

**SAIC
PARTIAL DRAFT**

Terrestrial and Wetland Covered Species’ Stressors, Objectives, and Conservation Measures

Note to Reviewers: The following tables identify the draft biological objectives and conservation measures that address stressors believed to adversely affect the various life stages of each of the terrestrial and wetland covered species. These tables serve as a tool for evaluating the degree to which draft objectives and conservation measures address each species stressors within the scope of the BDCP. This handout only addresses the proposed covered species approved by the Steering Committee in May 2008 and the next version will be updated to include the additional covered species approved by the Steering Committee in April 2009.

Table X. Riparian Brush Rabbit: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Limited habitat extent	X	Objective RIBR1.1: Increase the extent of riparian brush rabbit habitat near occupied habitats within the Planning Area.	<p>HRCM11: Provide for the establishment of native riparian woody vegetation and emergent vegetation on BDCP constructed levees.</p> <p>HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species.</p> <p>HRCM14: Restore between █ and █ acres of riparian forest and scrub communities as a component of restored floodplain, freshwater intertidal marsh, and channel margin habitats.</p>

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Limited abundance and populations	X	<p>Objective RIBR1.1: Increase the extent of riparian brush rabbit habitat near occupied habitats within the Planning Area.</p> <p>Objective RIBR1.2: Avoid mortality of riparian brush rabbit and removal or degradation of occupied habitat associated with implementation of covered activities and conservation measures.</p>	<p>HRCM11: Provide for the establishment of native riparian woody vegetation and emergent vegetation on BDCP constructed levees.</p> <p>HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species.</p> <p>HRCM14: Restore between █ and █ acres of riparian forest and scrub communities as a component of restored floodplain, freshwater intertidal marsh, and channel margin habitats.</p> <p>AMM3: Conduct preconstruction surveys and avoid mortality of riparian brush rabbit.</p>
Fragmentation of habitat/ population isolation	X	<p>Objective RIBR1.1: Increase the extent of riparian brush rabbit habitat near occupied habitats within the Planning Area.</p>	<p>HRCM11: Provide for the establishment of native riparian woody vegetation and emergent vegetation on BDCP constructed levees.</p> <p>HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species.</p> <p>HRCM14: Restore between █ and █ acres of riparian forest and scrub communities as a component of restored floodplain, freshwater intertidal marsh, and channel margin habitats.</p>
Predation	X		
Disease	X		
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

Table X. Salt Marsh Harvest Mouse: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	<p>Objective SMHM1.1: Increase the extent of tidal salt marsh harvest mouse habitat within Suisun Marsh.</p> <p>Objective SMHM1.2: Restore tidal marsh in portions of the Planning Area that may support salt marsh harvest mouse habitat in future years with sea level rise.</p>	<p>HRCM6: Restore a mosaic of ■ to ■ acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of ■ to ■ acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p>
Fragmentation of habitat/ population isolation	X	<p>Objective SMHM1.1: Increase the extent of tidal salt marsh harvest mouse habitat within Suisun Marsh.</p> <p>Objective SMHM1.2: Restore tidal marsh in portions of the Planning Area that may support salt marsh harvest mouse habitat in future years with sea level rise.</p>	<p>HRCM6: Restore a mosaic of ■ to ■ acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of ■ to ■ acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p>
Predation by non-native species	X	<p>Objective SMHM1.3: Reduce mortality attributable to non-native predation on salt marsh harvest mouse within preserved BDCP salt marsh harvest mouse habitats.</p>	
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

Table X. Suisun Shrew: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	<p>Objective SUSH1.1: Increase the extent of tidal Suisun shrew habitat within Suisun Marsh.</p> <p>Objective SUSH1.2: Restore tidal marsh in portions of the Planning Area that may support Suisun shrew habitat in future years with sea level rise.</p>	<p>HRCM6: Restore a mosaic of [] to [] acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of [] to [] acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p>
Fragmentation of habitat/ population isolation	X	<p>Objective SUSH1.1: Increase the extent of tidal Suisun shrew habitat within Suisun Marsh.</p> <p>Objective SUSH1.2: Restore tidal marsh in portions of the Planning Area that may support Suisun shrew habitat in future years with sea level rise.</p>	<p>HRCM6: Restore a mosaic of [] to [] acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of [] to [] acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p>
Bioaccumulation of toxics			
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

