3.4. Conservation Measures

Reclamation, DWR, and the construction contractor will implement conservation measures to avoid and minimize effects on Valley elderberry longhorn beetle, giant garter snake, Western Yellow-billed Cuckoo, Least Bell's Vireo, North American Green Sturgeon – southern DPS, steelhead – California Central Valley DPS, and Chinook Salmon – Central Valley spring-run ESU and Sacramento River winter-run ESU.

3.4.1. General Fish and Wildlife Conservation Measures

3.4.1.1. Conservation Measure 1: Conduct mandatory environmental awareness training for all construction personnel.

Prior to the start of construction activities, all construction personnel will participate in mandatory worker environmental awareness training conducted by a qualified biologist. Construction personnel will be informed about the identification, potential presence, life history, habitat requirements, legal protections, avoidance and minimization measures, and applicable conservation measures for all ESA-listed species identified in this document. Construction personnel will be informed of the procedures to follow should an ESA-listed species be encountered within the action area during construction.

3.4.1.2. Conservation Measure 2: Implement general wildlife protection measures during construction.

Reclamation, DWR, and the construction contractor will implement general wildlife protection measures during construction that will include, but may not be limited to, the following:

- Limit construction activities to daylight hours, to the extent feasible.
- Confine clearing to the minimal area necessary to facilitate construction activities.
- Clearly delineate the action area limits by using fencing, flagging, or other means prior to the start of construction activities.
- Avoid wildlife entrapment by completely covering, or providing escape ramps for, all excavated steep-walled holes or trenches more than 1 foot deep at the end of each work day.
- Inspect the work area and any equipment or material left on-site overnight for ESA-listed

species prior to the start of construction activities each day.

- Observe posted speed limit signs on local roads and observe a 15-mile-per-hour speed limit along ingress/egress routes.
- Dispose of garbage in wildlife-proof containers and remove the garbage from the construction area regularly during the construction period.
- Retain a qualified biological monitor to be present or on call during construction activities with the potential to affect ESA-listed species. The biological monitor will be on-site during initial ground disturbing activities. The biological monitor will ensure that any construction barrier fencing is maintained. The biological monitor will have the authority to stop work if an ESA-listed species is encountered within the action area during construction, and the appropriate regulatory agency(ies) will be notified. Construction activities will cease until it is determined that the species will not be harmed or that it has left the construction area on its own.

3.4.1.3. Conservation Measure 3: Prepare and implement a spill prevention, control, and counter-measure plan.

Reclamation, DWR, or the construction contractor will develop and implement a spill prevention, control, and countermeasure plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, and petroleum substances during construction and operation activities, as well as minimize the effects of unearthing previously undocumented hazardous materials. The SPCCP will be completed before construction activities begin. Implementation of this measure will comply with State and federal water quality regulations. The SPCCP will describe spill sources and spill pathways in addition to the actions that will be taken in the event of a spill (e.g., an oil spill from engine refueling will be cleaned up immediately with oil absorbents) or the exposure of an undocumented hazard. The SPCCP will outline descriptions of containment facilities and practices, such as double-walled tanks, containment berms, emergency shut-offs, drip pans, fueling procedures, and spill response kits. It will also describe how and when employees are trained in proper handling procedures, as well as spill prevention and response procedures.

Reclamation and DWR will review and approve the SPCCP before onset of construction activities and routinely inspect the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained. Reclamation and DWR will notify the construction contractor immediately if there is a non-compliance issue and Reclamation and DWR will require compliance.

If a spill is reportable, the construction contractor's superintendent will notify Reclamation and DWR, and Reclamation and DWR will take action to contact the appropriate safety and cleanup crews to ensure that the SPCCP is followed. A written description of reportable releases will be submitted to the Central Valley Regional Water Board and the California Department of Toxic Substances Control. This submittal will contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form.

