Table 3.3-1. Conservation Strategy Goals and Objectives with Associated Conservation Measures

Goals and Objectives	Applicable Conservation Measures
Landscape-Scale Goals and Objectives	
Objective L1.3: Restore and protect at least 10,000 acres of tidal natural communities and transitional uplands to accommodate sea level rise, in Suisun Marsh Cache Slough, and West ern Delta.	Tidal Natural Communities Restoration
Objective L1.4: Include a variety of environmental gradients (e.g., hydrology, elevation, soils, slope, and aspect) within and across a diversity of protected and restored natural communities.	Tidal Natural Communities Restoration
Objective L1.5: In restored floodplains, provide a range of elevations that transition from frequently flooded (e.g., every 1 to 2 years) to infrequently flooded (e.g., every 10 years or more) areas to provide a range of habitat conditions, upland habitat values, and refugia from flooding during most flood events.	Seasonally Inundated Floodplain Restoration, Yolo Bypass Fishery Enhancement Plan Implementation, see Salmon Species Specific Objectives
Objective L1.7: To accommodate sea level rise, within the 10,000 acres of tidal restoration (Objective L1.3), include sufficient upland transitional areas adjacent to restored brackish and freshwater tidal emergent wetlands to permit the future upslope establishment of tidal emergent wetland communities.	Tidal Natural Communities Restoration
Objective L1.8: To accommodate sea level rise, provide potential tidal marsh plain within the anticipated future eastward position of the low-salinity zone of the estuary.	Tidal Natural Communities Restoration

Goals and Objectives	Applicable Conservation Measures
Goal L2: Ecological processes and conditions that sustain and reestablish natural communities and native species.	
Objective L2.4: Promote water quality conditions in the Delta that help restore native fish habitat.	Tidal Natural Communities Restoration Methylmercury Management as part of Tidal and Floodplain Restoration Stockton Deep Water Ship Channel Dissolved Oxygen Levels (existing requirement)
Objective L2.5: Maintain or increase the diversity of spawning, rearing, and migration conditions for native fish species in support of life-history diversity.	Water Facilities and Operation Yolo Bypass Fisheries Enhancement Tidal Natural Communities Restoration Seasonally Inundated Floodplain Restoration Channel Margin Enhancement (mitigation for CWF facilities effects)
Objective L2.7: Produce sinuous, high-density, dendritic networks of tidal channels through tidal areas to promote effective exchange throughout the marsh plain and provide foraging habitat for covered fish species.	Tidal Natural Communities Restoration
Objective L2.8: Provide refuge habitat for migrating and resident covered fish species.	Yolo Bypass Fisheries Enhancement Tidal Natural Communities Restoration Channel Margin Enhancement Localized Reduction of Predatory Fishes
Objective L2.9: Increase the abundance and productivity of plankton and invertebrate species that provide diversity of food for covered fish species in the Delta waterways.	Yolo Bypass Fisheries Enhancements Tidal Natural Communities Restoration Seasonally Inundated Floodplain Restoration Channel Margin Enhancement Invasive Aquatic Vegetation Control
Objective L2.12: Enhance XX miles of channel margin in the Sacramento River systems to provide habitat along important migratory routes for anadromous fish and improve wildlife movement.	Channel Margin Enhancement
Goal L3: Capacity for movement of native organisms and genetic exchange among populations necessary to sustain native fish and wildlife species in the Plan Area.	

