APPENDIX A

USFWS Official Species List

ATTACHEMENT 1

USFWS Official Species List – 1 of 2

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 110630095444

Database Last Updated: April 29, 2010

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio

Conservancy fairy shrimp (E)

Critical habitat, Conservancy fairy shrimp (X)

Branchinecta longiantenna

longhorn fairy shrimp (E)

Branchinecta lynchi

Critical habitat, vernal pool fairy shrimp (X)

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

Lepidurus packardi

Critical habitat, vernal pool tadpole shrimp (X)

vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Critical habitat, CA tiger salamander, central population (X)

Rana draytonii

California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

Mammals

Dipodomys nitratoides exilis

Critical habitat, Fresno kangaroo rat (X)

Fresno kangaroo rat (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

Plants

Castilleja campestris ssp. succulenta

Critical habitat, succulent (=fleshy) owl's-clover (X)

succulent (=fleshy) owl's-clover (T)

Caulanthus californicus

California jewelflower (E)

Chamaesyce hooveri

Critical habitat, Hoover's spurge (X)

Hoover's spurge (T)

Cordylanthus palmatus

palmate-bracted bird's-beak (E)

Neostapfia colusana

Colusa grass (T)

Critical habitat, Colusa grass (X)

Orcuttia inaequalis

Critical habitat, San Joaquin Valley Orcutt grass (X)

San Joaquin Valley Orcutt grass (T)

Orcuttia pilosa

Critical habitat, hairy Orcutt grass (X)

hairy Orcutt grass (E)

Pseudobahia bahiifolia

Hartweg's golden sunburst (E)

Tuctoria greenei

Critical habitat, Greene's tuctoria (=Orcutt grass) (X)

Greene's tuctoria (=Orcutt grass) (E)

Quads Containing Listed, Proposed or Candidate Species:

MALAGA (357B)
CONEJO (357C)
FRESNO SOUTH (358A)
KEARNEY PARK (358B)
RAISIN (358C)
CARUTHERS (358D)
KERMAN (359A)
FRIANT (378B)
CLOVIS (378C)
LANES BRIDGE (379A)
GREGG (379B)
HERNDON (379C)
FRESNO NORTH (379D)
MADERA (380A)
BONITA RANCH (380B)
GRAVELLY FORD (380C)
BIOLA (380D)

FIREBAUGH NE (381A)
POSO FARM (381B)
OXALIS (382A)
RAYMOND (399B)
DAULTON (399C)
LITTLE TABLE MTN. (399D)
RAYNOR CREEK (400A)
LE GRAND (400B)
BERENDA (400C)
KISMET (400D)
PLAINSBURG (401A)
EL NIDO (401B)
BLISS RANCH (401C)
CHOWCHILLA (401D)
SANDY MUSH (402A)
TURNER RANCH (402B)
SANTA RITA BRIDGE (402D)
INDIAN GULCH (420B)
OWENS RESERVOIR (420C)
ILLINOIS HILL (420D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be

carried to their habitat by air currents.

- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special

management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be September 28, 2011.

ATTACHEMENT 2

USFWS Official Species List – 2 of 2

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

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Quad Lists

Listed Species

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Conservancy fairy shrimp (E)

Critical habitat, Conservancy fairy shrimp (X)

Branchinecta longiantenna

longhorn fairy shrimp (E)

Branchinecta lynchi

Critical habitat, vernal pool fairy shrimp (X)

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

Lepidurus packardi

Critical habitat, vernal pool tadpole shrimp (X)

vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha

Central Valley spring-run chinook salmon (T) (NMFS)

winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Critical habitat, CA tiger salamander, central population (X)

Rana draytonii

California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila

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Critical habitat, Hoover's spurge (X)

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Colusa grass (T)

Critical habitat, Colusa grass (X)

Orcuttia inaequalis

Critical habitat, San Joaquin Valley Orcutt grass (X)

San Joaquin Valley Orcutt grass (T)

Orcuttia pilosa

hairy Orcutt grass (E)

Sidalcea keckii

Keck's checker-mallow (=checkerbloom) (E)

Tuctoria greenei

Critical habitat, Greene's tuctoria (=Orcutt grass) (X)

Greene's tuctoria (=Orcutt grass) (E)

Quads Containing Listed, Proposed or Candidate Species:

HAYSTACK MTN. (421A)

YOSEMITE LAKE (421B)

MERCED (421C)

PLANADA (421D)

WINTON (422A)

CRESSEY (422B)

ARENA (422C)

ATWATER (422D)

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APPENDIX B

CNDDB Reports

ATTACHMENT 1

CNDDB Plant Report

California Department of Fish and Game

Natural Diversity Database

Selected Elements by Scientific Name - Portrait

Report for the following 7.5-minute USGS quads: Cressy, Winton, Yosemite Lake, Haystack Mountain, Indian Gulch, Arena, Atwater, Merced, Planada, Owens Reservoir, Illinois Hill, Turner Ranch, Sandy Mush, El Nido, Plainsburg, Le Grand, Raymor Creek, Raymond, Santa Rita Bridge, Bliss Ranch, Chowchilla, Berenda, Kismet, Daulton, Little Table Mountain, Oxalis, Poso Farm, Firebaugh NE, Bonita Ranch, Madera, Gregg, Lanes Bridge, Friant, Gravelly Ford, Biola, Herndon, Fresno North, Clovis, Kerman, Kearney Park, Fresno South, Malaga, Raisin, Caruthers, and Conejo.

