

Solano HCP Compliance Monitoring Table

Project Design, Review, and Approval Avoidance and Minimization Measure Requirements for Riparian, Stream, and Freshwater Marsh Natural Community	Project Impact/ Applicable Condition	Applicant Proposed Mitigation	Proposal Complies With Measures or Not
RIPARIAN, STREAM, AND FRESHWATER MARSH NATURAL COMMUNITY: DESIGN, REVIEW, AND APPROVAL AVOIDANCE AND MINIMIZATION MEASURES IN SECTION 6.3.5.1			
<p>General Note for RSM Avoidance and Minimization Measures- The Riparian, Stream, and Freshwater Marsh Natural Community avoidance and minimization measures apply to all seasonal and perennial wetlands, aquatic, marsh, and riparian habitats in the Plan Area, excluding vernal pools and seasonal wetlands associated with the Valley Floor Grassland and Vernal Pool Natural Community and Coastal Marsh Natural Community. Avoidance and minimization measures associated with wetlands in these two communities are addressed under the respective Natural Community measures.</p> <p>RSM DES 1: Habitat Avoidance- Plan Participants (or third-party applicants) shall avoid activities that will result in the loss of riparian or stream habitat that meet any one of the following conditions:</p> <ol style="list-style-type: none"> 1. Riparian and stream habitats and habitats in associated buffer zones located in Priority Drainages and Watersheds (Figure 4-10) (see Measure RSM DES 2 for buffer zone description) 2. More than 300 feet of channel in first or second order streams lacking woody riparian vegetation 3. Second order streams with riparian vegetation 4. Third, fourth, and higher order streams in non-priority watersheds 5. Activities that will create a significant barrier to wildlife movement along the stream corridor and/or significantly affect hydrological connectivity 6. Within Covered Activity Zones 2 and 3 <p>If Plan Participants (or third-party applicants) are proposing to fill any portion of a stream or permanently remove riparian habitat in any of the conditions described above, they must provide documentation explaining why avoidance is not practicable and/or would not contribute to the conservation goals and objectives of the Solano HCP. The determination of compliance with RSM DES 1 for any proposed activity that would result in the loss of such habitat types shall be made by SCWA in consultation with the HCP Technical Review Committee (see Sections 10.2.6 and 10.4.1). In general, the level of documentation required for a project varies by the significance of the project. Activities involving perpendicular crossings for roads, utility lines, or other Covered Activities are preferable and will generally require less documentation than longitudinal impacts.</p> <p>Plan Participants (or third-party applicants) conducting routine O&M activities are exempt from the above-stated requirement, provided they comply with all applicable avoidance and minimization measures described under Section 6.3.5.2.</p>			
RSM DES 2: Sethacks and Buffer Zones- Native vegetated buffer zones shall be established between development and stream corridors to protect riparian and stream habitats in accordance with the following			

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standards:			
1. For infill ¹ projects buffer zone widths shall, at a minimum, correspond to existing buffer widths found in the existing adjacent developed areas or a minimum of 1.5 times the drip line of trees and shrubs at maturity, whichever is greater. To the maximum extent practicable, buffer zones shall be widened to accomplish all of the following: (a) restoration of historical riparian vegetation stands; (b) establishment of protected zones of riparian vegetation that are at least the width of four mature riparian tree canopies; and (c) incorporation of existing native perennial upland vegetation (e.g., native grassland, oak woodland, elderberry stands, and other native shrubs).			
2. For projects in the urban expansion areas along third or higher order streams and lower order streams that support riparian vegetation (Figure 6-1), buffer zones shall extend at least 100 feet from either: (a) the top of the bank, or (b) the outside edge of the existing riparian vegetation, whichever distance is greater.			
3. Development may encroach into the buffer zone required under Conditions 1 and 2 provided that offsets are provided elsewhere in the buffer zone. The offsets shall be situated in the remainder of the buffer zone and shall be equal or greater in size to the encroachment areas. Under no circumstances shall the total area of all encroachments exceed 25 percent of the total buffer zone area or length as specified in Condition 2.			
4. The outer edges of the buffer (not to exceed 25 percent of the buffer width along third or higher order streams and lower order streams that support riparian vegetation) may also be used for public access and passive recreation such as hiking, wildlife viewing, and bicycling. For avoided first and second order streams lacking riparian vegetation, public access is limited to no more than 5 percent of the outer edge of the buffer.			
5. For projects in the urban expansion areas along avoided first and second order streams lacking riparian vegetation (Figure 6-1), stream setbacks shall be at least 25 feet from the top of the bank.			
6. For those projects that involve reconstruction/restoration of channelized streams (including both widening of riparian corridors and reestablishment of watercourse meander patterns), setbacks shall be at least 50 feet from either: (a) the top of the bank, or (b) the edge of the restored riparian corridor, whichever distance is greater. Creating meanders from a straight watercourse will require a wide area that encompasses the meanders and the additional 50 feet buffer from the top of bank (of the edge of the meandering watercourse) or edge of riparian vegetation (of a non-meandering watercourse). This area should provide a sufficient buffer for the watercourse and can support other native upland communities such as grasslands and oak woodlands.			
7. Buffers shall be preserved in perpetuity and managed consistent with the reserve criteria described in Sections 7.3 and 10.5.2.			

¹ For the purposes of this measure, an infill project must be 5 ac or less in size and be between two contiguous adjacent developments bordering the stream channel (one upstream and one downstream).

