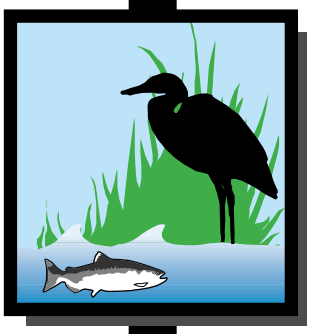

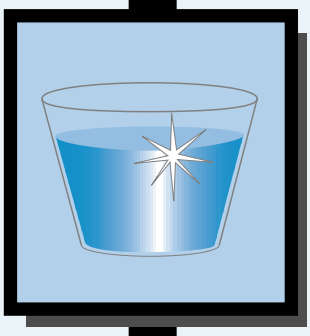

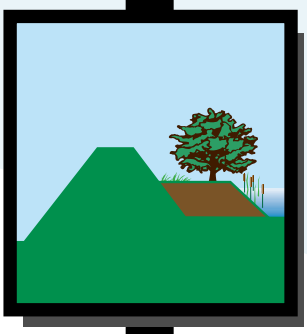

CALFED
BAY-DELTA
PROGRAM

Watershed Program Plan

Final Programmatic EIS/EIR Technical Appendix

July 2000

FOREWORD

The Watershed Program, like all components of the CALFED Bay-Delta Program (Program), has been developed and evaluated at a programmatic level. This report describes both the long-term programmatic actions that are assessed in CALFED's Final Programmatic EIS/EIR, as well as certain, more specific actions that may be carried out during implementation of the Program. The programmatic actions in a long-term program of this scope necessarily are described generally and without detailed site-specific information. More detailed information will be analyzed as the Program is refined during initial implementation.

Implementation of the Watershed Program is expected to begin in 2000, after the Programmatic EIS/EIR is finalized and adopted. Because of the size and complexity of the alternatives, the Program likely will be implemented over a period of 20-30 years. Program actions will be refined as implementation proceeds, initially focusing on the first 7 years (Stage 1). Subsequent site-specific proposals that involve potentially significant environmental impacts will require site-specific environmental review that tiers off the Programmatic EIS/EIR. Some actions, such as watershed restoration projects, also will be subject to permit approval from regulatory agencies.

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LIST OF ACRONYMS AND ABBREVIATIONS

BDAC	Bay-Delta Advisory Council
CALFED	CALFED Bay-Delta Program
CMARP	Comprehensive Monitoring, Assessment, and Research Program
CVP	Central Valley Project
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
IWAT	Interagency Watershed Advisory Team
RCD	Resource Conservation District
Strategy	CALFED Watershed Management Strategy
SWP	State Water Project

GLOSSARY

Adaptive management. The process of refining or redefining management actions as a process unfolds and results are obtained. Adaptive management is an interactive and iterative approach to decision making that incorporates feedback loops for evaluating actions and injecting new information as it becomes available.

Baseline assessment. An assessment intended to help characterize existing watershed conditions and/or to establish a background for planning or future comparisons.

Bay-Delta Advisory Council (BDAC). A 34-member federally chartered citizens' advisory committee. BDAC provides formal comment and advice to the CALFED agencies during regularly scheduled meetings.

Beneficial use. Actual or reasonable potential use that may be made of waters of the state, including but not limited to domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and propagation and enhancement of fish, wildlife, and other aquatic resources.

Common Program. One of the six program elements (Water Use Efficiency, Water Quality, Long-Term Levee Protection, Ecosystem Restoration, Water Transfers, and Watershed) that are essentially the same for each of the three Phase II alternatives.

Comprehensive Monitoring, Assessment, and Research Program (CMARP). A program currently under development by the CALFED Bay-Delta Program to identify the monitoring, assessment and research needed for CALFED-related projects, actions, and activities. CMARP is a critical component of the CALFED adaptive management strategy.

Ecosystem. An interactive system that includes the organisms of a natural community association together with their abiotic physical, chemical, and geochemical environment.

Ecosystem management. Management of land and aquatic resources based on perspective of ecosystem structure, function, and dynamics aimed at long-term sustainability of watershed productivity. Ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting ecosystem integrity over the long term.

Geographic information system (GIS). Computer programs that link features commonly seen on maps (such as roads, town boundaries, waterbodies) with related information not usually presented on maps, such as the type of road surface, population, type of vegetation, land use, or water quality information. A GIS is a unique information system in which individual observations can be spatially referenced to each other.

Government agencies. Federal, state, county, city, and town governments; Native American governments; and special districts.

GLOSSARY (CONTINUED)

Interagency Watershed Advisory Team (IWAT). A group of 16 individuals representing 10 CALFED lead and cooperating agencies. The IWAT functions to help direct the development and implementation of the Watershed Program. The IWAT meets on a regular basis to discuss the progression of the Watershed Program.

Monitoring. The organized collection of information over time to aid the understanding process of a watershed system. The information may be used in watershed assessment, watershed planning, and in overall watershed management decision making. Monitoring is also used to track the implementation accuracy and effectiveness of specific policies and projects.

Performance measures. A means to gauge the progress of an action. Progress may be judged based on a variety of factors.

Stakeholder. Anyone who lives in a watershed or has land management, administrative, or other responsibilities or interests in it. Stakeholders include private individuals, businesses, government agencies, and special interest groups, wildlife and fisheries, among others.

Stressors. Natural and unnatural events or activities that adversely affect ecosystem processes, habitats, and species. Environmental stressors include, but are not limited to, water diversions, water contaminants, levee confinement, stream channelization and bank armoring, mining and dredging in streams and estuaries, and invasive plant species in aquatic and riparian zones. Other major stressors include large dams and reservoirs that block transport of the natural supply of woody debris and sediment in streams or alter unimpaired flows.

Tributary. Stream flowing into a lake or larger stream.

Validation monitoring. Validation monitoring is used to test the accuracy and reliability of a model or hypothesis.

Watershed. Total land area draining to any point in a stream.

Watershed activity. One of the several and diverse actions and decisions that cumulatively amount to watershed management.

Watershed analysis. A systematic procedure for characterizing watershed and ecological processes to improve understanding and/or meet management and social objectives.

GLOSSARY (CONTINUED)

Watershed management. The net result of numerous and varied actions in a watershed that directly affect watershed function and productivity. Actions may include, but are not limited to, land-use decision making, restoration and enhancement projects, monitoring and assessment of watershed condition, natural resource allocation and use, parcel management techniques and education programs. Watershed management includes protection of existing healthy conditions.

Watershed restoration. Actions in a watershed that directly improve watershed function and productivity. Watershed restoration includes activities which promote conservation and protection of existing healthy conditions.

Watershed stewardship. See watershed management.

1. Overview

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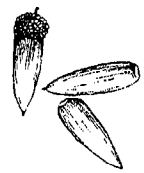

1. Overview

1.1 INTRODUCTION

The Watershed Program was established as an aid to achieving the overarching goal of the CALFED Bay-Delta Program (CALFED) to restore ecological health and improve water management by working with the community at a watershed level. The Watershed Program will use a comprehensive, integrated, basin-wide approach to help improve conditions in the Bay-Delta system, emphasizing local participation and government cooperation at all levels.

Since the release of the original Watershed Management Strategy in March 1998, the Watershed Program has expanded into a dual-nature program. One important component of the Watershed Program is to provide assistance—both financial and technical—for local watershed stewardship. The other integral component is to promote collaboration and integration among watershed efforts. Building partnerships throughout the Bay-Delta system will not only improve the efficacy of the Watershed Program but also will significantly contribute to the overall success of CALFED.

The purpose of this report is to describe programmatic actions, particularly during Stage 1 of CALFED.

1.2 OVERVIEW OF CALFED

The mission of CALFED is to develop a long-term comprehensive plan that will restore ecosystem health and improve water management for beneficial uses of the Bay-Delta system. CALFED has also identified a set of solution principles and primary objectives to support this mission.

CALFED comprises eight integrated program elements:

- Ecosystem Restoration
- Levee System Integrity
- Water Quality
- Water Transfers

- Water Use Efficiency
- Watershed
- Storage
- Delta Conveyance

The first six elements comprise hundreds of individual actions that will be implemented over a 20- to 30-year period. These elements will be guided by specific policy direction and an ongoing adaptive management framework; they will require local partnerships, coordination, and cooperation.

Implementation of storage and Delta conveyance modifications are included as a part of the preferred alternative. The combination of these elements, coupled with related assurances, financing, and monitoring will create a comprehensive package that, when implemented together, will reduce conflicts in the Bay-Delta system. This comprehensive package will move forward to meet the four primary objectives of CALFED: ecosystem quality, water supply reliability, water quality, and levee system integrity.

1.2.1 PRIMARY OBJECTIVES

Ecosystem Quality

Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species.

The Bay-Delta system no longer provides the diversity or quality of habitats needed to maintain ecological functions and support healthy populations and communities of plants and animals. Declining fish populations and endangered species designations have created major conflicts for beneficial uses of water in the system.

CALFED will take needed actions to begin recovery of ecosystem health by reducing or eliminating factors that degrade habitat, impair ecological functions, or reduce population size or health of species.

Water Supply

Reduce the mismatch between Bay-Delta water supplies and the current and projected beneficial uses dependent on the Bay-Delta system.

As water diversions and competition for use have increased over time, conflicts among users of Delta water also have increased. As the system is managed in an effort to meet export

demands, flow requirements for fish and wildlife needs, and to address water quality concerns, the uncertainty of Delta water supplies has increased.

CALFED seeks to reduce the mismatch between supply and beneficial uses through a variety of actions, including demand-side management, reducing the impacts of water diversions on the Bay-Delta system, and increasing the system's flexibility to store and transport water.

Water Quality

Provide good water quality for all beneficial uses.

The Delta is a source of drinking water for millions of Californians and is critical to the state's agricultural sector. Additionally, good water quality is required to maintain the high-quality habitat needed in the Bay-Delta system to support a variety of fish and wildlife populations.

CALFED will undertake actions to reduce or eliminate parameters that degrade water quality at its source.

Levee System Integrity

Reduce the risk to land use and associated economic activities, water supply, infrastructure, and the ecosystem from catastrophic breaching of Delta levees.

The existing system of Delta levees protects towns, farmland, wildlife habitat, and infrastructure from flooding and costly damages. The levee system provides an effective means by which to limit salt-water intrusion into the Delta; however, the current degraded status of many Delta levees leaves the system vulnerable to catastrophic failure, either by flooding or earthquake.

CALFED will implement a comprehensive plan to address long-term levee maintenance, stabilization, and emergency levee management while providing opportunities to enhance ecosystem values.

1.2.2 SOLUTION PRINCIPLES

In conjunction with the primary objectives of CALFED, the following solution principles were developed to guide the evaluation process for each alternative and to provide an overall measure of acceptability.

- ***Reduce conflicts in the system*** - Solutions will reduce major conflicts among beneficial uses of water.

- ***Be equitable*** - Solutions will focus on solving problems in all problem areas. Improvements for some problems will not be made without corresponding improvements for other problems.

- ***Be affordable*** - Solutions will be implementable and maintainable within the foreseeable resources of the Program and stakeholders.

- ***Be durable*** - Solutions will have political and economic staying power and will sustain the resources they were designed to protect and enhance.

