Appendix L: Mitigation and Monitoring Compliance Plan for the Sutter Bypass East Borrow Canal Water Control Structures Project

This document is prepared pursuant to Sections 15091 & 15097 of the Guidelines for Implementation of the California Environmental Quality Act and Section 21081.6 of the Public Resources Code. DWR has proposed the replacement of two weirs and their associated fish ladders on the East Borrow Canal (EBC) of the Sutter Bypass. Construction activities would take place during May through October 2009 at Willow Slough Weir, and during May through October of both 2009 and 2010 (two seasons). Construction would occur at the existing weirs that are located 14 miles apart on the EBC, with staging areas being used on adjacent disturbed areas at both sites, and in a disturbed area near the Sutter National Wildlife Refuge at Weir No. 2. By replacing these weirs and fish ladders, DWR will improve water control capabilities on the EBC and improve passage of anadromous fish, including Federally listed species, into spawning areas in the Butte Creek system.

In DWR's "Proposed Mitigated Negative Declaration And Initial Study For The Sutter Bypass East Borrow Canal Water Control Structures Project" (DWR 2008), DWR staff described potential environmental impacts of the project and mitigation measures that would reduce impacts to less than significant levels. This document describes how monitoring, reporting, and mitigation requirements will be satisfied. Table 1 provides a summary of all mitigation and monitoring that will be conducted for the project.

Pre-project Activities

The contractor will begin work at the site on or after ~~May 15, 2009~~ May 1, 2009. DWR environmental staff will coordinate with the Division of Engineering to ensure that pre-project surveys are completed before construction begins.

Pre-project surveys

A DWR biologist will conduct a pre-project survey to determine the presence of any Giant Garter Snakes within the project area according to US Fish and Wildlife protocols. Surveys for special status birds and nesting raptors will also be completed no more than 21 days prior to initiating construction activities. No special status birds or reptiles were observed within the project area during preliminary avian and wildlife surveys conducted by DWR staff.

Pre-project plant surveys were completed in spring 2007 and 2008. During these surveys, no special-status plant species or habitats were identified within the proposed project area. Because of these results, and because the project footprint is mostly in a highly disturbed area that contains ruderal vegetation or is unvegetated, no additional plant surveys are needed. Pre-project photos of the vegetation in the area will be compared with post-project photos to document the extent of vegetation disturbance and survival.

Purchase of Giant Garter Snake Mitigation Credits

Mitigation credits for Giant Garter Snake habitat will be purchased to compensate for any loss in habitat. (Note: This statement is added to be consistent with the mitigation described in the Initial Study).

During Project Activities

Environmental Monitoring

To ensure compliance with permit conditions and avoidance measures, DWR environmental staff will conduct an environmental awareness training session for contractor employees and the DWR inspector. The training session will be held on the first day equipment is brought to the project site. All contractor employees will attend. Copies of all permits, environmental requirements, and State policies that pertain to the work will be provided to the inspector and contractor. The DWR construction inspector and contractor crew leaders will communicate permit conditions to construction employees hired after the training session. The training session will cover topics such as avoidance areas, location of staging areas, special-status species education, water quality issues, oil spill prevention, standard DWR environmental policies, and other permit requirements. Each attendee will sign a form stating that they were provided with environmental compliance training. These forms will be kept on file at DWR's Division of Planning and Local Assistance in Sacramento.

DWR will provide a trained environmental project monitor to make inspections of the project area throughout the construction period. The project monitor will ensure that avoidance areas are clearly marked and will make inspections of protected areas to ensure that flags remain in place. This should reduce the chances of accidental disturbance. If a sensitive area is disturbed, the appropriate regulatory agencies will be notified immediately to determine suitable mitigation. The monitor will also be available to assist the construction supervisor if changes to the project plan occur. When changes to the project plan occur, the monitor will determine if additional surveys are needed and will notify permitting agencies as necessary. Qualified DWR environmental staff will perform any additional surveys.

During the first month of construction, the environmental project monitor will visit the site at least twice per week. After the initial month, the project monitor will visit the site at least once per week. The environmental project monitor will also be available to visit the site more frequently if needed.

