN-6 would also restrict December exports to protect these species, but would allow higher rates of export under wet conditions. Figure A1-5 shows the export inflow ratio for each of these scenarios in December.

Figures A1-6 and A1-7 show the projections under each scenario for total exports and the export-inflow ration in September, where scenarios EBSSN-5 and EBSSN-6 would allow a higher export-inflow ratio.

Figures A1-8 and A1-9 show the spring X2 position, in Critical and Dry years respectively, under each of the scenarios. The improvements in February and March in Dry and Critical years are due to the specific criteria recommended above. The improvements in April and May are due to the incremental protection provided by the extended export restriction during the April-May pulse period.

Table A1-1  
Delta Export Comparison  
(all values in TAF)

	Actual Historic Delta Exports	Study 549new		Study EBSSN-5		Study EBSSN-6	
Period	Average Exports	Average Exports	Difference from Actual	Average Exports	Difference from Actual	Average Exports	Difference from Actual
June 1986 - September 1992	4979	4328	651	4205	774	4342	636
October 1975 - September 1994	4596	5297	-700	4992	-395	5123	-527
October 1921 - September 1994	NA	5774	---	5402	---	5524	---

Figure A1-1  
Delta Export Comparison  
average of all years (1922-1994)

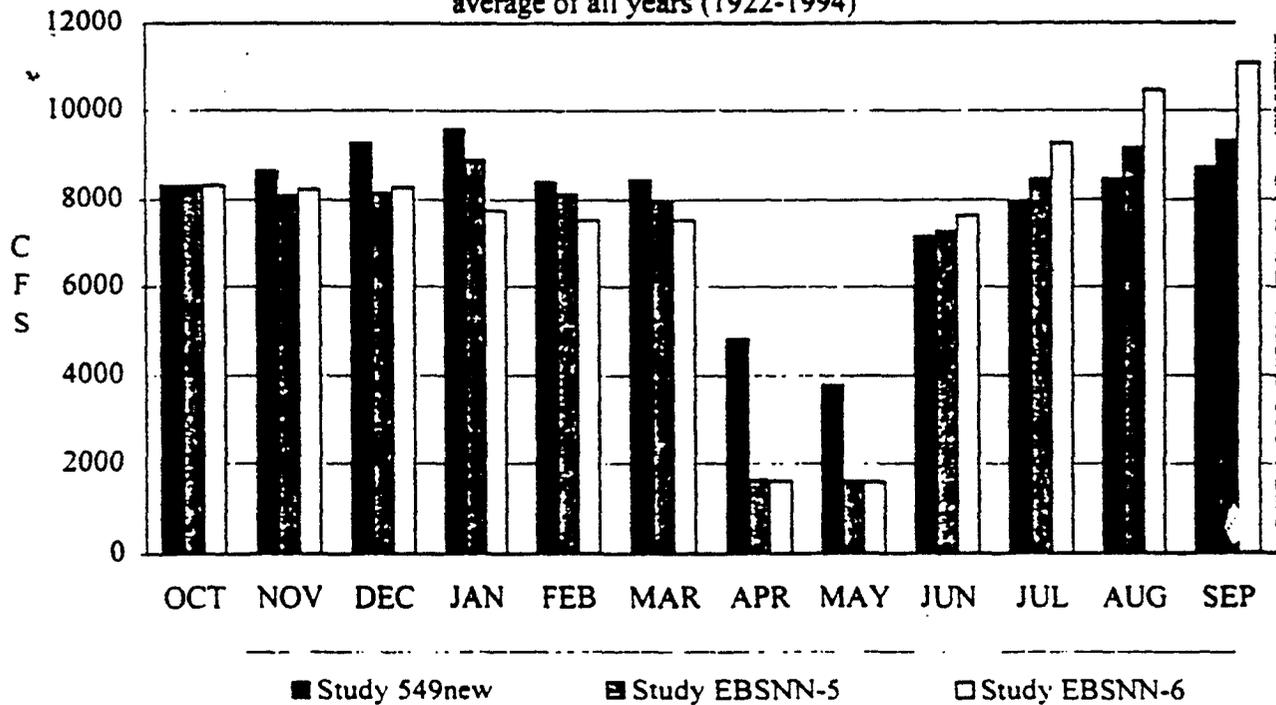


Figure A1-2  
 San Joaquin River at Vernalis  
 April-May Average Flow by Year Type

