Core Actions Detail

CALFED
BAY-DELTA
PROGRAM

PRELIMINARY DRAFT

POTENTIAL CALFED CORE ACTIONS

INTRODUCTION

DEFINITION OF AND CRITERIA FOR CORE ACTIONS

A core action is an action at a specific implementation level that would be included as an element of all CALFED program alternatives. Including such an action in all alternatives would be based on consensus among all stakeholders that implementation of the action is important and acceptable to contribute to meeting one or more program objectives.

DISTINGUISHING CRITERIA FOR CORE ACTIONS. The following criteria further define core actions.

- A core action would measurably contribute to achieving one or more program objectives.
- A core action is broadly supported by stakeholders whether or not the CALFED Bay-Delta Program exists or succeeds.
- A core action is compatible with and beneficial to all possible outcomes of the CALFED Bay-Delta Program.
- A core action would be beneficial and cost-effective in contributing to program objectives either over the long term or only during the interim until the long-term Bay-Delta solution is selected and implemented.
- A core action must be implementable at a reasonable cost, individually and collectively with other core actions, that is acceptable to all stakeholders.
- A core action could consist of using the CALFED Bay-Delta Program as an institutional framework for promoting, planning, coordinating, consolidating, and/or funding an action that otherwise generally falls under the purview of another agency (but has not been implemented because of lack of specific approval or funding).
- A core action could be implemented independently from the CALFED Bay-Delta Program.
- A core action would emphasize immediate implementation through voluntary and cooperative partnerships with landowners or other participants.

The following criteria distinguish core actions from other types of actions:

- A core action cannot preclude or conflict with implementing other actions.
- A core action cannot increase the level of conflict between Bay-Delta beneficial uses or among stakeholders.
- A core action does not yet have approval and funding for implementation by another agency or entity (thus, actions approved and fully funded by the Central Valley Project Improvement Act or as Category III projects would not qualify as core actions; actions that could be funded by future measures, could qualify as core actions).
- A core action cannot be solely viable as part of a major program alternative and cannot be so expensive that it is acceptable only in conjunction with other major actions (thus, construction of major structural facilities would not qualify as a core action).
- A core action cannot redistribute costs and benefits of Bay-Delta beneficial uses.

DEFINITION OF CORE LEVEL OF IMPLEMENTATION

A core level for implementing a core action would satisfy the above criteria for distinguishing the core action itself. Thus, an action implemented at a core level would be broadly acceptable, cost-effective, and beneficial to program objectives. Most core actions could theoretically be implemented at higher levels, but at these higher levels they may not receive broad support and be financially feasible. For example, installing fish screens on a small proportion of all diversions that qualify as highest priority (i.e., largest or most damaging to fish), most feasible, most cost-effective, and based on willing participation of diversion owners could be considered a core action at a core level of implementation. In contrast, installing screens on all diversions regardless of priority, feasibility, cost, and willing participation would be considered implementation at a higher-than-core level. This higher level of implementation would be perceived as unnecessary, non-cost-efficient, and burdensome and therefore not broadly supported by stakeholders.

LIST OF POTENTIAL CORE ACTIONS

Following is a list of potential core actions that are described in this report.

BAY-DELTA HABITAT RESTORATION:

- Protect and Enhance Existing Shallow-Water Habitat
- Protect and Enhance Existing Riverine Habitat on Channel Islands
- Include Riverine Elements at Channel Edges by Modifying Levee Protection Practices

- Protect and Enhance Existing Riparian Habitat
- Improve Riparian Habitat by Modifying Levee Maintenance Practices
- Improve Degraded Riparian Habitats
- Protect and Enhance Existing Wetlands
- Expand Wetland Acquisition Programs
- Protect and Enhance Existing Upland Habitat
- Encourage Wildlife-Friendly Agricultural Practices
- Preserve Agricultural Land Uses Providing Habitat
- Improve Regulations Regarding Ballast-Water Releases
- Improve Border Inspection Practices
- Establish a Rapid Response Program for Introduced Species

UPSTREAM HABITAT RESTORATION

- Improve Flows and Temperatures in Upstream Habitats
- Maintain Adequate Spawning Substrates
- Encourage Gravel-Mining Practices that Protect Fish Habitat
- Modify Fish Passage at Upstream Dams or Through Other Barriers
- Modify Natural Barriers to Improve Fish Passage
- Encourage Appropriate Livestock Management in Riparian Habitats
- Revegetate Degraded Riparian Habitats
- Encourage Wildlife-Friendly Agricultural Practices
- Preserve Agricultural Land Uses Providing Habitat

REDUCTIONS IN THE EFFECTS OF DIVERSIONS

- Use Real-Time Monitoring and Adaptive Management
- Install Screens on Unscreened In-Delta Diversions
- Install or Upgrade Screens on Upstream Diversions
- Evaluate and Implement Effective Acoustic Barriers to Anadromous Fish Movement
- Operate Fish Barrier on San Joaquin River at Merced River In Fall

MANAGEMENT OF ANADROMOUS FISH

- Modify Hatchery Operations to Reduce Effects on Wild Populations
- Improve Data Collection and Analysis needed to Regulate Commercial Take

REDUCTION IN EXPORT RELIANCE

- Establish Incentives for Use of Agricultural Water Conservation Practices
- Increase Incentives for Use of Municipal and Industrial Conservation Practices

- Educate Small Agencies about Conservation and Reclamation Feasibility

WATER SUPPLY ENHANCEMENT

- Establish Incentives for Conjunctive Use
- Ease Institutional Barriers to Encourage Conjunctive Use

INCREASING WATER SUPPLY PREDICTABILITY

- Ease Institutional Obstacles to Facilitate Water Transfers
- Improve Procedures for Water Transfer Permitting
- Coordinate Diversion and Conveyance of Water Transfers
- Establish a Water Transfer Brokering Mechanism or Institution
- Manage Water Resources Data and Information for the Bay-Delta System
- Encourage Long-Term Drought Contingency Planning

MANAGEMENT OF WATER QUALITY

- Establish Incentives for Retirement of Lands with Drainage Problems
- Provide Incentives for Pollution Source Control on Agricultural Lands
- Encourage Management of Riparian Zones to Protect Water Quality
- Encourage Management of Land Uses to Protect Water Quality

IMPROVEMENTS TO SYSTEM RELIABILITY

- Monitor, Evaluate, Maintain, and Stabilize Existing Levees
- Modify Agricultural Practices to Reduce Subsidence
- Investigate Techniques for Beneficial Reuse of Dredged Materials
- Establish an Emergency Levee Management Plan
- Provide Funding for Maintenance and Stabilization