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<p align="center">RIPARIAN, STREAM, AND FRESHWATER MARSH NATURAL COMMUNITY IMPLEMENTATION AND CONSTRUCTION AVOIDANCE AND MINIMIZATION MEASURES IN SECTION 6.3.5.2</p>			
<p>RSM CON 3: Riparian Tree Protection-</p> <ol style="list-style-type: none"> Where trees and/or riparian shrubs are present and will be preserved, ground disturbance shall avoid the drip line of the riparian trees and shrubs. Temporary construction fencing shall be placed at the edge of the work outside the edge of the tree drip lines. No construction work, storage of equipment or materials, or other disturbance shall be allowed in the protected areas. Excavation work within a distance of 1.5 times the radius of the drip line or within a 25 feet radius of the drip lines, whichever is greater, of native riparian trees shall be done with hand tools or with light mechanized equipment (e.g., mini or light excavator or backhoe) in order to minimize disturbance or damage to roots. An air spade or the equivalent shall be used to aerate and loosen any compacted soil in the structural root zone of protected trees to minimize physical injury to the tree roots. Branch or root pruning of native riparian trees, if required, shall be conducted under the supervision of a Certified Arborist. Equipment staging areas/storage areas shall not be located within a distance of 1.5 times the radius of the drip line or within a 25 feet radius of the drip line, whichever is greater, of native riparian trees. Fill, gravel, or other construction materials shall not be stockpiled in the drip lines of native riparian trees. 			
<p>RSM CON 4: Best Management Practices to be Implemented During O&M and Construction Activities-</p> <ol style="list-style-type: none"> Habitat Protection During Work Activities <ol style="list-style-type: none"> Removal of riparian vegetation to conduct O&M activities shall be limited to the minimum amount necessary to conduct such activities. Any such removal will require compensatory mitigation to reestablish riparian vegetation in accordance with Section 6.4.5. Exclusion fencing shall be installed prior to preconstruction surveys and maintained between project work areas and adjacent avoided habitat during all work activities. Exclusion fencing will consist of silt fabric, plywood, aluminum, or other SCWA-approved material at least 3 feet in height. The base of the fence will be buried in the ground to prevent animals from crawling under. The remainder of the fence will be left above ground to serve as a barrier for animals moving on the ground surface. Exclusion fences shall also include provisions (e.g., ramps, one-way doors, or exit funnels) for small mammal, reptile and amphibian species to leave the work area. The fence will be pulled taut at each support to prevent folds or snags. Construction personnel will also install an orange plastic-mesh construction fence 1 foot on the development side of the exclusion fence to increase visibility unless the exclusion fence is composed of highly visible materials. Exclusion fencing shall be inspected and repaired on a weekly basis during construction work. 			
<ol style="list-style-type: none"> Firebreak Construction and Maintenance <ol style="list-style-type: none"> To the maximum extent practicable, firebreaks shall be placed along the outer edge of riparian 			

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<p>vegetation (in accordance with the requirements of the general avoidance and minimization measures in Section 6.3.1), rather than within the riparian vegetation.</p> <p>b. If fuel breaks are needed in a stand of riparian woodland vegetation, the following measures shall apply to the maximum extent practicable²:</p> <ol style="list-style-type: none"> 1) Only understory vegetation and lower tree branches shall be removed in order to establish a minimum 8 feet vertical clearance between the lowest live branches and understory fuels. 2) All branches up to 3 inches in diameter may be pruned. For trees that are less than 24 feet tall, a maximum of one-third of the tree height may be pruned. 3) Trimming shall be done in a manner to encourage and maintain a closed canopy in all riparian woodlands so as to minimize understory growth. 			
<p>3. Dewatering Activities</p> <ol style="list-style-type: none"> a. Water drafting, pumping, or other water diversion shall be done in a manner that is not harmful to fish or other aquatic or semi-aquatic life. Pump inflow tubes or hoses shall be screened within a 0.5 mm mesh-screened cage to exclude aquatic wildlife that may otherwise be harmed in the process. b. Prior to dewatering, the Approved Biologist shall capture and relocate any native fish or other native vertebrate species found at the project site. Captured animals shall be relocated to another suitable waterbody preapproved by SCWA in consultation with the Resource Agencies; the water body shall be unaffected by the work or downstream of the work area. All nonnative invasive species shall be captured, removed from the project site, and humanely euthanized. c. All dewatering shall be pumped into a temporary siltation pond/desilting basin, Baker tank, or similar detention device in order to allow adequate time for settling of sediments prior to their release downstream in accordance with the approved SWPPP. d. Following adequate settling time, water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate. e. If cofferdams are used, turbid water pumped out of the dam shall not reenter the channel until the sediment has settled out to prevent any increase in turbidity in downstream waters. 			
<p>4. Work Timing</p> <ol style="list-style-type: none"> a. Construction work in riparian, stream, and freshwater marsh habitats shall be conducted between April 15 and October 15, except for streams and other water bodies in the California Red-Legged Frog and Giant Garter Snake Conservation Areas (Figures 4-14 and 4-18), in steelhead or Chinook salmon streams (Figure 4-17), or where more restrictive time frames to protect nesting birds and other Covered and Special Management Species may apply. 			

² These measures do not apply to elderberry trees and shrubs. See Avoidance and Minimization Measure RSM CON 6 for measures applicable to fuel breaks in the vicinity of elderberry.