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Agrostis hendersonii Henderson's bent grass	PMPOA040K0			G1Q	S1.1	3.2
2	Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1			G1T1	S1.1	1B.2
3	Atriplex cordulata heartscale	PDCHE040B0			G2?	S2.2?	1B.2
4	Atriplex joaquiniana San Joaquin spearscale	PDCHE041F3			G2	S2	1B.2
5	Atriplex minuscula lesser saltscale	PDCHE042M0			G1	S1.1	1B.1
6	Atriplex persistens vernal pool smallscale	PDCHE042P0			G2	S2.2	1B.2
7	Atriplex subtilis subtle orache	PDCHE042T0			G2	S2.2	1B.2
8	Calochortus clavatus var. avius Pleasant Valley mariposa-lily	PMLIL0D095			G4T3	S3	1B.2
9	Calycadenia hooveri Hoover's calycadenia	PDAST1P040			G2	S2.2	1B.3
10	Castilleja campestris ssp. succulenta succulent owl's-clover	PDSCR0D3Z1	Threatened	Endangered	G4?T2	S2.2	1B.2
11	Caulanthus californicus California jewel-flower	PDBRA31010	Endangered	Endangered	G1	S1.1	1B.1
12	Chamaesyce hooveri Hoover's spurge	PDEUP0D150	Threatened		G2	S2.1	1B.2
13	Clarkia rostrata beaked clarkia	PDONA050Y0			G2	S2	1B.3
14	Cordylanthus palmatus palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1.1	1B.1
15	Cryptantha hooveri Hoover's cryptantha	PDBOR0A190			GH	SH	1A
16	Delphinium recurvatum recurved larkspur	PDRAN0B1J0			G2	S2.2	1B.2
17	Downingia pusilla dwarf downingia	PDCAM060C0			G2	S2	2.2
18	Eriastrum hooveri Hoover's eriastrum	PDPLM03070	Delisted		G3	S3.2	4.2
19	Eryngium racemosum Delta button-celery	PDAPI0Z0S0		Endangered	G2Q	S2.1	1B.1
20	Eryngium spinosepalum spiny-sepaled button-celery	PDAPI0Z0Y0			G2	S2.2	1B.2
21	Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060		Endangered	G2	S2	1B.2
22	Imperata brevifolia California satintail	PMPOA3D020			G2	S2.1	2.1

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
23	Lasthenia glabrata ssp. coulteri Coulter's goldfields	PDAST5L0A1			G4T3	S2.1	1B.1
24	Lepidium latipes var. heckardii Heckard's pepper-grass	PDBRA1M0K1			G4T1	S1.2	1B.2
25	Leptosiphon serrulatus Madera leptosiphon	PDPLM09130			G1?	S1?	1B.2
26	Lupinus citrinus var. citrinus orange lupine	PDFAB2B103			G2T2	S2.2	1B.2
27	Navarretia myersii ssp. myersii pincushion navarretia	PDPLM0C0X1			G1T1	S1.1	1B.1
28	Navarretia nigelliformis ssp. radians shining navarretia	PDPLM0C0J2			G4T2T3	S2S3.2	1B.2
29	Navarretia prostrata prostrate vernal pool navarretia	PDPLM0C0Q0			G2?	S2.1?	1B.1
30	Neostapfia colusana Colusa grass	PMPOA4C010	Threatened	Endangered	G2	S2	1B.1
31	Orcuttia inaequalis San Joaquin Valley Orcutt grass	PMPOA4G060	Threatened	Endangered	G2	S2.1	1B.1
32	Orcuttia pilosa hairy Orcutt grass	PMPOA4G040	Endangered	Endangered	G2	S2.1	1B.1
33	Phacelia ciliata var. opaca Merced phacelia	PDHYD0C0S2			G5T1	S1.2	1B.2
34	Pseudobahia bahiifolia Hartweg's golden sunburst	PDAST7P010	Endangered	Endangered	G2	S2.1	1B.1
35	Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0			G3	S3	1B.2
36	Sidalcea keckii Keck's checkerbloom	PDMAL110D0	Endangered		G1	S1.1	1B.1
37	Trichocoronis wrightii var. wrightii Wright's trichocoronis	PDAST9F031			G4T3	S1.1	2.1
38	Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010			G1	S1.1	1B.1
39	Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G2	S2.2	1B.1

ATTACHMENT 2

CNDDB Wildlife Report

California Department of Fish and Game

Natural Diversity Database

Selected Elements by Scientific Name - Portrait

Report for the following 7.5-minute USGS quads: Cressy, Winton, Yosemite Lake, Haystack Mountain, Indian Gulch, Arena, Atwater, Merced, Planada, Owens Reservoir, Illinois Hill, Turner Ranch, Sandy Mush, El Nido, Plainsburg, Le Grand, Raymor Creek, Raymond, Santa Rita Bridge, Bliss Ranch, Chowchilla, Berenda, Kismet, Daulton, Little Table Mountain, Oxalis, Poso Farm, Firebaugh NE, Bonita Ranch, Madera, Gregg, Lanes Bridge, Friant, Gravelly Ford, Biola, Herndon, Fresno North, Clovis, Kerman, Kearney Park, Fresno South, Malaga, Raisin, Caruthers, and Conejo.

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Agelaius tricolor tricolored blackbird	ABPBXB0020			G2G3	S2	SC
2	Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SC
3	Antrozous pallidus pallid bat	AMACC10010			G5	S3	SC
4	Aquila chrysaetos golden eagle	ABNKC22010			G5	S3	
5	Athene cunicularia burrowing owl	ABNSB10010			G4	S2	SC
6	Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered		G1	S1	
7	Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened		G3	S2S3	
8	Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150			G2	S2	
9	Buteo regalis ferruginous hawk	ABNKC19120			G4	S3S4	
10	Buteo swainsoni Swainson's hawk	ABNKC19070		Threatened	G5	S2	
11	Charadrius montanus mountain plover	ABNNB03100	Proposed Threatened		G2	S2?	SC
12	Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
13	Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened		G3T2	S2	
14	Dipodomys heermanni dixoni Merced kangaroo rat	AMAFD03062			G3G4T2T3	S2S3	
15	Dipodomys nitratoides exilis Fresno kangaroo rat	AMAFD03151	Endangered	Endangered	G3T1	S1	
16	Efferia antiochi Antioch efferian robberfly	IIDIP07010			G1G3	S1S3	
17	Emys marmorata western pond turtle	ARAAD02030			G3G4	S3	SC
18	Eremophila alpestris actia California horned lark	ABPAT02011			G5T3Q	S3	
19	Euderma maculatum spotted bat	AMACC07010			G4	S2S3	SC
20	Eumops perotis californicus western mastiff bat	AMACD02011			G5T4	S3?	SC
21	Falco columbarius merlin	ABNKD06030			G5	S3	

Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
22 Gambelia sila blunt-nosed leopard lizard	ARACF07010	Endangered	Endangered	G1	S1	
23 Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S2	
24 Lasiurus blossevillii western red bat	AMACC05060			G5	S3?	SC
25 Lasiurus cinereus hoary bat	AMACC05030			G5	S4?	
26 Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered		G3	S2S3	
27 Linderiella occidentalis California linderiella	ICBRA06010			G3	S2S3	
28 Lithobates pipiens northern leopard frog	AAABH01170			G5	S2	SC
29 Lytta moesta moestan blister beetle	IICOL4C020			G2	S2	
30 Lytta molesta molestan blister beetle	IICOL4C030			G2	S2	
31 Metapogon hurdi Hurd's metapogon robberfly	IIDIP08010			G1G3	S1S3	
32 Mylopharodon conocephalus hardhead	AFCJB25010			G3	S3	SC
33 Myotis yumanensis Yuma myotis	AMACC01020			G5	S4?	
34 Perognathus inornatus inornatus San Joaquin pocket mouse	AMAFD01061			G4T2T3	S2S3	
35 Phalacrocorax auritus double-crested cormorant	ABNFD01020			G5	S3	
36 Phrynosoma blainvillii coast horned lizard	ARACF12100			G4G5	S3S4	SC
37 Rana boylii foothill yellow-legged frog	AAABH01050			G3	S2S3	SC
38 Spea hammondii western spadefoot	AAABF02020			G3	S3	SC
39 Taxidea taxus American badger	AMAJF04010			G5	S4	SC
40 Thamnophis gigas giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3	
41 Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2T3	S2S3	
42 Xanthocephalus xanthocephalus yellow-headed blackbird	ABPBXB3010			G5	S3S4	SC

APPENDIX C-1

Regional Special-Status Plant Species with Potential to Occur

Table C-1
Regional Special-Status Plant Species with Potential to Occur

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Alismataceae						
Sagittaria sanfordii	Sanford's arrowhead	--	--	1B.2	High	Freshwater habitats are present in the special-status plant study area and this species was found during May 2010 surveys within the special-status plant study area. The CNDDB reports one presumed extant occurrence approximately 1.17 miles northeast of the project footprint (Occurrence 7; CNDDB 2003d).
Apiaceae						
Eryngium racemosum	Delta button-celery	--	E	List 1B.1	Moderate	Riparian scrub and vernal pool habitats are present in the plant study area. CNPS and CNDDB both report occurrences of this species in the regional area (CNPS 2011, CNDDB 2011); however, no occurrences have been identified within 10-miles of the project footprint.
Eryngium spinosepalum	Spiny-sepaled button-celery	--	--	List 1B.2	Moderate	Vernal pool habitat and moderate quality annual grassland habitat are present in the special-status plant study area. The nearest reported occurrence is presumed extant and is located within the special-status plant study area, less than 0.08 feet from the project footprint (Occurrence 32; CNDDB 2003d).
Asteraceae						
Calycadenia hooveri	Hoover's calycadenia	--	--	List 1B.3	Moderate	California annual grassland habitat is present in the special-status plant study area. The nearest reported occurrence is 4.43 miles northeast of the project footprint and is presumed extant (Occurrence 14; CNDDB 2003d).

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Lasthenia glabrata ssp. *Coulteri*	Coulter's goldfields	--	--	List 1B.1	Moderate	Vernal pool habitat is present in the special-status plant study area. CNPS and CNDDB both report occurrences of this species in the regional area (CNPS 2011, CNDDB 2011); however, no occurrences have been identified within 10-miles of the project footprint.
Layia munzii	Munz's tidy-tips	--	--	List 1B.2	Unlikely	Moderate quality annual grassland habitat is present in the special-status plant study area; however, the special-status plant study area is below the reported elevation range for this species. CNPS reports occurrences of this species in the regional area (CNPS 2011); however, no occurrences have been identified within 10-miles of the project footprint.
Monolopia congdonii	San Joaquin woollythreads	E	--	List 1B.2	Unlikely	There are no reported occurrences within 10 miles of the project footprint, and the special-status plant study area is out of the current range of this species (USFWS, 2010). Moderate quality annual grassland habitat is present in the special-status plant study area.
Pseudobahia bahiifolia	Hartweg's golden sunburst	E	E	List 1B.1	Moderate	Moderate quality annual grassland habitat is present in the special-status plant study area. CNPS and CNDDB both report occurrences of this species in the regional area (CNPS 2011, CNDDB 2011); however, no occurrences have been identified within 10-miles of the project footprint.

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Trichocoronis wrightii var. *wrightii*	Wright's trichocoronis	--	--	List 2.1	Moderate	Riparian scrub and vernal pool habitats are present in the special-status plant study area. CNPS and CNDDB both report occurrences of this species in the regional area (CNPS 2011, CNDDB 2011); however, no CNDDB occurrences have been identified within 10-miles of the project footprint.
Boraginaceae						
Cryptantha hooveri	Hoover's cryptantha	--	--	List 1A	Unlikely	This species is presumed extinct in California (CNPS, 2011). The CNDDB reports one historic (1939) presumed extant occurrence within the project footprint (Occurrence 1; CNDDB, 2003d). Based on review of recent aerial imagery, the habitat at the reported location has been converted to agriculture (Google Earth, 2010). Moderate quality annual grassland habitat is present elsewhere in the special-status plant study area.
Caulanthus californicus	California jewel-flower	E	E	List 1B.1	Unlikely	This species is considered extirpated from the San Joaquin Valley. There are no reported extant occurrences within 10 miles of the project footprint; however, there is one historic extirpated occurrence of this species reported inside the project footprint (Occurrence 38; CNDDB, 2003d). Moderate quality annual grassland habitat is present in the special-status plant study area.
Lepidium latipes var. heckardii	Heckard's pepper-grass	--	--	List 1B.2	Moderate	Moderate quality valley grassland habitat is present in the special-status plant study area. The CNPS reports an occurrence of this species in the USGS 7.5-minute Arena quadrangle north of the special-status plant study area (CNPS, 2011).