- ***Be implementable*** - Solutions will have broad public acceptance and legal feasibility, and will be timely and relatively simple to implement compared with other alternatives.

- ***Result in no significant redirected impacts*** - Solutions will not solve problems in the Bay-Delta system by redirecting significant negative impacts, when viewed in their entirety, within the Bay-Delta or to other regions of California.

1.2.3 STAGED IMPLEMENTATION

CALFED is being implemented in three discrete phases. Phase I, completed in September 1996, identified the problems confronting the Bay-Delta, developed a mission statement and guiding principles, and devised three preliminary categories of solutions.

Phase II included the development and release of the Draft Programmatic Environmental Impact Statement/ Environmental Impact Report (Programmatic EIS/EIR) in March 1998. Phase II concludes with the selection of a preferred program alternative and development of an implementation strategy, including financing and assurances.

The completion of the Final Programmatic EIS/EIR will mark the beginning of Phase III. Implementation is expected to begin in year 2000 and will continue for 20-30 years.

1.3 WATERSHED PROGRAM BACKGROUND

Originally, CALFED consisted of four elements, each stemming from the four primary objectives. During Phase II, however, it was recognized that two additional elements—Water Transfers and the Watershed Program—were needed because of their multi-objective impact.

In March 1998, the CALFED Watershed Management Strategy (Strategy) was released as an appendix to the March 1998 Draft Programmatic EIS/EIR. The Strategy was an attempt to establish a framework for the Watershed Program. The document discussed the vision for watershed management, the geographic scope and goals for CALFED-funded watershed projects, and the need for coordination with ongoing watershed efforts. Since the release of the Strategy, much progress has been made in the development of the Watershed Program.

In March 1998, the Interagency Watershed Advisory Team (IWAT) was formed (see Appendix A). IWAT comprises 16 individuals who represent 10 CALFED lead and cooperating agencies. IWAT functions to help direct the development and implementation of the Watershed Program. IWAT members meet on a regular basis to discuss the elements of the Watershed Program and act as a liaison for their respective agencies.

In accordance with CALFED efforts to include public participation as an essential component of the overall program, two Regional Watershed Stakeholder Meetings (stakeholder meetings) were held in April 1998, one in Sacramento on April 23, 1998, and the other in Redding on April 30, 1998. Over 125 individuals attended each meeting. In addition to the stakeholder meetings, a well-attended Bay-Delta Advisory Council (BDAC) meeting that focused on watershed issues was held in Redding on May 14, 1998.

The stakeholder and BDAC meetings were intended to provide information on the development of the Watershed Program and encourage stakeholders to participate in the process. Significant portions of the meetings were devoted to public comments. Many participants stated that stakeholder involvement and communication among interested parties should be a critical component of the Watershed Program. Strong support was given to the idea of forming a "Watershed Work Group."

Based on the public's request for more participation in the Watershed Program, the BDAC Watershed Work Group (Work Group) was formed in July 1998. The Work Group provides a forum for stakeholders from a broad geographic area and representing a wide array of interests. The Work Group meetings are open to the public and draw individuals who represent local watersheds throughout the state; local government; water, agriculture, and timber interests; environmentalists; and others dedicated to building a successful Watershed Program. A list of participants from the Work Group meetings held from August 1998 through May 2000 is included in Appendix B.

Attendees of the Work Group meetings have direct interaction with IWAT and participate in developing activities related to the Watershed Program. The Work Group was instrumental in the formation of important components of the Watershed Program Plan, such as the goal and objectives, principles, and Stage 1 implementation actions.

The Watershed Program intends to continue as a community-based program with wide participation by all stakeholders throughout the life of CALFED.

1.4 GEOGRAPHIC SCOPE

CALFED is addressing problems that are manifested in or closely linked to the Suisun Bay/Suisun Marsh and Delta area (Problem Scope). However, the scope of possible solutions to those identified problems (Solution Scope) encompasses any action that can be implemented by the CALFED agencies or can be influenced by them to address the identified problems, regardless of whether implementation takes place in the Delta / Suisun Bay / Suisun Marsh area.

Any problem currently associated with (1) the management and control of water, or (2) the beneficial use of water in the Bay-Delta (including both environmental and economic uses) is within the purview of CALFED, if at least part of the problem is manifested in the Bay-Delta or is directly associated with conditions in the Bay-Delta.

In contrast to the Problem Scope, the Solution Scope is quite broad, potentially including any action that could help solve identified problems. A wide range of possible actions can be taken to address the issues in the Bay and Delta, not all of which will occur within the watershed of the Bay-Delta system. Additionally, not every action will affect every portion of the Bay-Delta system. Therefore, although not every action will affect the entire geographical solution area, specific actions will directly or indirectly affect areas within the Central Valley watershed, southern California system service area, Suisun Bay, San Pablo Bay and San Francisco Bay.

An expanded Solution Scope is necessary because many problems related to the Bay-Delta are caused by factors outside the Bay-Delta. Moreover, an expanded Solution Scope is desirable from a planning point of view because more benefits may be generated at lower cost if solutions are not limited to the geographic Bay-Delta. For example, the problem of declining salmon populations is linked to the Bay-Delta in part because of high salmon mortality during salmon migrations; however, the broader problem of declining salmon populations extends far beyond the Bay-Delta. One solution action might be to reduce salmon mortality during salmon migration through the Bay-Delta, but it might be less expensive to combine that action with an effort to promote greater salmon protection upstream.

The Watershed Program will support activities that provide benefits to the areas within the Problem Scope. Actions that would result in beneficial impacts on the resources of the Bay-Delta and that support the goals and objectives of CALFED will be considered, regardless of the physical location of action implementation. In addition to supporting the achievement of the goals and objectives outlined for CALFED and the Watershed Program, supported actions also should be developed and implemented following the principles of the Watershed Program (**see pages 3-2 and 3-3**).

1.5 WATERSHED PROGRAM GOALS AND OBJECTIVES

The goals of the Watershed Program are to provide assistance—both financial and technical—for watershed activities that help achieve the mission and objectives of CALFED, and to promote collaboration and integration among existing and future local watershed programs.

Although it recognizes the importance of project implementation, the Watershed Program also acknowledges that watershed management comprises more than just projects. It includes such diverse issues as land use decision making, parcel management techniques, restoration and enhancement projects, monitoring, and education programs. The Watershed Program will emphasize the importance of locally based environmental protection and enhancement in attaining the objectives of CALFED.

1.5.1 PRIMARY OBJECTIVES

To reach these goals, the Watershed Program has established the following six primary objectives.

Facilitate and improve coordination, collaboration, and assistance among government agencies, other organizations, and local watershed groups.

A broad array of government programs, non-governmental organization efforts, and local initiatives focus on watershed stewardship. The Watershed Program will encourage and support collaboration among these diverse interests to enhance and restore watershed functions in the Bay-Delta system.

Develop watershed monitoring and assessment protocols.

Adaptive management is possible only when an adequate feedback loop is available to assess assumptions, decisions and projects based on their outcomes. Effective monitoring programs that are based on sound science and that include a wide range of participants will help improve decision-making processes for enhancing watershed health.

Support education and outreach.

An important component of CALFED is sharing and disseminating information gathered through the implementation phase. The education and outreach element of the Watershed Program will facilitate information exchange, provide opportunities to build or increase local involvement in watershed activities, and augment local resource conservation education programs. The enhanced information exchange will better inform public dialogue and will improve watershed management decisions at all levels.

Integrate the Watershed Program with other CALFED program elements.

The CALFED program elements promote many activities that improve conditions in the greater watershed of the Bay-Delta system. It is important that the Watershed Program integrate with these other activities to effectively leverage the knowledge, energy, and funds available to meet the goals and objectives of CALFED.

Define the relationship between watershed processes and the goals and objectives of CALFED.

The function of a watershed is comprised of many physical, biological, and social processes. The Watershed Program will seek to define those processes that are most significant in achieving the goals and objectives of CALFED.

Implement a strategy that will ensure support and long-term sustainability of local watershed activities.

To effectively manage a watershed for optimum health, a long-term commitment to management and monitoring is necessary. To this end, the Watershed Program will seek to secure long-term support to promote sustainability of the watersheds of the Bay-Delta system.

2. Watershed Program Elements

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2. Watershed Program Elements

2.1 INTRODUCTION

The Watershed Program intends to enhance natural resource conservation, restoration, and management using a collaborative approach that encourages broad participation of all stakeholders in the greater watershed of the Bay-Delta system. Watershed management that is effective over the long term must go beyond the policy level and become personally relevant at an operational level. Extensive participation by diverse parties in improving the status of natural resources generates maximum energy and creativity in implementing sustained, effective watershed planning and management. The Watershed Program will facilitate the development of locally appropriate, community-based strategies to maintain and improve watershed conditions to achieve the objectives of CALFED:

- Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species.
- Provide good water quality for all beneficial uses.
- Reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system.
- Reduce the risk to land use and associated economic activities, water supply, infrastructure and the ecosystem from catastrophic breaching of Delta levees.

2.1.1 WATERSHED STEWARDSHIP

Stewardship activities supported by the Watershed Program must be not only technically appropriate but also socially and politically in concert with local needs and desires. The Watershed Program will support on-the-ground activities such as restoration projects and stream corridor rehabilitation, forest improvement projects, and water quality enhancement. The Watershed Program also will support activities that provide guidance or establish a framework for implementation of those types of projects. Such activities may include developing local capacity for improved watershed management in diverse arenas, providing

technical assistance as requested, identifying good management practices, providing assistance and training for monitoring programs, and supporting locally developed education programs.

Management of complex systems such as watersheds requires a significant steady flow of reliable information. The Watershed Program will emphasize activities that improve the diversity and reliability of information generation, analysis, distribution, and use. The program will support and broaden activities that make information more available to those who need it and present that information in formats that facilitate its effective use. Information sharing among watershed constituents will stimulate the transfer of local expertise and experience to others who may benefit from those ideas and experiences. Extensive access to information and shared experiences also stimulate formation of collaborative partnerships. The Watershed Program will support those partnerships by providing or arranging for technical and other assistance.

In the course of developing, obtaining, and distributing these sources of information and assistance, the Watershed Program will work with staff of the other CALFED program elements to ensure that the many and varied projects and programmatic actions that pertain to improved watershed management in the Bay-Delta system are integrated. Communication with other CALFED program elements will be an important aspect of developing the Watershed Program and in promoting a comprehensive and coordinated large-scale effort to attain the goals and objectives of CALFED.

2.1.2 WATERSHED RESTORATION PROJECTS

The Watershed Program will support local and regional activities that improve the ability of the watershed to function as a contributor to the health of the entire Bay-Delta system.

Water supply and quality in the Bay-Delta system require well-functioning watershed processes throughout the watershed. Land and resource management in the tributary watersheds can affect the reliability of high-quality water inflows to the Sacramento and San Joaquin River basins. Land and resource management in other watersheds south of the Delta also play a critical role in the ecological health of the Bay-Delta ecosystem.

The following are examples of watershed stewardship activities than can contribute to achieving each of the four objectives of CALFED.

Ecosystem Quality - Watershed activities that improve riparian habitat, increase or improve fisheries habitat and passage, restore wetlands, or restore the natural stream morphology affecting downstream flows or species may benefit ecosystem quality.