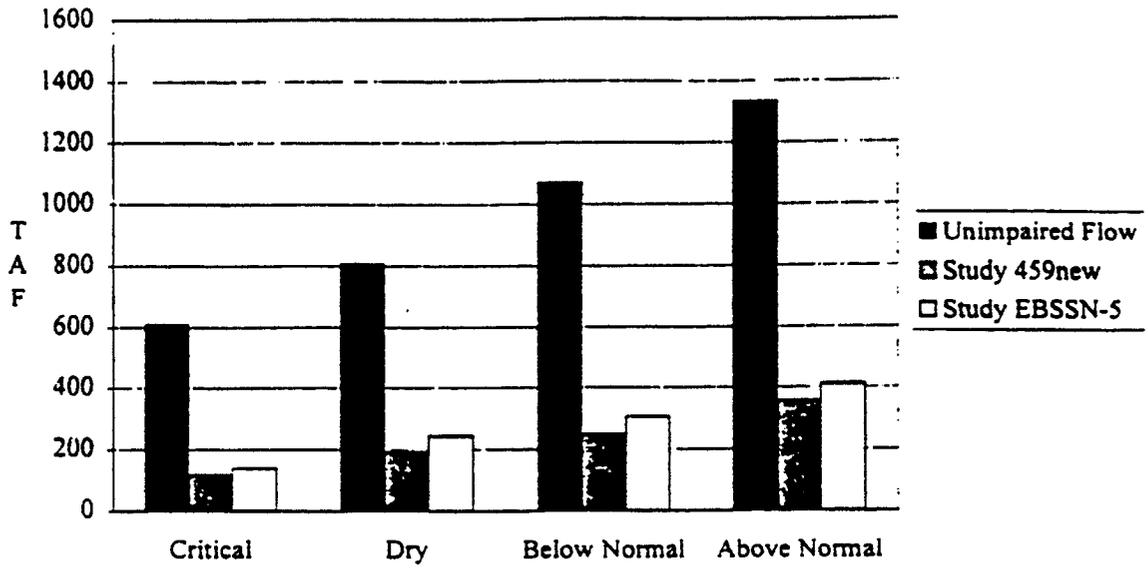


Figure A1-3  
 San Joaquin Tributary Reservoirs  
 Projected Carryover Storage

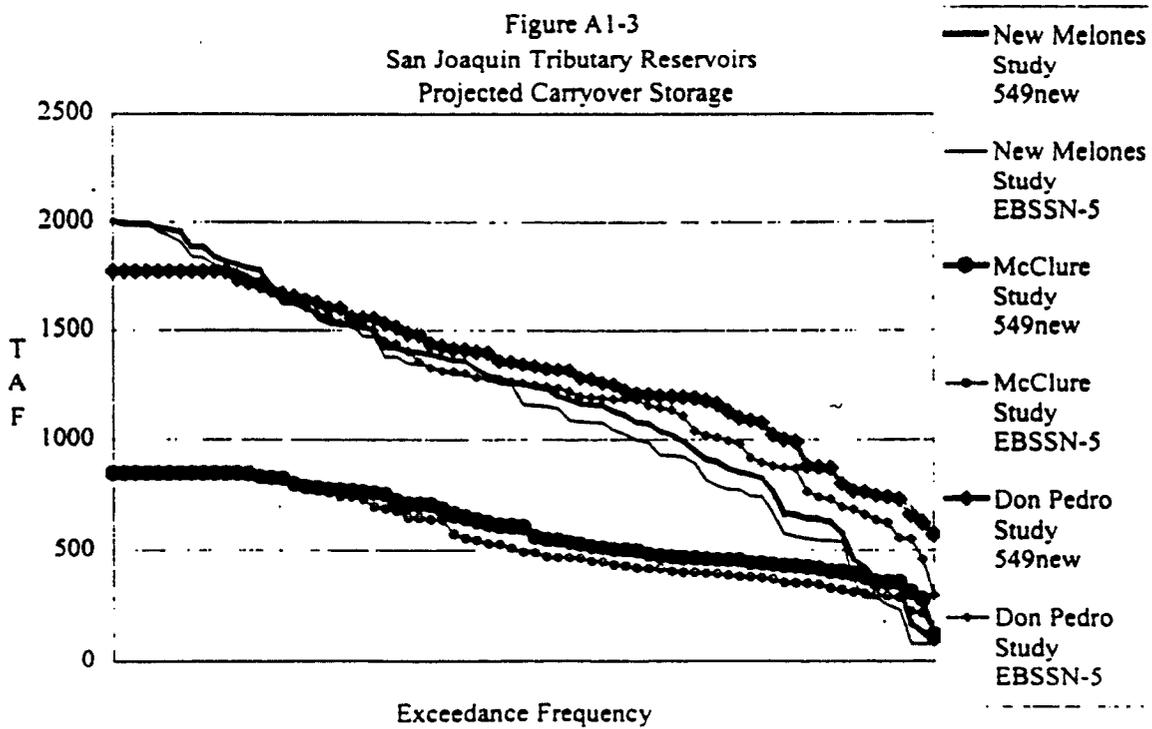