Table X. Tricolored Blackbird: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage		Biological Objectives	Conservation Measures
	Nesting	Pre- and Post Nesting		
Habitat loss and degradation	X	X	<p>Objective TRBB1.1: Increase the extent of tricolored blackbird nesting habitat within the Planning Area and Suisun Marsh.</p> <p>Objective TRBB1.2: Maintain or increase the extent of protected tricolored blackbird foraging habitat within the Planning Area and Suisun Marsh.</p>	<p>HRCM4: Restore a mosaic of [] to [] acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Yolo Bypass/Cache Slough Complex Restoration Opportunity Area.</p> <p>HRCM5: Restore a mosaic of [] to [] acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional habitat within the Cosumnes/Mokelumne ROA.</p> <p>HRCM6: Restore a mosaic of [] to [] acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM7: Restore a mosaic of [] to [] acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the South Delta Restoration Opportunity Area.</p> <p>HRCM8: Restore a mosaic of [] to [] acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the East Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of [] to [] acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p> <p>HRCM10: Support development and implementation of levee construction and maintenance designs that incorporate aquatic, intertidal marsh, and riparian habitat features.</p> <p>HRCM11. Provide for the establishment of native riparian woody</p>

Stressor	Life Stage		Biological Objectives	Conservation Measures
	Nesting	Pre- and Post Nesting		
				<p>vegetation and emergent vegetation on BDCP constructed levees.</p> <p>HRCM12: Enhance channel margin habitats along ___ to ___ miles of Steamboat and Sutter Sloughs to improve habitat conditions for covered fish species.</p> <p>HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species.</p> <p>HRCM14: Restore between █ and █ acres of riparian forest and scrub communities as a component of restored floodplain, freshwater intertidal marsh, and channel margin habitats.</p> <p>HRCM15: Preserve and manage ___ acres of agricultural lands as habitat for covered species and other associated native species.</p> <p>HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM17: Preserve ___ acres of grassland communities.</p> <p>HRCM22: Manage non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM23: Preserve ___ acres of non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities.</p> <p>HRCM24: Restore non-tidal emergent wetland communities in association with open water habitats.</p>

Stressor	Life Stage		Biological Objectives	Conservation Measures
	Nesting	Pre- and Post Nesting		
Human disturbance	X			
Direct removal of colonies (associated with agricultural practices)	X			
Predation	X			
Poisoning/contamination	X			
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>				

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Table X. Yellow-Breasted Chat: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage		Biological Objectives	Conservation Measures
	Nesting	Pre- and Post Nesting		
Habitat loss and degradation	X	X	<p>Objective YBCH1.1: Increase the extent of yellow-breasted chat nesting habitat within the Planning Area.</p>	<p>HRCM10: Support development and implementation of levee construction and maintenance designs that incorporate aquatic, intertidal marsh, and riparian habitat features.</p> <p>HRCM11: Provide for the establishment of native riparian woody vegetation and emergent vegetation on BDCP constructed levees.</p> <p>HRCM12: Enhance channel margin habitats along █ to █ miles of Steamboat and Sutter Sloughs to improve habitat conditions for covered fish species.</p> <p>HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species.</p> <p>HRCM14: Restore between █ and █ acres of riparian forest and scrub communities as a component of restored floodplain, freshwater intertidal marsh, and channel margin habitats.</p>
Cowbird parasitism	X			

¹From information presented in the *Threats and Stressors* section of this species' species account presented in Appendix A, *Covered Species Accounts*, of the BDCP HCP/NCCP document.