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<p>5. Habitat Protection and Site Restoration</p> <ul style="list-style-type: none"> a. Disturbed areas shall be hydroseeded or stabilized using other erosion control measures prior to October 15. Hydroseed mixes used along and immediately above stream banks to stabilize disturbed areas shall not contain fertilizers or nonnative invasive species. When necessary, SCWA, in consultation with the HCP Technical Review Committee, may grant extensions of this deadline on a case-by-case basis. b. Streambed and bank construction work shall not create any physical barriers to fish migration such as artificial berms or a uniformly flat channel profile. c. Bank stabilization projects shall also incorporate bioengineering techniques and other measures to promote reestablishment of native vegetation (e.g., anchored rootwads or ballast bucket plantings in riprap). The use of hardscape such as rock riprap and floodwalls shall be minimized. d. All debris, sediment, rubbish, vegetation, or other material removed from the channel banks, channel bottom, or sediment basins shall be disposed of at an approved upland disposal site. e. Excess drainage from the construction site shall be routed away from riparian, stream, and freshwater marsh habitats. f. Any riprap placed such that it will encounter water shall incorporate large woody cover (logs), other applicable bioengineering techniques, and/or vegetation planting depending on the character of the surrounding (natural) stream banks. g. During construction, inspection of in-stream habitat and performance of sediment control devices shall occur at least once a day when there are surface waters in the channel to ensure devices are functioning properly. h. Where erosion control blankets are placed in riparian zones, plantings of native riparian trees and shrub species shall occur in small openings in the erosion control blanket. i. Plastic monofilament or wire mesh straw wattles or erosion control blankets shall not be used. Only erosion control materials (blankets, rolls, mats, etc.) with a minimum 2-inch square mesh made of natural coir fibers or other netting approved by SCWA in consultation with the HCP Technical Review Committee shall be used. 			
<p align="center">RIPARIAN, STREAM, AND FRESHWATER MARSH NATURAL COMMUNITY: COVERED SPECIES-SPECIFIC AVOIDANCE AND MINIMIZATION MEASURES IN SECTION 6.3.5.2</p>			
<p>RSM CON 5 for Salmonids- The following measure applies to all Covered Activities affecting the main stems and tributaries (e.g., headwaters to the bay) of the following stream systems that support or have the potential to support salmonids: Green Valley Creek, Suisun Creek, Ledgebrook Creek, Gordon Valley Creek, Lynch Canyon Creek (a.k.a. American Canyon), Jameson Canyon Creek, the Napa River, and Putah Creek (only for Chinook salmon) (Figure 4-17).</p> <p>1. In Covered Activity Zones 1 and 2 (Figure 1-4), in-stream work shall only be allowed from June 15 to October 31 during low-flow conditions.</p>			

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2. No fill material, including concrete, shall be allowed to enter any waterways. Concrete piers, footings, or other structures shall be poured in tightly sealed forms and shall not encounter surface waters until the cement has fully cured (at least 30 days). Commercial sealants may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is dry.			
3. Channel disturbance shall be minimized, and no material shall be left in the channel. If bridge footings are to be protected by riprap, the channel bottom elevation shall not be raised above the natural channel bottom.			
4. For bridge removal, no portions of the old structure shall be left in the channel; and where abutments are removed, no depressions shall remain. Depressions shall be filled with a 2- to 5-inch layer of clean, round, river rock cobble or gravel.			
5. Bridges and culverts shall be designed as full span and avoid impacts to channel hydraulics. Bridge and road design shall prevent discharge (such as culverts or bridge drains) of any untreated storm water runoff directly into any waterways.			
6. Construction BMPs and erosion control methods (including revegetation of bare soil prior to October 15, unless an extension is granted by the applicable Resource Agencies) shall be implemented to prevent an increase in sediment entering waterways.			
7. Construction sites shall be monitored to ensure no salmonids are present that could be harmed by construction activities. If salmonids are present, a qualified fishery biologist shall capture and relocate the fish in suitable habitat downstream of the work area.			
8. Materials used for column repairs shall be non-toxic to aquatic life.			
9. All equipment refueling and maintenance shall occur outside the creek channel, and appropriate measures shall be implemented to prevent the discharge of fuels or other contaminants into the stream in the event of spills.			
10. Water that contacts wet concrete and has a pH greater than 9 shall be pumped out and disposed of outside the creek channel.			
11. Cleaning activities in designated salmonid habitat (see Chapter 4.0; Figure 4-17) shall be conducted during an appropriate work window when salmonids are less likely to be present (e.g., June 15 through October 31).			
12. A qualified fishery biologist shall be present to monitor the site for the presence of salmonids and, if necessary, provide for their escape or capture and relocation.			
13. All seasonal or temporary diversion dams on known or suspected salmonid streams and their tributaries shall be removed by October 31 each year, unless extensions are granted by the CDFW and National Oceanic Atmospheric Association, National Marine Fisheries Service (NOAA NMFS).			
14. Operation of heavy construction equipment in stream channels with wetted areas shall be avoided.			
15. Large woody debris shall be relocated rather than removed from the stream channel in order to maintain habitat for steelhead and Chinook.			
16. A hydroacoustic impact analysis and monitoring plan shall be submitted to the SCWA and the			

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<p>Resource Agencies for all pile driving in aquatic habitats supporting steelhead or salmon for review and written approval. This plan will contain details regarding any limitations on which type of driver should be used (e.g., vibratory or impact driver), which size pile(s) to use, what level of hydroacoustic monitoring is required, whether a noise attenuation method such as a bubble curtain should be utilized to reduce underwater sound levels, as well as any seasonal restrictions on pile driving that may negatively affect specific fish species. The following general measures (based on 2015 interim guidelines by the Fisheries Hydroacoustic Working Group (FHWG) Caltrans 2015) that shall be implemented, as applicable include:</p> <ul style="list-style-type: none"> a. Both the vibratory hammer driver and impact hammer pile driver are subject to the performance standards as specified by the FHWG, the specifics in the hydroacoustic monitoring plan, and what is stated below. b. A vibratory driver shall be used to the greatest extent possible before the impact driver is utilized to reduce the impact to fish species in the area. c. Where practicable, at the beginning of each construction day pile driving shall be started at a lower decibel level to stimulate avoidance behavior in fish and allow the fish time to vacate the area (known as a soft start). Then the pile driving shall be ramped up (limiting the maximum noise level to Measure 16.e below) to complete the pile driving faster. The details of the soft start will be included in the hydroacoustic monitoring plan. d. Pile driving with an impact driver shall only occur during the seasonal in-water work window specified by NOAA NMFS for this region, which is from August 1 through November 30. This limitation is for general avoidance of potential impacts to fish species in this region. The proposed work window may be adjusted based on the USFWS programmatic consultation on delta smelt. Conducting work within the work window will minimize the possibility that work activities may impact fish species as listed fish species are less likely to utilize the Plan Area as a migratory corridor during this period. e. The following sound requirements apply to pile driving with an impact hammer: accumulated sound exposure levels (SELs) shall not exceed 187 decibels (dB) measured at 33 feet (equivalent to 10 meters) for all listed fish, except those that are 0.07 ounce (equivalent to 2 grams) or less (Caltrans 2015). Accumulated SELs for fish weighing 0.07 ounce or less shall not exceed 183 dB measured at 33 feet. In addition, the peak sound pressure level for any single strike is 206 dB re: 1 micro-Pascal (µPa) for all listed fish, except those that are 0.07 ounce or less. As a conservative measure, NOAA NMFS has also identified a behavioral disturbance threshold of 150 dB re: 1µPa Root-Mean-Square (RMS) pressure for salmonids and green sturgeon as appropriate, until new information and research indicates otherwise. According to the FHWG, there are no established injury criteria for vibratory hammer pile driving (Caltrans 2015). 			