Goals and Objectives	Applicable Conservation Measures
Objective L3.2: Promote connectivity between low-salinity zone habitats and upstream freshwater habitats and availability of spawning habitats for native pelagic fish species.	South and North Delta Water Facilities and Operation criteria Tidal Natural Communities Restoration
Objective L3.3: Provide flows that support the movement of larval and juvenile life stages of native fish species to downstream rearing habitats.	South and North Delta Water Facilities and Operation criteria
Objective L3.4: Provide flows that support the movement of adult life stages of native fish species to natal spawning habitats.	Water Facilities and Operation Yolo Bypass Fishery Enhancement Plan implementation
Goal L4: Reduced harm of covered species in the Project Area.	
Objective L4.2: Manage the distribution and abundance of nonnative predators in the Delta to reduce predation on covered fishes.	Channel Margin Enhancement Invasive Aquatic Vegetation Control Localized Reduction of Predatory Fishes
Objective L4.3: Manage the distribution of covered fish species to minimize movements into areas of high predation risk in the Delta.	Water Facilities and Operation (preferential north or south exports) Implement Yolo Bypass Fisheries Enhancement prior to NDD operations (required by existing NMFS BO) Nonphysical Fish Barriers (DCC, Georgiana Slough, others TBD) Localized Reduction of Predatory Fishes
Objective L4.4: Reduce entrainment, impingement, and salvage losses of covered fish species.	Project Facilities and Operation (south and North Delta) Screen or remove Non-project Diversions
Natural Community Goals and Objectives	
Tidal Perennial Aquatic	
Goal TPANC1: Tidal perennial aquatic natural community that supports habitats for covered and other native species and that supports aquatic foodweb processes.	
Objective TPANC1.1: restore or create at least 10,000 acres of tidal perennial aquatic natural community in Suisun Marsh, Cache Slough and West Delta for improved aquatic primary productivity and habitat for covered and other native species by 2025.	8,000 acres required by FWS BO, NMFS BO, and CESA authorizations. Additional 1000 acres called for in EcoRestore. XXXX required as mitigation for CWF facilities and Critical Habitat effects.
Goal TPANC2: Tidal perennial aquatic natural community that supports viable populations of native fish.	
Objective TPANC2.1: Control invasive aquatic vegetation that adversely affects native fish habitat.	
Tidal Mudflat	
No natural community goals and objectives specific to this natural community.	

Goals and Objectives	Applicable Conservation Measures
Species-Specific Goals and Objectives	
Delta Smelt	
Goal DTSM1: Increased end of year fecundity and improved survival of adult and juvenile delta smelt to support increased abundance and long-term population viability.	
Objective DTSM1.1: Increase fecundity of delta smelt over baseline conditions as measured through field investigations and laboratory studies conducted through year 10 and refined through adaptive management.	South and North Delta Water Facilities and Operation criteria Yolo Bypass Fisheries Enhancement Tidal Natural Communities Restoration Seasonally Inundated Floodplain Restoration Channel Margin Enhancement Invasive Aquatic Vegetation Control Localized Reduction of Predatory Fishes
Objective DTSM1.2: Limit entrainment mortality associated with operations of water facilities in the south Delta to ≤5% of the delta smelt population, calculated as a 5-year running average of entrainment for subadults and adults in the fall and winter and their progeny in the spring and summer. Assure that the proportional entrainment risk is evenly distributed over the adult migration and larval-juvenile rearing time-periods.	North and South Deltat Water Facilities and Operation
Objective DTSM1.3: Achieve a Recovery Index ≥239 for delta smelt for at least 2 years of any consecutive 5-year period; measured from initial operations through the end of the permit term, the midpoint of any two consecutive Recovery Index values cannot be lower than 84.	Water Facilities and Operation Yolo Bypass Fisheries Enhancement Tidal Natural Communities Restoration Channel Margin Enhancement Invasive Aquatic Vegetation Control Localized Reduction of Predatory Fishes