Figure A1-4  
December Delta Exports

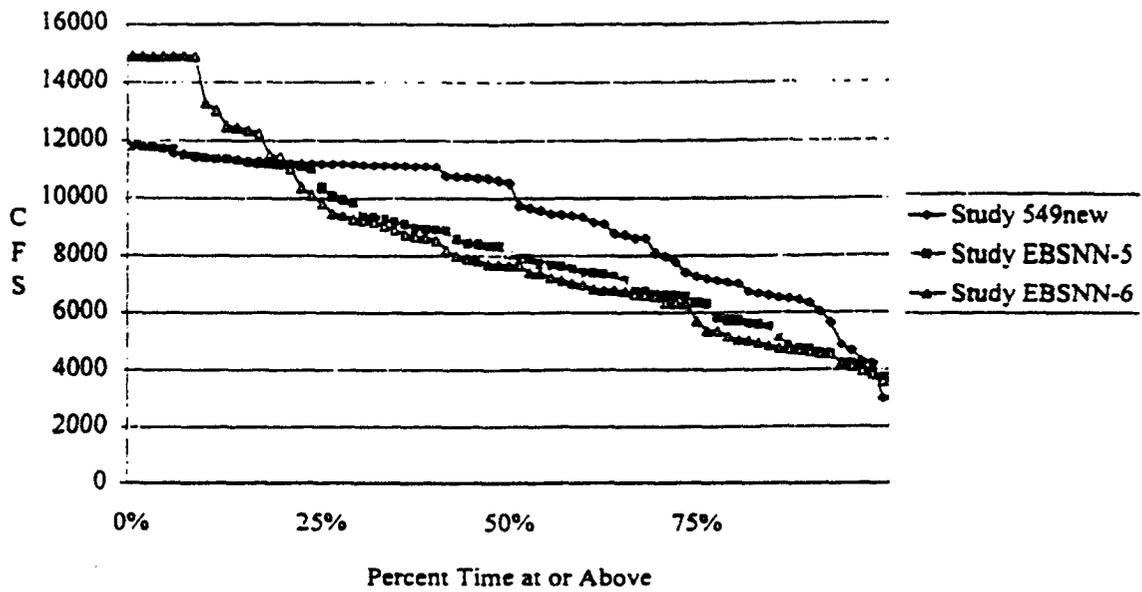


Figure A1-5  
December Export-Inflow Ratio

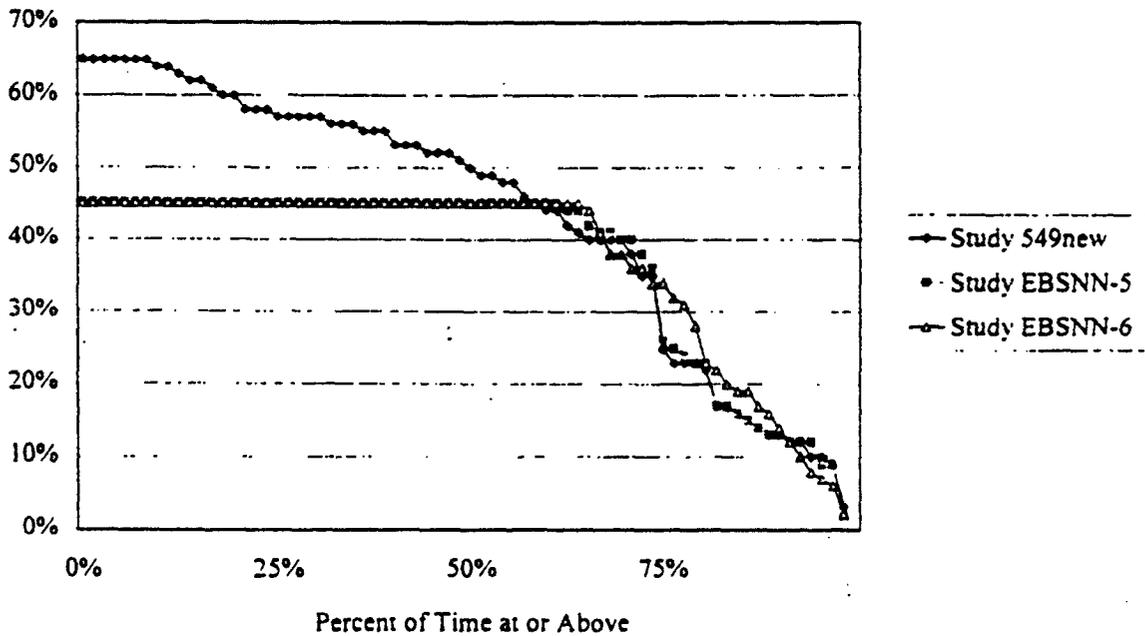