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Tropidocarpum capparideum	caper-fruited tropidocarpum	--	--	List 1B.1	High	One historic (1930) and presumed extant occurrence of this species is present within the project footprint (Occurrence 22; CNDDB, 2003d). Moderate quality annual grassland habitat is present within the special-status plant study area.
Campanulaceae						
Downingia pusilla	dwarf downingia	--	--	List 2.2	Moderate	Vernal pool habitat is present in the special-status plant study area. The nearest reported occurrence is located approximately 2.75 miles northeast of the project footprint and is presumed extant (Occurrence 109; CNDDB, 2003d).
Chenopodiaceae						
Atriplex cordulata	heartscale	--	--	List 1B.2	Moderate	Moderate quality annual grassland habitat is present in the special-status plant study area. The CNDDB denotes two extirpated occurrences within the project footprint (Occurrences 18 and 19; CNDDB, 2003d). Based on review of recent aerial imagery, habitat at these locations has been converted to agricultural uses (Google Earth, 2010). The nearest presumed extant occurrence is located approximately 3.97 miles southwest of the project footprint (Occurrence 15; CNDDB, 2003d).
Atriplex depressa	brittlescale	--	--	List 1B.2	Moderate	Vernal pool habitat and moderate quality annual grassland habitat are present in the special-status plant study area. CNPS reports this species in the regional area (CNPS 2011); however, no CNDDB occurrences have been identified within 10-miles of the project footprint.

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Atriplex joaquiniana	San Joaquin spearscale	--	--	List 1B.2	Moderate	Moderate quality annual grassland habitat is present in the special-status plant study area. The nearest CNDDB reported occurrence is located 9.96 miles southwest of the project footprint and is presumed extant (Occurrence 74; CNDDB 2011).
Atriplex minuscula	lesser saltscale	--	--	List 1B.1	High	Moderate quality annual grassland habitat is present in the special-status plant study area. There are two presumed extant occurrences within the project footprint (Occurrences 25 and 26; CNDDB, 2003d). Based on review of recent aerial imagery, most of the habitat at the reported locations for these populations has been converted to agricultural uses and residential development (Google Earth, 2010).
Atriplex persistens	vernal pool smallscale	--	--	List 1B.2	Moderate	Vernal pool habitat is present in the special-status plant study area. There is one historic (1926) occurrence approximately 2.26 miles southwest of the project footprint that is reported as possibly extirpated (Occurrence 7; CNDDB, 2003d). The nearest presumed extant occurrence is located 6.19 miles west of the project footprint (Occurrence 3; CNDDB, 2003d).

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Atriplex subtilis	subtle orache	--	--	List 1B.2	High	Moderate quality annual grassland habitat is present in the special-status plant study area and the CNDDB reports one presumed extant occurrence within the project footprint (Occurrence 4; CNDDB, 2003d). Based on review of recent aerial imagery, habitat at the reported location has been entirely converted to agriculture (Google Earth, 2010).
Atriplex vallicola	Lost Hills crownscale	--	--	List 1B.2	Moderate	Vernal pool and moderate quality annual grassland habitat is present in the special-status plant study area. CNPS reports occurrence of this species in the regional area (CNPS 2011); however, no CNDDB occurrences have been identified within 10-miles of the project footprint.
Euphorbiaceae						
Chamaesyce hooveri *Critical Habitat*	Hoover's spurge	T	--	List 1B.2	Moderate	Vernal pool habitat is present in the special-status plant study area. The nearest CNDDB reported occurrence is presumed extant and is located 9.93 miles southwest of the project footprint (Occurrence 22; CNDDB, 2003d). Critical Habitat for this species has been designated in the regional area 8.07 miles southwest of the project footprint.
Fabaceae						
Astragalus tener var. *tener*	alkali milk-vetch	--	--	List 1B.2	Moderate	Vernal pool and annual grassland habitats are present in the special-status plant study area. The nearest reported occurrence is located approximately 9.19 miles southwest of the project footprint (Occurrence 55; CNDDB, 2003d).This population is presumed extant.

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Lupinus citrinus var. *citrinus*	orange lupine	--	--	List 1B.2	Unlikely	Suitable habitat for this species is not present in the special-status plant study area. CNPS and CNDDB both report occurrences of this species in the regional area (CNPS 2011, CNDDB 2011); however, no CNDDB occurrences have been identified within 10-miles of the project footprint.
Hydrophyllaceae						
Phacelia ciliata var. *opaca*	Merced phacelia	--	--	List 1B.2	High	Moderate quality annual grassland is present within the special-status plant study area. The CNDDB reports one presumed extant occurrence of this species within the project footprint (Occurrence 6; CNDDB, 2003d).
Lamiaceae						
Monardella leucocephala	Merced monardella	--	--	List 1A	Unlikely	Annual grasslands are present in the special-status plant study area; however, the special-status plant study area not within the current range of Merced monardella (USFWS, 1998), and this species presumed extirpated in California (CNPS, 2011). There are no reported occurrences within 10 miles of the project footprint (CNDDB, 2003d).
Liliaceae						
Calochortus clavatus var. *avius*	Pleasant Valley mariposa lily	--	--	List 1B.2	Unlikely	Suitable habitat is not present in the special-status plant study area and there are no reported occurrences within 10 miles of the project footprint (CNDDB, 2003d).