DESCRIPTIONS OF POTENTIAL CALFED CORE ACTIONS

BAY-DELTA HABITAT IMPROVEMENT

CORE ACTION: Protect and Enhance Existing Shallow-Water Habitat

Shallow-water tidal habitat in the Bay-Delta consists of nearshore shallow and shoal waters at depths of less than approximately 6 feet. Such habitat is important for anadromous and native

resident fishes that reside at least a portion of their life cycle in the Bay-Delta. Protection of existing shallow-water habitat is critical because of the value of this habitat to important fish species and because much of such habitat has been lost or degraded as a result of channelization and wetland reclamation. Remaining shallow-water habitat is in jeopardy of being lost or degraded because of filling during levee maintenance, dredging to maintain channels, disturbance by boat operation, and erosion by increased circulation in conveyance channels. A core action would be to protect and enhance existing shallow-water habitat by prohibiting destructive activities and by physical protection where erosion is occurring.

CORE LEVEL OF IMPLEMENTATION: A core level of protection for remaining shallow-water habitat would be achieved by a concerted effort to minimize filling shallow areas adjacent to levees and to minimize loss of existing shallow areas from dredging and boat operation. Sites protected at the core level would be those of highest value for aquatic habitat and most feasible to protect from loss factors. The core action would entail identifying the shallow-water sites of highest priority and feasibility to protect and instituting protection measures through appropriate management and regulatory entities.

CORE ACTION: Protect and Enhance Existing Riverine Habitat on Channel Islands

Many channel or "tule" islands remaining in Delta channels continue to erode because of high flow velocities and boat wakes. Such islands are remnants of original tule lands or were formed from dredge spoils or other reclamation processes over the past century. Over the past several decades, many of these islands have been lost as a result of erosion-causing processes such as boat wakes and channel dredging. These islands provide valuable river-edge (i.e., riverine) habitat as well as shallow-water, riparian, and wetland habitat for important fish and wildlife. This core action would attempt to protect and enhance those islands that are important and threatened most by erosion forces.

CORE LEVEL OF IMPLEMENTATION: At a core level, this action would encompass protecting the sites with highest priority (e.g., most important location for aquatic habitat functioning, largest contiguous habitat areas) and the sites that could be protected most cost effectively. High-priority sites would be those situated in important spawning and rearing locations for Delta smelt and migratory pathways for winter-run chinook salmon. Perhaps approximately 50% of the area of the remaining channel islands could be protected at the core level of implementation of this core action.

CORE ACTION: Include Riverine Elements at Channel Edges by Modifying Levee Protection Practices

Protection and maintenance practices for levees and other near-water activities in the Bay-Delta and along tributary streams can be modified to protect and restore riverine elements. Shoreline and shallow-water edges of channels, which are key riverine habitat for fish and wildlife, can be enhanced and restored during levee protection and channel maintenance work. For example, riverside berms can be constructed in selected sites (e.g., where flood conveyance, water supply conveyance, or navigation is not impaired) to enhance riverine habitat values while installing bank protection.

CORE LEVEL OF IMPLEMENTATION: At a core level, this action would be implemented at highest priority (e.g., migration pathways for winter-run salmon) and most feasible (e.g., where channel cross-sections would allow such riverine habitat enhancements without impairing other functions) sites. At many channel sites, modified levee protection would not be possible because of structural or flow-related restrictions.

CORE ACTION: Protect and Enhance Existing Riparian Habitat

Existing tidal riparian habitat in the Delta is being lost, in part, as a result of erosion of channel islands and exposed levee banks. Nontidal riparian habitats within Delta islands are being lost as a result of development or other land use practices. Under this core action, sites would be identified for habitat protection measures (e.g., erosion control, acquisition of fee title or conservation easements, cooperative habitat management) and such measures would be implemented to ensure that these sites continue to produce important habitat values. Nontidal sites of riparian habitat within islands would be identified and specific sites would be considered for a cooperative program with landowners to protect them from loss of habitat values.

CORE LEVEL OF IMPLEMENTATION: At the core level, the sites with highest priority would be identified using criteria such as remaining habitat area, physical stability, and connectivity to other aquatic and wetland habitats. Feasibility for protection would be assessed using factors such as willing cooperation by landowners, compatibility with other management needs (e.g,. levee maintenance), and channel flow patterns. At a core level of implementation, sites would be protected using institutional and physical measures implemented by cooperative partnerships between landowners and responsible management and regulatory agencies.

CORE ACTION: Improve Riparian Habitat by Modifying Levee Maintenance Practices

Historical levee maintenance practices have generally been inconsistent with retaining and protecting riparian vegetation on levees. Currently, maintenance practices to protect and enhance riparian vegetation are being incorporated into many projects to stabilize levees where structurally and financially feasible. This core action would expand these current efforts to implement alternative levee maintenance practices that could allow riparian vegetation to remain, especially on the waterside that provides important values for adjacent aquatic habitat. New levee protection designs that can be used to both improve and maintain Delta levee and channel systems while protecting and enhancing riparian habitat have been developed by Delta levee engineers. Modification of maintenance standards on federal "project" levees may require authorization through federal legislation.

CORE LEVEL OF IMPLEMENTATION: At a core level, modified maintenance practices would be applied to the levee sites with highest priority and those most feasible for potentially supporting riparian habitat through willing partnerships with landowners and maintenance districts. Sites with highest priority would be those along important aquatic habitats (e.g., migration pathways for winter-run salmon, shallow-water habitat for rearing Delta smelt). At many sites (e.g., federal "project"

levees), standard maintenance practices will continue to be required because of institutional, structural, financial, or site-specific characteristics.

CORE ACTION: Improve Degraded Riparian Habitats

Riparian habitats that continue to exist in the Delta have been degraded by maintenance and land use practices. Riparian habitats in tidal areas provide increased habitat values to adjacent aquatic habitat if tree vegetation is sufficient to create shaded protected sites. Within-island sites sometimes provide larger cumulative riparian areas that are of value to migratory birds Improvements to degraded riparian habitat can include protecting sites from further degradation from land use activities (thus allowing natural riparian regrowth), coordinating erosion control efforts to prevent further habitat loss or degradation of levee and channel sites that support riparian vegetation, and planting riparian plant species to improve or expand the riparian areas that have been degraded.