Table X. Western Burrowing Owl: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All Life Stages		
Habitat loss, degradation, and fragmentation (through urbanization or agricultural crop conversion)	X	Objective BUOW1.1: Maintain or increase the extent of protected western burrowing owl foraging and breeding habitat within the Planning Area and Suisun Marsh.	<p>BUOW CM1: Acquire and manage grassland or agricultural habitats as burrowing owl habitat.</p> <p>HRCM15: Preserve and manage █ acres of agricultural lands as habitat for covered species and other associated native species.</p> <p>HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM17: Preserve █ acres of grassland communities.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve █ acres of vernal pools and vernal pool complexes.</p>
Rodent control (prey availability)	X		<p>BUOW CM1: Acquire and manage grassland or agricultural habitats as burrowing owl habitat.</p> <p>HRCM15: Preserve and manage █ acres of agricultural lands as habitat for covered species and other associated native species.</p> <p>HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM17: Preserve █ acres of grassland communities.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve █ acres of vernal pools and vernal pool complexes.</p>

Table X. Swainson’s Hawk: Biological Objectives and Conservation Measures that Address Stressors

Stressor ¹	Life Stage			Biological Objectives	Conservation Measures
	Eggs/ Nestlings	Nesting Adults	Pre- and Post Nesting		
Nesting habitat loss and degradation		X	X	Objective SWHA1.1: Increase the extent of Swainson’s hawk nesting habitat within the Planning Area that is located within █ miles of Swainson’s hawk foraging habitat.	HRCM11: Provide for the establishment of native riparian woody vegetation and emergent vegetation on BDCP constructed levees. HRCM12: Enhance channel margin habitats along █ to █ miles of Steamboat and Sutter Sloughs to improve habitat conditions for covered fish species. HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species. HRCM14: Restore between █ and █ acres of riparian forest and scrub communities as a component of restored floodplain, freshwater intertidal marsh, and channel margin habitats.
Foraging habitat loss and degradation		X	X	Objective SWHA1.2: Maintain or increase the extent of protected Swainson’s hawk foraging habitat within the Planning Area.	HRCM15: Preserve and manage █ acres of agricultural lands as habitat for covered species and other associated native species. HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species. HRCM17: Preserve █ acres of grassland communities. HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.
Food availability	X			Objective SWHA1.2: Maintain or increase the extent of protected Swainson’s hawk foraging habitat within the Planning	HRCM15: Preserve and manage █ acres of agricultural lands as habitat for covered species and other associated native species. HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.

Stressor ¹	Life Stage			Biological Objectives	Conservation Measures
	Eggs/ Nestlings	Nesting Adults	Pre- and Post Nesting		
				Area.	<p>HRCM17: Preserve ■ acres of grassland communities.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve ■ acres of vernal pools and vernal pool complexes.</p>
Predation	X				

¹From information presented in the *Threats and Stressors* section of this species' species account presented in Appendix A, *Covered Species Accounts*, of the BDCP HCP/NCCP document.

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Table X. White-Tailed Kite: Biological Objectives and Conservation Measures that Address Stressors

Stressor ¹	Life Stage			Biological Objectives	Conservation Measures
	Eggs/ Nestlings	Nesting Adults	Pre- and Post Nesting		
Nesting habitat loss and degradation		X	X	Objective WTKI1.1: Increase the extent of white-tailed kite nesting habitat within the Planning Area that is located within █ miles of white-tailed kite foraging habitat.	HRCM11: Provide for the establishment of native riparian woody vegetation and emergent vegetation on BDCP constructed levees. HRCM12: Enhance channel margin habitats along █ to █ miles of Steamboat and Sutter Sloughs to improve habitat conditions for covered fish species. HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species. HRCM14: Restore between █ and █ acres of riparian forest and scrub communities as a component of restored floodplain, freshwater intertidal marsh, and channel margin habitats.
Foraging habitat loss and degradation		X	X	Objective WTKI1.2: Maintain or increase the extent of protected white-tailed kite foraging habitat within the Planning Area.	HRCM15: Preserve and manage █ acres of agricultural lands as habitat for covered species and other associated native species. HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species. HRCM17: Preserve █ acres of grassland communities. HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.
Food availability	X			Objective WTKI1.2: Maintain or increase the extent of protected white-tailed kite foraging habitat within the Planning Area.	HRCM15: Preserve and manage █ acres of agricultural lands as habitat for covered species and other associated native species. HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.