3.4.1.4. Conservation Measure 4: Implement a stormwater pollution and prevention plan.

The National Pollutant Discharge Elimination System Program (NPDES) requires projects that would

result in ground disturbance of greater than 1 acre to obtain a general construction activity stormwater permit. The NPDES general construction activity stormwater permit generally requires the project applicant to prepare a stormwater pollution prevention plan (SWPPP) that describes the BMPs (best management practices) that will be implemented to control accelerated erosion, sedimentation, and other pollutants during and after project construction. The SWPPP will be prepared by the construction contractor prior to initiating construction activities. Specific BMPs that will be incorporated into the SWPPP will be site-specific and will be prepared in accordance with the regional water board field manual. The SWPPP will include, but not be limited to, the following standard erosion and sediment control BMPs:

- **Timing of construction**. All construction activities will occur from May 1 through October 31 to avoid ground disturbance in the rainy season and when ESA-listed fish species are least likely to be present in the action area.
- **Stabilize grading spoils**. Grading spoils generated during construction may be temporarily stockpiled in staging areas. Silt fences, fiber rolls, or similar devices will be installed around the base of the temporary stockpiles to intercept runoff and sediment during storm events. If a significant rain event is expected during construction, which is unlikely give the construction work window, temporary stockpiles will be covered with a geotextile material to increase protection from wind and water erosion.
- **Permanent site stabilization**. The construction contractor will install structural or vegetative methods to permanently stabilize all graded or disturbed areas once construction is complete. Structural methods may include the installation of biodegradable fiber rolls or erosion control blankets. Vegetative methods may include the application of organic mulch and tackifiers, and/or an erosion control native seed mix.
- **Staging of construction equipment and materials**. Equipment and materials will be staged in designated staging areas.
- **Minimize soil and vegetation disturbance**. The construction contractor will minimize ground disturbance and the disturbance/destruction of existing vegetation. This will be accomplished, in part, through establishing designated equipment staging areas, ingress and egress corridors, equipment exclusion zones prior to the commencement of any grading operations, and protection of existing trees.
- **Install sediment barriers**. The construction contractor will install silt fences, fiber rolls, or similar devices to prevent sediment-laden water from leaving the construction area.

3.4.2. Valley Elderberry Longhorn Beetle

Reclamation, DWR, or the construction contractor will implement Conservation Measures 5 through 7 to avoid and minimize effects on Valley elderberry longhorn beetle during construction of the new fish passage structure and associated features and during construction activities at all agricultural road crossings. Reclamation and DWR will implement Conservation Measure 8 to avoid and minimize effects on Valley elderberry longhorn beetle during maintenance activities associated with the project.

3.4.2.1. Conservation Measure 5: Conduct pre-construction elderberry shrub surveys.

Prior to the start of construction activities, elderberry shrub surveys will be conducted within the action area by a qualified biologist. All elderberry shrubs with stems greater than 1 inch in diameter at ground

level will be recorded and marked with flagging for avoidance.

3.4.2.2. Conservation Measure 6: Establish and maintain a buffer zone for elderberry shrubs during construction.

Elderberry shrubs within 100 feet of the project area identified during surveys will be flagged. For all elderberry shrubs identified for avoidance, an avoidance buffer of 100 feet or more will be established prior to construction activities. A 20 foot avoidance buffer would be established from the dripline of all elderberry shrubs within 50 feet of construction activity. The avoidance buffer will consist of a physical barrier, such as flagging, exclusion fencing, or K-Rail barriers, and will be maintained for the duration of project construction. Signs alerting construction workers to the presence of elderberry shrubs will be placed around the perimeter of the buffer. Signs and fencing will be posted in accordance with the USFWS's Conservation Guidelines for the Valley Elderberry Longhorn Beetle (United States Fish and Wildlife Service 1999). Any damage done within the buffer area during construction will be restored by providing erosion control.

3.4.2.3. Conservation Measure 7: Water dirt access and haul roads for dust control during construction.

Dirt access and haul roads within the project area will be watered at least twice each day when being used during dry periods during construction.

3.4.2.4. Conservation Measure 8: Implement avoidance and minimization measures during maintenance activities for Valley elderberry longhorn beetle.