CORE LEVEL OF IMPLEMENTATION: At the core level, Delta riparian habitats would be improved and protected on those sites of highest priority and those where such improvement is most feasible for immediate implementation through willing partnerships with landowners. High-priority sites represent those that currently include or are connected to important high-quality aquatic or wetland habitats and sites that are relatively large in area. Other sites (e.g., those in private ownership and subject to agricultural drainage-maintenance practices) may not be feasible to protect and improve at a core level of implementation.

CORE ACTION: Protect and Enhance Existing Wetlands

A CALFED core action could consist of promoting, coordinating, and funding protection of existing wetland habitat sites with highest priority. Under regulatory agencies' no-net-loss policies, any losses of existing wetland in the Delta will be mitigated through creation and restoration activities. Protection activities would include coordinating levee and channel maintenance and other land use activities to minimize further loss of existing wetland habitats. Protection activities could include identifying areas where erosion can be reduced through innovative bank protection activities that allow the retention of existing wetland habitats. At some sites of existing wetland habitat where current habitat values are low, loss of these existing wetlands could be better compensated through mitigation at other larger, more highly valued, and better-protected sites. Existing wetlands can be enhanced through activities to increase their habitat value for aquatic and terrestrial species (e.g., modifying substrate elevations, managing hydrological patterns, establishing vegetation).

CORE LEVEL OF IMPLEMENTATION: At the core level, protection and enhancement of existing wetland habitat would be applied to the sites with highest priority (e.g., those of highest value, best connected to other valuable aquatic and wetland habitats). Other sites of existing wetlands (e.g., low value, infeasible for enhancement) would be allowed to be lost and the wetland losses compensated at other sites of greater value. At a core level of implementation, sites would be protected and enhanced through cooperative partnerships between landowners and responsible management and regulatory agencies.

CORE ACTION: Expand Wetland Acquisition Programs

Acquiring wetlands to preserve habitat values in perpetuity can be implemented through purchase of fee title or conservation easements from willing sellers. The current level of acquisition by various agencies and conservation organizations could be expanded as a core action included in all CALFED alternatives. Expanded acquisition could be used to enlarge important areas of existing wetlands (e.g., freshwater and brackish water wetlands, riparian habitats) and to incorporate currently protected areas into a larger corridor development program.

CORE LEVEL OF IMPLEMENTATION: At a core level, a wetland acquisition program could provide a means for procuring the remaining wetlands sites with highest priority currently in unprotected ownerships. This core level of acquisition would be focused on sites available through voluntary participation by cooperative landowners and of highest priority in terms of size, connectivity, current habitat value, etc. The balance of existing wetlands would not be available on a willing-seller basis, would be of low priority for acquisition, or otherwise would not be feasible for acquisition and management.

CORE ACTION: Protect and Enhance Existing Upland Habitat

Existing areas of upland habitat in the Delta (e.g., grassland on sandhills in the western Delta) provide valuable habitat diversity and critical habitat elements for some terrestrial species. A possible CALFED core action could be to protect selected high-priority sites from loss or disturbance using voluntary cooperation of landowners or acquisition of fee title or conservation easements from willing sellers.

CORE LEVEL OF IMPLEMENTATION: At a core level, implementation of this action would focus on those sites of highest value, size, and connectivity to important wetland habitats and those sites where protection is most feasible through cooperative partnerships with landowners or through acquisition from willing sellers.

CORE ACTION: Encourage Wildlife-Friendly Agricultural Practices

Intensive agricultural practices often result in elimination of wildlife habitat by uniformly clearing all nonagricultural vegetation in and around fields and maintaining irrigation and drainage ditches clear of all vegetation. Substantial opportunities to provide wildlife habitat exist by retaining selected vegetation that is compatible with productive agricultural operations and by implementing other minor operational changes. California Department of Fish and Game (DFG) is producing a manual describing wildlife-friendly agricultural practices that provide wildlife habitat while maintaining agricultural productivity. A CALFED core action might consist of assisting DFG to disseminate this information and encourage Delta farmers to adopt these wildlife-friendly practices.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to provide funding for dissemination of literature, such as the DFG manual, and for staffing outreach programs to Delta farmers interested in adopting the practices through cooperative partnerships.

CORE ACTION: Preserve Agricultural Land Uses Providing Habitat

Certain agricultural land uses in the Delta provide valuable habitat for terrestrial wildlife species. For example, Swainson's hawks forage for prey in pastures and alfalfa fields; sandhill cranes roost and forage in hay and grain fields. Habitat valuable to wildlife species may be lost if important crop types such as these are converted to other crops that do not provide such habitat (e.g., vineyards). A CALFED core action could consist of providing monetary incentives or acquiring conservation easements to encourage farmers to retain the crop types and cropping practices that provide valuable wildlife habitat.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to provide coordination and funding for protection of the habitat sites with highest priority (i.e., those most limited in the Delta and most connected to other important habitat features for species of concern). At a core level of implementation, sites would be protected and enhanced through cooperative partnerships with landowners.

CORE ACTION: Improve Regulations Regarding Ballast-Water Releases

Many non-native aquatic species have been introduced to the Bay-Delta in ship ballast water over the past several decades with severe effects on native aquatic plant and animal communities. Shifts in the aquatic food web caused by introduced species threaten native plants, fish, and invertebrates. Introductions of non-native organisms to the estuary are most likely from releases of ballast water from ships entering the Bay or releases into nearby ocean waters from ships prior to entering the Bay. More stringent regulation of ballast-water releases could substantially reduce the likelihood of future introductions. Federal law now successfully regulates ballast-water releases in the Great Lakes and the Hudson River. The Aquatic Nuisance Species Act now up for reauthorization could be utilized to develop and implement ballast water regulations.

CORE LEVEL OF IMPLEMENTATION: At the core level, this core action would consist of CALFED promoting and coordinating California interest in applying existing federal law for regulating ballast-water releases to California ports.

CORE ACTION: Improve Border Inspection Practices

Many non-native aquatic organisms and terrestrial plants enter the state by overland transport from other states. Aquatic organisms such as the zebra mussel, or plants such as milfoil, may be present on the bottoms of boats or attached to boat motors. Such introductions of non-natives can do great harm to natural aquatic and terrestrial ecosystems in the Bay-Delta if they become

established and dominate these ecosystems. More rigorous inspection of vehicles at the borders could help reduce the number of such introductions. A CALFED core action could be to fund additional staffing and more rigorous vehicle inspections at California border stations.