Water Quality - Watershed activities may benefit water quality in the Bay-Delta by helping to identify and control non-point sources of pollution, and to identify and implement methods to control or treat contaminants. Watershed activities that reduce the pollutant loads in streams, lakes, or reservoirs could measurably improve downstream water quality.

Water Supply Reliability - As human land use activities within a watershed intensify, the ability of that watershed to slow runoff and allow water to infiltrate the soil and aquifers tends to decrease. This modified condition can increase surface runoff and result in higher peak flows during storms. This condition can make flood management more difficult and reduce the opportunities to capture runoff in downstream reservoirs. Activities designed to restore or enhance the ability of watersheds to absorb, store, and release water can reduce peak flows during storms, extend stream base flows through the dry season, and enhance the recharge of groundwater basins and aquifers. The benefits of these activities include reduced flood risks, increased water supply reliability, and improved habitat conditions for fish and wildlife.

Levee and Channel Integrity - Attenuation of flood flows coming from upper watershed areas can provide benefits far downstream in the same system. Delta levees are most vulnerable during high winter flows. Watershed activities that reduce these flows can help maintain the integrity of the levees.

The Watershed Program Plan comprises five primary elements:

- Element A - Coordination and assistance
- Element B - Adaptive management and monitoring
- Element C - Education and outreach
- Element D - Integration with other CALFED programs
- Element E - Watershed processes and relationships

These elements were developed with assistance from IWAT and the Work Group, based on the objectives identified for the Watershed Program. Although implementation of on-the-ground watershed activities is a large component of the Watershed Program Plan, emphasis also is placed on the importance of collaboration, supporting the infrastructure of watershed groups, and developing an effective education and outreach element. These elements will enable watershed projects, plans, and programs to be more effectively implemented.

Each element is discussed in more detail in the following sections.

2.2 ELEMENT A - COORDINATION AND ASSISTANCE

Facilitate and improve coordination and assistance among government agencies, other organizations, and local watershed groups.

The watershed of the San Francisco Bay and Delta system comprise many tributary watersheds, each with still further division into smaller tributary watersheds. Effective management of those lands to sustain high levels of productivity for all resources is complex. No single entity, group, agency, or government can handle the chore alone. The Watershed Program will facilitate means and opportunities to

improve coordination and collaboration among all stakeholders—including government and nongovernment interests—seeking to better manage watershed resources.

Watershed management involves many levels of activity, such as planning, policy establishment, project and program development, implementation of policy and projects, and information gathering and analysis (monitoring). This complex suite of activities is best accomplished through collaborative efforts among partners in the watershed. These partners may include government agencies, *ad hoc* watershed groups, individuals, trade organizations, interest groups, and many others who are active in a given watershed. The Watershed Program will facilitate the development of communication links and mutual support mechanisms to encourage the coordination of the varied activities of watershed constituents. The links and mechanisms developed will support the involvement of diverse interests at all levels of watershed management, with emphasis on sustaining watershed health through consensus management. Some existing programs, such as the Sacramento River Watershed Program, are quite large, yet are made up of other smaller-scale efforts. Some projects focus on parts of the watersheds, such as the Cosumnes Preserve and the Tuolumne Trust, and others—particularly some agency programs—are more programmatic than geographic. Each of these existing efforts, as well as new projects that will arise, can benefit from coordination with others and from added capacity to obtain access to wider technical and financial assistance. The Watershed Program will facilitate connections among related watershed management initiatives to strengthen the capacity for voluntary coordination and improve the efficiency of any specific endeavor.

To ensure that coordination and assistance are adequately developed and implemented as part of the Watershed Program, the following element components will be executed.

A1. Identify government agencies and watershed groups that participate in watershed activities consistent with the goals and objectives of CALFED.

In any given watershed, many different constituents often are working to improve the watershed condition. This action item will assist those constituents in finding and collaborating with other groups in their area to promote projects and activities that support the goals and objectives of CALFED.

In the greater watershed of the Bay-Delta, the number and diversity of entities involved in watershed management is quite large. Identifying and describing the many efforts and distributing that knowledge among watershed constituents will contribute to the formation of collaborative partnerships. Opportunities to coordinate and collaborate often are missed when knowledge of proposed and existing programs is not widespread. Describing the relationship of the programs to the attainment of CALFED goals and objectives will further enhance the possibility for active voluntary coordination among those involved in watershed management efforts.

A2. Identify and recommend types of partnerships that could be formed.

As the Watershed Program is implemented, opportunities for collaborative partnerships will arise. One part of the Watershed Program will support the generation and exchange of information, which will facilitate coordination and stimulate collaboration among entities. The Watershed Program will actively participate in the promotion of specific partnerships

among watershed constituents at all levels with the potential to help achieve the goals and objectives of CALFED. These recommended partnerships may include interagency partnerships, as well as possible collaborations among nongovernment efforts and between government and nongovernment programs. The recommendations may be geographically based, such as within a given watershed, or may be programmatic in nature, such as recommendations for partnerships to improve forest management or riparian corridor enhancements.

Organizational approaches to local watershed management have many variations in California. Alternatives include coordinated resource management, watershed conservancies, watershed task forces and working groups, local stewardship, and other programs led locally by counties, resource conservation districts (RCDs), water districts, and others. The appropriate structure for implementing the recommended watershed management partnerships will depend on the interests and circumstances of the affected watersheds, as well as those of the potential partners.

A3. Describe mechanisms to coordinate funding among government agencies and to local watershed programs.

A wide range of funding is available from government agencies at all levels. There are also many sources of funds from nongovernment groups, including foundations, industry trade groups, corporations, and local programs. However, information on funding is not readily available. Additionally, some funders are not aware of other active or possibly active programs in their area of interest. The Watershed Program will develop or support the development of a means to provide clear and direct connections for local watershed groups to find appropriate assistance in order to help further their efforts, and for funders of all types to research possible partners in order to leverage the financial resources available. The Watershed Program also will identify and recommend mechanisms intended to generate funding partnerships. These mechanisms will identify the correlation between the objectives of various funding programs and the possible means by which to combine programs in order to increase their effectiveness and ease of use by local watershed groups. In describing alternatives for funding partnerships, the Watershed Program will ensure that diversity of approaches and purposes is retained among the funding groups in order to promote creative generation of new ideas and new methods to improve watershed management in the Bay-Delta watershed.

A4. Describe mechanisms to facilitate technical assistance from government agencies and others to local watershed programs.

Agencies, governments, organized groups, and other entities have an extensive cumulative pool of expertise and talent that would be of great benefit to local operational watershed management. The Watershed Program will develop or support the development of a mechanism(s) by which to provide easier access to the technical assistance available from these sources. The mechanism(s) will enable clear and direct connections through which local programs and others can obtain appropriate and timely assistance in the development and implementation of watershed management activities.

The Watershed Program also will work with CALFED agencies to ensure that collaborating with local groups and communities is a priority. Through highlighting possible partnerships

and identifying compatible goals and objectives among local watershed groups and those agencies, the Watershed Program will illustrate the advantages of a collaborative approach to environmental management in the watershed of the Bay-Delta. The Watershed Program also will demonstrate the fiscal advantages of collaborative partnerships in watershed management.

A5. Improve collaboration between existing and future programs to achieve mutual watershed management objectives.

In most cases, the objectives of various watershed management initiatives and projects are similar; however, they often are presented differently according to the specific needs and desires of the watershed community or entity promoting the initiative or project. The Watershed Program will provide assistance in describing these varying statements of objectives to clarify and highlight the areas of mutual effort. The increased availability of information about various programs among groups working to improve the watershed of the Bay-Delta will enable quicker formation of collaborative, locally appropriate efforts that more efficiently use the resources available for Bay-Delta watershed improvements.

Through identification and encouragement of new types of partnerships, and through demonstration of success of those new partnerships, the Watershed Program will enhance the combined cumulative beneficial results of watershed management programs throughout the Bay-Delta watershed.

A6. Encourage collaboration with local general plans and regulations.

A very significant part of land management decision making in California is the guidance given by local governments through their general plans. Land use planning authority in California historically resides at the local level. The Watershed Program recognizes the important role that general plans play in setting the stage for improved watershed management. The program will encourage projects and programs to become familiar with and to follow the guidance given by local general plans, and to adhere to local ordinances established to implement those plans. As appropriate and as requested by local jurisdictions, the program also will support efforts to strengthen the awareness of watershed management issues in the scheduled revisions of those plans at the local level.

General plans are largely implemented through local regulations such as zoning and development standards. These local regulations are an important element of watershed management in the watersheds tributary to the Bay-Delta. Efforts of the Watershed Program should be consistent with and supportive of local regulations and policies.

A7. Establish and maintain information on watershed restoration and monitoring assistance and make it available to local watershed programs and private land-owners in their project conception, design, and implementation.

Watershed maintenance, conservation, and restoration are long-term undertakings. The Watershed Program will provide funding and other support to encourage and assist with development of local expertise through partnership assistance, training, and follow-up technical advice in order to foster improved watershed health.

The Watershed Program will compile and maintain a list of individuals and organizations with broad expertise and on-the-ground project experience that will be available on request to assist local watershed groups and private landowners. The list will include expertise in a broad range of issues, including project planning, development, and implementation; monitoring program establishment and use; data management; educational program development and implementation; land use planning; regulatory compliance procedures; and others. The sources listed in the compilation will include academia, private consultants, government agencies, nonprofit organizations, private individuals with successful projects and programs, and local watershed groups. The list will be available in many formats, including print and electronic media, and will be distributed widely throughout the watershed of the Bay-Delta.

A8. Help resolve issues of liability and indemnification for environmental restoration work.

During implementation of many phases of watershed management activities, issues of various types of legal liability frequently arise. These legal issues constitute part of the social processes that affect watershed condition. The present structure of legal liability policy at the local, state, and federal level sometimes impedes the participation of some agencies and individuals in implementing watershed activities. The Watershed Program will encourage stakeholders, including legislators and the legal community, to establish legal policies that will encourage involvement in watershed improvement activities without compromising avenues of recourse for individuals or entities who may be negatively affected by some watershed activities.

Because many laws and legal processes originally were established to prevent abuse of natural resources, in many instances restoration or rehabilitation work is treated the same as destructive development. Adjusting present policy to allow and even promote improvement of natural resources management will encourage and allow a much broader range of participation in collaborative efforts to effectively manage the watershed of the Bay-Delta. The Watershed Program will work over the long term to facilitate the establishment of policies that will ease inadvertent liability and indemnification restraints on widespread participation in watershed activities.

2.3 ELEMENT B - ADAPTIVE MANAGEMENT AND MONITORING

Develop watershed monitoring and assessment protocols. ✓

Adaptive management is the process of refining or redefining management actions as a process unfolds and results are obtained. It is an interactive and iterative approach to decision making that incorporates feedback loops for evaluating actions and injecting new information as it becomes available. Adaptive management begins with a clearly defined set of management goals and objectives; includes the development of actions meant to achieve those goals and objectives; and incorporates an evaluation of actions implemented to

determine whether goals and objectives are being met. Goals and objectives, actions, and monitoring protocols are established given today's knowledge. Experimental management is included where improved knowledge is essential. Results are monitored and actions modified as needed to achieve or even modify management goals.