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Malvaceae						
Sidalcea keckii *Critical Habitat*	Keck's checkerbloom	E/C	--	List 1B.1	Moderate	Vernal pool habitat and moderate quality annual grassland is present in the special-status plant study area. The nearest reported occurrence is located 6.54 miles north of the project footprint (Occurrence 6; CNDDB, 2003d). This population was last reported seen in 2005 and is presumed extant. Designated Critical Habitat for this species is not present within the regional area.
Onagraceae						
Clarkia rostrata	beaked clarkia	--	--	List1B.3	Moderate	Moderate quality annual grasslands are present in the special-status plant study area. The nearest reported occurrence is located approximately 4.61 miles northeast of the project footprint and is presumed extant (Occurrence 2; CNDDB, 2003d).
Poaceae						
Agrostis hendersonii	Henderson's bent grass	--	--	List 3.2	Moderate	Vernal pool habitat and moderate quality annual grassland habitat is present in the special-status plant study area. The nearest occurrence is located 4.90 miles northeast of the project footprint and is presumed extant (Occurrence 4; CNDDB, 2003d).
Imperata brevifolia	California satintail	--	--	List 2.1	High	Riparian scrub is present in the special-status plant study area. The CNDDB reports one presumed extant occurrence within the project footprint (Occurrence 22; CNDDB, 2003d).

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Neostapfia colusana *Critical Habitat*	Colusa grass	T	E	List 1B.1	Moderate	Vernal pool habitat is present in the special-status plant study area. The three nearest occurrences are reported as extirpated (Occurrence 42; CNDDB, 2003d) and possibly extirpated (Occurrences 12 and 39; CNDDB, 2003d), respectively located 2.43 miles north, 3.21 miles northeast and 4.12 miles southwest of the project footprint. The nearest presumed extant occurrence is located approximately 4.90 miles north of the project footprint (Occurrence 43; CNDDB, 2003d). Critical Habitat for this species has been designated in the regional area 2.09 miles southwest of the project footprint.
Orcuttia inaequalis *Critical Habitat*	San Joaquin Valley Orcutt grass	T	E	List 1B.1	High	Vernal pool habitat is present in the special-status plant study area. There is one possibly extirpated occurrence located within the project footprint (Occurrence 10; CNDDB, 2003d). The nearest presumed extant occurrence is located 0.72 miles northeast of the project footprint (Occurrence 51; CNDDB, 2003d). Critical habitat for this species has been designated within the project footprint.
Orcuttia pilosa *Critical Habitat*	hairy Orcutt grass	E	E	List 1B.1	High	Vernal pool habitat is present in the special-status plant study area. The CNDDB reports one presumed extant occurrence within the project footprint (Occurrence 19; CNDDB, 2003d). Critical Habitat for this species has been designated in the regional area 2.61 miles northeast of the project footprint.

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Tuctoria greenei *Critical Habitat*	Greene's tuctoria	E	R	List 1B.1	High	Vernal pool habitat is present in the special-status plant study area. The CNDDB reports one presumed extant occurrence within the project footprint (Occurrence 28; CNDDB, 2003d). Critical habitat for this species has been designated within the project footprint.
Polemoniaceae						
Leptosiphon serrulatus	Madera leptosiphon	--	--	List 1B.2	Unlikely	Cismontane woodland and coniferous forest habitats are no longer present in the special-status plant study area. Two presumed extant occurrences are reported within the project footprint (Occurrences 10 and 23; CNDDB, 2003d). These occurrences are historic records from 1889 and 1922, are not well documented and require fieldwork verification. Imagery review suggests suitable habitat is no longer present at these occurrence locations (Google Earth, 2010).
Navarretia myersii ssp. *myersii*	pincushion navarretia	--	--	List 1B.1	Moderate	Vernal pool habitat is present in the special-status plant study area. The nearest reported occurrence is presumed extant and is located 5.82 miles northeast of the project footprint (Occurrence 14; CNDDB, 2003d).
Navarretia nigelliformis ssp. radians	shining navarretia	--	--	List 1B.2	Moderate	Moderate quality annual grassland is present in the special-status plant study area. The nearest reported occurrence is located 0.60 miles northeast of the project footprint (Occurrence 44; CNDDB, 2003d). This occurrence is presumed extant.

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Navarretia prostrata	prostrate vernal pool navarretia	--	--	List 1B.1	Moderate	Vernal pool habitat and moderate quality annual grassland is present in the special-status plant study area. The nearest reported occurrence is located 9.38 miles southwest of the project footprint and is presumed extant (CNPS 2011, CNDDB 2011).
Ranunculaceae						
Delphinium recurvatum	recurved larkspur	--	--	List 1B.2	Moderate	Moderate quality annual grassland is present in the special-status plant study area. There is one historic (1955) reported occurrence 0.59 miles located within the project footprint (Occurrence 77; CNDDB, 2003d). This occurrence is possibly extirpated. Based on review of recent aerial imagery, the reported location has been converted to agriculture (Google Earth, 2010). The nearest presumed extant location is located approximately 5.03 miles west of the project footprint (Occurrence 78; CNDDB, 2003d).
Myosurus minimus ssp. *Apus*	little mousetail	--	--	List 3.1	Moderate	Vernal pool habitat and moderate quality annual grasslands are present in the special-status plant study area. The CNPS reports this species in the regional area but the CNDDB reports no occurrences within 10 miles of the project footprint (CNDDB, 2003d).
Scrophulariaceae						
Castilleja campestris ssp. *succulenta* *Critical Habitat*	succulent owl's-clover	T	E	List 1B.2	High	Vernal pool habitat is present in the special-status plant study area. There is one presumed extant occurrence reported within the project footprint (Occurrence 62; CNDDB, 2003d). Critical habitat for this species has been designated within the project footprint.

Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale
Cordylanthus palmatus	palmate-bracted bird's-beak	E	E	List 1B.1	Moderate	Moderate quality annual grassland is present within the special-status plant study area. The nearest reported occurrence is presumed extant and is located approximately 7.41 miles south of the project footprint (Occurrence 26; CNDDB, 2003d).
Gratiola heterosepala	Boggs Lake hedge-hyssop	--	E	List 1B.2	Moderate	Vernal pool habitat is present in the special-status plant study area. The nearest reported occurrence is presumed extant and is located approximately 7.26 miles north of the project footprint (Occurrence 83; CNDDB, 2011a).