- Prior to the start of maintenance activities, elderberry shrub surveys will be conducted within the maintenance area by a qualified biologist. All elderberry shrubs with stems greater than 1 inch in diameter at ground level will be marked with flagging and a 20-foot avoidance buffer will be established. These areas will be avoided by all maintenance personnel and maintenance activities.
- Insecticides, herbicides, or other chemicals that might harm the beetle or its host plant will not be used within the established buffers (20 feet) around elderberry shrubs. Inside established buffers grass and ground cover may be mowed from July to April to reduce fire hazard. Mowing will not occur within 5 feet of any elderberry stem 1-inch in diameter or greater. Vegetation within 5 feet of any elderberry stem 1-inch in diameter or greater will be removed by hand only.

3.4.3. Giant Garter Snake

Reclamation, DWR, or the construction contractor will implement Conservation Measures 9 through 11 to avoid and minimize effects on giant garter snake during construction of the new fish passage structure and associated features and during construction activities at all agricultural road crossings. Reclamation and DWR will implement Conservation Measure 12 to avoid and minimize effects on giant garter snake during maintenance activities associated with the project.

3.4.3.1. Conservation Measure 9: Implement standard avoidance and minimization measures during construction activities in giant garter snake habitat.

The following measures will be implemented to avoid or minimize giant garter snake impacts:

- To the extent possible, work will be conducted during the giant garter snake active period

(May 1 to October 1). Only construction phases that have started prior to October 1 will continue outside the active season, with CDFW and USFWS approval. No new construction work phases will be started after October 1.

- A USFWS- and CDFW-approved biologist will conduct pre-construction surveys in suitable giant garter snake habitat a maximum of 24 hours prior to the start of construction activities. If there is a lapse in construction activities of two weeks or greater, the construction area shall be resurveyed a maximum of 24 hours prior to recommencement of work.
- A qualified biological monitor will be onsite during vegetation removal in giant garter snake habitat and during construction activities adjacent to aquatic habitat at the deep pond.
- Prior to the start of construction activities and during the active period for giant garter snakes, the construction contractor will install exclusion fencing along the edge of construction areas that are within 200 feet of suitable giant garter snake aquatic habitat. The exclusion fencing material will consist of a material that snakes cannot get through or become entangled in and buried at least six inches below ground to prevent animals from entering below the fence. The exclusion fence will be regularly inspected and maintained throughout project construction. If work extends beyond October 1, the exclusion fencing shall be maintained to prevent giant garter snakes from entering the construction limit and utilizing upland areas for overwintering.
- Vegetation clearing within 200 feet of suitable giant garter snake aquatic habitat will be confined to the minimal area necessary to facilitate construction activities. Movement of heavy equipment will be confined to existing roadways or temporary construction access roads established during construction.
- After April 15, any dewatered habitat will be allowed to dry (no standing water) for at least 15 consecutive days prior to excavating or filling of the dewatered habitat.
- If a giant garter snake is observed in the construction area, all activities will cease and a qualified biologist will be notified immediately. If possible the snake should be allowed to leave on its own and activities will not resume until the snake has moved out of the area on its own. Alternatively, the qualified biologist may capture and relocate the snake unharmed to suitable habitat at least 200 feet from the construction area. If the snake does not leave on its own and cannot be relocated unharmed, construction activities within approximately 200 feet of the snake will stop to prevent harm to the snake, and USFWS and CDFW will be consulted to identify next steps. USFWS and CDFW will be notified by telephone or email within 24 hours of a giant garter snake observation during construction activities.

3.4.3.2. Conservation Measure 10: Restore temporarily disturbed giant garter snake aquatic and upland habitat after construction completion.

After completion of construction activities, the construction contractor will remove any temporary fill and construction debris from the channel. Temporarily disturbed upland areas will be reseeded with native seed mix and channel vegetation will be allowed to recolonize. Under this measure, temporary construction activities would not result in the permanent loss of giant garter snake aquatic and upland habitat.

3.4.3.3. Conservation Measure 11: Compensate for permanent loss of giant garter snake habitat.

The permanent loss of giant garter snake habitat will be compensated for by purchasing credits at a USFWS- and CDFW-approved conservation or mitigation bank at a 1:1 ratio (for every one acre of habitat lost one credit will be purchased). The proposed project would result in the permanent alteration of 0.51 acre of upland habitat.