Fish Passage

Downstream migration of special-status salmonids coincides with construction during the months of May, June, September, and October. Upstream migration of special-status salmonids coincides with construction during the months of May, September, and October. However, impacts on migration will be minimized by providing fish passage throughout the construction season.

At Weir No. 2, the existing fish ladder will remain operable until the new fish ladder is completed. At Willow Slough weir, the existing fish ladder will have to be removed before construction on the new fish ladder begins. However, a temporary fish ladder will be constructed so that fish migration is not interrupted.

The temporary fish ladder at Willow Slough will provide upstream passage for adult salmonids migrating from Willow Slough into the EBC and downstream passage for juvenile salmonids migrating from the EBC into Willow Slough.

During construction, anadromous fish migrating upstream will enter the side channel in Willow Slough and encounter the temporary Denil fish ladder, which was designed to meet NOAA fisheries criteria and has been certified by NOAA-Fisheries engineers. The ladder is designed to be 32' long with a slope of 20% and should not hinder fish passage of upstream migrating salmonids; the temporary ladder should actually perform better than the existing ladder because flows will be limited to about 100 cfs in Willow Slough during construction.

After passing through the fish ladder, upstream migrants will encounter a 25' long resting pool. The volume of the pool will range from 6000 cubic feet to about 8500 cubic feet depending on the stage in the EBC. Upstream migrants will swim into the EBC from the resting pool through a 50' long culvert, which will contain water flows with velocities that will not exceed 6 fps, except in rare circumstances. Furthermore, the culvert will be fully submerged and have sufficient depth at all times for fish passage.

Downstream migrating anadromous fish will first enter the culvert and then encounter the 25' long resting pool. From the resting pool, fish can either go over the spillway or travel down through the Denil fish ladder. At lower flows, all of the flow will go through the fish ladder. At the highest flows, twice the amount of flow will go over the spillway compared to the flow going through the fish ladder. Fish that go over the spillway will fall about five feet before landing in water five feet deep.

With the planned velocities and depth in the culvert, the conservative length and slope of the ladder, and large size of the resting pool, the temporary fish passage structure is expected to avoid impacts to migrating fish from construction activities at Willow Slough. With the continuous operation of the existing fish ladder at Weir No. 2 until the new ladder is operational, impacts to migrating fish from construction activities at Weir No. 2 are expected to be avoided.

Fish Rescue and Relocation

DWR will conduct fish rescue and relocation during cofferdam installation in May 2009 and May 2010. Species and lifestages that have the potential to be trapped in the isolated area behind the cofferdams include:

- Central Valley Spring-run Chinook salmon adult upstream migrants and juvenile downstream migrants
- Central Valley Fall/Late Fall-run Chinook salmon juvenile downstream migrants
- Central Valley Steelhead juvenile downstream migrants and rearing juveniles
- Green Sturgeon adults and juveniles introduced from Sacramento River overflow.

Areas that will be cofferdammed include a side channel in Willow Slough, an area surrounding the existing fish ladder and weir in Willow Slough, and an area surrounding the existing fish ladder and weir at Weir No. 2.

At the Willow Slough Weir site, the first area to be isolated will be the side channel in Willow Slough that leads to a closed concrete culvert. DWR staff will begin to rescue and relocate fish as soon as the area becomes isolated.

After the cofferdam is constructed in the side channel of Willow Slough and all fish have been relocated, a temporary fish ladder will be constructed, the closed culvert will be opened, and all flow at Willow Slough will then be directed through the side channel. Once the fish ladder in the side channel is deemed operable, cofferdam installation will begin around the existing fish ladder and the two remaining culverts at Willow Slough. This area consists of instream habitat in the EBC and Willow Slough. In the Willow Slough portion of the area, all flow will be directed from the main channel through the side channel.

At Weir No. 2, the east side of the channel will be cofferdammed first, leaving the existing fish ladder in operation. Once the area becomes isolated, DWR staff will perform fish rescue and relocation. Construction on the east side of the weir is expected to occur from May 2009 to October 2009. Cofferdams will be left in place during the flooding season, but the cofferdams will be breached in necessary locations so that fish do not become isolated when flood waters recede.

In May 2010 the cofferdams will be shifted to the west side of the weir. Fish that become isolated on the west side, will be rescued and relocated by DWR staff.