Adaptive management and monitoring are important program elements necessary to understand watershed resources conditions and the effects of Watershed Program actions on these conditions. Given the uncertainties involved in watershed management, an adaptive management approach is essential in establishing a learning process that reduces these uncertainties over time. Adaptive management and monitoring processes will measure the success of meeting objectives and help identify corrective steps needed when these objectives are not being achieved. Adaptive management and monitoring will be funded by CALFED and will be carried out throughout the life of the Program.

To understand how Watershed Program actions affect watershed resources conditions over time, an initial inventory and assessment of existing (baseline) conditions is required. In some cases, information on current conditions is available; in other cases, this information will need to be collected and analyzed before the initiation of Watershed Program actions. Baseline data collection could be funded as a part of CALFED-supported projects.

To ensure that adaptive management and monitoring are adequately developed and implemented as part of the Watershed Program, the following element components will be executed.

B1. Define performance measures that ensure adaptive management processes can be applied at multiple scales and across ownerships.

Building on the principles of the Watershed Program, specific performance measures will be developed by Watershed Program staff in conjunction with IWAT and other stakeholders. These performance measures will be applied to Watershed Program activities, as well as to watershed activities implemented by others using CALFED funding. Performance measures will be reviewed and updated periodically throughout the life of CALFED. This review will include validation testing of the performance measures.

B2. Assist CMARP in the development of watershed management monitoring protocols (if not already developed for the other CALFED programs).

The Watershed Program will coordinate with the Comprehensive Monitoring, Assessment, and Research Program (CMARP) to: (1) identify the fundamental biophysical parameters of watershed processes, and (2) develop the monitoring and assessment protocols appropriate to measure these biophysical parameters and stressors. The Watershed Program will work with IWAT and other stakeholders to identify and develop these factors, and related monitoring and assessment protocols.

B3. Facilitate monitoring efforts that are consistent with CMARP's protocols.

The Watershed Program will facilitate monitoring and assessment efforts consistent with CMARP protocols in several ways. The Watershed Program will encourage and support local watershed organization efforts to collect and assess data in accordance with CMARP

protocols, and share data and assessments with CALFED and stakeholders. Support for local watershed efforts can include monitoring and assessment protocol training programs for watershed projects, funding watershed groups' monitoring and assessment efforts, and requiring CMARP-compliant monitoring and assessment as a part of projects funded by CALFED. The Watershed Program values the contributions that data collection by watershed groups and other local organizations can make to CALFED objectives, assessment and protection of watershed resources, and the empowerment of local organizations and institutions.

The Watershed Program also will serve as an open repository for monitoring data collected and assessments completed under the program, and the projects and activities that the program supports. The Watershed Program will use this information as a part of its own adaptive management processes. It will retain this responsibility through Stage 1 implementation and the entire life of CALFED.

2.4 ELEMENT C - EDUCATION AND OUTREACH

Support education and outreach ✓

Many local watershed programs are in their formative stages. Those that are established may lack the resources or information in specific areas to function efficiently. CALFED will develop a support framework for local watershed programs to help them function more efficiently. Resource needs identified by stakeholders include:

- Funding assistance to conduct assessments, develop plans, and implement projects and monitoring;
- Funding for staff to coordinate local watershed activities, including environmental educational programs;
- Assistance from local agencies with planning, implementation, and monitoring;
- Centralized or coordinated resource information centers on funding opportunities; workshops; and outside assistance available, such as technical experts;
- Centralized or coordinated databases so that information can be readily accessible, shared, and commonly used; and
- Assistance with grant proposal writing.

Through the following four activities, this program element could help meet the needs of local watershed programs.

C1. Provide support to existing and future watershed programs.

Many local watershed programs lack staff or a support organization (for example, a local RCD or local university foundation) sufficiently funded to carry out many of the initial development activities needed to inform, organize, and assist local communities in addressing watershed management issues. Currently, the majority of these local programs depend on some source of outside funding to function. Sources of funding are typically from state or federal programs, private foundations, corporations, or generated within the community. Acquiring funding from these outside sources is often a sharply competitive process. Established, well-organized programs with skilled grant proposal writers, completed watershed assessments, or monitoring programs have distinct competitive advantages over new or developing local programs. This situation leaves new or developing programs in a cycle of unsuccessful attempts to gain initial funding for their efforts.

Once the initial phase of local watershed program development has been completed, there is also a continuing need for outside funding and technical support to sustain these community-based watershed programs over the long term. Therefore, the Watershed Program intends to provide financial and technical assistance to local watershed programs to help meet basic organizational, administrative, and support costs in two distinct phases.

The first phase will provide financial and technical support to help communities take the initial steps to organize and develop their local watershed program. Once the local program is organized, the Watershed Program plans to continue providing assistance to help local programs function efficiently and effectively, and perform watershed work in a science-based manner. The willingness of CALFED to fund or support new or existing local watershed programs will be determined based on established principles and how well these local programs contribute to the goals and objectives of CALFED.

Financial and technical support is designed to help local watershed programs meet three basic needs. First, funding could be used to hire or support staff and meet basic administrative costs, such as telephones, facsimiles, postage, equipment, and travel. Second, "start-up" funding or technical support also could be available to provide staff training in such basic skills as communication techniques, computer use, grant writing, and contract management. Third, technical support or assistance could be provided to help local programs with organizing the community, facilitating processes, resolving conflicts, and building organizational capacity. Support also could be provided to help local programs access and use existing sources of information, data, and other tools needed to begin the process of watershed assessment, planning, and management.

CALFED anticipates making this start-up funding available to local programs for a limited amount of time (perhaps 2 years). After this start-up period, it is anticipated that local watershed programs will have developed adequate capacity to successfully compete for other sources of outside funding or to generate funding from within the community in order to meet many of their administrative and program management costs.

As these community-based watershed programs continue to develop, the second part of program funding and technical support would be available. CALFED funding during this phase will be available to **partially** meet the administrative costs associated with ongoing local watershed program activities. This phase of funding is designed to supplement those

outside and locally developed sources of funding acquired by local programs during their initial development period. The full range of technical support needed by watershed programs to help meet their information management, training, watershed assessment, planning, management, and monitoring needs would continue to be provided.

C2. Support resource conservation education at the local watershed level.

The goal of resource conservation education is the development of a citizenry that is capable of and involved with making informed decisions on resource issues. Local watershed programs provide one of the best opportunities to educate local citizens, and particularly students, about their local watershed and its relationship to the bioregion. However, existing funding for resource conservation education is limited. In addition, although resource conservation education programs are offered through some school districts, the availability of such programs varies greatly.

CALFED plans to provide funding for conservation education programs conducted at the local watershed level, as well as for regional programs that match and help meet the broad goals and objectives of CALFED.

For example, CALFED could provide funding and technical support to expand and accelerate the introduction and use of conservation education programs, such as the Adopt-A-Watershed Program, into local communities. The Adopt-A-Watershed Program is a dynamic strategy that helps bring educators, students, and the community together to better address local natural resources issues and helps bring about a sustained commitment to addressing those issues. This environmental education program is implemented at both the regional and local levels. Funding could be provided to the Adopt-A-Watershed Program to help establish "regional leadership institutes" that would be used to train and support community teams working to introduce the Adopt-A-Watershed educational process into their communities. In turn, CALFED could provide continuing financial support to those local communities and schools that choose to use the Adopt-A-Watershed process.

CALFED also will consider funding and support for other conservation education curriculum where there is clear community interest and support for their use, and where these educational programs contribute to the broad goals and objectives of CALFED.

CALFED's interim restoration program has provided funding to support regional interpretative centers, such as the Sacramento River Discovery Center. These interpretative centers can provide valuable environmental educational opportunities for local and regional audiences—helping people to better understand watersheds, resource values, and the benefits realized from sound watershed management activities. The Watershed Program will evaluate the benefits created by regional interpretative centers funded through the interim program. Future funding or support for these types of centers will be considered based, in part, on this evaluation. The Watershed Program also will explore the potential for helping establish a linked network of information centers throughout the geographic area of CALFED.

C3. Sponsor general stakeholder workshops and BDAC Watershed Work Group meetings to allow the exchange of information on local watershed program successes and failures.

Many groups are working on similar watershed problems throughout the CALFED study area. The successes and failures of one group may be relevant to another group and result in a more efficient expenditure of funds and time by the group. Existing programs that allow groups to come together, share their experiences, and learn from each other do not adequately span the geographic area of CALFED.

CALFED will sponsor public workshops to provide a forum in which information can be exchanged between watershed groups. CALFED will continue working with agencies, educational institutions, and other interested parties to host the workshops. Furthermore, the workshops and public meetings will provide a forum in which stakeholders can provide comments on the progress of the Watershed Program.

C4. Improve the use and usefulness of existing or future resource information centers to assist watershed groups in conducting watershed activities. The resource information center(s) will include information about funding opportunities and relevant information on watershed activities.

The Watershed Program is committed to supporting and facilitating the exchange of information, data, and knowledge between all people interested in, involved with, or affected by watershed management activities. One way of supporting and facilitating this information exchange is through the use of resource information centers. Many agencies, universities, organizations, and institutions compile, manage, and distribute information of value to local watershed management programs. Geographic information systems (GISs) displaying data, historical information, physical features, other watershed attributes in easily used map forms have become valuable tools for local watershed managers. These tools will become increasingly important as more and more people become involved in watershed management activities. Local watershed programs also rely on existing resource centers to provide information on funding opportunities, lists of other watershed programs and the activities in which they participate, data collected by various watershed programs, and other useful information. However, watershed groups desire the ability to do "one-stop shopping" and determine what information is available that is relevant to them.

The Watershed Program will help improve the use and usefulness of selected resource information centers by providing funding and support to help meet basic infrastructure and management needs so that these centers can adequately meet the information demands of existing and future watershed programs. In addition to helping meet basic infrastructure requirements of these resource information centers, CALFED also will support cooperative efforts to link existing and future resource information centers so that information is easily available to and exchanged with watershed program users. Funding opportunities from various organizations will either be linked or collated into a single database. Data from or information on watershed activities in the CALFED area will be easily accessible.

Data and information being readily available for watershed management activities does not guarantee that the information will be used and will contribute to the goals and objectives of CALFED. CALFED recognizes the need to aggressively market the value and utility of these information centers to the broad range of potential users within the geographic scope

of the program. Therefore, the Watershed Program will assist and support efforts of specific resource centers to expand their outreach and training efforts to watershed programs and other potential users in order to significantly increase the use and value of these resource centers to support watershed management activities.

2.5 ELEMENT D - INTEGRATION WITH OTHER CALFED PROGRAMS

Integrate and collaborate with other CALFED common programs. ✓

The large extent of CALFED, both programmatic and spatial, makes integration of the various Program elements essential. To achieve maximum effectiveness of Program implementation, those involved must be aware of and responsive to the elements of the other CALFED programs. Additionally, the importance of local participation and assistance is emphasized by the extensive nature of CALFED as a whole. The Watershed Program will encourage and promote a community-based watershed approach in implementing all of the CALFED programs. The Watershed Program will encourage the recognition and, where appropriate, the adoption of the Watershed Program Principles (**see pages 3-1 and 3-2**). Implementation of CALFED programs in a watershed context will enhance the effectiveness, acceptance, sustainability, and appropriateness of projects and programs supported by CALFED.

Many projects and initiatives of the other CALFED programs constitute, in part, watershed management of the Bay-Delta watershed system. The Watershed Program will identify those activities that support watershed management and will integrate supported projects, programs, and other initiatives with those of the other CALFED programs. This integration will ensure that the cumulative result of implementation is a coherent suite of activities directed at achieving the goals and objectives of CALFED.