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RSM CON 6 for Valley Elderberry Longhorn Beetle- The following measures apply to all Covered Activities that would entail ground-disturbing activities within 100 feet of elderberry plants:			
1. A minimum setback of 20 feet from the drip line of each elderberry plant shall be established between the development and all elderberry plants containing stems measuring 1 inch in diameter or greater at ground level, except where elderberry plants are established immediately along existing roads or other paved or graveled surfaces (e.g., sidewalks, bike/pedestrian paths, facility access roads).			
2. Where elderberry plants are established adjacent to existing roads and facilities, construction avoidance fencing shall be provided to protect the trunk and main stems of the plant.			
3. All contractors shall be briefed on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements. Work crews shall be instructed on the status of the valley elderberry longhorn beetle and the need to protect its elderberry host plant.			
4. Signs shall be placed every 50 feet along the edge of the buffer zone with the following information: <i>"This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Federal Endangered Species Act. Violators are subject to prosecution, fines, and imprisonment."</i> The signs shall be clearly readable from a distance of 20 feet and must be maintained for the duration of construction.			
5. Routine trimming of overgrown and overhanging elderberry shrubs that may pose a human safety threat along pathways, trails, bike paths, and roadways shall adhere to the following restrictions: <ul style="list-style-type: none"> a. Only branches and stems less than 1 inch in diameter may be trimmed or cut. b. Trimming may only occur between September 1 and March 14. Trimming is recommended from November through the first 2 weeks in February, when plants are dormant and have lost their leaves. c. Trimming shall not occur after the shrubs have leafed out (when adult valley elderberry longhorn beetles are likely to be active). d. Vegetation clearing within 5 feet of elderberry shrub stems shall be done by hand (pulling, clipping, etc.). 			
6. Following completion of construction work affecting the buffer zone, any damage done to the buffer zone shall be restored using native erosion control seed mixes and native riparian plant species, as appropriate.			
7. Any elderberry plants that cannot be avoided during construction shall be transplanted to other appropriate locations in the buffer zone, and other mitigation as specified in Section 6.4.5.2 shall be implemented.			
8. After construction, buffer zones must continue to be protected from adverse effects of the development project. Protection measures such as fencing and signage shall be included in the project plans and are subject to the approval of SCWA in consultation with the HCP Technical Review Committee.			
9. No insecticides, herbicides, fertilizers, or other chemicals that might harm the valley elderberry longhorn beetle or its host plant shall be used in the buffer areas or within 100 feet of any elderberry plant with one or more stems measuring 1 inch in diameter or greater at ground level.			

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10. Fire fuel breaks (disked land) may not be included within the 100 feet setback; however, vegetation in the setback may be cleared by mowing (e.g., mower, mechanical trimmers, and hand tools) to less than 2 inches in height. The mowing of grasses/ground cover in the buffer zone may occur from July through April to reduce fire hazards. No mowing shall occur within 5 feet of elderberry plant stems. Mowing must be done in a manner that avoids damaging plants (e.g., stripping away bark through careless use of mowing/trimming equipment).			
11. An Approved Biologist shall be retained to monitor implementation and compliance of all the above measures.			
<p>RSM CON 7 for Tricolored Blackbird- The following measures are for Covered Activities that are within 250 feet of suitable tricolored blackbird breeding habitat:</p> <p>1. During the breeding season (February 1 through August 31), an Approved Biologist shall conduct preconstruction surveys for all Covered Activities (including weed abatement/wildfire fuel reduction) in known or suitable nesting habitat areas no more than 15 days prior to scheduled work. Suitable nesting habitat includes any of the following: (a) dense vegetation near open water; (b) emergent marsh vegetation, especially cattails and tules; (c) thickets of willow, blackberry, wild rose, or thistles; (d) silage and other grain fields such as sorghum.</p> <p>Preconstruction surveys shall be conducted for each phase of development. If ground-disturbing activities are delayed or suspended for more than 15 days following completion of the preconstruction survey, an Approved Biologist shall resurvey the site and shall conduct a second follow-up survey at least 5 days prior to the start of construction activities.</p>			
<p>2. A minimum 250 feet buffer shall be established between work activities and any active nests. Construction buffers may be reduced under the following conditions:</p> <ul style="list-style-type: none"> a. A site-specific analysis prepared by an Approved Biologist indicates that construction activities would not adversely affect nesting birds. SCWA, in consultation with the HCP Technical Review Committee, must approve the analysis in writing before construction can proceed. b. Nesting birds do not exhibit significant adverse reaction to construction activities (e.g., changes in behavioral patterns, reactions to noise) based on sufficient monitoring (minimum of 3 consecutive days following construction initiation). Construction will stop if a significant adverse reaction is observed during any of the monitoring days and will only commence again with a 250 feet buffer once behavioral patterns return to preconstruction activities. c. Additional monitoring shall be required any time there is a change in heavy equipment use or activity that results in greater noise levels. A change in heavy equipment use or greater noise levels that may require additional monitoring will be determined by an Approved Biologist. d. Monitoring is continued at least once a week through the nesting cycle until the young have fledged and left the nest area. e. Monitoring reports are submitted to SCWA. 			

