

June 1999

**Table H-1. Natural Seasonal Wetland Communities: Potential CALFED Effects and Conservation Measures**

**Summary Effect of Implementing CALFED Actions and Conservation Measures on Natural Seasonal Wetland Communities:** Potential for protection, enhancement, and/or restoration of 600 to 1,100 acres of vernal pools and associated watershed in the Bay Region and potential for protection or enhancement of existing and creation of additional seasonal wetlands incidental to implementing other CALFED actions. Potential for short-term loss or degradation of existing natural seasonal wetland habitats and long-term increase in habitat area with implementation of conservation measures to compensate for CALFED impacts.

**Associated Evaluated Species:** American peregrine falcon, giant garter snake, California red-legged frog, California tiger salamander, greater sandhill crane, white-tailed kite, tricolored blackbird, short-eared owl, Swainson's hawk, California gull, long-billed curlew, northern harrier, western spadefoot, delta green ground beetle, delta green ground beetle critical habitat, Conservancy fairy shrimp, longhorn fairy shrimp, Mid-valley fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, Sonoma alopecurus, North Coast semaphore grass, Ferris' milkvetch, hispid bird's-beak, mad-dog skullcap, slough thistle, Henderson's bent grass, alkali milk-vetch, heartscale, brittlescale, lesser saltscale, San Joaquin spearscale, vernal pool, smallscale, Sonoma sunshine, Lost Hills crownscale, succulent owl's clover, Hoover's spurge, Palmate-bracted bird's-beak, recurved larkspur, Loch Lomond button-celery, spiny-sepaled button-celery, Boggs Lake hedge-hyssop, Hall's tarplant, Ahart's dwarf rush, Contra Costa goldfields, legenera, San Joaquin woollythreads, Heckard's peppergrass, Butte County meadowfoam, Sebastopol meadowfoam, few-flowered navarretia, many-flowered navarretia, pincushion navarretia, Colusa grass, San Joaquin Valley orcutt grass, Hairy orcutt grass, slender orcutt grass, Sacramento orcutt grass, Ahart's paronychia, Red Hills ragwort, Greene's tuctoria, Crampton's tuctoria.

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
<b>Delta Region</b>					
<b>Associated Evaluated Species:</b> American peregrine falcon, giant garter snake, California red-legged frog, greater sandhill crane, California black rail, white-tailed kite, short-eared owl, California gull, black tern, long-billed curlew, northern harrier, white-faced ibis, western least bittern, delta green ground beetle, delta green ground beetle critical habitat, bristly sedge, hispid bird's-beak, mad-dog skullcap, rose-mallow, and slough thistle.					
Summary Programmatic Action Outcomes E1, E9, E17, E19-22, E24, E25, E28, Q1, Q2, Q7, and T1 are likely to have no discernable effect on natural seasonal wetland communities in the Delta Region.					
<b>Ecosystem Restoration Program</b>					
E4. Provide more natural Delta hydraulic conditions (internal flow and velocity patterns) by altering channel configurations (e.g., setback levees) and physical barriers to channel flow.	E010601, E010602, E010603, E010604, E010605, E010606, E010607	Likely to be no discernable beneficial effects on existing habitat areas and associated evaluation species (N/E).	Potential for permanent loss or degradation of existing natural seasonal wetland habitat near levees if construction activities results in removal of seasonal wetland vegetation (AE1).	To the extent practicable, avoid disturbance to habitat areas occupied by evaluated species (M1).	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.

D-051310

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			<p>Construction-related activities associated with implementing actions could result in take of evaluated species (AE2).</p>	<p>Restore or enhance 2-5 acres of natural seasonal wetland habitat for every acre of existing natural seasonal wetland habitat near affected habitat areas (M2).</p> <p>To the extent consistent with ERP objectives, include project design features that allow for onsite reestablishment and long-term maintenance of natural seasonal wetland vegetation following project construction (M3).</p> <p>To the extent practicable, avoid construction activities during the breeding period of species that could be adversely affected by the actions (M4).</p> <p>To the extent practicable, avoid direct disturbance to populations and individuals of evaluation plant and invertebrate species (M5).</p>	