Stressor ¹	Life Stage			Biological Objectives	Conservation Measures
	Eggs/ Nestlings	Nesting Adults	Pre- and Post Nesting		
					<p>HRCM17: Preserve █ acres of grassland communities.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve █ acres of vernal pools and vernal pool complexes.</p>
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>					

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Table X. Greater Sandhill Crane: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Young	Juvenile/ Adult	Biological Objectives	Conservation Measures
	Nesting/ Egg				
Loss/ degradation of nesting habitat	X				
Grazing in nesting habitat	X				
Mowing/ haying operations in rearing habitat		X			
Loss of winter foraging habitat			X	Objective SACR1.2: Maintain or increase the extent of protected greater sandhill crane foraging habitat within the Planning Area.	HRCM15: Preserve and manage █ acres of agricultural lands as habitat for covered species and other associated native species.
Disturbance of foraging habitat			X	Objective SACR1.2: Maintain or increase the extent of protected greater sandhill crane foraging habitat within the Planning Area.	HRCM15: Preserve and manage █ acres of agricultural lands as habitat for covered species and other associated native species.
Disturbance of roost sites			X	Objective SACR1.1: Maintain or increase the extent of protected greater sandhill crane roosting habitat within the Planning Area.	SACR CM1: Restore roosting habitat.
Collision with powerlines/ structures			X		
Disease			X		

¹From information presented in the *Threats and Stressors* section of this species' species account presented in Appendix A, *Covered Species Accounts*, of the BDCP HCP/NCCP document.

Table X. California Black Rail: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
Loss/degradation/fragmentation of habitat	All	<p>Objective BLRA1.1: Increase the extent of tidal California black rail habitat within the Planning Area and Suisun Marsh.</p>	<p>HRCM4: Restore a mosaic of [] to [] acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Yolo Bypass/Cache Slough Complex Restoration Opportunity Area.</p> <p>HRCM5: Restore a mosaic of [] to [] acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional habitat within the Cosumnes/Mokelumne ROA.</p> <p>HRCM6: Restore a mosaic of [] to [] acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM7: Restore a mosaic of [] to [] acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the South Delta Restoration Opportunity Area.</p> <p>HRCM8: Restore a mosaic of [] to [] acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the East Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of [] to [] acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p> <p>HRCM10: Support development and implementation of levee construction and maintenance designs that incorporate aquatic, intertidal marsh, and riparian habitat features.</p> <p>HRCM11: Provide for the establishment of native riparian woody</p>
	X		

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
			vegetation and emergent vegetation on BDCP constructed levees.
Land uses in occupied habitat	X		
¹ From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i> , of the BDCP HCP/NCCP document.			

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Table X. California Clapper Rail: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	<p>Objective CLRA1.1: Increase the extent of tidal California clapper rail habitat within Suisun Marsh.</p> <p>Objective CLRA1.2: Restore tidal marsh in portions of the Planning Area that may support California clapper rail habitat in future years with sea level rise.</p>	<p>HRCM6: Restore a mosaic of ■ to ■ acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of ■ to ■ acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p>
Predation by non-native species	X	<p>Objective CLRA1.3: Reduce mortality attributable to non-native predation on California clapper rail within preserved BDCP California clapper rail habitats.</p>	
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

