Note: *The following is Section 4.0 disaggregated from Handout#1 discussed at the May 29, 2009 Terrestrial Subgroup meeting.*

4.0 Avoidance and Minimization Measures

AMM1: Avoid and minimize impacts on vernal pool, vernal swale, alkali meadow, and alkali sink habitats, including their watersheds. [*To come*]

AMM2: Avoid and minimize impacts on riparian communities. [*To come*]

AMM3: Conduct preconstruction surveys and avoid mortality of riparian brush rabbit. Assess habitat suitability for riparian brush rabbit and if habitat is considered potentially occupied conduct protocol surveys according to the USFWS Draft Habitat Assessment Guidelines and Survey Protocol for the Riparian Brush Rabbit and the Riparian Woodrat or the most current guidelines at the time of implementation of covered activities. If occupied riparian brush rabbit is present along construction corridors, avoid mortality ~~and minimize impacts on individuals~~ by 1) reducing the corridor width to avoid occupied riparian habitat,~~where it crosses the occupied riparian corridor to the extent practicable to minimize disturbance to occupied habitat,~~ 2) if feasible, consider tunneling beneath the occupied riparian corridor, and 3) if appropriate, coordinate with the USFWS to develop a trapping and relocation program. All trapped animals will be relocated to approved sites prior to construction activities. If occupied riparian brush rabbit is present within proposed habitat restoration sites, avoid mortality and minimize impacts on individuals by 1) selecting alternative unoccupied restoration sites; or 2) designing the habitat restoration to avoid direct impacts on individuals, ~~and~~ minimize impacts on riparian brush rabbit habitat, and include brush rabbit habitat in the restoration project design.
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AMM4: Conduct pre-construction surveys and avoid ~~and minimize impacts~~mortality ~~on~~of salt marsh harvest mouse. Conduct surveys to identify salt marsh harvest mouse habitat present in potential BDCP habitat restoration sites in Suisun Marsh. Conduct surveys of identified habitat areas (if present) using USFWS and DFG approved protocols before implementing BDCP actions that could result in mortality of salt marsh harvest mouse. If salt marsh harvest mouse is present, avoid mortality and minimize impacts on individuals by 1) selecting alternative unoccupied restoration sites; 2) designing the habitat restoration to avoid the potential for mortality of salt marsh harvest mouse as a result of habitat restoration activities; or remove salt marsh harvest mice from locations that could be affected by habitat restoration activities using DFG approved methods.

AMM5: Conduct preconstruction surveys and avoid mortality of greater sandhill cranes. Conduct pre-construction surveys during late-October/early-November of each construction year within the identified greater sandhill crane winter use area to determine

occupied winter roosting and foraging use areas within 0.5 miles of the project footprint limits~~roject center line~~. Create a 0.5 mile no-disturbance buffer around each identified roost area and restrict activity in the buffer based on crane use patterns of the roost while the site is occupied during the winter season (approximately October 15 through February 28).

AMM6: Conduct pre-construction surveys and avoid mortality of California black rail and California clapper rail. Conduct surveys to identify California black rail and California clapper rail habitat present in areas that could be impacted by implementation of BDCP covered activities and conservation measures. Conduct surveys of identified habitat areas (if present) using USFWS and DFG approved protocols before implementing BDCP actions that could result in mortality of black rails or clapper rails. If California black rail or California clapper rails are present, avoid mortality and minimize impacts on individuals by ~~1) selecting alternative unoccupied restoration sites; 2) designing the habitat restoration to avoid and minimize impacts on clapper rail habitat and to avoid disturbance to breeding birds; or 3)~~ restricting restoration activities to the non-breeding season (approximately August through February).

AMM7: Conduct pre-construction surveys and avoid and minimize impacts on tricolored blackbird. Conduct pre-construction surveys of potentially-occupied breeding habitat within 0.25 miles from BDCP ~~the~~ project footprint limits (covered activities and habitat restoration projects)~~and proposed restoration sites~~. Pre-construction surveys ~~are~~ will be conducted during the breeding season prior to project activity, and during the construction year. If an active tricolored blackbird colony is present within the construction right of way, avoid mortality and minimize impacts by creating a __-~~mile~~ foot no-disturbance buffer around each active colony and allow no entry of any kind into the buffer while the colony site is occupied during the breeding season (approximately mid-March through mid-August). Entry into the buffer is granted when a qualified biologist, with concurrence from USFWS~~/~~ and DFG, determines that healthy young have fledged and nest sites are no longer active. ~~If an active tricolored blackbird colony is present within proposed restoration sites, avoid mortality and minimize impacts by 1) selecting alternative unoccupied restoration sites; or 2) designing the habitat restoration to avoid the disturbance to the active colony.~~