Goals and Objectives	Applicable Conservation Measures
Goal DTSM2: Increased quality and availability of habitat for all life stages of delta smelt and increased availability of high-quality food for delta smelt. The habitat objective can be met through a combination of Delta outflow and/or physical habitat restoration suitable for delta smelt.	
Objective DTSM2.1: Increase the extent of suitable habitat, as defined by flow, salinity, temperature, turbidity, food availability and presence of delta smelt, to conserve delta smelt in the Plan Area by the achieving the following subobjectives. • Provide a monthly average of at least 37,000 acres of open-water habitat in hydrologically wet years*, and at least 20,000 acres of connected open-water habitat in hydrologically above-normal years*, of 1 to 6 psu habitat surface area during July–November. This habitat will meet all of the following criteria: extensive vertical circulation including gravitational circulation, contiguous with other open-water habitat, lateral mixing, and other hydrodynamic processes keeping Secchi disk depths less than 0.5 meter, high calanoid copepod densities (over 7,000 per cubic meter), hydrologically connected to substantial tidal marsh areas, and maximum water temperatures less than 25°C. * Because July–November crosses a water year boundary, the water-year type criteria apply to the first 3 months of that period. • Increase the extent of tidal wetlands of all types in the Plan Area by 10,000 acres by year 10. In Suisun Marsh, West Delta and Cache Slough, individual restoration projects must show a net-positive flux of calanoid copepods and mysids off of the restored wetlands into open water occupied by delta smelt. Food production targets and export distances will be determined through field investigations and modeling, and refined through adaptive management. • Increase by 100% the surface area of open-water, very low-salinity (<1 psu) habitat in the Cache Slough during July–November by 2025. This habitat will meet all of the following criteria: extensive lateral mixing, contiguous with other open-water habitat, hydrodynamic processes keeping Secchi depth less than 0.5 meter, high calanoid copepod density (over 7,000 per cubic meter), and temperature criteria described in item b, above.	Water Facilities and Operation Yolo Bypass Fisheries Enhancement Tidal Natural Communities Restoration Invasive Aquatic Vegetation Control Localized Reduction of Predatory Fishes

Goals and Objectives	Applicable Conservation Measures
Longfin Smelt	
Goal LFSM1: Increased fecundity and improved survival of adult and juvenile longfin smelt to support increased abundance and long-term population viability.	
Objective LFSM1.1: Achieve longfin smelt productivity, as measured by the Fall Midwater Trawl, equal to or greater than predicted for 5 of 10 years based upon a regression of 1987 to 2000 abundance on December through May mean outflow (or X2).	Water Facilities and Operation criteria, spring outflow Tidal Natural Communities Restoration Invasive Aquatic Vegetation Control Localized Reduction of Predatory Fishes
Objective LFSM1.2: Limit entrainment mortality associated with operation of water facilities to ≤5% of the longfin smelt population, calculated as a 5-year running average of entrainment for subadults and adults in the fall and winter and their progeny in the winter and spring. Assure that the proportional entrainment risk is evenly distributed over the adult migration and larval-juvenile rearing periods.	South Delta Water Facilities and Operation
Chinook Salmon, Sacramento River Winter-Run Evolutionarily Significant Unit	
Goal WRCS1: Improved survival (to contribute to increased abundance) of immigrating and emigrating winter-run Chinook salmon through the Plan Area.	
Objective WRCS1.1: For winter-run Chinook salmon originating in the Sacramento River, achieve through the CWF and other actions a 5-year geometric mean interim through-Delta survival objective of 52% by year 2030 (from an estimated 40 measured between Knights Landing and Chipps Island. The CWF will contribute the majority of this improvement (>50%) in the Delta. This survival metric is an interim value based on limited data from fall-run Chinook salmon in the Sacramento River. This survival metric will be revised to account for new monitoring data and improved modeling expected by year 2025.	Water Facilities and Operation criteria Yolo Bypass Fisheries Enhancement Tidal Natural Communities Restoration Seasonally Inundated Floodplain Restoration Channel Margin Enhancement Localized Reduction of Predatory Fishes Nonphysical Fish Barriers
Objective WRCS1.2: Create a viable alternate migratory path through Yolo Bypass in >70% of years for outmigrating winter-run Chinook salmon juveniles by year 15.	Yolo Bypass Fisheries Enhancement implementation by 2025
Objective WRCS1.3: Reduce illegal harvest of adult winter-run Chinook salmon in the Plan Area by year 5.	Illegal Harvest Reduction through enforcement of fishing regulations
Goal WRCS2: Substantial reduction of passage delays (to contribute to increased migration and spawning success, and thus abundance) at human-made impediments for adult winter-run Chinook salmon migrating through the Delta.	
Objective WRCS2.1: Limit adult winter-run Chinook salmon passage delays in the Yolo Bypass to fewer than 36 hours by year 15.	Yolo Bypass Fisheries Enhancement