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3. The Approved Biologist has the authority to stop work at any time if signs of disturbance to the nesting colony are noted. If adverse effects are identified, construction activities shall cease immediately and construction shall not resume until SCWA and the Resource Agencies are consulted to determine if construction may continue under modified restrictions or shall be suspended until nesting activity is complete.			
4. Plan Participant and eligible third-party facilities and properties known to support tricolored blackbird breeding colonies shall retain at least 50 percent of originally available suitable nesting habitat for this species in the facility/property in any given year unless nesting has not occurred for a period of 5 consecutive years. If more than half the originally available nesting habitat is removed for more than one year, mitigation per RSM MIT 13 for permanent impacts shall be required.			
<p align="center">RIPARIAN, STREAM, AND FRESHWATER MARSH NATURAL COMMUNITY: MITIGATION MEASURES IN SECTION 6.4.5.1</p>			
<p>General Notes about Mitigation Requirements: These mitigation measures apply to all seasonal and perennial wetlands, aquatic, freshwater marsh, and riparian habitats in the Plan Area, excluding vernal pools and seasonal wetlands associated with the Valley Floor Grassland and Vernal Pool Natural Community and Coastal Marsh Natural Community. Not all riparian, stream, and freshwater marsh communities are mapped on Figures 3-5 and 4-10. Mitigation measures associated with wetlands in these two communities are addressed under the respective Natural Community measures. In general, mitigation for indirect impacts to habitat within the Riparian, Stream, and Freshwater Marsh Natural Community is not required provided that the project complies with Measure RSM DES 2.</p> <p>Habitat mitigation will vary depending on the type of impact (direct, indirect, or temporary) and the conservation value of the impacted area. Mitigation for temporary impacts associated with routine O&M activities shall include implementation of invasive species control programs and direct replacement of native vegetation. Restoration programs shall include measures to control and remove invasive species, replant native vegetation in existing riparian corridors and marshes, and, where possible, restore riparian corridor widths to historical margins to provide for natural stream behavior and flood regimes. In general, the preference for the following mitigation requirements is through on-site enhancement, creation, or restoration in open space areas. These open space areas shall have a minimum 100 feet wide buffer from either: (a) the top of the bank, or (b) the outside edge of the existing riparian vegetation, whichever distance is greater, the establishment of an endowment or other suitable funding source for long-term management of the mitigation habitat, and a conservation easement (see Section 10.5). Where on-site mitigation is not practicable, the purchase of credits at an approved mitigation bank or off-site mitigation site will be acceptable (except where on-site channel relocation/rerouting requirements for longitudinal fills are required).</p>			
<p>RSM MIT 1: Mitigation for Direct Impacts to Riparian, Stream, and Freshwater Marsh Habitat- Mitigation for direct impacts to Riparian, Stream, and Freshwater Marsh habitat associated with riverine systems in the Plan Area shall be provided through restoration of in-kind habitat. Restoration of riparian habitat or creation of new habitat must occur either on site, at an approved mitigation bank, or at another</p>			

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<p>high-quality site, which must be capable of supporting similar quality and species as the impacted site. All Riparian Restoration Plans (see Section 10.5.4) shall be reviewed and approved by the SCWA in consultation with the HCP Technical Review Committee. Plan Participants shall direct restoration and enhancement activities toward severely degraded stream segments in Priority Drainages and Watersheds (Figure 4-10). Basic mitigation requirements are based on impact area, vegetation replacement, and designated conservation values of the Riparian, Stream, and Freshwater Marsh habitat as assessed in Section 4.3.6.3.</p> <p>1. Vegetation. All native, woody vegetation greater than 1 inch in diameter shall be replaced by planting native woody vegetation at the minimum ratios and performance standards:</p>						
Vegetation Replacement Size (inches)	Native Species (except Oaks and Elderberry)	Oak Species	Nonnative Species			
Priority Drainages						
<12	3:1	5:1	1:1			
12–24	6:1	7:1	2:1			
>24	10:1	12:1	3:1			
Non-Priority Drainages						
<12	3:1	5:1	1:1			
12–24	4:1	7:1	1.5:1			
>24	6:1	12:1	3:1			
<p>NOTE: Performance Criteria – The number of native riparian plants that become established at the end of the 5 year monitoring period shall equal a minimum of 80 percent of total required plantings. Established plants may include natural regeneration and volunteer plants.</p> <p>¹ Trees shall be measured at diameter at breast height (dbh); multiple trunked trees shall be reported as the cumulative total of all trunks. Shrubs shall be measured at the midpoint of the main trunk (the ground and the first major branch).</p> <p>² Elderberry replacement ratios and other associated mitigation requirements are prescribed in Measure RSM MIT 12. Tree and shrub replacement requirements under this mitigation measure may be used to fulfill all or contribute to the associated native woody riparian vegetation requirements prescribed under Measure RSM MIT 12.</p> <p>³ Due to slow growth rates, oak species require higher replacement ratios. If acorns are used instead of seedlings (at least 1 year old), planting ratios shall be doubled.</p> <p>⁴ The 5-year monitoring period for documenting successful establishment may be extended if the mitigation is not performing adequately. At a minimum, the determination of success monitoring shall require at least 2 years without significant intervention (e.g., additional plantings or irrigation). Vegetation may need to be planted at higher ratios, depending on site conditions, in order to account for mortality of planted material.</p>						
The goal of the riparian vegetation replacement is to contribute to the establishment of a multi-story riparian community with a variety of native riparian species appropriate for the mitigation site. Plantings						