Table X. Giant Garter Snake: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
Loss/degradation/fragmentation of habitat	All	<p>Objective GIGS1.1: Increase the extent of tidal giant garter snake habitat within the Planning Area.</p> <p>Objective GIGS1.2: Maintain or increase the extent of protected non-tidal giant garter snake habitat within the Planning Area and Suisun Marsh.</p>	<p>HRCM4: Restore a mosaic of [] to [] acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Yolo Bypass/Cache Slough Complex Restoration Opportunity Area.</p> <p>HRCM5: Restore a mosaic of [] to [] acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional habitat within the Cosumnes/Mokelumne ROA.</p> <p>HRCM6: Restore a mosaic of [] to [] acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM7: Restore a mosaic of [] to [] acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the South Delta Restoration Opportunity Area.</p> <p>HRCM8: Restore a mosaic of [] to [] acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the East Delta Restoration Opportunity Area.</p> <p>HRCM15: Preserve and manage [] acres of agricultural lands as habitat for covered species and other associated native species.</p> <p>HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM17: Preserve [] acres of grassland communities.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve [] acres of vernal pools and vernal pool complexes.</p> <p>HRCM20: Restore vernal pool habitats.</p> <p>HRCM21: Preserve [] acres of managed wetlands.</p> <p>HRCM22: Manage non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities within</p>
	X		

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		<p>BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM23: Preserve █ acres of non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities.</p> <p>HRCM24: Restore non-tidal emergent wetland communities in association with open water habitats.</p> <p>GIGSCM2: Acquire and manage aquatic and adjacent upland habitat as giant garter snake habitat.</p>
Land uses in occupied habitat	X	<p>Objective GIGS1.1: Increase the extent of tidal giant garter snake habitat within the Planning Area.</p> <p>Objective GIGS1.2: Maintain or increase the extent of protected non-tidal giant garter snake habitat within the Planning Area and Suisun Marsh.</p>	<p>HRCM4: Restore a mosaic of █ to █ acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Yolo Bypass/Cache Slough Complex Restoration Opportunity Area.</p> <p>HRCM5: Restore a mosaic of █ to █ acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional habitat within the Cosumnes/Mokelumne ROA.</p> <p>HRCM6: Restore a mosaic of █ to █ acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM7: Restore a mosaic of █ to █ acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the South Delta Restoration Opportunity Area.</p> <p>HRCM8: Restore a mosaic of █ to █ acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the East Delta Restoration Opportunity Area.</p> <p>HRCM15: Preserve and manage █ acres of agricultural lands as habitat for covered species and other associated native species.</p> <p>HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM17: Preserve █ acres of grassland communities.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species</p>

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		<p>and other associated native species.</p> <p>HRCM19: Preserve [] acres of vernal pools and vernal pool complexes.</p> <p>HRCM20: Restore vernal pool habitats.</p> <p>HRCM21: Preserve [] acres of managed wetlands.</p> <p>HRCM22: Manage non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM23: Preserve [] acres of non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities.</p> <p>HRCM24: Restore non-tidal emergent wetland communities in association with open water habitats.</p> <p>GIGSCM2: Acquire and manage aquatic and adjacent upland habitat as giant garter snake habitat.</p>
Non-native predation	X		
Contaminants	X		
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

Table X. Western Spadefoot Toad: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage		Biological Objectives	Conservation Measures
	Eggs/ Larvae	Adults		
Loss/degradation/ fragmentation of habitat	X	X	<p>Objective SPTO1.1: Maintain or increase the extent of protected western spadefoot toad breeding and upland habitats within the Planning Area and Suisun Marsh.</p>	<p>HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM17: Preserve [] acres of grassland communities.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve [] acres of vernal pools and vernal pool complexes.</p> <p>HRCM20: Restore vernal pool habitats.</p> <p>HRCM21: Preserve [] acres of managed wetlands.</p> <p>HRCM22: Manage non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM23: Preserve [] acres of non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities.</p> <p>HRCM24: Restore non-tidal emergent wetland communities in association with open water habitats.</p>