Fish relocation operations are expected to minimize project impacts to all special-status fish species by removing them from areas where they would have experienced high rates of injury or mortality.

~~***Water Conveyance***~~

~~Instream construction areas will be completely isolated from flow. However, the amount of water flowing downstream of the project site will not change significantly. Aquatic communities downstream of project sites will not be subjected to a decrease in water flow from baseline conditions. With the interruption of flow, impacts to downstream aquatic resources are expected to be avoided.~~ (Note: Although flow will still continue past construction areas, water conveyance is not considered mitigation. Therefore, we have removed it from our list of Mitigation Measures)

~~***Storm Water Pollution Prevention Plan (SWPPP) and a Spill Prevention and Countermeasure Plan***~~

~~Construction activities will disturb soils and could mobilize sediment into the main channel, producing temporary increases in turbidity and sedimentation downstream of the construction sites. Periods of localized, high suspended-sediment concentrations can cause clogging and abrasion of gill filaments in all fish, and reduce feeding opportunities for sight-feeding fish. Water quality and fish habitat could also be impacted by accidental spills or seepage of hazardous materials during construction. The implementation of a Storm Water Pollution Prevention Plan (SWPPP) and a Spill~~

~~Prevention and Countermeasure Plan will greatly reduce the potential for these adverse effects to occur by implementing the best available preventative measures. Additionally, the May 1 – October 15 work window insures that such events would occur when listed fish species are less likely to be in the action area.~~ (Note: SWPPP and other erosion control measures have been incorporated as part of the project description and are not considered mitigation. Therefore, we have removed it from our list of Mitigation Measures)

Post Project Mitigation and Monitoring Activities

The environmental project monitor will make a final inspection of the project area after construction is completed for the season. The monitor will ensure that the contractor removed all equipment (except at Weir No. 2 where equipment will be stored on staging areas over the winter) and trash from the project area, and will notify the construction supervisor if any items remain in the area. The monitor will also remove flagging from avoidance areas.

A log of monitoring activities and final monitoring report will be available to the regulatory agencies at the completion of the project upon request. The log will include date, time, monitor name, description of construction activities, description of which avoidance and construction areas were inspected, any changes to the project plan, and completion of additional survey if necessary. The log and final monitoring report will be available to the regulatory agencies following completion of the willow plantings in spring 2009.

Vegetation reestablishment and monitoring

DWR will revegetate areas where vegetation was removed by construction activities. Pole cuttings of woody riparian plant species will be planted on the south (downstream) side of Willow Slough Weir to replace vegetation removed during construction and to replace lost Shaded Riverine Aquatic habitat. If circumstances allow, poles will be salvaged from vegetation scheduled to be removed. A trained DWR botanist will coordinate the willow planting in the spring following construction (2010). Poles will be planted at a minimum 3:1 ratio relative to original number of individuals and a drip irrigation system will be established to increase survivorship. Irrigation will be applied during the growing season (ca. March – October) for a minimum of three years. DWR will also apply a native grass seed mix to all upland areas that are disturbed by construction activities.

Each year for three years, beginning in Spring/summer 2010, a qualified DWR botanist will monitor the vegetation and measure cover, species composition and survivorship. In the planted riparian vegetation, each individual will be recorded; in upland areas seeded with native grasses, a random sampling scheme will be used to determine canopy cover. A report summarizing the vegetation recovery will be submitted by December of each year to the Department of Fish and Game and NOAA-Fisheries. When vegetation has achieved the goals set by regulatory agencies, the monitoring and irrigation will be

discontinued. If vegetation is not performing satisfactorily (e.g., insufficient cover, excessive mortality) then remedial actions will be taken by DWR, after consultation with regulatory agencies, such as replanting, reseeding, disking, etc.

Fish Ladder Monitoring

DWR will accomplish fish ladder monitoring in three ways:

- Verify new fish ladder designs meet engineering specifications
- Verify hydraulic conditions in new fish ladders meet fish passage criteria
- Verify fish are successful in navigating through fish ladder

The fish ladder designs were approved by NOAA and DFG. DWR surveyors will ensure that ladders are built according to DFG and NOAA approved specifications. The surveys will occur after construction, as early as October 15, 2009. However, if flooding in the bypass occurs, surveys will occur after floodwaters recede in 2010.