CORE LEVEL OF IMPLEMENTATION: The core level of implementation would be to make cost-effective improvements in inspection practices at the borders by increased staffing to more intensively apply current regulatory practices.

CORE ACTION: Establish a Rapid Response Program for Introduced Species

Establishment and spread of invasive aquatic and terrestrial introduced species may be prevented if a program exists to rapidly respond to such a threat. Such a program could consist of a joint effort by state and federal resource agencies to coordinate monitoring for early detection of new introductions and to rapidly eradicate any detected populations before they have an opportunity to spread. A CALFED core action could consist of promoting, coordinating, and funding the establishment of such a rapid-response program.

CORE LEVEL OF IMPLEMENTATION: The core level of implementation would be to provide the funding needed to establish such a rapid-response program.

UPSTREAM HABITAT RESTORATION

CORE ACTION: Improve Flows and Temperatures in Upstream Habitats

The upper reaches of the Sacramento and San Joaquin Rivers and their tributaries are important spawning and nursery areas for salmon and steelhead. In many of these reaches, flows are determined by storage reservoirs and irrigation or hydropower diversions. In some locations, controlled flows below reservoirs can lead to high water temperatures downstream in summer or fall that threaten survival of eggs, fry, or even adult salmon. This core action would attempt to alleviate the most severe problems in the basin on a priority basis. The top priority action site is the upper Sacramento River below Keswick Dam, where water temperatures in summer can be sufficiently high (above 56°F) to jeopardize survival of eggs of winter-run salmon. CVPIA provision 3406(b)(6) allocates funds for the Shasta Dam temperature control device. Twenty-five percent of the costs associated with the planning and construction of the temperature control device at Shasta Dam is to be shared by the State of California. Other potential actions include installing a temperature control device on Whiskeytown Dam, management of return flows from the Colusa Drain and Sutter Slough to help reduce water temperatures in the Sacramento River during the fall outmigration of winter-run salmon, and modification of Central Valley Project operations as needed to help control water temperature in the upper Sacramento River.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be funding the 25% cost to the state for the Shasta Dam temperature control device, evaluating the need for a similar

device at Whiskeytown Dam, releasing sufficient storage from Whiskeytown and Shasta to maintain adequate temperatures in the upper Sacramento River without significantly affecting water supply, and a temperature management control plan for return flows from the Colusa Drain and Sutter Slough.

CORE ACTION: Maintain Adequate Spawning Substrates

The upper reaches of the Sacramento and San Joaquin Rivers and their tributaries are important spawning and nursery areas for salmon and steelhead. Some of these areas lack sufficient spawning substrates to support natural or target levels of salmon and steelhead production. Spawning substrates are depleted below reservoirs by channel scour, armoring of channels, sediment accretion, or dam blockage of gravel input. Natural flooding may also rob river channels of sufficient gravels for spawning salmon and steelhead. Poor watershed management may also lead to loss of quality spawning gravel habitat. This core action would expand gravel restoration programs to include watersheds that are demonstrated to have severe gravel deficits in spawning habitat. Emphasis would be on maintaining and enhancing gravel recruitment to major spawning areas in the rivers and tributaries. CVPIA provision 3406(b)(13) provides funds for restoring and replenishing spawning gravels. State funds are required on a cost-sharing basis to support these actions.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation as a CALFED core action might be to provide the state-share of funding for the CVPIA provision to restore spawning substrates in the upper Sacramento River, Clear Creek, Butte Creek, and the Yuba, Mokelumne, Stanislaus, Tuolumne, and Merced Rivers.

CORE ACTION: Encourage Gravel-Mining Practices to Protect Fish Habitat

Gravel-mining practices in some tributaries of the Sacramento and San Joaquin Rivers have led to loss of gravel recruitment or modified instream habitats to the advantage of predators on anadromous fish. Gravel-mining practices could be modified to alleviate these problems. For example, mining activities could be isolated from river channels, or gravel extraction could be discouraged in important fish habitat areas. This core action would consist of providing encouragement through cooperative partnerships with landowners and gravel-mine operators to implement such measures to protect important fish habitats.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to fund cooperative partnerships with willing landowners to implement gravel-extraction practices to protect important spawning and migratory areas on a priority basis.

CORE ACTION: Modify Fish Passage at Upstream Dams or Through Other Barriers

Diversion dams and other artificial barriers on the Sacramento and San Joaquin Rivers and their tributaries are obstacles to upstream and downstream passage of salmon and steelhead young

and adults. Some of these barriers allow passage but offer predators highly effective feeding stations for preying on young salmon and steelhead. Other barriers block upstream passage or hinder downstream passage of fry and smolts. This core action would focus on modifying or removing those barriers that are deemed most detrimental to restoring anadromous fish runs in the basin. Fish passage problems could be identified and corrected. Diversion dams could be removed or fish ladders could be installed or improved. Barriers that have been identified to significantly hinder fish migration could be removed or adequate fish passage facilities installed (e.g., removal of Clough Dam on Mill Creek, repair of fish ladders on Big Chico Creek). Matching funds could be provided under CVPIA provisions 3406(b)(10) and (17) for the Red Bluff Diversion Dam and Anderson-Cottonwood Irrigation District diversion dam (ACID), respectively.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be for CALFED to provide the state cost-share funds to implement the CVPIA provisions to develop and implement permanent measures to minimize fish passage problems at the Red Bluff Diversion Dam, ACID diversion dam, and Keswick Dam on the Sacramento River.

CORE ACTION: Modify Natural Barriers to Improve Fish Passage

Some natural barriers in tributaries of the Sacramento and San Joaquin Rivers are obstacles to salmon and steelhead attempting to reach upstream natural spawning and rearing habits. Removal of these natural barriers would allow expansion of anadromous fish spawning and rearing habitat and perhaps thereby increase the natural production of salmon and steelhead. This core action would focus on modifying those natural barriers in the basin where they are most detrimental or restrictive to anadromous fish passage.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to improve anadromous fish passage and migration at Eagle Canyon on Battle Creek.