Stressor	Life Stage		Biological Objectives	Conservation Measures
	Eggs/ Larvae	Adults		
Land uses in occupied habitat	X	X	<p>Objective SPT01.1: Maintain or increase the extent of protected western spadefoot toad breeding and upland habitats within the Planning Area and Suisun Marsh.</p>	<p>HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM17: Preserve <input type="checkbox"/> acres of grassland communities.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve <input type="checkbox"/> acres of vernal pools and vernal pool complexes.</p> <p>HRCM20: Restore vernal pool habitats.</p> <p>HRCM21: Preserve <input type="checkbox"/> acres of managed wetlands.</p> <p>HRCM22: Manage non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM23: Preserve <input type="checkbox"/> acres of non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities.</p> <p>HRCM24: Restore non-tidal emergent wetland communities in association with open water habitats.</p>

Stressor	Life Stage		Biological Objectives	Conservation Measures
	Eggs/ Larvae	Adults		
Noise and vibration		X	<p>Objective SPTO1.1: Maintain or increase the extent of protected western spadefoot toad breeding and upland habitats within the Planning Area and Suisun Marsh.</p>	<p>HRCM16: Manage grassland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM17: Preserve <input type="checkbox"/> acres of grassland communities.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve <input type="checkbox"/> acres of vernal pools and vernal pool complexes.</p> <p>HRCM20: Restore vernal pool habitats.</p> <p>HRCM21: Preserve <input type="checkbox"/> acres of managed wetlands.</p> <p>HRCM22: Manage non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM23: Preserve <input type="checkbox"/> acres of non-tidal perennial aquatic and associated non-tidal perennial permanent emergent marsh communities.</p> <p>HRCM24: Restore non-tidal emergent wetland communities in association with open water habitats.</p>
Non-native predation/competition	X		<p>Objective SPTO1.2: Reduce mortality attributable to non-native predation on western spadefoot toad within preserved BDCP western spadefoot toad habitats.</p>	

¹From information presented in the *Threats and Stressors* section of this species' species account presented in Appendix A, *Covered Species Accounts*, of the BDCP HCP/NCCP document.

Table X. Valley Elderberry Longhorn Beetle: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Habitat loss and degradation	X	Objective VELB1.1: Increase the extent of valley elderberry longhorn beetle habitat within the Planning Area.	<p>HRCM10: Support development and implementation of levee construction and maintenance designs that incorporate aquatic, intertidal marsh, and riparian habitat features.</p> <p>HRCM11: Provide for the establishment of native riparian woody vegetation and emergent vegetation on BDCP constructed levees.</p> <p>HRCM12: Enhance channel margin habitats along █ to █ miles of Steamboat and Sutter Sloughs to improve habitat conditions for covered fish species.</p> <p>HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species.</p> <p>HRCM14: Restore between █ and █ acres of riparian forest and scrub communities as a component of restored floodplain, freshwater intertidal marsh, and channel margin habitats.</p> <p>VELB CM1: Compensate for removal of or disturbance to elderberry shrubs.</p>
Non-native predation (Argentine ant and European earwig)	X		
Non-native plant competition with host plant	X		
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

Table X. Fairy Shrimp (Vernal Pool Fairy Shrimp, Vernal Pool Tadpole Shrimp, Conservancy Fairy Shrimp, Longhorn Fairy Shrimp, and Mid Valley Fairy Shrimp): Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	VPFS1.1: Maintain or increase the extent of protected vernal pool, vernal pool complex, alkaline/saline seasonal wetlands, and alkaline sink scrub habitats that support fairy shrimp within the Planning Area.	HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species. HRCM19: Preserve █ acres of natural seasonal wetland habitats. HRCM20: Restore natural seasonal wetland habitats. VPFSCM1: Compensate for loss or degradation of occupied fairy shrimp habitats.
¹ From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i> , of the BDCP HCP/NCCP document.			