June 1999

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	M3. M4. M5. M6.	
E10a. Restoration of 85-190 miles of tidal sloughs.	E015201, E015202, E011101, E011102	N/E	AE1.       AE2.	M1.     M2. M3. M4. M5. M6.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
E11. Restoration of up to 19,600 acres of nontidal freshwater emergent wetland.	E010403, E010406, E011001, E011002, E011003, E011004, E011005, E011006, E011007, E011301, E011302, E011303, E011304, E011305	Potential for increase in natural seasonal wetland habitat on margins of converted and restored freshwater emergent wetland habitat (BE1).	AE1.	M1.       M2.	Potential for increases in habitat area incidental to restoration of permanent wetlands.  Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.

D-051313

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	M3. M4. M5. M6.	
E13a. Enhancement of up to 4,000 acres of existing and restoration and management of up to 28,000 acres of seasonal wetlands for wildlife.	E010403, E010406, E011501, E011502, E011503, E011504, E011505, E011506, E011507, E011508, E011509, E011510, E017201, E017202	Potential for increases in natural seasonal wetland habitat area incidental to restoration and enhancement of managed seasonal wetlands (BE2).	Potential for loss or degradation of existing natural seasonal wetland habitat as a result of restoration activities (AE3).  AE2.	M1.  M2. M3. Minimize the potential for construction-related runoff into nearby wetlands through use of siltation-control barriers, detention basins, or other appropriate methods (M8). M4. M5. M6.	Potential for increases in habitat area incidental to restoration of managed seasonal wetlands.  Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.



Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
				M6. M8.	
E18a. Cooperative management of 40,000–75,000 acres of agricultural lands to enhance habitat values for waterfowl and other associated species.	E011901, E011902, E011903, E011904, E011905, E011906, E011907, E007101	Potential for enhancement and long-term protection of existing natural seasonal wetland habitats associated with agricultural lands if enhancement activities also improve the management and quality of associated seasonal wetlands (BE4).	Likely to be no discernable adverse effects on existing habitat areas and associated evaluation species (N/E).	None.	Potential for long-term protection and enhancement of natural seasonal wetland habitats incidental to implementing proposed actions.
E27a. Reduction in the concentrations and loadings of contaminants in the aquatic environment by 25%–50%.	E015701, E015702	Reduction in the use of herbicides and pesticides in or near existing seasonal wetland habitat areas could improve the vigor of associated plant populations and result in an increase in populations of invertebrates that are adversely affected by these compounds (BE5).	N/E	None.	Implementation of the proposed actions would most likely have no discernable effect on the evaluation species' numbers or distribution.



Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
<b>Water Quality Program</b>					
Q4. Reduction of pesticide loadings in the aquatic environment.	Q010501	BE5.	N/E	None.	Implementation of the proposed actions would most likely have no discernable effect on the evaluation species' numbers or distribution.
<b>Water Use Efficiency Program</b>					
W1. Support implementation of water management techniques that increase the effectiveness of water-use management and efficiency for agricultural uses.	None.	N/E	Potential for localized loss of relatively small seasonal wetland habitat areas where wetland vegetation is supported primarily by seeps or runoff associated with existing inefficiencies in the use of agricultural water (AE5).	M1.  M2.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
W2. Support implementation of measures that increase agricultural production per unit of water used, protect water quality, or increase environmental benefits while meeting agricultural needs.	None.	N/E	AE5.	M1.  M2.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.

June 1999

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
W3. Provide planning and technical assistance, financing assistance, and assurances for development and implementation of water management plans and best management practices to urban water agencies.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
W4. Support development and implementation of water-recycling projects.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
<b>Watershed Management Program</b>					
M1. Fund and implement watershed restoration, maintenance, conservation, and monitoring activities.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
<b>Conveyance Facilities</b>					
C1. Construct and operate modifications to existing south-Delta conveyance features.	C010101, C010102, C010103, C010104, C010105, C010106, C010107, C010108	N/E	Construction of interties and supporting infrastructure between existing conveyance facilities and export pumps could result in the permanent loss of natural seasonal wetland habitat (AE6).	M1.  M2. M3. M8.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.

