

## Alternative SV-1

## Minimum Protection Level of Delta Islands and System Functions

Formulation of this alternative began with preliminary alternative WS-1, Demand Reduction. The preliminary assessment of WS-1 suggests the following weaknesses:

1. Slightly greater than minimum ecosystem quality improvements are achieved;
2. Only minimum improvements in water quality are achieved; and
3. Only minimum decreases in system vulnerability are achieved.

Preliminary alternative WQ-128; Managing Discharges, Restoring Existing and Creating New Habitat; addresses these points as follows:

1. Habitat restoration actions significantly improve ecosystem quality;
2. Wastewater reclamation and treatment significantly improve water quality; and
3. Levee upgrades reduce the risk of catastrophic failure of Delta facilities;

In addition, the action to modify reservoir operations was added to utilize potentially available storage space for flood control benefits.

Combining WS-1 and WQ-128 results in the following alternative SV-1, Minimum Protection Level of Delta Islands and System Functions, which promotes a minimum level of protection necessary to protect Delta functions (including land use, Delta water quality and supply, export water quality and supply, and ecosystem functions) from catastrophic failure.

## Alternative SV-1

*Group*

**Land Use/Flood Control/Habitat**

*Title*

**Minimum Protection Level of Delta Islands  
and System Functions**

The vulnerability of Delta functions (including land use, Delta water quality and supply, export water quality and supply, and Delta ecosystem functions) to catastrophic failure is reduced by providing a minimum level of flood protection for all Delta islands. The alternative integrates the linkage between flood control and Delta functions such as Delta water supply and habitat protection. This alternative also advances opportunities for protection and enhancement of habitat elements that have been modified and are currently insufficient as well as reducing reliance upon the Delta as a source of export water supply.

Improving levee maintenance and stabilization for all Delta levees (such as Project and Non-Project) in the Delta to provide a minimum level of flood protection such as the hazard mitigation plan (HMP) standard or the National Flood Insurance Program (NFIP) adopted standard for all Delta islands will reduce the vulnerability of Delta functions to catastrophic failure. These efforts reduce the vulnerability of islands with critical infrastructure such as Brannan-Andrus, Bontly and Sherman and the vulnerability of islands with valuable existing habitat such as Lodi. Flood protection and seismic improvements of the levees around the critical western islands such as Sherman and Jersey increases protection of those islands as well as protecting Delta and export water supplies from salinity intrusion due to island failure. Actions to control subsidence adjacent to the island levees could include modifying agricultural practices adjacent to levees or creating landside habitat. In addition, an emergency levee management plan to reclaim Delta islands in the event of inundation is necessary to continue protection of Delta functions as an integrated resource. Land retirement and fallowing could provide habitat restoration and contribute to improved water quality. Delta water quality is also improved through agricultural, industrial, and municipal wastewater reclamation and reuse. Conservation and land retirement and fallowing are used to reduce demand and combine with wastewater reclamation and water transfers to match current needs with available capacity.

### **Key Actions**

***Levee and Channel Improvements*** - Core actions to improve system reliability such as channel improvements and levee maintenance and stabilization, modifying agricultural practices to reduce subsidence, provide funding for maintenance and stabilization, and reconstruct levees around infrastructure are implemented at higher levels than minimum core level to reduce the risk of the Bay-Delta system, including water supply, water quality, ecosystem quality, and existing land uses/infrastructure. Improve levee maintenance and stabilization of all Delta levees (such as Project and Non-Project) and channels in the Delta to provide at least the NFIP adopted standard or hazard mitigation

standard for all Delta islands. Levee improvements would focus on levee dimensions (including height above the flood water surface) and creating stabilizing berms. These berms would be constructed on the landside or waterside. Waterside berms would only be constructed to enhance aquatic habitat and if they do not interfere with conveyance of adjacent channels. Actions to control subsidence adjacent to the levees could include modifying agricultural practices adjacent to levees or creating landside habitat. Channel maintenance would improve conveyance of flood flows through the Delta and could include efforts to restore aquatic habitats in combination with waterside berms where current habitat is inadequate. Improve flood protection and seismic resistance of levees around the critical western Delta islands such as Sherman, Jersey, and Stafford to protect the Delta water quality from salinity intrusion and associated beneficial uses from catastrophic failure. An emergency levee management plan would provide necessary funding and direction to reclaim Delta islands in the event of inundation. Continue protection of Delta functions as an integrated resource system.

**Conservation** - Core actions such as conservation and water pricing are implemented at higher levels than minimum core level reduce water demand and reduce reliance on the Delta as a source of export water supply. Implement residential, industrial, and agricultural demand reduction in and upstream of the Delta to increase annual and dry year inflow to the Delta. Implement equal measures in the export areas to reduce reliance on the Delta as a source of export water supply for M&I and agricultural uses.