CORE ACTION: Encourage Appropriate Livestock Management in Riparian Habitats

Upstream riparian areas provide important fish and wildlife habitats. Particularly, overhanging vegetation can lower water temperatures and provide shaded areas for fish protection. Intensive cattle grazing can result in the loss of riparian vegetation from physical damage to plants and soil disturbance when the cattle access the rivers and streams. This soil disturbance leads to higher erosion rates and poor plant establishment. Managing cattle to prevent degradation of important riparian areas can significantly improve aquatic habitat conditions. For example, cattle can be given access to rivers and creeks through nonriparian corridors.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to undertake cooperative partnerships with landowners to protect higher quality sites, such as extensive riparian habitat that provides good shading and overhanging vegetation, from grazing activities to allow the maintenance of important riparian vegetation. As a CALFED core action, this effort would seek to extend and expand similar existing efforts by other resource management agencies.

CORE ACTION: Revegetate Degraded Riparian Habitats

Riparian areas that have been degraded could be enhanced and potentially expanded through revegetation activities. Sites that would be revegetated would be ones that can contribute to a larger riparian area such as improving large degraded habitats where previous disturbance has reduced vegetation cover. Activities could include modifying riprap to include vegetation, acquiring land and conservation easements, and planting riparian vegetation at selected sites. Such areas include the Sacramento River corridor and its tributaries; and the San Joaquin River corridor and its three major tributaries: the Merced, Stanislaus, and Tuolumne Rivers; and Delta tributaries such as the Mokelumne River.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to address the sites identified as highest priority in various state and federal plans calling for riparian habitat restoration. At a core level, this action would be implemented through cooperative partnerships with willing landowners to develop and implement revegetation plans.

CORE ACTION: Encourage Wildlife-Friendly Agricultural Practices (see description above)

CORE ACTION: Preserve Agricultural Land Uses Providing Habitat (see description above)

REDUCTION IN THE EFFECTS OF DIVERSIONS

CORE ACTION: Use Real-Time Monitoring and Adaptive Management

Real-time monitoring and adaptive management are presently being used on a trial and experimental basis to reduce losses of fish to south-Delta pumping plants. Real-time monitoring focuses on the distribution patterns of important anadromous and resident fish relative to their vulnerability of being drawn into the south Delta to the export pumps. Adaptive management refers to the process under which CALFED agencies adjust the operations of the State Water Project and CVP to minimize effects on key fish based on the available real-time monitoring information.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to continue the present program at an expanded level to ensure a greater number of species and habitat conditions are monitored and protected as best possible through project operation adjustments.

CORE ACTION: Install Screens on Unscreened In-Delta Diversions

Approximately 1,800 small, siphon and pump diversions are unscreened in the Delta that, combined, divert up to 3,000 cubic feet per second (cfs) of Delta water during the irrigation season. These diversions take as many or more small fish than the state and federal pumping plants. This core action would consist of installing screening on currently unscreened diversions in the Delta (other

than the Banks and Tracy pumping plants) to reduce losses at these diversions. Emphasis would be on the larger siphons and pumps in Suisun Marsh, Montezuma Slough, the western Delta, the lower Sacramento River, Cache Slough, and the lower San Joaquin River.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to screen those diversions believed to have the highest potential loss of fish, as determined by location, season of diversion, and volume diverted. The State of California should cost share (50%) with the federal government for CVPIA provisions 3406(b)(5) to screen the Contra Costa Canal intake and 3406(b)(21) to screen other unscreened Delta diversions. This core action would be implemented through cooperative partnerships with the owners of the diversions where screens would be installed.

CORE ACTION: Install or Upgrade Screens on Upstream Diversions

Hundreds of small-size (<10 cfs) and moderate-size (10-50 cfs) diversions in the Sacramento and San Joaquin Rivers and tributaries are unscreened, contributing substantially to the loss of salmon and steelhead fry and smolts in the basin. Screens exist or are planned at a small number of larger diversions in the basin. Existing screens at some diversions are ineffective at protecting fish and require upgrading. For example, existing screening problems at the Glenn-Colusa Irrigation District diversion facility near Colusa on the Sacramento River are being addressed by implementing an ongoing mitigation program. Screens should be installed at all moderate-size and larger diversions on the upper Sacramento River and Battle Creek.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to screen those diversions believed to have the highest potential loss of young salmon and steelhead, as determined by location, season of diversion, and volume diverted. Core-level implementation could include state contribution to the CVPIA cost-sharing program on a 25%-share basis. Screening needs at small diversions in the rivers and tributaries should be determined, and screens should be installed at high-priority diversions. This core action would be implemented through cooperative partnerships with the owners of the diversions where screens would be installed.

CORE ACTION: Evaluate and Implement Effective Acoustic Barriers to Anadromous Fish Movement

Salmon and other anadromous fish are sometimes diverted into the Delta by way of Georgiana Slough from their normal downstream route along the Sacramento River to the Pacific. For three years, an experimental acoustic barrier has been operated at the mouth of Georgiana Slough. Studies are continuing to evaluate its effectiveness on salmon outmigrants and its effects on non-target fish. If effective, such an acoustic barrier may reduce the numbers of salmon that are diverted into the Delta and potentially lost at the south Delta pumping plants. A CALFED core action might be to complete these evaluations and, if feasibility and effectiveness are demonstrated, to provide ongoing funding for its operation and operation of other acoustic barriers. The core action could also include investigating other experimental technologies that could function as barriers to anadromous fish movement.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to provide the funding to complete the evaluation of the Georgiana Slough acoustic barrier and to continue operation of the barrier, if effective, at least during the primary salmon and steelhead outmigration period.

CORE ACTION: Operate Fish Barrier on San Joaquin River at Merced River In Fall

Salmon and steelhead adults returning to the major San Joaquin River tributaries including the Merced, Tuolumne, and Stanislaus Rivers sometimes stray upstream of the Merced River into the upper San Joaquin River below Friant Dam where their chances of successful spawning is minimal. This CALFED core action would provide ongoing funding and support for placing a barrier in the San Joaquin River, just upstream of the mouth of the Merced River, to block such movement into the upper San Joaquin River below Friant Dam.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to provide the funding needed for ongoing installation and operation of this barrier on the San Joaquin River.

MANAGEMENT OF ANADROMOUS FISH

CORE ACTION: Modify Hatchery Operations to Reduce Effects on Wild Populations

Hatchery operations may adversely affect wild populations of salmon by diluting the genetic pool of native runs, stimulating commercial and sport fisheries and thus the harvest rate of wild fish, and by increasing competition and predation on wild fish by the release of tens of millions of hatchery fish into the rivers and estuary of the basin. Increased predation can occur from direct predation on wild fish from hatchery smolts or from unnaturally large populations of predator fish, such as striped bass and squawfish, whose numbers are larger because of the abundance of hatchery fish. Data received through recapture of tagged or marked hatchery salmon and steelhead and other hatchery fish released into the Bay-Delta system can be used to evaluate the contribution of these fish to the populations, provide insight into fish life history patterns (through tag return information), and allow selective fisheries on the hatchery fish. A CALFED core action could consist of specific activities, such as adjusting stocking numbers, schedules, and release points, to reduce effects of hatchery fish on wild populations. Such a core action also could include ongoing support for implementing and expanding tagging of hatchery fish to provide needed information to make such improvements.