Project Design, Review, and Approval Avoidance and Minimization Measure Requirements for Riparian, Stream, and Freshwater Marsh Natural Community					Project Impact/ Applicable Condition	Applicant Proposed Mitigation	Proposal Complies With Measures or Not
are not required to directly replace impacts on a species-by-species basis.							
2. Area. Riparian and channel mitigation shall also achieve the following area criteria based on whether the mitigation is achieved through enhancement (e.g., supplemental planting of existing riparian habitats) or through establishment of new channel and woody riparian habitats (e.g., existing or created channel lacking native woody riparian vegetation):							
	Priority Drainages		Non-Priority Drainages				
	Enhancement	Created/Restored	Enhancement	Created/Restored			
Area Ratios	4:1	2:1	3:1	2:1			
3. Hydrological and Biological Connectivity- Mitigation for direct impacts to third and higher order streams and second order streams with riparian vegetation shall maintain the hydrologic and biological connectivity between downstream and upstream areas. Facilities such as bridges, culverts, outfalls, and grade control structures shall not create cumulative gaps in the channel or riparian corridor greater than 100 feet in length than conditions at the time of the adoption of the HCP. Bypass or rerouted channels shall be constructed where necessary to replace impacted habitats and to limit gaps between existing riparian habitats.							
Note: The intent of requiring mitigation for removal of nonnative trees and shrubs is to protect riparian habitat. It is not intended to require mitigation for the removal of nonnative trees or shrubs as a part of riparian restoration or enhancement projects. Measure RSM MIT 1 does not apply to the undergrounding or lining of irrigation supply ditches for water conservation purposes. However, conversion or loss of ditches subject to Section 404 of the Clean Water Act for urban development or other Zone 1 or 2 Covered Activities would be subject to the mitigation requirements.							
RSM MIT 2: Mitigation for the Loss or Fill of Ponds, Freshwater Marsh Habitat, and Channels-Direct Impacts: Mitigation for direct impacts to ponds, freshwater marsh habitat, and channels shall be provided at a 2:1 ratio for non-priority drainages and at a 3:1 ratio for priority drainages. This mitigation may be achieved by creating/restoring on-site open space areas with a minimum 100-foot-wide buffer, establishing an endowment or other suitable funding source for long-term management of the mitigation habitat, or purchasing credits at an approved mitigation bank.							
Indirect Impacts: No mitigation is required for indirect impacts to ponds, freshwater marsh habitat, and channels provided that the project complies with RSM DES 2.							
RSM MIT 3: Mitigation for the Loss or Fill of Seasonal Wetlands-Direct Impacts: Mitigation for direct impacts to seasonal wetlands in the Plan Area shall be provided at a 2:1 ratio .							
Indirect Impacts: Mitigation for indirect impacts to seasonal wetlands in the Plan Area within 100 feet of seasonal wetlands shall be provided at a 1:1 ratio .							
RSM MIT 4: Mitigation for Temporary Impacts to Riparian, Stream, and Freshwater Marsh							

Project Design, Review, and Approval Avoidance and Minimization Measure Requirements for Riparian, Stream, and Freshwater Marsh Natural Community	Project Impact/ Applicable Condition	Applicant Proposed Mitigation	Proposal Complies With Measures or Not
<p>Habitat- Temporary impacts (i.e., typically where project activities result in the removal of vegetation, except woody riparian vegetation, lasting no more than one growing season) associated with ordinary channel O&M activities conducted by Plan Participants, or construction/installation of permanent features (e.g., outfalls, bridges, utility lines), except in designated giant garter snake habitat areas (see Section 6.4.6), shall comply with the following conditions:</p> <ol style="list-style-type: none"> 1. Implement appropriate erosion control measures, including reseeded disturbed soils with an appropriate seed mix, for all disturbed areas above the waterbody's ordinary high water mark consistent with general avoidance and minimization measures (Section 6.3.1). 2. Conduct all work associated with ordinary channel O&M activities in compliance with general avoidance and minimization measures (Section 6.3.1). 3. Implement BMPs consistent with Measure RSM CON 4 (Section 6.3.5.2) for all work associated with new development projects. 4. Replace all native, woody riparian vegetation greater than 1 inch in diameter consistent with the replacement mitigation ratios specified in RSM MIT 1. 5. Restore channel or bank disturbance to original conditions at a 1:1 ratio. <p>Note: The above measure does not apply to O&M of constructed irrigation supply ditches associated with ongoing agricultural activities.</p>			
<p>RSM MIT 5: Base Flow- New developments shall not result in any increase in the base flood elevation. "Base flood" means a flood with a 1 percent chance of being equaled or exceeded in any given year (also called the "100-Year Flood").</p>			
<p>RSM MIT 6: Development in Watersheds of Priority Drainages- In Priority Drainages and Watersheds (Figure 4-10), new urban development projects more than 10 acres in size shall detain water for a minimum of 12 to 24 hours for discharges that exceed pre-project level, 2-year recurrence, and 24-hour storm event discharges. All flood control and water quality basins in Priority Drainages and Watersheds shall be designed to minimize the establishment and expansion of nonnative species such as bullfrog and warm water fish consistent with RSM MIT 8.</p>			
<p>RSM MIT 7: Restoring Naturalized Channel Processes- New urban development projects bordering Priority Drainages (Figure 4-10) shall restore and expand riparian habitat along existing stream and flood channels to allow more naturalized channel processes to occur and riparian vegetation to establish. Channel design standards shall include establishing a two-stage floodplain corridor that allows natural channel meander patterns to develop while still providing for riparian habitat restoration and protection, and adequate capacity to meet flood control requirements.</p>			
<p>RSM MIT 8: Prevent the "Perennialization" of Ponds and Intermittent Creeks- Development activities shall not establish perennial ponds and small lakes, and urban runoff shall be controlled to prevent "perennialization" of intermittent creeks in the Inner Coast Range Natural Community and California Red-Legged Frog Conservation Area.</p>			