AMM8: Conduct pre-construction surveys and avoid and minimize impacts on yellow-breasted chat. Conduct pre-construction surveys of potentially-occupied breeding habitat within 0.25 miles from the project footprint limit (covered activities and habitat restoration projects). Pre-construction surveys ~~are~~ will be conducted during the breeding season prior to project activity, and during the construction year. If an active yellow-breasted chat nest is present within a BDCP project site ~~the construction right of way~~, avoid mortality and minimize impacts by creating a __-~~mile~~ foot no-disturbance buffer around the nest site and allow no entry of any kind into the buffer while the site is occupied during the breeding season (approximately early April through late-August). Entry into the buffer is granted when a qualified biologist, with concurrence from USFWS~~/~~ and DFG, determines that healthy young have fledged and nest sites are no longer active. ~~If an active yellow-breasted chat nest is present within proposed~~

~~restoration sites, avoid mortality and minimize impacts by 1) selecting alternative unoccupied restoration sites; or 2) designing the habitat restoration to avoid the disturbance to the active nest.~~

AMM9: Conduct preconstruction surveys and avoid and minimize impacts on nesting and wintering burrowing owls. Conduct pre-construction surveys of ~~potentially occupied~~suitable breeding and wintering habitat within __ feet of the project footprint limit~~center line~~ (covered activities and habitat restoration projects)~~and within __ feet of planned restoration sites~~. Pre-construction surveys are conducted during the breeding or wintering season prior to project activity, and during the construction year. Create a __-foot no-disturbance buffer around each occupied breeding burrow and allow no entry of any kind into the buffer while the site is occupied during the breeding season (approximately March through August). The buffer can be reduced through consultation with a qualified biologist and with concurrence from USFWS~~/~~ and DFG based on line-of-sight, topography, land uses, type of disturbance, and other issues. Entry into the buffer is granted when a qualified biologist, with concurrence from USFWS~~/~~ and DFG, determines that healthy young have fledged, are capable of independent survival, and nest sites are no longer active. Avoid disturbances to winter burrows by creating a __-foot no-disturbance buffer around each occupied wintering burrow and allow no entry of any kind into the buffer while the site is occupied during the winter season (approximately September through February). The buffer can be reduced through consultation with a qualified biologist and with concurrence from USFWS~~/~~ and DFG based on line-of-sight, topography, land uses, type of disturbance, monitoring of the site to evaluate reaction to disturbances, and other issues. If direct impacts to active winter burrows cannot be avoided and the site is also used for breeding, implement standard DFG guidelines for passive relocation by installing one-way doors on active winter burrows (see Appendix X).

AMM10: Conduct preconstruction surveys and avoid and minimize impacts on nesting Swainson's hawks. Conduct pre-construction surveys of potentially-occupied breeding habitat within 0.5 miles from the project footprint limits (covered activities and habitat restoration projects) ~~and within 0.5 miles of planned restoration sites~~ to locate active Swainson's hawk nest sites. Pre-construction surveys ~~are~~ will be conducted during the breeding season (March 15 to September 1), prior to project activity, and during the planned construction year. Create a 0.25 mile no-disturbance buffer around each active nest and allow no entry of any kind into the buffer while the site is occupied during the breeding season. The buffer can be reduced through consultation with a qualified biologist and with concurrence from USFWS~~/~~ and DFG based on line-of-sight, topography, land uses, type of disturbance, ambient noise and disturbance levels, and other issues. Entry into the buffer is granted when a qualified biologist, with concurrence from USFWS~~/~~ and DFG, determines that healthy young have fledged, capable of independent survival, and nest sites are no longer active. If nest tree removal is necessary, tree removal will occur only during the non-breeding season (September through February).