CORE LEVEL OF IMPLEMENTATION: The core level of implementation of this core action would consist of CALFED efforts to promote and fund activities such as annually tagging a sufficient fraction of the hatchery production that is stocked to provide a reliable estimate of its contribution to the overall population and to provide other life-history information needed to better manage effects on wild populations.

CORE ACTION: Improve Data Collection and Analysis Needed to Regulate Commercial Take

Though commercial fisheries are well-regulated by the Pacific Fisheries Management Council, some improvements are possible, especially if more and better information is available. This core action would consist of developing and evaluating more information on wild stocks of Sacramento-San Joaquin salmon. This information could then be used to determine adjustments to selected fishery regulations to maximize protection of wild stocks. Coded wire tagging of juvenile wild fish or hatchery reared "wild" fish can help determine areas and seasons where wild stocks are vulnerable. Tagging hatchery races of salmon also provides valuable information for managing the fisheries.

CORE LEVEL OF IMPLEMENTATION: At a core level of implementation, this core action would support a reasonable effort to provide the information needed to improve commercial harvest management of wild and hatchery stocks. For example, CALFED could coordinate and fund a pilot program to work with the Pacific Fisheries Management Council to jointly develop a cost-effective program for improving regulation of commercial take.

REDUCTION IN EXPORT RELIANCE

CORE ACTION: Establish Incentives for Use of Agricultural Water Conservation Practices

Substantial opportunity may exist to reduce agricultural use of water by implementing conservation practices more widely, both on individual farming operations and on district-wide bases. For example, broader application of the agricultural Efficient Water Management Practices (EWMPs) might contribute to resolving conflicts between supplies and demands for Delta export water. As a core action, CALFED might promote, coordinate, and fund incentives to encourage greater application of EWMPs in agricultural use of Delta water. CALFED could also support further use of the California Irrigation Management Information System (CIMIS). Financial incentives could consist of cost-sharing in preparing EWMP plans or loan programs for conservation improvements. CALFED could work with agricultural water districts to evaluate and determine changes to pricing structures that would encourage use of EWMPs.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation for this core action might be to provide incentives, loans, or cost-sharing for voluntary implementation of EWMPs. Core-level implementation could also include providing adequate funding to ensure availability of water management services to all water users. Examples of these services include mobile irrigation laboratories and real-time evapotranspiration data.

CORE ACTION: Increase Incentives for Use of Municipal and Industrial Conservation Practices

Substantial opportunity also continues to exist to reduce municipal and industrial (M&I) use of water by more widely implementing conservation practices. Although conservation Best Management Practices (BMPs) have been agreed on by most urban water agencies, compliance with

the BMPs could be improved. CALFED might promote, coordinate, and fund increased incentives for urban water districts to implement BMPs. Low-interest loan programs and cost-sharing for cost-effective conservation improvements might be encompassed by this core action. CALFED could work with urban water districts to evaluate, promote, and determine changes to pricing structures that would further encourage use of BMPs.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation for this core action might be to provide low-interest loans to urban water suppliers that cannot afford to implement BMPs. Core-level implementation could also include providing adequate funding to ensure availability of technical support. Examples of support include training for water auditors and loan of leak-detection equipment.

CORE ACTION: Educate Small Agencies about Conservation and Reclamation Feasibility

Most large water agencies implement ongoing and sophisticated programs to promote cost-effective water conservation and reclamation practices. Some opportunity may exist to further educate smaller and more traditional water districts about potential opportunities to conserve and reclaim water in cost-effective ways. A CALFED core action could consist of promoting and funding educational outreach programs to water districts that have not yet seriously considered implementing modern conservation and reclamation technologies.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation for this core action might be to provide technical and planning support to smaller water suppliers in the Delta watershed and export areas.

WATER SUPPLY ENHANCEMENT

CORE ACTION: Establish Incentives for Conjunctive Use

Substantial opportunities exist to more reliably manage water supplies in the Bay-Delta system by increasing implementation of conjunctive-use programs among surface and groundwater users. Broader implementation of conjunctive use could be encouraged by a CALFED core action to establish incentives for conjunctive use. Financial incentives could include cost-sharing for studies of conjunctive-use feasibility and low-interest-loan programs to fund capital improvements to facilitate conjunctive-use operations.

CORE LEVEL OF IMPLEMENTATION: The core level of implementation for this core action might be the level of CALFED funding that could be predicted to produce a 10% reduction in water supply deficiencies for target water districts during drought periods.

CORE ACTION: Ease Institutional Barriers to Encourage Conjunctive Use

Implementation of conjunctive-use programs may be limited by certain institutional barriers to such programs. For example, limited information may exist about the characteristics and capacities of groundwater basins that govern their cost effectiveness and feasibility as components of conjunctive-use programs. Hydrological linkages between surface water features and underlying groundwater basins must be known to appropriately understand the contributions possible from conjunctive-use programs. Also, potential participants in a conjunctive-use program may perceive a lack of legal protection or other unfavorable institutional circumstances that need to be addressed to further implementation of such programs. A CALFED core action could consist of promoting and coordinating efforts to ease these institutional barriers.

CORE LEVEL OF IMPLEMENTATION: At a core level, this action would be implemented to ease those obstacles, where judged to be most feasible and in most need of modification, to increase the contribution of conjunctive-use programs to water supply predictability.

INCREASING WATER SUPPLY PREDICTABILITY

CORE ACTION: Ease Institutional Obstacles to Facilitate Water Transfers

Completing a water transfer is a complicated transaction and certain institutional obstacles could be eased to facilitate water transfers to contribute to water supply predictability. Only holders of pre-1914 rights may transfer water without seeking approval from the State Water Resources Control Board. Whether the water right is appropriative or riparian, or if the water is obtained pursuant to a water supply contract, also affects whether the water is transferable and what must be done to transfer it. Different sections of the California Water Code are applicable according to which type of water transfer is being considered. In 1992, as a result of changes to the law designed to facilitate the State Drought Water Bank in 1991, the Governor stated that certain criteria must be met in developing a fair and effective water transfer policy. The CVPIA also contains provisions intended to increase the use of water transfers.