D-051319

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	M4. M5. M6.	
C2. Construct and operate modifications to existing north-Delta conveyance features.	C020101, C020102, C020103	N/E	Potential for permanent loss of natural seasonal wetland habitat if conveyance channel capacity is increased by setting back channel levees in areas with existing seasonal wetland habitat (AE7).  AE2.	M1.  M2. M3. M8. M4. M5. M6.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
C3 Construct and operate an isolated conveyance facility from the Sacramento River along the east side of the Delta to Clifton Court Forebay.	C030101	N/E	Construction of conveyance facilities and associated infrastructure could result in short-term or permanent loss or degradation of natural seasonal wetland habitat (AE8).	M1.  M2. M3.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	M8. M4. M5. M6.	
<b>Storage Facilities</b>					
S1. Construct and operate enlarged or new surface storage facilities.	None.	N/E	Construction and operation of water storage facilities could result in short-term or permanent loss or degradation of natural seasonal wetland habitat (AE9).  AE2.	To the extent consistent with program objectives, select Delta islands that support little or no wetland habitat for use as storage facilities (M7).  M2. M3. M4. M5. M6.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
<b>Water Operations</b>					
01. Implement operating criteria needed to improve water management for beneficial uses.	None.	N/A	N/A		Potential program effects cannot be evaluated.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
02. Implement an Environmental Water Account to provide operational flexibility to achieve environmental benefits.	None.	N/A	N/A		Potential program effects cannot be evaluated.
<b>Bay Region</b>					
<b>Associated Evaluated Species:</b> American peregrine falcon, giant garter snake, California red-legged frog, Calistoga popcornflower, Kenwood marsh checkerbloom, Napa blue grass, Pitkin marsh lily, Sonoma alopecurus, white sedge, California black rail, white-tailed kite, North Coast semaphore grass, tricolored blackbird, short-eared owl, California gull, long-billed curlew, northern harrier, white-faced ibis, western spadefoot, hipsid bird's-beak, march checkerbloom, and Sanford's arrowhead.					
Summary Programmatic Action Outcomes E1, E21, E22, E24, E25, E28, Q2, Q7, Q8 and T1 are likely to have no discernable effect on natural seasonal wetland communities in the Bay Region.					
<b>Ecosystem Restoration Program</b>					
E5b. Restoration of at least 1,500 acres of tidal shallow-water habitat.	E020401, E020901, E021101, E025201	N/E	AE1.          AE2.	M1.    M2.  M3.  M4.  M5.  M6.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.





Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	To the extent practicable, avoid direct disturbance to populations and individuals of evaluation plant and animal species associated with vernal pools (M9).	
E15b. Restoration of 50-75 miles of riparian habitat along channels and reduction of populations of invasive non-native riparian plants by 50%.	E021601, E025301, E025302	N/E	AE1.          AE2.	M1.    M2. M3. M4. M5. M6.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
E16b. Restoration of up to 5,000 acres of perennial grassland.	E021801	BE3.	AE4.	M1.          M2.	Potential for increases in habitat area incidental to restoration of perennial grassland.  Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	M3. M9. M4. M5. M9. M6.	
E30. Enhancement of habitat conditions for the Suisun song sparrow in occupied habitat areas.	E023901, E023902, E023903, E023904	N/E	AE1.       AE2.	M1.     M2. M3. M4.  M6.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
<b>Levee System Integrity Program</b>					
L3. Enhancement of the level of flood protection provided by Suisun Marsh levees.	None.	BE6.	AE1.          AE2.	M2.       M3. M8. M4. M5. M6.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.  Long-term protection of existing habitat areas from flooding that would be associated with levee failures.
<b>Water Quality Program</b>					
Q4. Reduction of pesticide loadings in the aquatic environment.	Q020501	BE5.	N/E	None.	Implementation of the proposed actions would most likely have no discernable effect on the evaluation species' numbers or distribution.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
<b>Water Use Efficiency Program</b>					
W1. Support implementation of water management techniques that increase the effectiveness of water-use management and efficiency for agricultural uses.	None.	N/E	AE5.	M1.  M2.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
W2. Support implementation of measures that increase agricultural production per unit of water used, protect water quality, or increase environmental benefits while meeting agricultural needs.	None.	N/E	AE5.	M1.  M2.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
W3. Provide planning and technical assistance, financing assistance, and assurances for development and implementation of water management plans and best management practices to urban water agencies.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
W4. Support development and implementation of water-recycling projects.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
<b>Watershed Management Program</b>					
M1. Fund and implement watershed restoration, maintenance, conservation, and monitoring activities.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
<b>Sacramento River Region</b>					
<p><b>Associated Evaluated Species:</b> American peregrine falcon, Aleutian Canada goose, giant garter snake, California red-legged frog, greater sandhill crane, California black rail, white-tailed kite, tricolored blackbird, short-eared owl, California gull, black tern, long-billed curlew, northern harrier, white-faced ibis, western least bittern, western spadefoot, California beaked-rush, Ferris' milkvetch, four-angled spikerush, hipsid bird's-beak, rose-mallow, Sanford's arrowhead, lesser saltscare, vernal pool smallscale, Ahart's paronychia, black-crowned night heron (rookery) and snowy egret (rookery).</p>					
<p>Summary Programmatic Action Outcomes E1, E3, E22-26, Q1-3, Q7, and T1 are likely to have no discernable effect on natural seasonal wetland communities in the Sacramento River Region.</p>					
<b>Ecosystem Restoration Program</b>					
E1. Provide for more natural river flows and Bay-Delta freshwater inflow peaks in fall, winter, and spring of all but critical years.	E030101, E030102, E040101, E040102, E040103, E040104, E044701, E044703, E050101, E070101, E070102, E070103, E070104, E070105, E070106, E080101, E080102, E080103, E080104, E090101, E090102, E090103, E090104, E090105, E090106, E090107, E100101, E100102	Potential for increase in habitat area if increased flows inundate overflow channels, old oxbows, and other floodplain features for sufficient periods to allow for the establishment and maintenance of seasonal wetland vegetation (BE8).	N/E	None.	Potential for increase in habitat area associated with floodplains.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
<p>E2. Improvement in the supply of sediment to rivers and streams necessary for providing spawning gravels and rehabilitation of related ecological processes (e.g., stream meander) and floodplain habitats (e.g., riparian habitats).</p>	<p>E030201, E030202, E030301, E030302, E030303, E030604, E031602, E040201, E040202, E040203, E040301, E040402, E050201, E050202, E050203, E060401, E070201, E070202, E070203, E080201, E080202, E080203, E080303, E090201, E090401, E090403, E090404, E090407, E090409, E100201, E100202, E105101.</p>	<p>Potential for increase in seasonal wetland habitat area on floodplains as a result of improving floodplain ecological processes (BE9).</p>	<p>Potential for loss of seasonal wetlands that are near channels resulting from actions to reintroduce erosional processes by setting back levees or otherwise allowing banks to erode (AE11).</p> <p>AE2.</p>	<p>M1.</p> <p>M2.</p> <p>M3.</p> <p>M4.</p> <p>M5.</p> <p>M6.</p>	<p>Potential for increase in natural seasonal wetland habitat area associated with floodplains.</p> <p>Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.</p>
<p>E6. Restoration and maintenance of riverine aquatic habitats.</p>	<p>E031602, E030301, E030302, E030303, E030604, E040301, E040402, E050201, E050202, E050203, E050301, E050401, E050402, E050403, E050404, E050405, E060401, E070201, E070202, E070203, E080301, E080302, E080303, E080401, E080402, E090401, E090402, E090403, E090404, E090407, E090408, E090408, E091604, E091605, E090201</p>	<p>BE9.</p>	<p>AE11.</p>	<p>M1.</p>	<p>Potential for increase in natural seasonal wetland habitat area associated with floodplains.</p> <p>Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.</p>

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	M2. M3. M4. M5. M6.	
E13c. Enhancement and management of up to 73,325 acres of existing seasonal wetlands for wildlife.	E061501, E061502, E071501, E071502, E081501, E081502, E090405, E090406, E091501, E091502	BE2.	AE3.          AE2.	M1.       M2. M3. M4. M5. M6.	Potential for long-term increase in natural seasonal wetland habitat area or quality incidental to enhancement of managed seasonal wetlands.  Potential for short-term loss of natural seasonal wetlands and long-term increase in habitat area with implementation of conservation measures.



Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	M2. M3. M4. M5. M9. M6.	
E18b. Cooperative management of up to 298,643 acres of agricultural lands to enhance habitat values for waterfowl and other associated species.	E061901, E061902, E061903, E071901, E071902, E071903, E081901, E091901, E091902	BE4.	N/E	None.	Potential for long-term protection and enhancement of natural seasonal wetland habitats incidental to implementing proposed actions.
E27b. Reduction in the concentrations and loadings of contaminants in the aquatic environment.	E035702, E035703, E035704, E095701, E095702, E105701, E105702	BE6.	N/E	None.	Implementation of the proposed actions would most likely have no discernable effect on the evaluation species' numbers or distribution.
<b>Water Quality Program</b>					
Q4. Reduction of pesticide loadings in the aquatic environment.	Q030501, Q040501, Q050501, Q060501, Q070501, Q080501, Q090501, Q100501	BE5.	N/E	None.	Implementation of the proposed actions would most likely have no discernable effect on evaluation species numbers or distribution.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
<b>Water Use Efficiency Program</b>					
W1. Support implementation of water management techniques that increase the effectiveness of water-use management and efficiency for agricultural uses.	None.	N/E	AE5.	M1.  M2.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
W2. Support implementation of measures that increase agricultural production per unit of water used, protect water quality, or increase environmental benefits while meeting agricultural needs.	None.	N/E	AE5.	M1.  M2.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
W3. Provide planning and technical assistance, financing assistance, and assurances for development and implementation of water management plans and best management practices to urban water agencies.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
W4. Support development and implementation of water-recycling projects.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
<b>Watershed Management Program</b>					
M1. Fund and implement watershed restoration, maintenance, conservation, and monitoring activities.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
<b>Storage Facilities</b>					
S1. Construct and operate enlarged or new surface storage facilities.	None.	Depending on storage design and operation, potential for the natural establishment and long-term maintenance of seasonal wetland vegetation along shorelines of storage pools (BE10).	<p>Permanent loss of habitat if storage facilities and associated infrastructure are constructed in drainages that support seasonal wetlands (AE12).</p> <p>Recreation-related activities potentially associated with new storage facilities could result in take of evaluated species (AE13).</p> <p>AE2.</p>	<p>M1.</p> <p>M2.</p> <p>M3.</p> <p>M8.</p> <p>Manage recreational uses to avoid or reduce the likelihood for recreation-related impacts on sensitive plant and invertebrate populations and wildlife use areas (M10).</p> <p>M4.</p> <p>M5.</p>	<p>Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.</p> <p>Potential for establishment of seasonal wetland vegetation along reservoir shorelines.</p>



Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
02. Implement an Environmental Water Account to provide operational flexibility to achieve environmental benefits.	None.	N/A	N/A		Potential program effects cannot be evaluated.
<b>San Joaquin River Region</b>					
<p><b>Associated Evaluated Species:</b> American peregrine falcon, Aleutian Canada goose, giant garter snake, California red-legged frog, greater sandhill crane, California black rail, white-tailed kite, tricolored blackbird, short-eared owl, California gull, black tern, long-billed curlew, white-faced ibis, western spadefoot, lesser saltscall, bristly sedge, Ferris' milkvetch, four-angled spikerush, hipsid bird's-beak, mad-dog skullcap, rose-mallow, Sanford's arrowhead, slough thistle, recurved larkspur, Hall's tarplant, black-crowned night heron (rookery), and snowy egret (rookery)</p>					
<p>Summary Programmatic Action Outcomes E18c, E22-26, Q1, Q2, Q5-Q8, and T1 are likely to have no discernable effect on natural seasonal wetland communities in the San Joaquin River Region.</p>					
<b>Ecosystem Restoration Program</b>					
E1. Provide for more natural river flows and Bay-Delta freshwater inflow peaks in fall, winter, and spring of all but critical years.	E110101, E110102, E110103, E110104, E110105, E110106, E110107, E110108, E110109, E110110, E110205, E110502, E120101, E130103, E130101, E130102, E130104, E130105, E140101, E140102, E140103, E140104	BE8.	N/E	None.	Potential for increase in habitat area associated with floodplains.
E2. Improvement in the supply of sediment to rivers and streams necessary for providing spawning gravels and rehabilitation of related ecological processes (e.g., stream meander) and floodplain habitats (e.g., riparian habitats).	E110201, E110202, E110203, E110204, E110205, E110206, E110207, E110208, E110209, E130201, E130202, E130203, E130301, E130302, E130303, E130304, E130305, E130306, E130307, E130402, E135601, E140401, E140403	BE9.	AE11.	M1.	<p>Potential for increase in natural seasonal wetland habitat area associated with floodplains.</p> <p>Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.</p>







Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
E27b. Reduction in the concentrations and loadings of contaminants in the aquatic environment.	E115701, E115702, E115703, E125701, E125702	BE5.	N/E	None.	Implementation of the proposed actions would most likely have no discernable effect on the evaluation species' numbers or distribution.
<b>Water Quality Program</b>					
Q4. Reduction of pesticide loadings in the aquatic environment.	Q120501, Q130501, Q140501, Q140502	BE5.	N/E	None.	Implementation of the proposed actions would most likely have no discernable effect on the evaluation species' numbers or distribution.
<b>Water Use Efficiency Program</b>					
W1. Support implementation of water management techniques that increase the effectiveness of water-use management and efficiency for agricultural uses.	None.	N/E	AE5.	M1.  M2.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
W2. Support implementation of measures that increase agricultural production per unit of water used, protect water quality, or increase environmental benefits while meeting agricultural needs.	None.	N/E	AE5.	M1.  M2.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
W3. Provide planning and technical assistance, financing assistance, and assurances for development and implementation of water management plans and best management practices to urban water agencies.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
W4. Support development and implementation of water-recycling projects.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
<b>Watershed Management Program</b>					
M1. Fund and implement watershed restoration, maintenance, conservation, and monitoring activities.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
<b>Storage Facilities</b>					
S1. Construct and operate enlarged or new surface storage facilities.	None.	BE10.	AE12.	M1.          M2.  M3.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.  Potential for establishment of seasonal wetland vegetation along reservoir shorelines.

D-051342

June 1999

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE13. AE2.	M8. M10. M4. M5. M6.	
				M11.	
S2. Construct and operate new groundwater storage facilities.	None.	N/E	AE12.  AE2.	M1.  M2. M3. M2. M4. M5. M6.	Potential for short-term loss of seasonal wetland habitat and long-term increase in habitat area with implementation of conservation measures.
<b>Water Operations</b>					
01. Implement operating criteria needed to improve water management for beneficial uses.	None.	N/A	N/A		Potential program effects cannot be evaluated.

D-051343

Table H-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
02. Implement an Environmental Water Account to provide operational flexibility to achieve environmental benefits.	None.	N/A	N/A		Potential program effects cannot be evaluated.

Contributors to the development of this table: Lisa Webber, Pete Rawlings, and Gerrit Platenkamp of Jones & Stokes Associates.