3.4.3.4. Conservation Measure 12: Implement avoidance and minimization measures during maintenance activities in giant garter snake habitat.

The following measures will be implemented to avoid or minimize giant garter snake impacts during maintenance activities:

- Prior to the start of maintenance activities, all personnel will participate in mandatory worker environmental awareness training conducted by a qualified biologist. Personnel will be informed about the identification, potential presence, life history, habitat requirements, legal protections, and avoidance and minimization measures for giant garter snake.
- To the extent possible, work will be conducted during the giant garter snake active period (May 1 to October 1). Only maintenance phases that have started prior to October 1 will continue outside the active season, with CDFW and USFWS approval. No new maintenance work phases will be started after October 1.
- Observe a 15-mile-per-hour speed limit on the Fremont Weir maintenance road, levee access roads, and at agricultural road crossing 2. Observing a 15 mile-per-hour speed limit will allow personnel in vehicles to see and avoid giant garter snakes that may be present on the roads.
- A qualified biologist will be available on an on-call basis during project-related maintenance activities with the potential to affect giant garter snake. If needed, a qualified biologist will be maintained on-site during maintenance activities to ensure the protection of giant garter snake. The biological monitor will have the authority to stop work if a giant garter snake is encountered within the project area during maintenance.
- If a giant garter snake is observed in the maintenance area, all activities will cease and a qualified biologist will be notified immediately. If possible the snake should be allowed to leave on its own and activities will not resume until the snake has moved out of the area on its own. Alternatively, the qualified biologist may capture and relocate the snake unharmed to suitable habitat at least 200 feet from the maintenance area. If the snake does not leave on its own and cannot be relocated unharmed, maintenance activities within approximately 200 feet of the snake will stop to prevent harm to the snake, and USFWS and CDFW will be consulted to identify next steps. USFWS and CDFW will be notified by telephone or email within 24 hours of a giant garter snake observation during maintenance activities.

3.4.4. Western Yellow-billed Cuckoo and Least Bell's Vireo

Reclamation, DWR, or the construction contractor will implement Conservation Measures 13 through 16 to avoid and minimize effects on Western Yellow-billed Cuckoo and Least Bell's Vireo during construction of the new fish passage structure and associated features and during construction activities at all agricultural road crossings. Reclamation and DWR will implement Conservation Measures 13 through 15 to avoid and minimize effects on Western Yellow-billed Cuckoo and Least Bell's Vireo during maintenance activities associated with the project.

3.4.4.1. Conservation Measure 13: Conduct surveys for Western Yellow-billed Cuckoo, Least Bell's Vireo, and migratory birds prior to construction and maintenance activities.

For construction and maintenance conducted between April 1 and August 31, a USFWS-approved biologist will conduct passive surveys within a minimum of 500 feet of proposed activities to determine the presence of cuckoos and vireos. Nesting surveys will be conducted in accordance with the recommended timing, methodology, and/or protocol for Western Yellow-billed Cuckoo, Least Bell's Vireo, and migratory birds, including but not limited to A Natural History Summary and Survey Protocol for the Western Yellow-billed Cuckoo Population (Halterman et al. 2015), and Least Bell's Vireo Survey Guidelines (United States Fish and Wildlife Service 2001). Surveys will also include a 0.25 mile radius outside the project area for other nesting migratory birds such as Swainson's Hawk (*Buteo swainsoni*), and a 500-foot radius outside of the project area for other nesting migratory birds. Surveys will be conducted within 14 days prior to the start of construction. If there is a break in construction of one week or more, surveys will be conducted prior to the re-initiation of construction. If birds or nests are located within this buffer, USFWS will be contacted for further guidance to ensure birds or nests are not disturbed.