Definitions

No Potential: No historic range or habitat within the habitat study area

Future Potential: Potential following the San Joaquin River Restoration Program

Unlikely Potential: No suitable habitat and presumed extirpated within the habitat study area

Low Potential: Low or marginal quality habitat within habitat study area

Moderate Potential: Potential current range and moderate habitat within the habitat study area

High Potential: Presumed extant, observed or otherwise expected.

Designations:

-- = No status designation.

[a] Federal Status:

E (Endangered) = Listed as endangered under the Federal ESA.

T (Threatened) = Listed as threatened under the Federal ESA.

C (Critical Habitat)

[b] State Status:

E (Endangered) = Listed as endangered under the CESA.

T (Threatened) = Listed as threatened under the CESA.

R (Rare) = Listed as rare under the CESA.

[c] CNPS Status

LIST 1A = Presumed extinct in California.

LIST 1B = Rare, threatened, or endangered in California and elsewhere.

LIST 2 = Rare, threatened, or endangered in California, but more common elsewhere.

LIST 3 = More information about this plant (Review List).

.1 = Seriously endangered in California; .2 = Fairly endangered in California; .3 = Not very endangered in California

Sources:

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Scientific Name	Common Name	Federal Status[a]	State Status[b]	CNPS Status[c]	Potential to Occur	Rationale

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Fish & Wildlife Service. 2011. Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested. Document Number 110315042646. Dated March 15, 2011. Information expires on June 13, 2011. Sacramento, CA.

APPENDIX C-2

Regional Special-Status Wildlife Species with Potential to Occur

Table C-2
Regional Special-Status Wildlife Species with Potential to Occur

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Invertebrates					
Branchinecta conservatio	Conservancy fairy shrimp	E	--	Moderate	Vernal pools are present in the habitat study area. The nearest CNDDB reported occurrence is located approximately 1.89 miles south of the project footprint and is presumed extant (Occurrence 34; CNDDB, 2003e). Critical habitat for this species has been designated within the project footprint.
Branchinecta lynchi	vernal pool fairy shrimp	T	--	High	Vernal pools are present in the habitat study area. There are three CNDDB reported presumed extant occurrences of this species within the project footprint (Occurrence 12, 153, and 181; CNDDB, 2003e). One additional presumed extant occurrence is located within the habitat study area 0.06 miles southwest of the project footprint (Occurrence 310; CNDDB, 2003e). Critical habitat for this species has been designated within the project footprint.
Branchinecta longiantenna	longhorn fairy shrimp	E	--	Unlikely	The habitat study area is outside the known range for this species. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	T	--	Moderate	Valley elderberry shrubs have been identified within the habitat study area. The nearest CNDDB reported occurrence is located 0.96 miles northeast of the project footprint, and is presumed extant (Occurrence 134; CNDDB, 2003e).
Lepidurus packardi	vernal pool tadpole shrimp	E	--	High	Vernal pools are present within the habitat study area. There are two CNDDB reported and presumed extant occurrences within the project footprint (Occurrences 81 and 244; CNDDB, 2003e). Critical habitat

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
					for this species has been designated within the project footprint.
Fish					
Lampetra hubbsi	Kern brook lamprey	--	SSC	Moderate	Suitable aquatic habitat is present within the habitat study area. The project footprint is within the reported range of this species (Moyle 2002).
Oncorhynchus kisutch	Coho salmon - central California coast ESU	--	E	No	The project region is outside of the current and historic range of this species (Moyle 2002).
Oncorhynchus mykiss	Central Valley steelhead	T	SSC	Low (but moderate in the foreseeable future)	Could occur in the habitat study area in small numbers and would likely benefit to a limited extent from the San Joaquin River Restoration Program, although not the focus of current restoration plans (SJRRP 2009). Critical habitat for this species has been designated within the regional area, approximately 5.90 miles northwest of the project footprint.
Oncorhynchus tshawytscha	Central Valley spring-run Chinook salmon	T	T	Future	This species is the primary target species of San Joaquin River Restoration Program, but an experimental population does not currently occur in the regional area (Reclamation et al. 2009).
Oncorhynchus tshawytscha	winter-run Chinook salmon, Sacramento River	E	E	No	The regional area is outside of the current and historic range of this species; it is only reported as occurring in the Sacramento River system (Moyle 2002)
Oncorhynchus tshawytscha	Chinook salmon - Central Valley fall / late fall-run ESU	--	SSC	Low (but high in the foreseeable future)	This species could occur in the habitat study area in small numbers and would benefit from the San Joaquin River Restoration Program (Reclamation et al. 2009).
Hypomesus transpacificus	delta smelt	T	T	No	The regional area is outside of the current and historic range of this species; it is only reported to occur downstream of Mossdale in the San Joaquin River system (Moyle 2002)