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Table X. Alkali Milk-Vetch, San Joaquin Spearscale, Legenere, and Heckard’s peppergrass: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	<p>ALMV1.1: Maintain or increase the extent of protected vernal pool, vernal pool complex, alkaline/saline seasonal wetland, and alkali sink scrub habitats that support alkali milk-vetch habitat within the Planning Area and Suisun Marsh.</p> <p>SJSP1.1: Maintain or increase the extent of protected vernal pool, alkaline/saline seasonal wetland, and alkaline sink scrub, habitats that support San Joaquin spearscale habitat within the Planning Area and Suisun Marsh.</p> <p>LEGE1.1: Maintain or increase the extent of protected vernal pool, alkaline/saline seasonal wetland, and alkaline sink scrub habitats that support legenere habitat within the Planning Area.</p> <p>HEPE1.1: Maintain or increase the extent of protected vernal pool, vernal swale, alkali meadow, and alkali sink habitats that support Heckard’s peppergrass habitat within the Planning Area.</p>	<p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve █ acres of natural seasonal wetland habitats.</p> <p>HRCM20: Restore natural seasonal wetland habitats.</p> <p>ALMVCM1: Compensate for loss or degradation of alkali milk-vetch occurrences.</p> <p>SJSPCM1: Compensate for loss or degradation of San Joaquin spearscale occurrences.</p> <p>LEGECM1: Compensate for loss or degradation of legenere occurrences.</p> <p>HEPECM1: Compensate for loss or degradation of Heckard’s peppergrass occurrences.</p>
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species’ species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

Table X. Soft Bird’s-Beak: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	<p>SOBB1.1: Increase the extent of brackish tidal marsh habitats that could support soft bird’s-beak habitat in Suisun Marsh.</p> <p>SOBB1.2: Restore tidal marsh in portions of the Planning Area that may support soft bird’s-beak habitat in future years with sea level rise.</p> <p>SOBB1.3: Avoid take of soft bird’s beak associated with implementation of covered activities and conservation measures.</p>	<p>HRCM6: Restore a mosaic of [] to [] acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of [] to [] acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p>
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species’ species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

Table X. Delta Button-Celery: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	DEBC1.1: Maintain or increase the extent of protected seasonal floodplain and alkaline sink scrub habitats that support habitat for Delta button-celery within the Planning Area.	<p>HRCM1: Restore floodplain habitat along █ miles of the San Joaquin River from Vernalis to Mossdale.</p> <p>HRCM18: Manage natural seasonal wetland and managed wetland communities within BDCP preserve lands to benefit covered species and other associated native species.</p> <p>HRCM19: Preserve █ acres of natural seasonal wetland habitats.</p> <p>HRCM20: Restore natural seasonal wetland habitats.</p> <p>DEBCCM1: Compensate for loss or degradation of delta button-celery occurrences.</p>
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

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Table X. Delta Tule Pea: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	DETP1.1: Increase the extent of delta tule pea habitat within the Planning Area and Suisun Marsh.	<p>HRCM3: Restore between [] and [] acres of inundated floodplain habitat in the South Delta Restoration Opportunity Area.</p> <p>HRCM4: Restore a mosaic of [] to [] acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Yolo Bypass/Cache Slough Complex Restoration Opportunity Area.</p> <p>HRCM5: Restore a mosaic of [] to [] acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional habitat within the Cosumnes/Mokelumne ROA.</p> <p>HRCM6: Restore a mosaic of [] to [] acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM7: Restore a mosaic of [] to [] acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the South Delta Restoration Opportunity Area.</p> <p>HRCM8: Restore a mosaic of [] to [] acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the East Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of [] to [] acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p> <p>HRCM10: Support development and implementation of levee construction and maintenance designs that incorporate aquatic, intertidal marsh, and riparian habitat features.</p> <p>DETPCM1: Compensate for loss or degradation of delta tule pea and Suisun Marsh aster occurrences.</p>
<p>¹From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i>, of the BDCP HCP/NCCP document.</p>			