Physical measurements will be taken to verify that fish ladders meet NOAA and DFG fish passage criteria for target fish species and lifestages. DWR will perform hydraulic analysis after construction of the fish ladders, as early as October 15, 2009. However, if flooding in the bypass occurs, the analysis will occur after floodwaters recede in 2010.

DWR will use underwater imagery to carryout a fisheries monitoring plan to show successful passage of adult salmonids. The details of the fisheries monitoring plan will be created according to NMFS needs. Surveys will likely occur in May and September of 2009 and possibly May and September of 2010. This timing will allow us to verify the use of the ladder by spring-run Chinook salmon, steelhead, and potentially fall-run Chinook salmon. However, timing is also dependent on flow conditions in the Bypass.

The results of the fish ladder monitoring and the Fisheries Monitoring Plan will be made available to agencies following the monitoring season of 2010. If additional seasons are requested by NMFS or DFG, an annual report will be submitted following each monitoring season.

References

Department of Water Resources. 2008. Mitigated Negative Declaration and Initial Study for the Sutter Bypass East Borrow Canal Water Control Structures Project. June 2008. DWR, Division of Planning and Local Assistance, Sacramento, CA.

Environmental Factors and Resources	Potential Impact	Mitigation Measure or Monitoring	Objective of Mitigation Measure or Monitoring	Deadline for Implementation of Measure	Responsible Party	Estimated Completion Deadline
Special-Status Fish Species	Impediment to Fish Passage	Fish Passage	At Weir No. 2, keep existing fish ladder operable until new fish ladder is complete. At Willow Slough Weir, install and operate temporary fish ladder until new fish ladder is complete.	At least one fish ladder at each site will remain operational throughout the construction season.	James Newcomb	Entire construction season
	Entrapment of Fish	Fish Rescue and Relocation	Rescue fish from cofferdammed construction area by use of seines and dipnets. Fish relocation operations are expected to minimize project impacts to all special-status fish species by removing them from areas where they would have experienced high rates of injury or mortality.	Fish rescue and relocation will occur as construction areas become isolated from the waterway.	James Newcomb	Throughout construction season as cofferdams are installed and repositioned
	~~Alteration of Flow~~	~~Water Conveyance~~ (see Note above)	~~Normal flows will continue past construction areas to provide baseline conditions to aquatic resources downstream.~~	~~Entire construction season~~	~~Various DWR Staff~~	~~Entire construction season~~
	~~Temporary increases in turbidity and sedimentation downstream of the construction sites~~	~~Storm Water Pollution Prevention Plan (SWPPP) and a Spill Prevention and Countermeasure Plan~~ (see Note above)	~~The implementation of a Storm Water Pollution Prevention Plan (SWPPP) and a Spill Prevention and Countermeasure Plan will greatly reduce the potential for these adverse effects to occur by implementing the best available preventative measures.~~	~~Entire construction season~~	~~Various DWR Staff~~	~~Entire construction season~~
	New fish ladder design is harmful to anadromous fish or acts as an impediment to upstream migration	Verify new fish ladder designs meet engineering specifications	The fish ladder designs were approved by NOAA and DFG. DWR surveyors will ensure that ladders are built according to DFG and NOAA approved specifications.	Post-construction As Early as October 15, 2009.	James Newcomb & Randy Beckwith	November 1, 2009 - If flooding in the bypass occurs, survey will occur after floodwaters recede in 2010.
		Verify hydraulic conditions in new fish ladders meet fish passage criteria	Physical measurements will be taken to verify that fish ladders meet NOAA and DFG fish passage criteria for target fish species and lifestages.	Post-construction As Early as October 15, 2009.	James Newcomb	November 1, 2009 - If flooding in the bypass occurs, survey will occur after floodwaters recede in 2010.