Active communication among the CALFED programs will be a critical part of this integration. By definition, however, integration and collaboration cannot be accomplished unilaterally and will function most effectively with the participation of all aspects of CALFED. Free exchange of information among the CALFED programs will improve the integration of the diverse activities supported by the programs. Opportunities to coordinate implementation of activities such as funding solicitations, report generation, and geographic target area selections will be recommended as they arise. The Watershed Program will actively encourage and support interaction among the CALFED programs to maintain consistent communication among the programs. The consistent flow of information will improve the opportunities to coordinate efforts in order to more efficiently and effectively pursue the goals of CALFED. Integration of the CALFED programs also will provide a more clear and understandable presentation of CALFED overall to interested participants and observers.

To ensure that the Watershed Program is integrated with other CALFED programs, the following elements will be executed.

D1. Identify the relationship of the Watershed Program with other CALFED programs (Ecosystem Restoration, Water Quality, Water Use Efficiency, Water Transfers, Levee System Integrity, Storage, and Delta Conveyance).

The programs listed above were designed as a whole to achieve the goals of CALFED. The programs are discretely described to segment the overall effort into separately manageable but highly interrelated units. To maintain the intended integration, a system of regular communication among the individuals involved in the programs is necessary. Active communication will better promote these programs, in addition to Storage and Delta Conveyance, in order to form a comprehensive, integrated program.

The Watershed Program will work with the CALFED programs listed above to describe the types of activities of each and will identify the relationships among those activities to watershed management and the Watershed Program. Gaps and areas of duplication will be identified, and recommendations will be made to fill those gaps and to eliminate unnecessary duplication. The Watershed Program will work with IWAT and the Work Group to generate recommendations in order to improve the coordination and collaboration of funding cycles, solicitation package releases, summary report delivery, and other areas of opportunity for improved collaborative efforts.

2.6 ELEMENT E - WATERSHED PROCESSES AND RELATIONSHIPS

Identify the relationship between watershed processes and the goals and objectives of CALFED. ✓

The watershed of the Bay-Delta in its entirety, including human settlements, is highly complex. The constituents of the Bay-Delta watershed system are dynamically interrelated in an extensive and intensive manner from the uppermost reaches to the Golden Gate Bridge. Threading through this complexity are processes such as hydrological, geomorphological, biological, and human-generated processes that, although highly interrelated with other processes, can be discretely identified. Nearly all watershed processes are a part of or are made up of other processes. Because of this complexity, the most effective means by which to achieve a healthy Bay-Delta watershed is through increased understanding of the functions of the entire system as programs and projects are developed. The Watershed Program will, through funding and partnership building, define those processes that are discretely identifiable, the relationship of identified processes to one another, and the relationship of processes to the achievement of CALFED goals and objectives.

Identification of these processes is important because a watershed's condition is largely determined by the forces of the physical laws of nature. Understanding how these processes work, including how various human activities affect and are affected by them, will provide

an informed basis for decision making and project planning to achieve a healthy, well functioning watershed for the Bay-Delta. The Watershed Program will relate the physical, biological, and human-generated processes to the goals of CALFED in order to improve the understanding of watershed conditions relative to those goals.

The Watershed Program's examination of watershed processes will involve several parts, each of which will further the understanding of the complex makeup of watershed systems. The development of each of the following parts will, in turn, strengthen and inform the development of the others. Taken as a whole, the results of implementing these parts will provide an increased ability to understand and evaluate Watershed Program effectiveness and progress. Some activities carried out through the Watershed Program may create new tools to better understand watershed processes, while other activities may make these tools accessible for use by community based watershed programs.

E1. Describe the basic biological or physical functions and processes of a watershed.

The physical form of the Bay-Delta watershed affects and is affected by the nature of its biological components. The relationship of the hydrologic processes to forests, grasslands, and stream corridors, for example, is tightly linked to the Delta habitats that arise from those relationships. Activities and processes throughout the watershed positively or negatively affect such things as water quality, flow regime, food supply, and sediment transport into and through the Bay and Delta. Processes occurring in one part of a watershed often result in impacts in other parts of the watershed that may be removed in time or space. For example, large fires in the upper reaches of tributary streams may result in downstream water quality impacts a year or more later, affecting spawning habitat for salmonids dependent on adequate migration corridors to and from the upper reaches of the watershed to the Golden Gate.

Through direct funding or partnership generation, the Watershed Program will support the development of materials and programs that clarify these direct and indirect interactions. The information may then be used to form decisions regarding projects and programs developed to achieve the goals of CALFED. The following three areas are part of the Watershed Program's role in describing watershed processes and their part in achieving the goals of CALFED.

- Identify the watershed functions and processes likely to affect the attainment of the goals of CALFED.

The Watershed Program will provide funding or technical assistance to produce materials that illustrate watershed processes and their effects on watershed conditions from upper to lower reaches of the Bay-Delta watershed. The Watershed Program will support research and education to help clarify areas where understanding of processes and interrelationships needs expansion.

- Describe how land use and other human activities affect or have affected watershed functions and processes in ways that are favorable for or adverse to attainment of the goals of CALFED.

Human activities make up part of many watershed processes; human activities affect and are affected by watershed processes. The Watershed Program will fund the production of materials and training that will illustrate these relationships. Fire management, road construction and maintenance, river and stream alterations, increasing impervious surfaces, and land management practices are some of the areas where human land use can affect management functions. The Watershed Program also will support research in these and other areas where the understanding of the human role in these processes can be improved.

- Illustrate the benefits (including economic) that accrue from watershed plans and projects designed to achieve the goals of CALFED.

To adequately support the continuation of CALFED, a thorough description of all the benefits that accrue from program implementation is important; however, many benefits of watershed management improvement are not directly quantifiable. Improvement in intangible values of the watershed, such as enhanced riparian corridors, increased biological diversity, or noticeably more-pleasant physical surroundings, are hard to measure but can be described. Other values, such as improved fisheries, expanded opportunities for recreation, or enhanced forest health, can be more directly measured. The Watershed Program will fund and otherwise assist in the development of illustrations of intangible improvements as well as regular tabulation of directly quantifiable benefits of program implementation. These illustrations will include compilation of existing measurements currently done by local communities, universities and other educational institutions, trade associations, government agencies, commercial organization, and others. Where appropriate, the Watershed Program also will support research necessary to develop the information needed for a complete description of benefits from program implementation. By developing a comprehensive suite of benefit descriptions and quantification, a more complete picture can be drawn of the effectiveness of the Watershed Program in improving watershed conditions through improving watershed management.

E2. Maintain a set of principles that will provide the basis for setting criteria for funding of watershed activities that can be supported by CALFED.

To help provide continuity of the Watershed Program through time, a foundation of basic principles is necessary. The nature of adaptive management is such that strategies for achievement of CALFED goals and objectives must change over time to adapt to changes and increased knowledge. Although the principles themselves will be adjusted as experience and changing conditions warrant, any adjustments will be less frequent and smaller in scope than the changes in strategies.

The Watershed Program will maintain a set of watershed principles with the participation and assistance of IWAT and other stakeholders. Collectively, the Watershed Program will build on these principles to develop criteria to help guide funding decisions and aid in assessing the success of programs and projects. The Watershed Program will complete the initial development of these principles and criteria during the first year of Stage 1 implementation. As necessary, the principles and criteria will be revisited and revised over the life of CALFED. IWAT and other stakeholders will be asked to participate in any such revisions.

E3. Identify examples of watershed activities that improve the basic biological or physical functions and processes of a watershed.

The definition of watershed activities is not an exclusive one. Just as the Bay-Delta watershed is complex, the activities that compose watershed management must also be complex. To assist in describing the types of activities that will achieve the goals and objectives of the Watershed Program, a set of examples will be developed. These examples will illustrate the wide range of activities from local land use planning to individual wetland restoration or education program development. In addition to describing the nature of the activity, the examples will illustrate the impacts of the activities on various watershed processes and the ways in which those activities contribute to the attainment of the goals and objectives of CALFED. The examples developed will serve as illustrations only and are not intended to become a list of "approved activities." A specific type of activity undertaken in one watershed may not be appropriate or effective in another watershed or at a different point in time. The Watershed Program will continually update the example list to include creative illustrations of effective tools, projects, and programs developed to improve the condition of the Bay-Delta watershed.

3. Implementation Strategy

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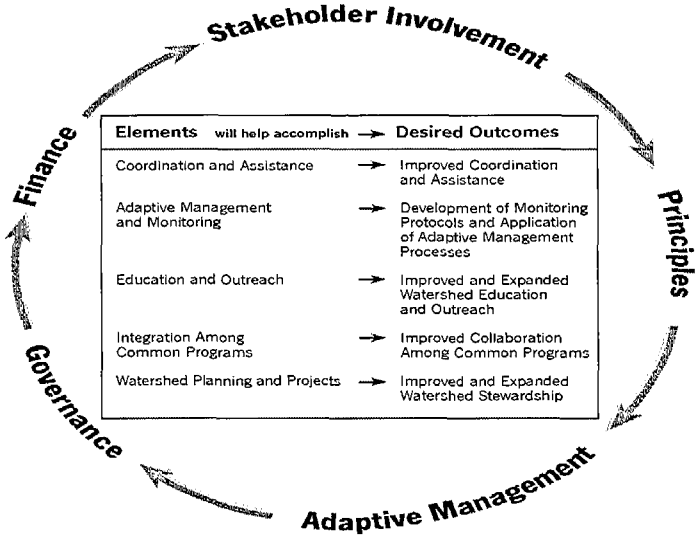
3. Implementation Strategy

3.1 INTRODUCTION

The intent of the Implementation Strategy is to lay the framework for carrying out the Watershed Program through Phase III. The Watershed Program is a broad effort to help reach the goals of the over-arching CALFED Program. Whereas other common programs are primarily focused on addressing a single problem area, the Watershed Program - like watershed management - requires a comprehensive approach. This approach creates some overlap with the other Common Programs, e.g., Watershed Program actions may address ecosystem quality, water supply, water quality, and to a lesser degree levee system integrity. However, the Watershed Program is not designed to implement specific actions identified in other Program Plans; rather, it is the Watershed Program's intention to recognize and articulate relationships among the Common Programs, as well as between those Programs and other efforts in the Bay-Delta watershed. Identification of these relationships will help provide opportunities to develop new partnerships.

Figure 1. Watershed Program Implementation



In addition to Watershed Program activities that directly correlate with CALFED's goals, other activities will be supported which will significantly increase the efficacy and success of the overall CALFED Program. These activities are described in the Watershed Program

elements and include enhanced coordination among government agencies and other stakeholders, and improved watershed education. The elements of the Watershed Program are directly tied to the desired outcomes (see Figure 1). Interwoven in the transition from the elements to the desired outcomes are stakeholder involvement, Watershed Program Principles, governance, finance, and adaptive management.

3.2 WATERSHED PROGRAM PRINCIPLES

The Watershed Program supports and encourages locally led watershed activities that benefit the Bay-Delta system. Because local approaches may vary, a set of guiding principles has been established that emphasizes the importance of community involvement and support. The Watershed Program Principles were developed in open meetings with stakeholders of diverse interests and geographic regions. The following principles will guide the development of the Watershed Program and criteria for funding or supporting watershed activities.