CORE LEVEL OF IMPLEMENTATION: At a core level, CALFED would attempt to promote and coordinate easing those obstacles where modification is judged to be most feasible and the highest priority in achieving a substantial increase in the contribution of water transfers to water supply predictability. Modifications would emphasize cooperative partnerships between sellers and buyers.

CORE ACTION: Improve Procedures for Water-Transfer Permitting

Permitting of water transfers requires compliance with numerous requirements, depending on the type of transfer and the source and destination of the transferred water. These requirements may include compliance with the California Environmental Quality Act, and with rules of the state and federal water projects, the State Water Resources Control Board, state and federal resource agencies,

and local agencies. Both the Bureau of Reclamation and Department of Water Resources have prepared guidebooks to assist permitting of water transfers. Additional improvements are possible (e.g., consolidating anticipated transfers as they are considered for permitting to effectively address cumulative impacts). Also, providing for better understanding of the hydrological linkages between groundwater and surface water could facilitate permitting of transfers.

CORE LEVEL OF IMPLEMENTATION: At a core level of implementation, CALFED could promote and coordinate the implementation of those procedural improvements for permitting that would achieve the most cost-effective increases in the contribution of water transfers to water supply predictability.

CORE ACTION: Coordinate Diversion and Conveyance of Water Transfers

Water transfers often require diversion and conveyance of transferred water through state and/or federal water project facilities as well as facilities of local water management agencies. The physical diversion and conveyance of the transferred water could be improved through better coordination among the operators of these facilities to better use physical capacities, when available, of the facilities. For example, a central coordination point could be established to arrange the use of unused capacity and to coordinate the movement of transferred water through the various facilities. A CALFED core action might be to promote, develop, and fund the establishment of procedures to coordinate diversion and conveyance operations for water transfers. Such a core action also could include the development of criteria to guide the use of the existing Delta export pumps as a joint point of diversion for the SWP and CVP.

CORE LEVEL OF IMPLEMENTATION: At a core level, CALFED would undertake activities to achieve more efficient coordination to better use existing physical capacities in moving transferred water to achieve the highest priority and most cost-effective increases in the contribution of water transfers to water supply predictability. For example, the highest priority coordination would most likely be between the operators of the state water projects and those of federal water projects.

CORE ACTION: Establish a Water-Transfer Brokering Mechanism or Institution

The existing State Drought Water Bank, for which the California Department of Water Resources serves as the transaction principal, applies only in drought situations and to State Water Project contractors. A brokerage mechanism or clearinghouse could be set up to function permanently and to be available to link or broker transactions between all potential sellers and buyers of water. Legislation continues to be introduced with the hope of removing impediments to such transfers by establishing mechanisms for market-based water transfers. A CALFED core action might be to promote and coordinate establishment of such mechanisms.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation for this core action would focus on the most feasible mechanisms for brokerage of water transfers.

CORE ACTION: Manage Water Resources Data and Information for the Bay-Delta System

Water resources data and information management consists of assembling, compiling, and interpreting accurate and appropriate data to support management decisions for Bay-Delta water resources and aquatic habitats. Data are needed on meteorologic and hydrologic conditions, reservoir operations, diversions and exports, water use rates and patterns, and groundwater levels and pumping. Data for appropriate resource management are also needed on water quality, habitat conditions, and movements and populations of organisms that depend on specific hydrologic conditions. A CALFED core action might be to promote, coordinate, and fund the development and establishment of ongoing procedures and protocols for integrated water resource data management. The CVPIA includes provisions to develop a comprehensive assessment monitoring program for fish resources and ecological and hydrological models and data for system operations. A CALFED core action could consist of funding the state's share of the cost for these activities.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be to fund the state's 25% share of costs for the CVPIA activities to develop and establish water resources data and models for water system management.

CORE ACTION: Encourage Long-Term Drought Contingency Planning

Contingency planning for future long-term droughts consists of developing plans to accommodate future water shortages. Such planning may encompass activities to temporarily or permanently reduce demands for water and activities to develop emergency supplies of water. Contingency plans can be developed to accommodate various durations and intensities of drought. A CALFED core action could consist of promoting and funding the development of such plans by local water management agencies, and by developing such plans at the state and federal level.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation might be for CALFED to fund long-term drought contingency planning through cooperative partnerships with local water districts whose water supply reliability could substantially benefit from such planning.

MANAGEMENT OF WATER QUALITY

CORE ACTION: Establish Incentives for Retirement of Lands with Drainage Problems

Some marginally productive agricultural lands in California produce drainage water that causes substantial degradation of downstream aquatic habitats. This problem is most prevalent in some portions of western San Joaquin Valley where a shallow clay layer prevents applied water from percolating into the aquifer. Water drained from these soils often contains nutrients, sediments, and pollutants, such as pesticides, that can adversely affect beneficial uses of the Bay-Delta system. Under this core action, CALFED would establish a program to retire, by compensated purchase, marginally-productive (and voluntarily retired by landowners) agricultural lands that have drainage

problems. Removing these lands from production would reduce pollutant discharges into waterways and reduce demands for irrigation water.

CORE LEVEL OF IMPLEMENTATION: As a core action, CALFED would implement this action through cooperative partnerships with willing landowners to assist them to retire those lands having the most severe drainage problems and those that could be retired in the most cost-effective manner.

CORE ACTION: Provide Incentives for Pollution Source Control on Agricultural Lands

Drainage discharges from agricultural lands may contain pollutants, such as salts and pesticide residues, that degrade water quality for beneficial uses in the Bay-Delta system. For example, naturally occurring salts in marine soil sediments on the west side of the San Joaquin Valley are transported in drainage water to the San Joaquin River. Changes to agricultural practices can be used to control pollutants at their sources and thereby protect instream water quality. A CALFED core action might be to provide financial incentives to encourage growers to use practices such as delaying timing of drainage discharges, modifying field drainage systems to reduce drainage volumes, managing irrigation tailwater to reduce pesticide residues, and adopting BMPs to reduce rainfall-induced discharge of pesticides to watercourses.

CORE LEVEL OF IMPLEMENTATION: As a core action, CALFED would implement this action through cooperative partnerships with willing landowners to assist them in adopting and implementing pollution source control measures on a voluntary basis. As a CALFED action, this effort would serve to expand and extend similar programs already being implemented by other agencies.