Table X. Delta Mudwort: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	<p>DEMW1.1: Increase the extent of delta mudwort habitat within the Planning Area.</p>	<p>HRCM2: Restore floodplain habitat along █ miles of the San Joaquin River from Mossdale to French Camp Slough.</p> <p>HRCM3: Restore between █ and █ acres of inundated floodplain habitat in the South Delta Restoration Opportunity Area.</p> <p>HRCM4: Restore a mosaic of █ to █ acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Yolo Bypass/Cache Slough Complex Restoration Opportunity Area.</p> <p>HRCM5: Restore a mosaic of █ to █ acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional habitat within the Cosumnes/Mokelumne ROA.</p> <p>HRCM6: Restore a mosaic of █ to █ acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM7: Restore a mosaic of █ to █ acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the South Delta Restoration Opportunity Area.</p> <p>HRCM8: Restore a mosaic of █ to █ acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the East Delta Restoration Opportunity Area.</p> <p>HRCM12: Enhance channel margin habitats along █ to █ miles of Steamboat and Sutter Sloughs to improve habitat conditions for covered fish species.</p> <p>HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species.</p> <p>DEMWCM1: Compensate for loss or degradation of delta mudwort and Mason’s lilaepsis occurrences. Replace occupied delta mudwort and Mason’s lilaepsis habitat removed or degraded by covered activities and conservation measures by restoring comparable habitat at a ratio of █:1 or preserve █ currently unprotected occurrences of these species for each occurrence</p>

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
			removed or degraded by BDCP actions. To the extent determined to be practicable prior to the impact, salvage and transplant vegetative propagules from the affected site to restored habitats.
¹ From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i> , of the BDCP HCP/NCCP document.			

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Table X. Mason’s lilaepsis: Biological Objectives and Conservation Measures that Address Stressors

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
Loss/ degradation of habitat	X	MALI1.1: Increase the extent of Mason’s lilaepsis habitat within the Planning Area and Suisun Marsh.	<p>HRCM2: Restore floodplain habitat along █ miles of the San Joaquin River from Mossdale to French Camp Slough.</p> <p>HRCM3: Restore between █ and █ acres of inundated floodplain habitat in the South Delta Restoration Opportunity Area.</p> <p>HRCM4: Restore a mosaic of █ to █ acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Yolo Bypass/Cache Slough Complex Restoration Opportunity Area.</p> <p>HRCM5: Restore a mosaic of █ to █ acres of freshwater intertidal marsh, shallow subtidal aquatic, and transitional habitat within the Cosumnes/Mokelumne ROA.</p> <p>HRCM6: Restore a mosaic of █ to █ acres of intertidal marsh, channel margin, and shallow subtidal aquatic habitat within the West Delta Restoration Opportunity Area.</p> <p>HRCM7: Restore a mosaic of █ to █ acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the South Delta Restoration Opportunity Area.</p> <p>HRCM8: Restore a mosaic of █ to █ acres of intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the East Delta Restoration Opportunity Area.</p> <p>HRCM9: Restore a mosaic of █ to █ acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.</p> <p>HRCM12: Enhance channel margin habitats along █ to █ miles of Steamboat and Sutter Sloughs to improve habitat conditions for covered fish species.</p> <p>HRCM13: Enhance channel margin habitats along █ to █ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species.</p> <p>DEMWCM1: Compensate for loss or degradation of delta mudwort and Mason’s lilaepsis occurrences.</p>

¹From information presented in the *Threats and Stressors* section of this species’ species account presented in Appendix A, *Covered Species Accounts*, of the

Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
BDCP HCP/NCCP document.			

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Stressor	Life Stage	Biological Objectives	Conservation Measures
	All		
			DETPCM1: Compensate for loss or degradation of delta tule pea and Suisun Marsh aster occurrences.
¹ From information presented in the <i>Threats and Stressors</i> section of this species' species account presented in Appendix A, <i>Covered Species Accounts</i> , of the BDCP HCP/NCCP document.			

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