Goals and Objectives	Applicable Conservation Measures
Goal WRCS3: No degradation of aquatic habitat conditions for winter-run Chinook salmon upstream of the water facilities.	
Objective WRCS3.1: Operate water facilities so as to not result in a reduction of the primary constituent elements of designated critical habitat for winter-run Chinook salmon upstream of the Plan Area.	Upstream Water Facilities and Operation (Shasta, Oroville, American River)
Objective WRCS3.2: Operate water facilities to support a wide range of life-history strategies for winter-run Chinook salmon without favoring any one life-history strategy or trait over another (e.g., Real-time operation of water facilities will have an implementation window covering at least 95% of the life stages present in the Plan Area.).	In Delta CWF Water Facilities and Operation
Chinook Salmon, Central Valley Spring-Run Evolutionarily Significant Unit	
Goal SRCS1: Increased spring-run Chinook salmon abundance.	
Objective SRCS1.1: For spring-run Chinook salmon originating in the Sacramento River and its tributaries, achieve through the CWF and other actions a 5-year geometric mean interim through-Delta survival objective of 50% by year 2030 (from an estimated 40%) measured between Knights Landing and Chipps Island. The Sacramento River survival metric is an interim value based on limited data from fall-run Chinook salmon in the Sacrament River. This survival metric will be revised to account for new monitoring data and improved modeling expected by year 2025. For spring-run Chinook salmon originating in the San Joaquin River and its tributaries, achieve through the CWF and other actions a 5-year geometric mean interim through-Delta survival objective of 33% by year 2030 measured between Mossdale and Chipps Island. Spring-run Chinook salmon do not currently exist in the San Joaquin subbasin, thus these subbasin metrics are considered interim. The CWF will contribute the majority of this improvement (>50%) in the Delta.	In Delta Water Facilities and Operation Head of Old River Operable Gates Yolo Bypass Fisheries Enhancement Tidal Natural Communities Restoration Seasonally Inundated Floodplain Restoration Channel Margin Enhancement Stockton Deep Water Ship Channel Dissolved Oxygen Levels Localized Reduction of Predatory Fishes Nonphysical Fish Barriers
Objective SRCS1.2: Create a viable alternate migratory path through Yolo Bypass in >70% of years for outmigrating spring-run Chinook salmon juveniles by year 2025.	Yolo Bypass Fisheries Enhancement
Objective SRCS1.3: Reduce illegal harvest of adult spring-run Chinook salmon in the Plan Area by year 5.	Illegal Harvest Reduction through enforcement of fishing regulations
Goal SRCS2: Substantial reduction of passage delays (to contribute to increased migration and spawning success and thus abundance) at human-made impediments for adult spring-run Chinook salmon migrating through the Delta.	
Objective SRCS2.1: Limit adult spring-run Chinook salmon passage delays in the Yolo Bypass and at other human-made barriers and impediments in the Plan Area (e.g., Stockton DWSC) to fewer than 36 hours by year 2030.	Yolo Bypass Fisheries Enhancement Stockton Deep Water Ship Channel Dissolved Oxygen Levels
Goal SRCS3: No degradation of aquatic habitat conditions for spring-run Chinook salmon upstream of water facilities.	