June 1999

**Table H-2. Key to Table H-1 Potential Beneficial Effects, Potential Adverse Effects, and Conservation Measures Codes**

Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program
Potential for increase in natural seasonal wetland habitat on margins of converted and restored freshwater emergent wetland habitat (BE1).	Potential for permanent loss or degradation of existing natural seasonal wetland habitat near levees if construction activities results in removal of seasonal wetland vegetation (AE1).	To the extent practicable, avoid disturbance to habitat areas occupied by evaluated species (M1).
Potential for increases in natural seasonal wetland habitat area incidental to restoration and enhancement of managed seasonal wetlands (BE2).	Construction-related activities associated with implementing actions could result in take of evaluated species (AE2).	Restore or enhance 2-5 acres of natural seasonal wetland habitat for every acre of existing natural seasonal wetland habitat near affected habitat areas (M2).
Potential for long-term protection and enhancement of existing natural seasonal wetland habitat associated with existing perennial grassland habitat if grassland restoration activities also improve the quality of the associated seasonal wetlands (BE3).	Potential for loss or degradation of existing natural seasonal wetland habitat as a result of restoration activities (AE3).	To the extent consistent with ERP objectives, include project design features that allow for onsite reestablishment and long-term maintenance of natural seasonal wetland vegetation following project construction (M3).
Potential for enhancement and long-term protection of existing natural seasonal wetland habitats associated with agricultural lands if enhancement activities also improve the management and quality of associated seasonal wetlands (BE4).	Potential for short-term degradation of vernal pools or other seasonal wetlands as a result of implementing proposed actions (AE4).	To the extent practicable, avoid construction activities during the breeding period of species that could be adversely affected by the actions (M4).
Reduction in the use of herbicides and pesticides in or near existing seasonal wetland habitat areas could improve the vigor of associated plant populations and result in an increase in populations of invertebrates that are adversely affected by these compounds (BE5).	Potential for localized loss of relatively small seasonal wetland habitat areas where wetland vegetation is supported primarily by seeps or runoff associated with existing inefficiencies in the use of agricultural water (AE5).	To the extent practicable, avoid direct disturbance to populations and individuals of evaluation plant and invertebrate species (M5).

D-051345

Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program
Long-term protection of existing habitat areas from flooding that would result from levee failures (BE6).	Construction of interties and supporting infrastructure between existing conveyance facilities and export pumps could result in the permanent loss of natural seasonal wetland habitat (AE6).	When feasible, establish and protect additional populations of evaluation plant and invertebrate species in suitable nearby natural seasonal wetland habitat areas before implementing construction activities that could affect existing populations or individuals (M6).
Increase in vernal pool habitat area and long-term protection of existing vernal pool habitats from potential loss or degradation from future changes in land use (BE7).	Potential for permanent loss of natural seasonal wetland habitat if conveyance channel capacity is increased by setting back channel levees in areas with existing seasonal wetland habitat (AE7).	To the extent consistent with program objectives, select Delta islands that support little or no wetland habitat for use as storage facilities (M7).
Potential for increase in habitat area if increased flows inundate overflow channels, old oxbows, and other floodplain features for sufficient periods to allow for the establishment and maintenance of seasonal wetland vegetation (BE8).	Construction of conveyance facilities and associated infrastructure could result in short-term or permanent loss or degradation of natural seasonal wetland habitat (AE8).	Minimize the potential for construction-related runoff into nearby wetlands through use of siltation-control barriers, detention basins, or other appropriate methods (M8).
Potential for increase in seasonal wetland habitat area on floodplains as a result of improving floodplain ecological processes (BE9).	Construction and operation of water storage facilities could result in short-term or permanent loss or degradation of natural seasonal wetland habitat (AE9).	To the extent practicable, avoid direct disturbance to populations and individuals of evaluation plant and animal species associated with vernal pools (M9).
Depending on storage design and operation, potential for the natural establishment and long-term maintenance of seasonal wetland vegetation along shorelines of storage pools (BE10)	Potential for short-term disturbance of degraded vernal pools as a result of implementing proposed actions (AE10).	Manage recreational uses to avoid or reduce the likelihood for recreation-related impacts on sensitive plant and invertebrate populations and wildlife use areas (M10).
Potential beneficial effects of the program are not analyzed. The type and magnitude of potential beneficial effects would depend on the type of specific program actions that are implemented (N/A).	Potential for loss of seasonal wetlands that are near channels resulting from actions to reintroduce erosional processes by setting back levees or otherwise allowing banks to erode (AE11).	To the extent practicable, trap and relocate evaluated wildlife species that would be unlikely to escape from the inundation area of new or enlarged reservoirs to suitable nearby habitat areas (M11).
Likely to be no discernable beneficial effects on existing habitat areas and associated evaluation species (N/E).	Permanent loss of habitat if storage facilities and associated infrastructure are constructed in drainages that support seasonal wetlands (AE12).	

Table H-2. Continued

Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program
	<p>Recreation-related activities potentially associated with new storage facilities could result in take of evaluated species (AE13).</p> <p>Potential adverse effects of the program are not analyzed. The type and magnitude of potential adverse effects would depend on the type of specific program actions that are implemented (N/A).</p> <p>Likely to be no discernable adverse effects on existing habitat areas and associated evaluation species (N/E).</p>	