Figure A1-6  
September Delta Exports

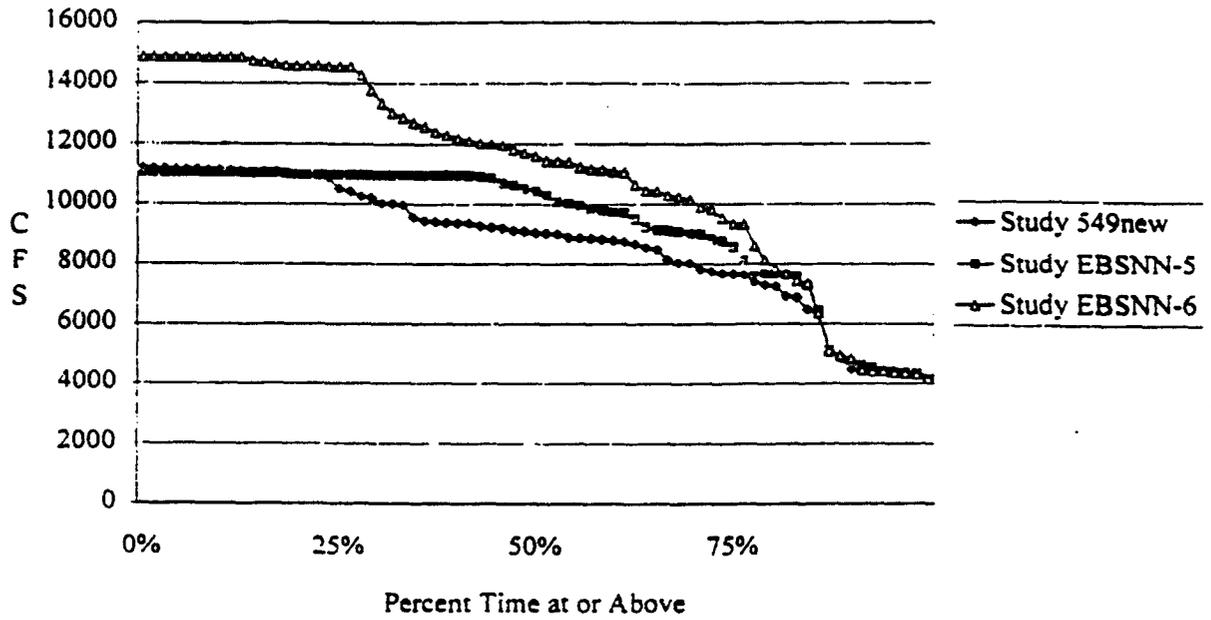


Figure A1-7  
September Export-Inflow Ratio