		Verify fish are successful in navigating through fish ladder.	Underwater imagery will be used to show successful passage of adult salmonids. The details of the fisheries monitoring plan will be created according to NMFS needs.	Surveys will likely occur in May and September of 2009 and possibly May and September of 2010 depending on flow conditions in the Sutter Bypass.	James Newcomb & Roger Padilla	November 1, 2010
Giant Garter Snake	Disturbance, mortality	Restrict work windows to GGS active season	Avoid inactive (hibernating) snakes that could be injured by construction while they are unable to escape from underground dens			
		Conduct an environmental awareness training session for construction personnel	USFWS-approved biologist will instruct workers on how to identify Giant Garter Snakes and their habitat, how they can minimize take of the snake, what to do if they encounter a snake, and any additional terms of environmental documents obtained for the project	1 day prior to beginning of any construction	Laura Patterson	1 day prior to beginning of any construction
		Construction sites in streambeds will be dewatered for at least 15 days prior to start of construction in areas with Giant Garter Snake habitat.	Encourage any resident Giant Garter Snakes to leave the aquatic portion of the construction area.	15 days prior to start of construction	Construction staff, Various DWR staff	15 days prior to start of construction
		Project area will be surveyed for Giant Garter Snakes. Surveys will be repeated if a lapse in construction activity of two weeks or greater occurs. A biological monitor will be available thereafter	Determine if snakes are present in construction area.	No more than 24 hours prior to construction activities beginning	Laura Patterson	No more than 24 hours prior to construction activities beginning

		If a Giant Garter Snake is observed, construction activities will be redirected to another portion of the project area until the snake has moved away on its own	Avoid take of Giant Garter Snakes	During construction	Various DWR staff	Project duration
		No plastic, monofilament, jute, or similar erosion matting that could entangle snakes will be used on the project site.	Avoid injury to Giant Garter Snakes	During construction	Construction staff, Various DWR staff	Project duration
		The worksite will be kept free of trash that could attract predators of Giant Garter Snakes to the area.	Avoid increasing predation on Giant Garter Snakes	During construction	Construction staff, Various DWR staff	Project duration
		After completion of construction activities, any temporary fill and construction debris will be removed. All uplands involved in the project (staging areas, construction sites, access roads, levees) will be restored using a native grass and forb seed mixture.	Restore Giant Garter Snake habitat to pre-construction conditions.	After construction is completed	Harry Spanglet	Willow Slough Weir: October, 2009 Weir No. 2: October 2009, and October 2010
		Conduct post-project monitoring surveys of re-seeded upland areas.	Measure cover and species composition to monitor revegetation; re-seed if necessary	Spring of the year following project completion	Harry Spanglet	Willow Slough Weir: October, 2012 Weir No. 2: October 2012, and October 2013

Special-Status Birds	Injury to Birds, Disturbance to Nesting Birds	Pre-construction surveys	Determine if nesting birds or special status birds are present within or near the project area and if necessary, coordinate with DFG and/or USFWS to implement protective measures.	Surveys for special status birds and nesting raptors will be completed no more than 21 days prior to initiating construction activities.	Various DWR Staff	1 day prior to beginning of any construction in May 2009 and May 2010.
Riparian Vegetation and Shaded Riverine Aquatic habitat	Disturbance or removal	Obtain pre-project photographs of project area and surroundings	Establish a baseline of conditions prior to construction activities	1 day prior to contractor being on site	Harry Spanglet	1 day prior to contractor being on site
		Determine species composition and stand characteristics of existing vegetation that will be impacted	Determine goals for revegetation effort	1 growing season prior to construction	Harry Spanglet	June, 2008
		Mark off areas of vegetation that are to be avoided by construction machinery	Reduce impacts to vegetation from machinery and personnel	1 day prior to contractor being on site	Harry Spanglet	1 day prior to contractor being on site
		Conduct weekly inspection to ensure areas outside construction area have remained undisturbed	Reduce the chance of accidental disturbance	During construction	Various DWR staff	Project duration
		Re-plant riparian vegetation, with appropriate irrigation capabilities, at Willow Slough Weir	Re-establish riparian and shaded riverine aquatic habitats	After construction is completed	Harry Spanglet	October, 2009
		Conduct post-project monitoring surveys of re-planted vegetation	Count and measure planted riparian vegetation to determine survivorship, species composition, and canopy cover	Spring of the year following project completion	Harry Spanglet	Summer, 2012