CALFED supports watershed activities that:

1. Are community based

- Promote community and landowner involvement,
- Have demonstrable community support,
- Contribute to ongoing local watershed management,
- Foster the development and maintenance of local watershed efforts,
- Reach out to and encourage participation of local leadership,
- Reach out to and encourage participation of individuals with diverse interests, and
- Foster collaboration among multiple interests.

II. Collaborate and are consistent with CALFED

- Are consistent with the goals and objectives of CALFED,
- Promote information exchange with CALFED, and
- Promote local community involvement in CALFED.

III. Address multiple watershed issues

- Address multiple ecosystem issues,
- Are consistent with related resources protection activities and applicable regulations,
- Contribute to beneficial environmental results,
- Improve ecosystem values and watersheds that directly or indirectly affect the Bay-Delta system, and
- Are consistent with general principles of good watershed management.

IV. Are coordinated with and supported at multiple levels

- Enhance coordination between CALFED, government agencies, and local community groups.

V. Provide for ongoing implementation

- Identify performance measures to achieve goals and objectives,
- "Leverage" other funding sources and institutional mechanisms, and
- Possess the flexibility to allow for adaptive management.

VI. Include monitoring protocols

- Measure success and are consistent with CALFED monitoring protocols (to be developed),
- Support coordination of local and regional monitoring efforts, and
- Promote citizen monitoring programs where appropriate.

VII. Increase learning and awareness

- Promote conservation education in local watersheds, schools, or to the general public,
- Enhance local skills in watershed management,
- Promote technology and information transfer between local watershed groups, and
- Deliver technical assistance and information to local watershed groups.

3.3 DESIRED OUTCOMES

The following list illustrates the desired outcomes of the Watershed Program elements. Whereas other Common Programs have identified specific projects to be implemented in distinct geographic regions, the Watershed Program has taken a different approach and compiled a list of desired effects. Projects which aim at achieving one or more of the desired outcomes and advocate the goals of the CALFED Program may be supported by the Watershed Program. Support may be in the form of funding through formal proposal solicitations, technical assistance, facilitation of partnerships to provide funding, or funding directly from CALFED. Projects supported by the Watershed Program must not only be technically appropriate, but also socially and politically in concert with local needs and desires.

The following desired outcomes illustrate what will be achieved by implementing the elements through locally developed watershed programs and projects. Some of the endeavors supported by the Program will be largely procedural in nature, some will involve planning and coordination, and others will be actual on-the-ground watershed projects. The list is not inclusive, illustrating only some of the outcomes likely to result from the Watershed Program. The desired outcomes are intended to demonstrate the potential for

collaboration among different parties seeking to improve the greater Bay-Delta watershed. Many of the desired outcomes show clear connection with other Common Programs and with many existing governmental and non-government sponsored programs.

In the course of implementing the major elements of the Program, many varied decisions will need to be made. The Watershed Program intends to continue the participatory consensus building methods used to develop the Program itself. A possible structure within which that participation takes place is outlined in the Implementation Plan Appendix of the Programmatic EIS/EIR. As the Program is implemented, some clear decision points will be reached. Some of those decisions that will be necessary to successfully translate the program elements into the desired outcomes are identified below. Some decisions will be made jointly by IWAT, the Watershed Work Group, and CALFED staff after thorough discussion of alternatives. Some decisions will be forwarded as recommendations to the Policy Group and BDAC for review and final determination. The decision points noted below are intended as an illustrative summary, and are not intended to represent all decisions necessary for implementation of the Watershed Program Plan.

3.3.1 IMPROVED COORDINATION AND ASSISTANCE

3.3.1.1 Collaboration Between Public and Private Parties

Watershed management has significantly evolved over the last 20 years. Traditionally, efforts to improve water quality and fisheries have largely been site specific and single problem oriented. Today's challenges, however, require more creative, comprehensive solutions. Watershed management has emerged as the multi-faceted approach to not only improving water quality and fisheries, but also reducing flood flows, improving water supply reliability, riparian habitats, and many other land/water processes. This paradigm shift can be seen around the state from several expansive projects to hundreds of projects at the grassroots level. Because many of these watershed projects affect the Bay-Delta system, either directly or indirectly, CALFED believes that many beneficial partnerships can be formed from these opportunities. Partners may include government agencies, tribal governments, ad hoc watershed groups, interest groups, and many others who are active in a given watershed. These partnerships will create many benefits including enhanced information exchange and improved relationships among government agencies and other stakeholders, as well as illustrate new opportunities. CALFED will facilitate means and opportunities to improve coordination and collaboration among those seeking to better manage watershed resources.

Anticipated Decisions may include:

- Criteria describing a "watershed group"
- Agreement on which agency programs contribute to watershed conservation, maintenance restoration and enhancement
- Agreement on a list of agencies, watershed groups, and other entities that are likely to help achieve CALFED goals
- Degree of involvement of the Watershed Program in promoting active partnerships

- Priority of desired partnership developments to attain Watershed Program objectives
- Recommendations for funding and technical coordination mechanisms to improve assistance in improved watershed management
- Composition of a list of entities and individuals with expertise and on the ground experience in watershed improvement
- Recommendations for legislative and other legal changes to promote involvement in active watershed improvement and restoration

3.3.2 DEVELOPMENT OF MONITORING PROTOCOLS AND APPLICATION OF ADAPTIVE MANAGEMENT PROCESSES

3.3.2.1 Watershed Assessments

In order to understand how Watershed Program actions affect the condition of watershed resources over time, an inventory and assessment of existing conditions (baseline conditions) will be needed. CALFED may provide support to collect, analyze, and compile information to establish baseline conditions for a watershed.

3.3.2.2 Watershed Monitoring

Monitoring is an essential element in good watershed management. Monitoring protocols that generate information consistent with CMARP will be supported and made available to local groups. Training in the implementation of monitoring protocols can be applied in local watershed communities. Other projects that receive support may include data analysis training and data management assistance.

3.3.2.3 Effective Watershed Plan Implementation

As information is gathered through experience and monitoring, the Program will periodically assess the appropriateness and success of Program implementation methods and priorities. The Program will adapt its implementation to continually improve effectiveness in attaining the goals of the CALFED Program.

Anticipated Decisions may include:

- Success criteria delineation (for Program implementation), and measurement methods
- Agreement on a description of fundamental watershed processes
- Monitoring protocols for assessing project impacts on the described processes

- Program adjustments based on monitoring feedback (including decision making changes if necessary)
- Project adjustments necessary based on monitoring feedback
- What monitoring information gathered through Program support should be made available to the general public, and in what form

3.3.3 IMPROVED AND EXPANDED WATERSHED EDUCATION AND PUBLIC OUTREACH

3.3.3.1 Informed Citizenry

Raising watershed awareness in communities can help people who live, work, and recreate in a watershed better understand natural processes and the impacts of their daily activities. CALFED will support actions which facilitate information exchange regarding the importance of watershed management. Projects may include watershed awareness campaigns and education programs; watershed forums; and resource information centers (websites).

3.3.3.2 Sustainable Watershed Programs

Watershed protection involves many stakeholders and therefore requires much coordination. Many local watershed groups find it difficult to carry out many of the initial development activities needed to inform, organize, and assist local communities in addressing watershed management issues. CALFED will provide support - financial and technical - to help communities take the initial steps to organize and develop their local watershed programs. Initial funding may be used to hire a watershed coordinator; meet basic administrative costs, such as telephones, postage, facsimiles, and travel; and other initial "start-up" needs. In addition, CALFED will assist with the facilitation of technical assistance to help local programs with organizing the community, facilitating processes, resolving conflicts, and building organizational capacity. Over time, individual programs will be expected to cover more of these administrative and management costs, thus allowing CALFED's funding to focus more towards implementing watershed restoration, conservation, and management actions.

Anticipated decisions may include:

- Priority of different types of education support
- Implementation mechanisms to conduct and support watershed education
- Methods of gathering feedback from communities about needs
- Format, content and locations for Work Group meetings and other assemblies
- Nature, content and management of resource information center(s)

3.3.4 MAXIMIZATION OF THE MULTIPLE BENEFITS OF THE COMMON PROGRAMS

3.3.4.1 Maximized Benefits

The Common Programs provide multiple benefits which can be maximized with effective communication and collaboration. The Watershed Program has begun to coordinate Watershed Work Group meetings in conjunction with other Common Programs to share information and ideas. The Watershed Program will advocate similar meetings in the future. In addition, the Watershed Program will encourage the identification of gaps and areas of duplication, and move to make recommendations to fill those gaps and to eliminate unnecessary duplication.

The Watershed Program will also recommend possible partnerships among the Common Programs, and between the Common Programs and other programs, agencies, local governments, local watershed groups, and other entities that are likely to contribute significantly to the attainment of CALFED goals and objectives.

Anticipated decisions may include:

- Design of a communication system to improve timeliness of inter-program information sharing
- Recommendations for improved collaboration among programs
- Design of a mechanism to promote implementation of recommendations
- Articulation of the relationship of the Watershed Program with other Common Programs

3.3.5 IMPROVED WATERSHED STEWARDSHIP

3.3.5.1 Improved Watershed Ecosystem Maintenance and Enhancement

In collaboration with the Common Programs, as well as other existing Federal, State, and local programs, CALFED will support planning and implementation of activities to conserve, restore, enhance and maintain healthy watersheds. The support provided will be in the form of local capacity building in facilitation, planning, monitoring and technical expertise in addition to project based assistance. Emphasis will be placed on developing sustainable locally led programs and projects that can be maintained and replicated within the local communities of the Bay-Delta watershed. Methods used to implement these priorities will be scientifically sound, and locally appropriate. Monitoring of programs and projects will be supportive of the CMARP monitoring program of CALFED.

Typical activities supported for this desired outcome may include projects or programs that address:

Streamflow Enhancements - Planning, management and project activities that maintain or restore appropriate stream flows in the tributary streams to the Bay-Delta system. Support to achieve this outcome will be provided to encourage adequate planning, technical training, some necessary materials, and programs for adequate assessment and monitoring. Particular emphasis will be on the restoration or maintenance of appropriate seasonal patterns that will sustain important ecological systems and successions.

Sediment Balance - Many of the tributary streams to the Bay-Delta have had a sediment imbalance for over a century. Prior activities as well as present ones such as mining, urbanization, dams, and various types of agricultural practices have altered the sediment regime in many streams. Support will be provided to assess present sediment generation, transport and deposition, as well as assessment of optimum conditions. In addition, programs and projects that help establish appropriate sediment balance - both in quantity and in quality of sediment - in streams tributary to the Bay-Delta will be supported. Assistance may include technical training and support, assessment protocol development, land use practice research and promotion, and monitoring.

Geomorphic Stabilization - Many factors such as dam construction, flood management projects, land management practices, and urbanization have altered the geomorphic characteristics of streams feeding the Bay and Delta. Where feasible, CALFED will support projects and programs intended to restore geomorphic stability to streams in the Bay-Delta watershed, based on present and/or anticipated future hydrologic characteristics. The purpose of such support is to maximize habitat value along these streams, while minimizing costs of maintenance. Features of particular emphasis are meander characteristics, flood plain development and riparian corridor habitat quality and diversity.