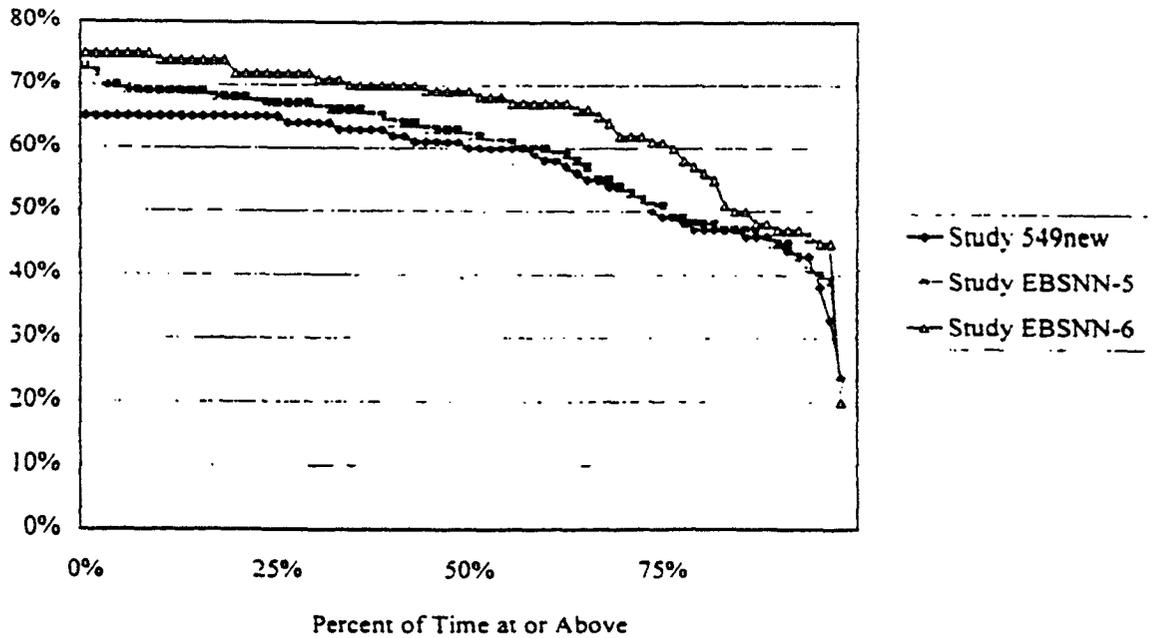


Figure A1-8  
Critical Year Average X2 Position

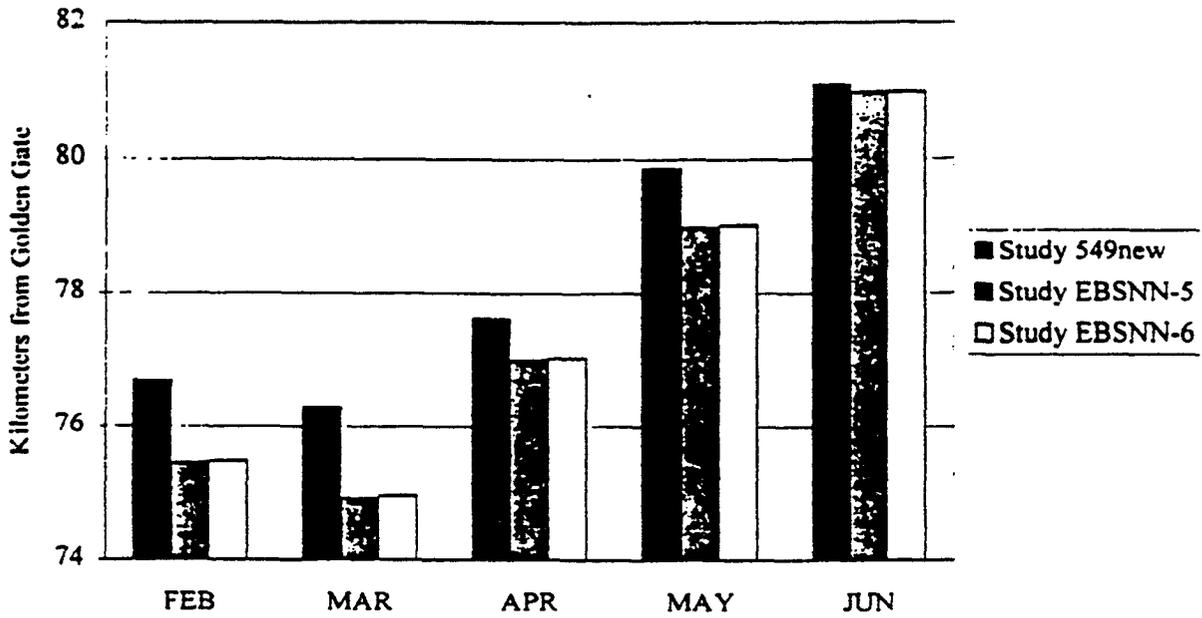


Figure A1-9  
Dry Year Average X2 Position