3.4.4.2. Conservation Measure 14: Establish nest protection buffers for active bird nests.

If an active bird nest is located in the survey area, an appropriate nest protection buffer will be established by a qualified biologist based on the species, type of construction or maintenance activities, and line of sight to the work area. Under this measure, nesting birds and offspring would not be disturbed or killed, and nests and eggs would not be destroyed. Work will be conducted no less than 500 feet from an active raptor nest and 100 feet from an active migratory bird nest, though buffer distances for all nesting birds may differ based on consultation with CDFW and USFWS. To prevent encroachment, the established buffer(s) will be clearly marked by high-visibility material if it has been determined by the qualified biologist that high-visibility material would not attract predators to the nest site. No construction activities, including tree removal, will occur within the buffer zone until the young have fledged or the nest is no longer active, as confirmed by the qualified biologist.

3.4.4.3. Conservation Measure 15: Monitor active nests within nest protection buffer.

If construction or maintenance activities must occur within established buffer zones, a qualified biologist will establish monitoring measures, including frequency and duration, based on species, individual behavior, and type of construction activities. If birds are showing signs of distress within the established buffer(s), construction or maintenance activities will be modified or the buffer(s) will be expanded to prevent birds from abandoning their nest. At any time the biologist will have the authority to halt work if there are any signs of distress or disturbance that may lead to nest abandonment. Work will not resume until corrective measures have been taken or it is determined that continued activity would not adversely affect nest success.

3.4.4.4. Conservation Measure 16: Compensate for permanent loss of riparian habitat.

The permanent loss of riparian habitat will be compensated for by purchasing credits at a USFWS- and CDFW-approved conservation or mitigation bank at a 1:1 ratio (for every one acre of habitat lost one credit will be purchased) in compliance with CDFW Lake and Streambed Alteration (Fish and Game Code Section 1600-1603) requirements. The proposed action will result in the removal of approximately 1.18 acres of upland riparian habitat. Since the project design allows some riparian trees to be avoided, a

portion of the impacts will be mitigated before construction begins and the remainder will be mitigated after full impacts are known.

3.4.5. Green Sturgeon, Steelhead, and Chinook Salmon

Reclamation, DWR, or the construction contractor will implement Conservation Measures 17 through 21 to avoid and minimize effects on ESA-listed fish species during construction of the new fish passage structure and associated features and during construction activities at all agricultural road crossings. Reclamation, DWR, or the construction contractor will implement Conservation Measure 22 to avoid and minimize effects on ESA-listed fish species during project operation.

3.4.5.1. Conservation Measure 17: All in-water construction work will be preceded by a dewatering/fish rescue effort.

Reclamation and DWR will submit a dewatering and fish rescue plan to NMFS and CDFW for approval prior to construction. NMFS- and CDFW-approved fish biologists will conduct fish rescues in isolated pools and channels within the project area prior to pumping operations. At the agricultural road crossings, earthen dams may need to be installed to dewater the area. Fish relocation at these sites will be done downstream of the agricultural road crossings within suitable habitat in the Tule Canal. If dewatering is needed at the Fremont Weir, native fish species will be transported to the Sacramento River (roughly 400 feet away) and nonnative fish species will be transported to the deep pond. Fish will be collected using a fine-mesh beach seine to reduce the risk of gills becoming entangled in the beach seine. Small fish will be held temporary in aerated coolers with clean, locally-sourced water. Efforts will be made to keep densities low enough to reduce stress and to maintain suitable dissolved oxygen levels and water quality in the cooler. Fish will be shuttled to the nearest suitable habitat and released using water-to-water transfers. Large fish will be moved immediately after collection and transferred to suitable habitat via fish cradles.

After efforts have been made to remove as many fish as possible, pumps fitted with NMFS-approved fish screens will be used to further dewater the site (National Marine Fisheries Service 2011). The field crew will continue to monitor for and rescue fish as the water levels decrease and relocate fish to suitable habitat. In the event that groundwater infiltration continues to occur following a fish rescue and dewatering effort, pumps will remain operational to keep the project area dry. All ESA-listed fish species observed will be logged into a project database and reported to NMFS and CDFW.