Fire Management - Fire is an essential ecological process in many watersheds that sustain the Bay-Delta system. The frequency and character of fire is a factor in both fuels management and ecosystem balance. CALFED will support planning and implementation of fire and fuel load management programs that maintain, enhance or restore sustainable ecosystem processes while protecting human safety. Such programs may vary according to the needs of individual watersheds.

Water Quality Enhancement - CALFED will provide support and assistance to watershed communities who desire to maintain existing high water quality, as well as providing support to those communities working to improve water quality conditions. Support may be in the form of technical training, monitoring program development, partnership enhancements, and public outreach. Water quality issues addressed in supported programs will be those which have importance to local communities and that address state or national concerns as well. The following are specific water quality issues that are especially pertinent to the greater Bay-Delta watershed:

- **Improved Drinking Water** - CALFED will support watershed protection measures which reduce sources of turbidity, nutrients, and toxic substances that contribute to reducing the safety of drinking water supplies. Projects to improve water quality may include efforts that seek improvement by reducing source water constituents such as bromide, natural organic matter, microbial pathogens, nutrients, total dissolved solids (TDS), salinity, and turbidity that have a negative impact on a safe drinking water supply.

- **Protection to Wildlife, Aquatic Species, and Humans** - CALFED will support projects, programs, and other actions that reduce the impairment of beneficial uses in the Bay-Delta system. For example, project support may be given to programs associated with controlling excess metals and toxic elements in watershed system. Support may be in the form of technical training, monitoring development and implementation, public outreach activities, and partnership development.

- **Improved Spawning Habitat** - CALFED will support efforts to assess present sediment generation, transport and deposition, as well as assessment of optimum conditions (sediment budgets). In addition, assistance will be provided to programs and projects that help establish appropriate sediment balance - both in quantity and in quality of sediment - in Bay-Delta tributary streams. Assistance may be in the form of technical training and support, assessment protocol development, land use practice research and promotion, and monitoring.

Biological Diversity Maintenance and Improvement - A key indicator of the health of a watershed is the diversity of its biological communities. Programs, projects and other actions that maintain and conserve existing diversity will be supported. In addition, support will be provided for actions and programs that are intended to improve the diversity of appropriate local biological communities including riparian corridors, aquatic communities, wetlands, floodplains, forests and uplands. Types of support will include technical assistance and training, monitoring protocol development and implementation, on the ground projects, and partnership development.

Groundwater Management and Protection - Groundwater management is critical to Californians. Many communities depend on groundwater as the main source for their public water supply system, as well as many agricultural operations who are partly or entirely dependent on groundwater for their water supply. The management of groundwater has a direct effect on the health of a watershed. Degraded basins impact terrestrial habitats, riparian habitats, and stream flow. In an effort to improve groundwater management and protection, CALFED will support the development of local groundwater management plans, including well head protection programs, and monitoring.

Water Conservation - Water conservation benefits all users of the Bay-Delta system - including wildlife. CALFED will support activities which encourage the prudent use of water generated in or flowing through the Bay-Delta watershed.

Activities may include water awareness through education and research, development of watershed conservation plans, and monitoring.

Anticipated decisions may include:

- Development of a list of watershed processes and their relationships with one another
- Description of the relationships of watershed processes and CALFED goals and objectives
- Selection of illustrations of benefits of watershed conservation, maintenance, restoration and enhancement activities
- Development and maintenance of a priority list of watershed functions to guide Program implementation
- Derivation (from the Watershed Program Principles) of specific criteria for funding support when funds become available
- Selection of examples to demonstrate watershed process improvements resulting from watershed activities

3.3.5.2 Improved Watershed Planning and Management

To promote the ability for sustained local management of the sub-watersheds of the Bay-Delta system, CALFED will provide support to efforts that build capacity and self reliance at local levels. Technical training, building creative private/public partnerships, strengthening the use of available education institutions such as colleges and universities, and developing local capacity for monitoring and assessment are some of the activities that may contribute to local sustainability of quality watershed management. Developed local capacity will help ensure the long term health and productiveness of the greater Bay-Delta watershed.

Watershed management is a complex task. It requires a strong network in and among local communities that links desires, interests, needs and capabilities of as broad a section of the community as possible. Improved information transfer allows a larger context to be constructed when individual decisions are made that may have incremental impacts on the local drainage basin. In addition, many opportunities for partnerships in improving watershed condition are foregone because groups and agencies are not always aware of one another's programs and projects. Improved capacity to develop collaborative approaches to meeting the needs of the watershed will increase both the efficacy and the efficiency of watershed management. It also will provide greater opportunity to align local, state and federal interests in creative management that better meets all their needs.

The following types of programs and projects are illustrative of the support that CALFED will develop in collaboration with agencies, individuals, academic institutions, groups and

local governments. These programs and projects will provide improved capacity and context for the design and implementation of watershed enhancement activities illustrated above.

Watershed Science Training for Local Planners - Local planners, such as in city and county planning departments, as well as planning commissioners, have indicated a desire to know more about the functions and attributes of watershed systems. The Watershed Program can facilitate the delivery of training to planners and commissioners that will provide a platform for land use decision making in the full context of likely impacts of those decisions on the watershed system. Training may include hydrology, fluvial geomorphology, wildlife habitat types, forest management, wetlands, and other aspects of watershed scale physical and biological functions.

Applied Fluvial Geomorphology and Habitat Restoration - There is presently no widely available training in stream and river maintenance and enhancement for local interests such as public works and parks departments. Many local jurisdictions do not have sufficient funding for their personnel to attend the training classes that are available. The Watershed Program can develop a comprehensive program in collaboration with universities and private consultants that can build the capacity of local watershed managers, both public and private, to effectively maintain and enhance local watersheds. Greater local capacity will have beneficial impacts on wildlife habitat, water quality, water supply, and the integrity of levees in the greater Bay-Delta watershed.

Anticipated decisions may include:

- Selection of projects to be supported by CALFED
  - Geographic priorities
  - Programmatic priorities
  - Selection criteria
  - Selection mechanisms
  - Contract management

- Monitoring adaptation recommendations to CMARP

3.4 GOVERNANCE

For information on governance please refer to the **Implementation Plan Appendix** of the Programmatic EIS/EIR.

3.5 FINANCING

Financing the CALFED Program to ensure successful funding throughout Stage 1 will require a significant effort by CALFED agencies and other stakeholders. A conceptual foundation for the Finance Plan has been proposed. Details on exactly how to obtain and bring funds to bear will be worked out prior to the Record of Decision.

For more information on financing, please refer to the **Implementation Plan Appendix** of the Programmatic EIS/EIR.

3.6 STAGED IMPLEMENTATION

The Watershed Program will be implemented in three stages. The CALFED Program currently is in what is referred to as Phase II, in which the CALFED agencies are developing a Preferred Program Alternative that will be subject to a comprehensive programmatic environmental review. Implementation of Phase III is expected to begin in 2000, after the Programmatic EIS/EIR is finalized and adopted. Because of the size and complexity of the alternatives, the Program will likely be implemented over a period of 20-30 years. Program actions will be refined as implementation proceeds, initially focusing on the first 7 years (Stage 1). This staged implementation process will allow for an adaptive management philosophy and process.

Actions implemented during Stage 2 largely depend on the results of Stage 1; however, it is anticipated that the Watershed Program will continue to fund and implement watershed restoration and monitoring activities that support the goals and objectives of CALFED. Additionally, the Watershed Program will continue to assist local watershed groups with coordination, technical assistance, and monitoring, as needed, and as Program capacity allows.

Stage 3 is the final stage of the Watershed Program. Adaptive management and monitoring will be critical components during this implementation phase. Stage 3 actions will be based on the results of Stages 1 and 2.

3.6.1 STAGE 1 ACTIONS

Stage 1 is the 7-year phase commencing with the final decisions on the Programmatic EIS/EIR. Stage 1 implementation is scheduled to begin in 2000.

The Watershed Program is designed to be coordinated and integrated with existing and future local watershed programs and to provide technical assistance and funding for watershed activities that support the goals and objectives of CALFED. The actions during Stage 1 are a mix of watershed coordination, restoration, maintenance, and conservation

activities, as well as demonstration projects designed to show benefits to the Bay-Delta system without harm to existing watershed resources.

Each potential action in the following Stage 1 list includes an estimate (in parenthesis) of when the action may occur in Stage 1. For example, "(Year 1)" indicates that the action is expected to occur in the first year following the final decisions on the Programmatic EIS/EIR.

1. Fund and implement locally led watershed restoration, maintenance, conservation, and monitoring activities that support the goals and objectives of CALFED. (Years 1-7).

2. Assist local watershed groups and government agencies to address common issues (including roles and responsibilities, funding support, technical assistance, and information exchange) and to ensure effective communication and implementation among government agencies and stakeholder groups (Years 1-7).

3. Implement a funding process and provide watershed stewardship funds to build the capacity of locally led watershed organizations that ensure participation of local landowners (Years 1-7).

4. Improve the use and usefulness of existing or future watershed clearinghouse functions to assist watershed groups with obtaining information on funding opportunities, technical assistance, and data storage and retrieval (Years 3-7).

5. Ensure the completion of project-level environmental documentation and permitting; assist with documentation and permitting processes as appropriate (Years 1-7).

6. Evaluate the benefits (including economics) that accrue from watershed plans and projects designed to achieve CALFED goals and objectives (Years 3-7).

7. Establish, fund, and maintain watershed restoration and maintenance assistance to aid local watershed groups and private landowners in project concept, design, and implementation (Years 1-7).

8. Collaborate with other CALFED and non-CALFED programs on watershed-related activities (Years 1-7).

9. Work with stakeholders and the Legislature to develop a state-wide umbrella watershed management act (Year 1).

To effectively implement the Stage 1 actions, the Watershed Program will execute a strategy that will ensure support and long-term sustainability of local watershed activities and adhere to the following four objectives:

- ***Building on existing programs, the Watershed Program will develop a long-term plan that identifies the types of assistance that may be needed, the array of government agencies or other entities best suited to deliver this***

assistance, and the funding levels necessary to carry out these long-term assistance programs.

This action will require an inventory of needs and assistance available. The inventory will be provided to local watershed programs and to government agencies in order to provide greater opportunities for collaboration and partnership building. Additionally, this item will develop estimates of the cost to fulfill the assistance needs identified to promote the long-term efforts necessary for effective watershed management.

- ***Ensure that watershed programs are included in all CALFED planning and funding cycles.***

Because watershed management is perpetual, it will require long-term dedicated support. The Watershed Program will seek to ensure that adequate funding be made available to continue the growth of effective operational watershed management for at least the expected life of CALFED.

- ***Ensure that stakeholders are fully informed at all stages of Program implementation.***

To be truly effective, the Watershed Program must include all stakeholders in its implementation. Government agencies at all levels; local, regional, and national interest groups; landowners; private individuals; and other watershed constituents will be involved in developing and implementing the Watershed Program.

- ***Fund and implement watershed restoration, maintenance, conservation, and monitoring activities that support the goals and objectives of CALFED.***

The Watershed Program will support local and regional activities that improve the ability of the watershed to function as a contributor to the health of the entire Bay-Delta system. See pages 2-2 and 2-3 for examples of possible watershed projects.