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Mylopharodon conocephalus	hardhead	--	SSC	Moderate	The habitat study area is within range of this species (Moyle 2002) and contains limited habitat in Bear Creek. The CNDDB reports a presumed extant occurrence approximately 6.41 miles northeast of the project footprint (Occurrence 12; CNDDB, 2003e).
Lavinia symmetricus symmetricus	San Joaquin roach	--	SSC	Moderate	The habitat study area is within range of this species (Moyle 2002) and contains potentially suitable habitat.
Amphibian					
Ambystoma californiense	California tiger salamander	T	T/SSC	High	Vernal pools with adjacent California annual grassland habitat occur within the habitat study area. This species has been observed in vernal pool habitat adjacent to the BNSF alignment during field surveys. The CNDDB reports three occurrences within the project footprint; two are denoted as extirpated (Occurrences 583 and 616; CNDDB, 2011) and one is presumed extant (Occurrence 901; CNDDB, 2011). Critical habitat for this species has been designated within the regional area, 1.52 miles northeast of the project footprint.
Ensatina eschscholtzii	yellow-blotched salamander	--	SSC	Unlikely	The habitat study area is outside the known range for this species. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Lithobates pipiens	northern leopard frog	--	SSC	Unlikely	The habitat study area is outside the known range for this species. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Rana aurora draytonii	California red-legged frog	T	SSC	Unlikely	The habitat study area is outside the known range for this species. (Jennings et al. 1994). There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Rana boylii	foothill yellow-legged frog	--	SSC	Unlikely	Suitable habitat for this species is not present in the habitat study area. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Spea hammondii	western spadefoot	--	SSC	High	The habitat study area is within range and contains suitable habitat for this species. The CNDDB reports three presumed extant occurrences within the project footprint (Occurrences 168, 376 and 377; CNDDB, 2003e). One additional occurrence is located within the habitat study area, 0.06 miles northeast of the project footprint (Occurrence 240; CNDDB, 2011).
Reptiles					
Actinemys marmorata	western pond turtle	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat for this species. The nearest CNDDB reported occurrence is located 0.23 miles northeast of the project footprint, and is presumed extant (Occurrence 321; CNDDB, 2003e).
Anniella pulchra pulchra	silvery legless lizard	-	SSC	Unlikely	Suitable habitat for this species is not present in the habitat study area. The CNDDB reports 1 presumed extant occurrence in the regional area, 9.83 miles west of the project footprint (Occurrence 82; CNDDB, 2003e).

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Gambelia (=Crotaphytus) sila	blunt-nosed leopard lizard	E	E/FP	Unlikely	Suitable habitat for this species has not been identified in the habitat study area. The nearest CNDDB reported occurrence is located 3.70 miles south of the project footprint and is presumed extant (Occurrence 403; CNDDB, 2003e).
Masticophis flagellum ruddocki	San Joaquin whipsnake	--	SSC	Unlikely	Suitable habitat for this species is not present in the habitat study area. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Phrynosoma blainvillii	coast horned lizard	--	SSC	Unlikely	Suitable habitat for this species is not present in the project footprint. The nearest CNDDB reported occurrences of this species is located approximately 9.30 miles southwest of the project footprint (Occurrence 608; CNDDB, 2003e).
Thamnophis gigas	giant garter snake	T	T	Unlikely	The CNDDB reports one possibly extirpated occurrence of this species within the project footprint (Occurrence 144; CNDDB, 2003e). The habitat study area is currently outside the current range of this species (USGS, 2009).
Birds					
Anseriformes					
Aythya americana	redhead	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Bucephala islandica	Barrow's goldeneye	--	SSC	Unlikely	The habitat study area is beyond the known range for this species. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Dendrocygna bicolor	fulvous whistling-duck	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat for this species.
Histrionicus histrionicus	harlequin duck	--	SSC	Unlikely	The habitat study area is beyond the known range for this species. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Apodiformes					
Calypte costae	Costa's hummingbird	BCC	--	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Charadriiformes					
Calidris canutus	red knot	BCC	--	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Charadrius alexandrinus	snowy plover	T	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Charadrius montanus	mountain plover	PT/BCC	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. The nearest CNDDB reported occurrence is located approximately 5.64 miles north of the project footprint (Occurrence 8; CNDDB, 2003e).
Chlidonias niger	black tern	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Limnodromus griseus	short-billed dowitcher	BCC	--	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Limosa fedoa	marbled godwit	BCC	--	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Numenius americanus	long-billed curlew	BCC	--	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Numenius phaeopus	whimbrel	BCC	--	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Ciconiiformes					
Ixobrychus exilis	least bittern	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles (CNDDB, 2003e).
Cuculiformes					
Coccyzus americanus	western yellow-billed cuckoo	FC/BCC	E	Low	The habitat study area is within range and contains potentially suitable habitat. The CNDDB reports one extirpated occurrence 7.30 miles east of the project footprint (Occurrence 87; CNDDB, 2003e). No presumed extant occurrences have been reported within 10-miles of the project footprint.

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Falconiformes					
Aquila chrysaetos	golden eagle	BGEPA	FP	Moderate	The habitat study area is within range and contains potentially suitable habitat. This species was observed in non-nesting (vernal pool) habitat along the BNSF alignment on March 17, 2011. The nearest CNDDB reported occurrence is located approximately 1.18 miles northeast of the project footprint and is presumed extant (Occurrence 263; CNDDB, 2003e).
Buteo swainsoni	Swainson's hawk	--	T	High	This species has been observed in the project footprint. The CNDDB reports two presumed extant occurrences of this species within the project footprint (Occurrences 476 and 821; CNDDB, 2003e). Five additional presumed extant occurrences are located within the habitat study area: Occurrences 1690 and 1692 are both located less than 20 feet from the project footprint (CNDDB, 2011). Occurrences 820 and 749 are respectively located 0.01 miles to the north and northeast of the project footprint (CNDDB, 2011). Occurrence 1000 is located 0.19 miles to the northeast of the project footprint (CNDDB, 2011).
Circus cyaneus	northern harrier	--	SSC	High	This species was observed in the project footprint during field surveys. There are no CNDDB reported occurrences of this species within 10 miles (CNDDB, 2003e).
Elanus leucurus	white-tailed kite	--	FP	High	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles (CNDDB, 2003e).

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Falco peregrinus anatum	American peregrine falcon	BCC	FP	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles (CNDDB, 2003e).
Haliaeetus leucocephalus	bald eagle	BGEPA	E/FP	Moderate	This species was observed within the habitat study area on May 25, 2010. The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Gaviiformes					
Gavia immer	common loon	--	SSC	Unlikely	The habitat study area is beyond the known range for this species. There are no CNDDB reported occurrences of this species within 10 miles (CNDDB, 2003e).
Gruiformes					
Grus canadensis Canadensis	lesser sandhill crane	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Grus canadensis tabida	greater sandhill crane	--	T/FP	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles (CNDDB, 2003e).
Passeriformes					
Agelaius tricolor	tricolored blackbird	BCC	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. The nearest CNDDB reported occurrence is located approximately 2.24 miles southwest of the project footprint and is presumed extant (Occurrence 65; CNDDB 2010).