CORE ACTION: Manage Riparian Zones to Protect Water Quality

Riparian habitat within the Bay-Delta and tributary watersheds plays an important role in protecting water quality for all beneficial uses in the basin. Riparian vegetation filters runoff and reduces siltation of streambeds and reservoirs. Riparian vegetation also protects shorelines from erosion, helping to minimize stream sedimentation. Riparian trees shade shallow, nearshore waters, reducing the occurrence of high water temperatures. Opportunities may exist to improve water quality in the Delta watershed by promoting and implementing better management of riparian zones. For this core action, CALFED could promote, coordinate, and fund a program to identify high-priority sites and implement management improvements at those sites through cooperative partnerships with landowners.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation would consist of funding a cooperative program for willing landowners to improve riparian zone management, perhaps on a cost-sharing basis, in watershed areas tributary to reservoirs operated by local water districts that participate in the CALFED Bay-Delta Program.

CORE ACTION: Manage Land Uses to Protect Water Quality

Various forms of land use in the Bay-Delta watershed contribute to reduced water quality within the basin. Timber harvesting and road building in mountain watersheds can produce substantial siltation in downstream areas if not managed carefully. Grazing along streambanks can lead to shoreline erosion, loss of riparian vegetation, and associated increases in water temperatures. Agricultural practices can increase water temperatures and introduce pollutants directly into water bodies. Better management of watershed land uses can improve water quality in the Delta watershed. For this core action, CALFED could promote, coordinate, and/or fund a program to identify high-priority watershed areas and implement management improvements in those areas.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation would consist of funding a cooperative program for willing landowners to improve land use practices on watershed areas tributary to reservoirs operated by local water districts that participate in the CALFED Bay-Delta Program. Core-level implementation could also include development and dissemination of land management information for landowners.

IMPROVEMENTS TO SYSTEM RELIABILITY

CORE ACTION: Monitor, Evaluate, Maintain, and Stabilize Existing Levees

Many levees that protect land uses, infrastructure, and habitat in the Delta are inadequately maintained and stabilized against failures caused by overtopping, slippage, or collapse. Furthermore, information is lacking on the condition of most levees in the Delta and where maintenance is needed. It is widely accepted that efforts to maintain and stabilize these existing levees are necessary in the near term. Maintenance standards may differ among different types of levees and different facilities or land uses that are protected by the levees. Entities to perform or fund levee monitoring and evaluations and the actual maintenance and stabilization work could include local reclamation districts, the Department of Water Resources, the U.S. Army Corps of Engineers, and other agencies. Funding of such work, even though widely accepted as necessary, is uncertain as to source and amount. Thus a CALFED core action could be to promote and fund such work.

CORE LEVEL OF IMPLEMENTATION: At a core level, this action would be undertaken to determine and correct conditions on the sites with highest priority. High-priority sites would include those that are important in protecting residential or commercial developments (e.g., north and east Delta), infrastructure facilities (e.g., highways, pipelines, railroads), and water quality at Delta export locations (e.g., west Delta islands).

CORE ACTION: Modify Agricultural Practices to Reduce Subsidence

Soil tilling for intensive agricultural cropping causes peat oxidation and thereby Delta island subsidence where peat soils are predominant. Subsidence adjacent to levees is particularly threatening

to levee stability. Ceasing agricultural practices and establishing wetland hydrologic conditions in peat-soil areas would reduce peat oxidation and resulting subsidence. Subsidence reduction could be achieved by providing incentives for voluntary participation by farmers in halting agriculture on peat soils or purchasing conservation easements that eliminate cropping practices. Such a subsidence reduction program would also benefit Delta water quality by reducing discharge of dissolved organic carbon (DOC) in drainage from oxidized peat soils. Such a program would also increase the extent of wetland habitats in areas where subsidence is controlled.

CORE LEVEL OF IMPLEMENTATION: At a core level, this action could be applied to a zone, 25-50 yards wide for example, along the interior toes of levees on islands dominated by peat soils. This zone immediately adjacent to the levee toes is most critical for halting subsidence that threatens levee stability. The core level of implementation would focus on cooperative partnerships with landowners to voluntarily cease agricultural practices on peat soils near levee toes.

CORE ACTION: Investigate Techniques for Beneficial Reuse of Dredged Materials

Dredged materials excavated in maintaining channels for navigation and flood conveyance could provide a valuable resource for maintaining and improving levees and for reclaiming wetland habitats on subsided Delta islands. Uncertainty exists, however, about the suitability of such materials for these kinds of beneficial reuse. For example, channel sediments are suspected of containing toxic pollutants; these sediments need to be monitored and evaluated for reuse. Dredged materials also may not be of suitable texture and consistency for levee maintenance or to support desirable plant growth. A CALFED core action could consist of conducting a pilot program to examine and evaluate techniques for using dredged material in ways that are feasible and do not cause adverse impacts to water quality and ecosystem health.

CORE LEVEL OF IMPLEMENTATION: A core level of implementation could consist of CALFED coordinating and funding a pilot program to evaluate techniques for beneficial reuse of dredged materials.

CORE ACTION: Establish an Emergency Levee Management Plan

Currently, funding and clear authority does not exist regarding the roles and responsibilities of various federal, state, and local agencies in responding to levee failures. Agency responses could consist of immediate actions at the time of the emergency to block or control a levee break and longer term actions to recover or rehabilitate a flooded island. Agencies with possible roles in responding to emergencies could include the U.S. Army Corps of Engineers, Federal Emergency Management Agency, Department of Water Resources, and local reclamation districts. An emergency management plan would provide funding and clearly identify the responsibilities of each of these and other agencies in responding to levee failures, both immediately and for longer term recovery.

CORE LEVEL OF IMPLEMENTATION: At a core level, an emergency levee management plan would be established for the islands in the Delta with highest priority (e.g., those where lives or improved property would be affected).

CORE ACTION: Provide Funding for Maintenance and Stabilization

Funding sources and amounts for maintaining Delta levees and channel flood-conveyance capacities at the current level of flood protection in the Delta are uncertain. It is likely that providing a core level of funding for such work could receive broad support in all CALFED program alternatives. A number of different mechanisms are available to generate such funding if CALFED decides to implement such an action.

CORE LEVEL OF IMPLEMENTATION: At a core level, the funding made available would be sufficient for levee maintenance and stabilization to maintain the current level of flood protection on the sites with highest priority (see core action above "Maintain and Stabilize Existing Levees").