Anticipated decisions may include:

- Development of a list of watershed processes and their relationships with one another
- Description of the relationships of watershed processes and CALFED goals and objectives
- Selection of illustrations of benefits of watershed conservation, maintenance, restoration and enhancement activities
- Development and maintenance of a priority list of watershed functions to guide Program implementation
- Derivation (from the Watershed Program Principles) of specific criteria for funding support when funds become available

- Selection of examples to demonstrate watershed process improvements resulting from watershed activities

- Staffing needs of the Watershed Program

This Implementation Strategy is an outline for the Watershed Program to utilize the elements of the Program in order to realize the desired outcomes stated above. Participation in and support from the Watershed Program will be guided by the Program Principles. Implementation management will focus on the development and enhancement of collaborative partnerships and the building of local watershed management capacity to improve natural resource conditions in the Bay-Delta system.

4. Adaptive Management and Monitoring

4. Adaptive Management and Monitoring **4-1**
4.1 ADAPTIVE MANAGEMENT 4-1
4.2 MONITORING 4-2

4. Adaptive Management and Monitoring

4.1 ADAPTIVE MANAGEMENT

Adaptive management is the process of refining or redefining management actions and assumptions as a process unfolds and results are obtained. It is an interactive and iterative approach to decision making that incorporates feedback loops for evaluating decisions and other actions, and injecting new information as it becomes available. Adaptive management begins with a clearly defined set of management goals and objectives; includes the development of actions meant to achieve those goals and objectives; and incorporates an evaluation of actions implemented to determine whether goals and objectives are being met. Goals and objectives, actions, and monitoring protocols are established given today's knowledge. Experimental management is included where improved knowledge is essential. Results are monitored and actions modified as needed to achieve management goals, which also may be modified.

Adaptive management is a fundamental concept of CALFED. The Watershed Program will use the principles of adaptive management in managing those actions and projects implemented by or on behalf of the program and in managing the overall program.

Adaptive management and monitoring are necessary to understand watershed resource conditions and the effects of Watershed Program actions on these conditions. Given the uncertainties involved in watershed management, an adaptive management learning process reduces these uncertainties over time. Adaptive management and monitoring processes will measure the success of meeting objectives and help identify what corrective steps need to be taken when these objectives are not being achieved. Adaptive management and monitoring will be funded by CALFED and will be carried out throughout the life of the overall program.

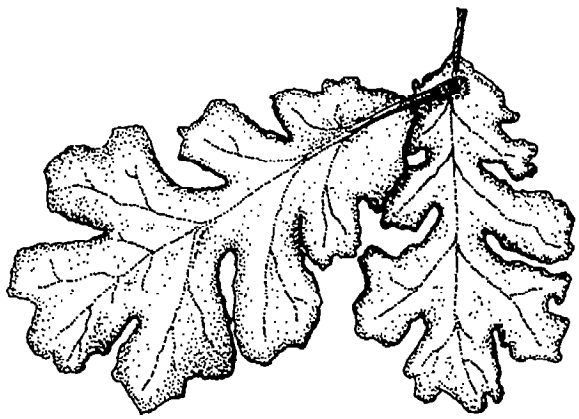
Adaptive management will be used as a structured decision-making process that includes monitoring, research, and staged implementation of the program; a feedback process to integrate knowledge gained from monitoring and research; and the flexibility to change the program in response to new information. Adaptive management may also be relevant in institutional arrangement and funding scenarios.

4.2 MONITORING

Monitoring is also a fundamental component of CALFED and directly related to the adaptive management cycle. Monitoring will gauge the success of Watershed Program actions and provide feedback necessary for successful implementation. The Watershed Program participants are working closely with the CMARP and stakeholders to develop watershed management monitoring protocols. Because some watershed actions are focused on education and outreach, it is anticipated that the Watershed Program also will include some nontraditional monitoring protocols, such as monitoring to gauge public awareness of particular watershed issues.

APPENDIX A

INTERAGENCY WATERSHED ADVISORY TEAM



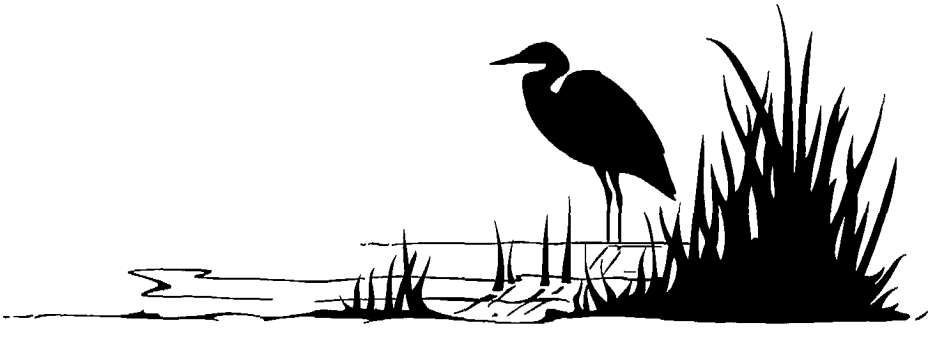
INTERAGENCY WATERSHED ADVISORY TEAM

(Alphabetical Listing)

Name	Affiliation
Bill Bennett	California Department of Water Resources
Jerry Bruns	Central Valley Regional Water Quality Control Board
Dan Castleberry	U.S. Fish and Wildlife Service
Ken Coulter	California State Water Resources Control Board
Sara Denzler	California Department of Water Resources
Tim Farley	California Department of Fish and Game
Dennis Heiman	Central Valley Regional Water Quality Control Board
Russ Henly	California Department of Forestry
Jerry Johns	California State Water Resources Control Board
John Lowrie	USDA - Natural Resources Conservation Service (Watershed Program Manager)
Christopher Reeves	Bureau of Indian Affairs
Carl Rountree	U.S. Bureau of Land Management
Fraser Sime	California Department of Water Resources
Julie Tupper	U.S. Forest Service
Ken Trott	Department of Conservation
Phil Wendt	California Department of Water Resources

APPENDIX B

BAY-DELTA ADVISORY COUNCIL WATERSHED WORK GROUP MEETING PARTICIPANTS



BDAC WATERSHED WORK GROUP
MEETING PARTICIPANTS
(Alphabetical Listing)

Name	Affiliation
Alcott, Rob	East Bay Municipal Utilities Water District
Alexade, Camel	Sacramento Resident
Al-Kazily, Fadhil	California Department of Water Resources
Allen, Bob	Burney Forest Power
Ames, Laurel	Sierra Nevada Alliance
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Anderson, Shannah	Aquatic Outreach Institute
Arnold, Brad	South Sutter Water District
Aumack, Laurie	Battle Creek Watershed Project
Barrett, Lee	Coon Creek Restoration Project
Barretta, Ben	Nevada Irrigation District
Barris, Lynn	Sacramento River Watershed Program
Beaulaurier, Diane	Meeting Participant
Beeman, Howard	Meeting Participant
Benedict, Chuck	Butte Creek
Benedict, Geri	Butte Creek
Berry, David	Kleinfelder Inc.
Bill, Demery	Grindstone Indian Rancheria
Brandow, Clay	California Department of Forestry
Breninger, David	Placer County Water Agency
Bischel, David	California Forestry Association
Bobker, Gary	The Bay Institute
Bogener, Dave	California Department of Water Resources
Boitave, Michael	Amador Agriculture Commission
Boles, Jerry	California Department of Water Resources - Red Bluff

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Bolland, Dave	Association of California Water Agencies
Borgonova, Roberta	League of Women Voters/BDAC
Boucher, Dave	Friends of the Tuolumne
Bowker, Dennis	Sacramento River Watershed Program
Bradt, Josh	Urban Creeks Council
Breninger, Dave	Placer County Water Agency
Briden, Laurie	California Department of Fish and Game
Brown, David	California State University Chico - Geoscience Department
Brown, Karen	California Department of Water Resouces
Brown, Melinda	Shasta-Tehama Bioregional Council
Bryant, Jeff	Firebaugh Canal Water District
Bundy, Burt	Mill Creek Conservancy
Burke, Steve	Community Resource Center
Burrows, Terri	Grindstone Indian Rancheria
Campbell, Tim	Meeting Participant
Carpenter, Mark	Westlands Water District
Carrico, Loretta	Cottonwood Creek Watershed Group
Castleberry, Dan	U.S. Fish and Wildlife Service/IWAT
Cativiela, J.P.	California Rice Industry Association
Ceppos, Dave	Jones & Stokes
Cervantes, Robert	Lake County
Chadima, Carole	MYRACL
Chang, Phil	University of California Berkeley Watershed Policy Project
Chatigny, Jim	Nevada Irrigation District
Cheechov, Walt	Natural Resources Conservation District
Clamurro, Lori	Delta Protection Commission
Clark, Henry	West County Toxics Coalition
Coburn, John	State Water Contractors
Cole, Linda	Cherokee Watershed

Name	Affiliation
Connelly, John	Orland Water Users Association
Cooper Carter, Kristin	CSU Chico - Environmental Resource Program
Cornelius, James	Calaveras Water District
Cornwall, Caitlin	Sonoma Ecology Center
Cowdin, Steve	California Department of Water Resources
Coulter, Ken	State Water Resources Control Board
Cromwell, Dean	California Department of Forestry
Crooks, Bill	City of Sacramento
Curtis, Bill	Northern California Water Agencies
Dale, Richard	Sonoma Ecology Center
Daniel, Dick	CALFED Bay-Delta Program
Davis, Fred	Butte County
Davis, Martha	Inland Empire Utilities Agency
Dawley, Vicky	Tehama County Resource Conservation District
de Alba, Fernando	City of Mendota
de Haas, Merv	El Dorado County Water Agency
Demariuis, John	Big Valley Pomos
Dennis, Ann	US Geological Survey - Biological Resources Division
Dennis, Tess	California Farm Bureau
Denzler, Sara	California Department of Water Resources
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Dickinson, Mary Ann	California Urban Water Conservation Council
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Dolan, Jane	Butte County Supervisor
Drake, Nettie	Panoche/Silver Creek CCRMP
Driscoll, Alan	HydroGeologic, Inc.
Dunn, Keith	Office of Congressman Wally Herger
Edson, Allen	Environmental Science Institute

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Everts, Conner	Public Officials for Water and Environmental Reform
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Fitch, Steve	California Assembly
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Garland, Judith	East Bay Municipal Utilities District
Gaumer, Diane	Deer Creek Watershed Conservancy
Garvey, Shawn	South Yuba River Citizens League
Genaris, Mark	EIP Associates
Gentry, Isla	Gentry & Associates
Giacomini, Pam	Rancher/Hat Creek Landowner
Gibbs, Suzanne	Big Chico Watershed Alliance
Ginney, E.M.	Butte Creek Watershed Project
Goehring, Vern	Friends of the River
Gohring, Tom	CALFED Bay-Delta Program
Goldberg, Harvey	Petaluma River Property
Gonzalez, Kenneth	Lytton Rancheria Band of Pomo Indians
Gordon, Nina	California Resources Agency
Gottlieb, David	Resource Conservation District of the Santa Monica Mountains
Gresham, Rich	Placer County Resource Conservation District
Grimes, Russ	U.S. Bureau of Reclamation
Guy, David	Northern California Water Association
Guzman, Martha	United Farm Workers
Hammerling, Eric	National Fish and Wildlife Foundation

Name	Affiliation
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