3.4.5.2. Conservation Measure 18: Develop turbidity monitoring program for construction activities.

The Basin Plan for the Sacramento River and San Joaquin River basins (Fourth Edition) (Central Valley Regional Water Quality Control Board 2011) contains turbidity objectives. Specifically, the plan states that where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors will not cause downstream turbidity to exceed 2 NTUs; where natural turbidity is between 1 and 5 NTUs, increases will not exceed 1 NTU; where natural turbidity is between 5 and 50 NTUs, turbidity levels may not be elevated by 20 percent above ambient conditions; where ambient conditions are between 50 and 100 NTUs, conditions may not be increased by more than 10 NTUs; and where natural turbidity is greater than 100 NTUs, increases will not exceed 10 percent.

When water is flowing through the project area, Reclamation, DWR, or the construction contractor will

monitor turbidity approximately 500 feet downstream of construction activities to determine whether turbidity is being affected by construction. Grab samples will be collected at a downstream location that is representative of the flow near the construction site. If there is a visible sediment plume being created from construction, the sample will represent this plume. A sampling plan will be developed and implemented based on specific site conditions and in consultation with the Central Valley Regional Water Quality Control Board.

Silt fencing and turbidity curtains would be implemented where necessary. If turbidity limits exceed basin plan standards, construction-related earth-disturbing activities will slow to a point that would alleviate the problem. Reclamation and DWR will notify the regional water quality control board of the issue immediately and provide an explanation of the cause.

3.4.5.3. Conservation Measure 19: No construction will be done during a Fremont Weir overtopping event.

Though unlikely to occur during the May 1 through October 31 work window, work will be suspended in the event that a Fremont Weir overtopping is forecasted to occur, to reduce the likelihood of encountering ESA-listed fish species that may be drawn into the Yolo Bypass during an overtopping event. Based on water years 1996 to 2013, the probability of the Sacramento River exceeding the crest of Fremont Weir in May and June is 2.8% and 1.5%, respectively. The probability of the Sacramento River exceeding the crest of Fremont Weir from July through October is 0%.

3.4.5.4. Conservation Measure 20: Implement protective measures for work during non-daylight hours near ESA-listed fish habitat

If project activities must occur during non-daylight hours, a qualified biologist will establish monitoring measures, including frequency and duration, based on species, individual behavior, and type of construction activities. Juvenile salmonids are particularly active during low-light periods, where they move into shallow water to forage. Construction-related activities may impede their ability to forage during these times. When night work cannot be avoided, night lighting will be used only within the portion of the project actively being worked on (limited to a minimum distance of 200 feet from ESA-listed fish species habitat), and focused directly on the work area. Lights on work areas will be shielded and focused to minimize lighting of ESA-listed fish species habitat. If the work area is located near surface waters, the lighting will be shielded such that it does not shine directly into the water. If ESA-listed fish species are showing signs of distress or are attracted to the lighted areas, work activities will be modified to prevent ESA-listed fish species from altering their migration or feeding behavior. At any time, the biologist will have the authority to halt work if there are any signs of distress or disturbance that may lead to delayed migrations or increased predation. Work will not resume until corrective measures have been taken or it is determined that continued activity would not adversely affect ESA-listed fish species.

3.4.5.5. Conservation Measure 21: Compensate for permanent loss of shaded riverine aquatic habitat.

The permanent loss of riparian habitat, which may contribute shaded riverine aquatic habitat, will be compensated for by purchasing credits at a USFWS- and CDFW-approved conservation or mitigation bank in compliance with CDFW Lake and Streambed Alteration (Section 1600-1603) requirements. Since the project design allows some riparian trees to be avoided, a portion of the impacts will be mitigated

before construction begins and the remainder will be mitigated after full impacts are known. The mitigation ratio will be determined in coordination with NMFS, USACE, and CDFW during the permitting process.

3.4.5.6. Conservation Measure 22: Monitor for stranded ESA-listed fish species during operation of the fish passage structure.

Following all future overtopping events, an NMFS- and CDFW-approved fish biologist will survey the fish passage structure, the Upstream Channel, and Reach 1. Under an existing Section 10(a)(1)(A) permit, CDFW will conduct fish rescues for fish and will return fish to the Sacramento River (permit # 18181-3A). Potential stranding trouble spots will be noted. Additional earthwork will be performed at these sites in the event that post-construction monitoring indicates that stranding has increased as a direct result of project implementation.