Project Design, Review, and Approval Avoidance and Minimization Measure Requirements for Riparian, Stream, and Freshwater Marsh Natural Community	Project Impact/ Applicable Condition	Applicant Proposed Mitigation	Proposal Complies With Measures or Not
<p>RSM MIT 9: Storm Water Discharge- Municipal Plan Participants shall require all new development and redevelopment projects that will increase directly connected impervious area (DCIA) to filter, retain, detain, or infiltrate storm water prior to discharge consistent with National Pollutant Discharge Elimination System (NPDES) permit requirements established by the Regional Water Quality Control Board (RWQCB). Such developments shall be required to implement storm water management plans to adequately treat urban runoff prior to discharge into wetlands, streams, rivers, ponds, or other local water bodies or into municipal storm systems that discharge to aquatic habitats. Minimum design standards for structural or treatment control storm water runoff shall be determined by one of the following methods:</p> <p>1. Volumetric Treatment Control BMPs (e.g., water quality ponds, treatment wetlands)</p> <p>a. Treat runoff up to and including the 85th percentile, 24-hour runoff event determined as the maximum capture of storm water volume for a specific jurisdiction, according to the formula recommended in <i>Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87</i> (or most current update); or</p>			
<p>b. Treat runoff up to and including the annual runoff volume based on a unit basin storage water quality volume, by the method recommended in <i>California Stormwater Best Management Practices Handbook – Industrial Commercial</i> (CASQA 2004) to achieve 80 percent or more volume treatment; or</p>			
<p>c. Treat runoff up to and including the runoff volume produced from a 0.75-inch storm event, prior to its discharge to a storm water conveyance system; or</p>			
<p>d. Treat runoff up to and including the runoff volume produced from a historical record-based reference, 24-hour criterion for “treatment” that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile, 24-hour runoff event; or</p>			
<p>e. Treat runoff up to and including the flow of runoff produced by a rain event of at least 0.2 inch per hour; or</p>			
<p>f. Treat runoff up to and including the flow of runoff produced by a rain event of at least twice the 85th percentile hourly rainfall intensity for the applicable Plan Participant jurisdiction; or</p>			
<p>g. Treat runoff up to and including the flow of runoff produced by a rain event resulting in the treatment of an equivalent portion of runoff as treated by the volumetric standards above.</p>			
<p>The water quality protection measures are adapted from the SWRCB Phase II NPDES general storm water permit standards and contribute to maintaining and improving the chemical, physical, and biological integrity of waters in the Plan Area. All storm water-related mitigation measures shall conform to NPDES permit requirements in place at the time of a project’s approval when such permit requirements exceed the minimum standards presented in the HCP (e.g., the more protective standards shall apply).</p>			

Project Design, Review, and Approval Avoidance and Minimization Measure Requirements for Riparian, Stream, and Freshwater Marsh Natural Community	Project Impact/ Applicable Condition	Applicant Proposed Mitigation	Proposal Complies With Measures or Not
<p>RSM MIT 10: Invasive Species, Water Quality Control, Species Introductions, and Barrier Removal Enhancement Program- All development projects that create new or increase impervious surfaces shall provide funding to contribute toward a grant funding program (see Chapter 5.0 Objectives RSM 2.1, GGS 1.1, and CM 1.1) to implement cost-share programs to control invasive species, implement additional water quality control measures, establish new populations/occurrences of Covered Species, and remove in-stream barriers. Costs shall be based on a per-acre basis of new or increased impervious surface.</p> <p>Note: RSM MIT 10 is intended to contribute to mitigation for unavoidable, cumulative adverse effects of increased urban development runoff on downstream receiving waters and associated Covered Species.</p>			
<p align="center">RIPARIAN, STREAM, AND FRESHWATER MARSH NATURAL COMMUNITY: COVERED SPECIES-SPECIFIC MITIGATION MEASURES IN SECTION 6.4.5.2</p>			
<p>RSM MIT 11: New Stream Crossings- New crossings in streams that are known to, or have the potential to, support salmonids (i.e., the main stems and tributaries to Lynch Canyon, Jameson Canyon, Ledgewood, Green Valley, Gordon Valley and Suisun creeks, and the Napa River) shall adhere to the guidelines developed by NOAA NMFS and CDFW for safe passage of salmonids. Note: The following alternatives and structure types shall be considered in order of preference:</p>			
1. Nothing: Realign the road to avoid crossing the stream,			
2. Bridge: Span the stream to allow for long-term dynamic channel stability,			
3. Streambed Simulation Strategies: Implement a bottomless arch, embedded culvert design, or ford,			
4. Non-Embedded Culvert: Utilize a non-embedded culvert or hydraulic design for limited to low slopes,			
5. Baffled Culvert or Structure Designed with a Fishway: Utilize a baffled culvert or similar facility for steeper slopes.			
If a crossing is proposed in a known salmonid spawning area, only full-span bridges or culverts that provide natural streambed substrates are acceptable.			
<p>RSM MIT 12: Elderberry Shrub Mitigation for Valley Elderberry Longhorn Beetle- Where removal of elderberry shrubs or their stems measuring 1 inch in diameter or greater is unavoidable, these impacts shall be mitigated. Removal of elderberry shrubs or stems 1 inch in diameter or greater and associated riparian vegetation shall not create cumulative gaps in a riparian corridor greater than 100 feet in length than conditions at the time of the adoption of the HCP. Mitigation will include salvaging and replanting affected elderberry shrubs and planting additional elderberry shrubs and associated native riparian plants according to the following criteria:</p>			
1. Transplanting Removed Elderberry Shrubs. Transplant removed elderberry shrubs to an approved, secure site, such as an approved mitigation bank location in Solano County or non-bank relocation site to be approved by SCWA. All non-bank relocation sites shall meet the minimum reserve standards identified in Section 10.5 (e.g., site shall be protected by a conservation easement or other applicable			