Goals and Objectives	Applicable Conservation Measures
Objective SRCS3.1: Operate water facilities so as to not result in a reduction in the primary constituent elements of designated critical habitat for spring-run Chinook salmon upstream of the Plan Area.	Upstream Water Facilities and Operation (Shasta, Oroville, Stanislaus)
Objective SRCS3.2: Operate water facilities to support a wide range of life-history strategies for spring-run Chinook salmon without favoring any one life-history strategy or trait over another (e.g., Real-time operation of water facilities will have an implementation window covering at least 95% of the life stages present in the Plan Area.).	North and South Delta Water Facilities and Operation criteria
Steelhead, Central Valley Distinct Population Segment	
Goal STHD1: Increased steelhead abundance.	
Objective STHD1.1: For steelhead originating in the San Joaquin River and its tributaries, achieve through the CWF and other actions a 5-year geometric mean interim through-Delta survival objective of 44% by year 2030 (from an estimated 10%) measured between Mossdale and Chipps Island. For steelhead originating in the Sacramento River and its tributaries, achieve through CWF and other actions a 5-year geometric mean interim through-Delta survival objective of 54% by year 2030 (from an estimated 45%) measured between Knights Landing and Chipps Island. The CSF will contribute the majority of this improvement (>50%) in the Delta. These survival metrics are interim values based on limited data from fall-run Chinook salmon in the San Joaquin and Sacramento Rivers. These survival metrics will be revised to account for new monitoring data and improved modeling expected by year 2025.	North and South Delta Water Facilities and Operation criteria Operable Head of Old River Barrier San Joaquin River and Tributary Pulse Flows Yolo Bypass Fisheries Enhancement Tidal Natural Communities Restoration Seasonally Inundated Floodplain Restoration Channel Margin Enhancement Localized Reduction of Predatory Fishes Nonphysical Fish Barriers
Objective STHD1.2: Create a viable alternate migratory path through Yolo Bypass in >70% of years for outmigrating steelhead juveniles by year 2025.	Yolo Bypass Fisheries Enhancement
Objective STHD1.3: Reduce illegal harvest of adult steelhead in the Plan Area by year 5.	Illegal Harvest Reduction
Goal STHD2: Substantial reduction in passage delays (to contribute to increased migration and spawning success and thus abundance) at human-made impediments for adult steelhead migrating through the Delta.	
Objective STHD2.1: Limit adult steelhead passage delays in the Yolo Bypass and at other human-made barriers and impediments in the Plan Area (e.g., Stockton DWSC) to fewer than 36 hours by year 15.	Yolo Bypass Fisheries Enhancement Stockton Deep Water Ship Channel Dissolved Oxygen Levels
Goal STHD3: No degradation of aquatic habitat conditions for steelhead upstream of the water facilities.	

Goals and Objectives	Applicable Conservation Measures
Objective STHD3.1: Operate water facilities so as to not result in a reduction to the primary constituent elements of designated critical habitat for steelhead upstream of the Plan Area, within the Study Area	Upstream Water Facilities and Operation (Shasta, Oroville, American, Stanislaus)
Objective STHD3.2: Operate water facilities to support a wide range of life-history strategies for steelhead without favoring any one life-history strategy or trait over another (e.g., Real-time operation of water facilities will have an implementation window covering at least 95% of the life stages present in the Plan Area).	North and South Delta Water Facilities and Operation criteria
Green Sturgeon, Southern Distinct Population Segment	
Goal GRST1: Increased abundance of green sturgeon.	
Objective GRST1.1: Increase juvenile green sturgeon survival (as a proxy for juvenile abundance and population productivity) throughout the CWF permit term and increase adult green sturgeon survival (as a proxy for adult abundance and productivity) by year 2030.	Water Facilities and Operation Yolo Bypass Fisheries Enhancement Tidal Natural Communities Restoration Channel Margin Enhancement Invasive Aquatic Vegetation Control Stockton Deep Water Ship Channel Dissolved Oxygen Levels Illegal Harvest Reduction
Goal GRST2: Improved connectivity that facilitates timely passage and reduces stranding of adult green sturgeon.	
Objective GRST2.1: Eliminate stranding of adult green sturgeon at Fremont Weir, the scour pools directly below Fremont Weir, and the Tule Pool, by year 2025, and minimize stranding until this time.	Yolo Bypass Fisheries Enhancement
Goal GRST3: Increased spatial distribution of young-of-the-year (YOY) and juvenile green sturgeon in the Delta compared to existing conditions.	
Objective GRST3.1: Improve water quality parameters and physical habitat characteristics in the Bay-Delta to increase the spatial distribution of green sturgeon in the Plan Area by year 2030.	Tidal Natural Communities Restoration Stockton Deep Water Ship Channel Dissolved Oxygen Levels