AMM11: Conduct pre-construction surveys and avoid and minimize impacts on giant garter snake. Assess suitability of habitat for giant garter snake within the project sites and rights-of-way and adjacent lands according to current agency guidance. Avoid and minimize impacts on giant garter snake by implementing measures approved by USFWS to avoid and minimize impacts.
~~right-of-way and adjacent lands and in proposed conservation sites according to current agency guidance. Avoid/minimize potential impacts to giant garter snake by implementing standard USFWS avoidance and minimization measures that are current at the time BDCP actions are implemented.~~

AMM12: Conduct pre-construction surveys and avoid ~~or~~ and minimize impacts on western spadefoot toad. Identify ~~potentially occupied~~suitable aquatic habitat (vernal pools, ponds, pools along intermittent streams) for spadefoot within 0.25 miles of the project footprint limits. Conduct pre-construction surveys of ~~potentially occupied~~suitable aquatic habitat within 0.25 miles of the project center line using standard and approved survey protocols. Avoid disturbance to occupied sites within or near the ~~ROW~~ project footprint to the extent feasible and minimize the loss of occupied and potentially occupied seasonal pool and grassland vegetation through adjustments in project design, as practicable. Capture and ~~ROW boundaries (e.g., narrow the right-way-way corridor to avoid direct disturbance to the habitat). R~~relocate individuals found within the construction ~~ROW~~ footpring to receiving habitat approved ~~locations~~by USFWS and DFG.

AMM13: Conduct pre-construction surveys and avoid and minimize impacts on valley elderberry longhorn beetle. Conduct preconstruction surveys for elderberry shrubs within the project footprint and within 200 feet of the project footprint limits. Document shrub and habitat conditions according to USFWS conservation guidelines ~~current at the time BDCP actions are implemented~~(see Appendix X). Avoid disturbance to elderberry shrubs large enough to support beetle habitat within or near the ~~ROW~~ project footprint to the extent ~~feasible~~ practicable through adjustments in ~~ROW~~ project design~~boundaries (e.g., narrow the right-way-way corridor to avoid direct disturbance to the habitat)~~.

Note: *the following avoidance and minimization measures are proposed additions to the measures presented in the April 9, 2009 handout.*

AMM14: Conduct pre-construction surveys and avoid and minimize impacts on fairy shrimp (vernal pool fairy shrimp, vernal pool tadpole shrimp, conservancy fairy shrimp, longhorn fairy shrimp, and mid valley fairy shrimp). Conduct preconstruction surveys to identify suitable habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, conservancy fairy shrimp, longhorn fairy shrimp, and mid valley fairy shrimp ~~within the species' habitat as defined in the BDCP species' accounts~~ before implementing BDCP actions that could result in impacts on ~~fairy shrimp~~habitat. The surveys will be conducted using methods approved by the USFWS ~~Fishery Agencies~~ at

the time impacts may be incurred. To the extent practicable, implement measures approved by the USFWS~~Fishery Agencies at the time impacts are incurred~~ to avoid and minimize impacts on ~~occupied~~ suitable habitat~~s~~ for these species.

AMM15: Conduct pre-construction surveys and avoid and minimize impacts on delta mudwort, Mason's lilaeopsis, delta tule pea, Suisun Marsh aster, delta button-celery, alkali milk-vetch, Heckard's peppergrass, legenere, and San Joaquin spearscale. Conduct preconstruction surveys within delta mudwort**,** Mason's lilaeopsis, delta tule pea, Suisun Marsh aster**,** delta button-celery, alkali milk-vetch, Heckard's peppergrass, legenere, and San Joaquin spearscale habitat as identified in ~~the~~ BDCP ~~the~~ species accounts before implementing BDCP actions that could result in impacts on these species. The surveys will be conducted using methods approved by the USFWS and/or DFG~~Fishery Agencies~~ at the time impacts may be incurred. To the extent practicable, implement measures approved by the USFWS and~~/or~~ DFG ~~Fishery Agencies at the time impacts could be incurred~~ to avoid and minimize impacts on these species.

AMM16: Conduct soft bird's-beak surveys in locations that could be affected by proposed BDCP covered activities and conservation measures and avoid impacts on soft bird's-beak. Conduct surveys within the soft bird's-beak habitat~~s~~ as identified in ~~the~~ BDCP ~~the~~ species accounts that could be affected by proposed BDCP actions. The surveys will be conducted using methods approved by the USFWS and~~/or~~ DFG ~~Fishery Agencies~~. If occurrences of soft bird's-beak are detected, design and implement the proposed actions to avoid the loss of any soft bird's-beak plants~~that could affect the species such that all direct and indirect impacts on the species are avoided~~.