Project Design, Review, and Approval Avoidance and Minimization Measure Requirements for Riparian, Stream, and Freshwater Marsh Natural Community	Project Impact/ Applicable Condition	Applicant Proposed Mitigation	Proposal Complies With Measures or Not																									
protection measure, and funding shall be provided for long-term monitoring and maintenance). Transplanting shall occur between June 15 and March 15 (November through February is the optimal period for transplanting). Elderberry may not be transplanted between March 16 and June 14 except where isolated bushes are located more than 0.5 mile from other suitable valley elderberry longhorn beetle habitat and no signs of use (exit holes) have been identified.																												
2. Mitigation for Whole Shrub Removal. For each removed elderberry bush, plant a minimum of five elderberry seedlings or rooted cuttings and five associated native, woody riparian plants in the mitigation area, or purchase applicable credits from a mitigation bank approved under the Solano HCP to sell valley elderberry longhorn beetle credits.																												
3. Mitigation for Trimming/Removal of Stems 1 Inch in Diameter or Greater. Trimming/removal of elderberry stems 1 inch in diameter or greater shall be mitigated by planting elderberry seedlings and associated native plant species at the following ratios based on stem size and presence of valley elderberry longhorn beetle exit holes: <table> <tr> <th>Elderberry Stem Size</th><th>Exit Holes on Shrub (Y/N)</th><th>Elderberry Seedling Ratio</th><th>Associated Native Plant Ratio</th></tr> <tr> <td rowspan="2">Stems ≥ 1" & ≤ 3"</td><td>No:</td><td>2:1</td><td>1:1</td></tr> <tr> <td>Yes:</td><td>4:1</td><td>2:1</td></tr> <tr> <td rowspan="2">Stems ≥ 3" & ≤ 5"</td><td>No:</td><td>3:1</td><td>1:1</td></tr> <tr> <td>Yes:</td><td>6:1</td><td>2:1</td></tr> <tr> <td rowspan="2">Stems > 5"</td><td>No:</td><td>4:1</td><td>1:1</td></tr> <tr> <td>Yes:</td><td>8:1</td><td>2:1</td></tr> </table>	Elderberry Stem Size	Exit Holes on Shrub (Y/N)	Elderberry Seedling Ratio	Associated Native Plant Ratio	Stems ≥ 1" & ≤ 3"	No:	2:1	1:1	Yes:	4:1	2:1	Stems ≥ 3" & ≤ 5"	No:	3:1	1:1	Yes:	6:1	2:1	Stems > 5"	No:	4:1	1:1	Yes:	8:1	2:1			
Elderberry Stem Size	Exit Holes on Shrub (Y/N)	Elderberry Seedling Ratio	Associated Native Plant Ratio																									
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	Yes:	4:1	2:1																									
Stems ≥ 3" & ≤ 5"	No:	3:1	1:1																									
	Yes:	6:1	2:1																									
Stems > 5"	No:	4:1	1:1																									
	Yes:	8:1	2:1																									
Mitigation plantings shall occur, to the maximum extent practicable, in areas adjacent to the impact area and/or in existing gaps in riparian corridors. Priority areas for riparian revegetation and planting of elderberry include Alamo, Ulati, and Putah creeks in order to expand suitable habitat for the valley elderberry longhorn beetle in the Plan Area. The requirements for associated native, woody riparian plant establishment may be fulfilled in combination with the woody riparian vegetation replacement requirements prescribed under RSM MIT 1.																												
RSM MIT 13: Direct Loss or Conversion of Tricolored Blackbird Foraging Habitat- Mitigation for the direct disturbance, destruction, or conversion of tricolored blackbird foraging habitat ³ for urban development or other permanent facilities shall be provided at a 1:1 ratio . Sites that have been occupied at any time during the past 5 years will be considered occupied by tricolored blackbirds and will require additional nesting habitat mitigation including funding for protection of the existing tricolored blackbird colonies (Section 11.1.5). All foraging habitat affected either directly or indirectly by the project will be subject to the compensation requirement. Mitigation lands used to satisfy mitigation measures for other Natural Communities and/or Covered Species (i.e., Valley Floor Grassland and Vernal Pool Natural																												

³ Tricolored blackbird foraging habitat consists of the following: grain/hay crops, row crops and other irrigated agriculture, valley floor/vernal pool grassland, grassland and oak savanna within the Inner Coast Range, pasture, vacant or fallow fields, diked historical tidal wetlands within the Coastal Marsh Natural Community, and riparian habitat within the Riparian, Stream, and Freshwater Marsh Natural Community.

Project Design, Review, and Approval Avoidance and Minimization Measure Requirements for Riparian, Stream, and Freshwater Marsh Natural Community	Project Impact/ Applicable Condition	Applicant Proposed Mitigation	Proposal Complies With Measures or Not
<p>Community [excluding the wetland restoration/construction component] Coastal Marsh Natural Community, Swainson's hawk, California red-legged frog, and Callippe silverspot butterfly) can be used to satisfy tricolored blackbird conservation if the reserve area meets the basic reserve management standards (Sections 7.3 and 10.5.3) and criteria specified in Objective RSM 1.2 (Section 5.6.1).</p> <p>Exemption: In-fill projects on small, in-fill lots (which are not part of undeveloped lands greater than 5 acres of contiguous habitat) and which are bordered by contiguous urban development (based on conditions at the time the HCP is adopted) would have minimal effects on the extent and quality of tricolored blackbird habitat and are exempt from foraging habitat mitigation requirements. Nonetheless, project proponents are obligated to avoid destruction of active tricolored blackbird nest colonies and take of tricolored blackbirds in compliance with the Federal Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5 and to meet the requirements specified in RSM CON 7.</p>			
<p>RSM MIT 13- Temporary Impacts: Temporary impacts associated with Covered Activities affecting tricolored blackbird foraging habitat shall not require direct compensation provided activities comply with RSM CON 7, and all temporarily disturbed habitats shall be restored to original conditions within 1 year at a minimum 1:1 ratio.</p>			

BA = Biological Assessment
CDFW = California Department of Fish and Wildlife
DPS = Distinct Population Segment
HCP = Habitat Conservation Plan
MPWD = Maine Prairie Water District
NPDES = National Pollutant Discharge Elimination System
RD 2068 = Reclamation District 2068
RWQCB = Regional Water Quality Control Board
SID = Solano Irrigation District
USFWS = United States Fish and Wildlife Service

BMP = Best Management Practices
Dixon RCD = Dixon Resource Conservation District
ESU = Evolutionarily Significant Unit
MMP = Mitigation and Monitoring Plan
NOAA NMFS = National Oceanic Atmospheric Association National Marine Fisheries Service
O&M = Operation and Maintenance
RSM = Riparian, Stream, and Freshwater Marsh
SCWA = Solano County Water Agency
SWPPP = Storm Water Pollution Prevention Plan