**Reclamation** - Core actions such as reclamation and most-effective management of urban, and industrial discharges and runoff are implemented at higher levels than minimum core level to improve Delta water quality. Support efforts to implement municipal wastewater and agricultural drainage reclamation and reuse to reduce current discharges into the Delta. Development of alternative sources of water supply for export areas will reduce reliance on the Delta as a source of export water supply for current M&I and agricultural needs.

**Habitat Restoration** - Core actions to improve and protect existing aquatic, riparian, and wetland habitats in the Bay-Delta and upstream are implemented at higher levels than minimum core level. Restore riverine, riparian, wetland, and adjacent terrestrial habitat, and expand wetland habitat, channels, and meander belts in the Bay-Delta and upstream in rivers and tributaries to restore fish spawning, rearing, and feeding habitats and improve fish survival. Restoration involving setback levees, channel improvements, and shaded riverine habitats focused on high priority sites (e.g. to form corridors of key habitat mosaics), and of high feasibility (e.g. along north Delta islands with relatively high interior surface elevations). Habitat restoration involving setback levees and levee reconstruction simultaneously reduces the vulnerability of adjacent land uses to catastrophic failure. Habitat restoration along the landside or waterside of existing levees could be combined with efforts to improve levee stability and mitigate for losses due to levee maintenance and stabilization actions.

**Flow Barriers** - Install flow barriers in the South Delta to support existing in-Delta

diversions.

## Supporting Actions

**Water Transfers** -- Core actions such as water transfers are implemented at higher levels than minimum to increase water supply predictability. Facilitate additional water marketing during dry and average year supplies to increase the efficient utilization of existing water supplies.

**Groundwater Banking and Conjunctive Use** -- Core actions such as groundwater banking and conjunctive use are implemented at higher levels than minimum core level to increase available water supplies. Increase support of efforts to provide increased opportunities for groundwater banking and conjunctive use during dry and average years.

**Land Retirement and Fallowing** -- Implement retirement of marginal agricultural lands and lands from willing sellers. Fallow enough land during drought periods to reduce current M & I deficiencies and agricultural deficiencies while maintaining ecosystem quality at acceptable levels. Land retirement and fallowing of lands adjacent to levees can control subsidence and is potentially a habitat restoration due to levee maintenance and stabilization actions. Land retirement and fallowing in the Delta can also reduce organic content of Delta water used for export purposes.

**Develop Export-Area Alternative Supplies** -- Develop alternative water supplies such as desalination and potable reuse for export areas to provide current dry year needs.

**Modify reservoir operations** -- Utilize reduced reliance on Delta export water needs to reduce carryover storage and increase flood control space.

## Preliminary Assessment

**Ecosystem Quality** -- This alternative would improve ecosystem quality through habitat restoration and flow management above current values. The selection of high priority and highly feasible sites may result in disjointed habitat throughout the Bay-Delta system.

**Water Supply** -- This alternative improves export water supply reliability by reducing reliance on the Delta as a source of water supply for current M&I and agricultural needs through demand reductions and development of alternative sources of supply. The quantity of reductions achieved through these measures may not be sufficient to meet future M&I and agricultural needs. Delta water supply reliability is also improved through channel improvements and levee maintenance and stabilization actions and in particular from salinity intrusion by protection of the critical western Delta islands.

**Water Quality** -- Water quality is improved through the key action of reclamation of agricultural, municipal, and industrial wastewater. Other water quality improvements are achieved by supporting and core actions including mine drainage remediation. Reliability of Delta water quality is also improved through channel improvements and levee maintenance and stabilization actions. Water quality concerns for beneficial use of in-Delta and export water supply due to salinity intrusion is addressed by improving flood protection and seismic resistance of levees on the critical western Delta islands such as Sherman, Jersey and Bradford.

**System Vulnerability** -- Channel improvements and levee maintenance and stabilization actions improve the reliability of the Delta from catastrophic inundation which protects existing and restored shallow water habitat, land use, infrastructure, water supply and water quality. These efforts reduce the vulnerability of islands with critical infrastructure such as Brannan-Andrus, Bethel, and Sherman and the vulnerability of islands with valuable existing habitat such as Bradford. Flood protection and seismic improvements of the levees around the critical western islands such as Sherman and Jersey increases protection of those islands as well as protecting in-Delta and export water supplies from salinity intrusion due to island failure. Continuous protection of Delta functions as an integrated resource system is accomplished by an emergency levee management plan to provide necessary funding and direction to reclaim Delta islands in the event of inundation. These actions could be accomplished through expansion and continuation of existing programs such as the Delta Flood Protection Act of 1988 (SB 24) as well as sufficient funding of these efforts in the future. The minimum levee protection for Delta islands will require development and funding of an emergency levee management plan to reclaim Delta islands in the event of inundation.