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Ammodramus savannarum	grasshopper sparrow	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Carduelis lawrencei	Lawrence's goldfinch	BCC	--	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Dendroica petechia brewsteri	yellow warbler	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Icteria virens	yellow-breasted chat	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Lanius ludovicianus	loggerhead shrike	BCC	SSC	High	This species has observed in the habitat study area on multiple occasions during field surveys. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Melospiza melodia	song sparrow ("Modesto" population)	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Pica nuttalli	yellow-billed magpie	BCC	--	High	This species was observed in the habitat study area during field surveys. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Pipilo maculates	spotted towhee	BCC	--	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Pooecetes gramineus affinis	Oregon vesper sparrow	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Progne subis	purple martin	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Vireo bellii pusillus	least Bell's vireo	E/BCC	E	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Xanthocephalus xanthocephalus	yellow-headed blackbird	--	SSC	High	This species has been observed in the habitat study area during field surveys. The project footprint is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Pelecaniformes					
Pelecanus erythrorhynchos	American white pelican	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles (CNDDB, 2003e).

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Piciformes					
Melanerpes lewis	Lewis's woodpecker	BCC	--	Unlikely	Open forest and woodland habitat is not present within the habitat study area. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Strigiformes					
Asio flammeus	short-eared owl	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Asio otus	long-eared owl	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Athene cunicularia	western burrowing owl	BCC	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat. The CNDDB reports one possibly extirpated occurrence approximately 0.46 miles southwest of the project footprint (Occurrence 757; CNDDB, 2003e). The nearest presumed extant occurrence is located approximately 0.95 miles southwest of the project footprint (Occurrence 877; CNDDB, 2003e).
Mammals					
Ammospermophilus nelsoni	Nelson's antelope squirrel	--	T	Unlikely	Suitable habitat for this species is not present in the habitat study area. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Antrozous pallidus	pallid bat	--	SSC	Moderate	The habitat study area is within range and contains potentially suitable habitat for this species. The nearest CNDDB reported occurrence is located 1.34 miles

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
					northeast of the project footprint and is presumed extant (Occurrence 147; CNDDB, 2003e).
Bassariscus astutus	ringtail	--	FP	Unlikely	Suitable habitat for this species is not present in the project footprint. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Corynorhinus townsendii	Townsend's big-eared bat	--	SSC	Unlikely	Suitable habitat for this species is not present in the habitat study area. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Dipodomys nitratoides exilis	Fresno kangaroo rat	E	E	Unlikely	Suitable habitat for this species is not present in the habitat study area. The CNDDB reports one extirpated occurrence within the project footprint (Occurrence 15, CNDDB, 2003e). The nearest presumed extant occurrence is located approximately 7.19 miles southwest of the project footprint (Occurrence 22; CNDDB, 2003e).
Euderma maculatum	spotted bat	--	SSC	Unlikely	Suitable habitat for this species is not present in the habitat study area. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CNDDB, 2003e).
Eumops perotis californicus	western mastiff bat	--	SSC	High	The habitat study area is within range and contains potentially suitable habitat for this species. The CNDDB reports one presumed extant occurrence within the project footprint (Occurrence 71; CNDDB, 2003e) and one additional presumed extant occurrence within the habitat study area, 0.12 miles northeast of the project footprint (Occurrence 47; CNDDB, 2011).

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale
Lasiurus blossevillii	western red bat	--	SSC	Moderate	The habitat study area is within the range of this species and contains potentially suitable habitat. The nearest CNDDB occurrence is located approximately 8.06 miles north of the project footprint and is presumed extant (Occurrence 79; CNDDB, 2003e).
Taxidea taxus	American badger	--	SSC	Moderate	The habitat study area is within range of and contains potentially suitable habitat for American badger. The nearest CNDDB reported occurrence is located approximately 0.54 miles northeast of the project footprint and is presumed extant (Occurrence 79; CNDDB, 2003e).
Vulpes macrotis mutica	San Joaquin kit fox	E	T	High	The habitat study area is within range and contains potentially suitable habitat for this species. The CNDDB reports two presumed extant occurrences within the project footprint (Occurrence 24 and 25; CNDDB, 2003e), and one additional presumed extant occurrence within the habitat study area, 0.01 miles southwest of the project footprint.

Definitions

No Potential: No historic range or habitat within the habitat study area

Future Potential: Potential following the San Joaquin River Restoration Program

Unlikely Potential: No suitable habitat and presumed extirpated within the habitat study area

Low Potential: Low or marginal quality habitat within habitat study area

Moderate Potential: Potential current range and moderate habitat within the habitat study area

High Potential: Presumed extant, observed or otherwise expected.

Designations:

-- = No status designation.

[a] Federal Status:

E (Endangered) = Listed as endangered under the Federal ESA.

T (Threatened) = Listed as threatened under the Federal ESA.

PT (Proposed Threatened) = Proposed for listing as Threatened under the Federal ESA.

FC (Federal Candidate) = Federal candidate species (former Category 1 candidates) under Federal ESA.

BCC (Birds of Conservation Concern) = U.S. Fish and Wildlife Service

BGEPA

[b] State Status:

E (Endangered) = Listed as endangered under the CESA.

T (Threatened) = Listed as threatened under the CESA.

Scientific Name	Common Name	Federal Status	State Status	Potential to Occur	Rationale

SSC (Species of Special Concern) = California Department of Fish and Game

FP (Fully Protected) = California Department of Fish and Game

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APPENDIX D

Special-Status Plant and Wildlife Species Potentially Affected by the HST Alternatives

ATTACHMENT 1

Special-Status Plant Species Potentially Affected During the Construction Period

Table D1-1
Special-Status Plant Species Potentially Affected During the Construction Period of the UPRR/SR 99 and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Sanford's arrowhead	11.63	13.11	12.33	--	--	11.63 to 13.33
Delta button-celery	10.51	12.01	11.66	--	--	10.51 to 12.01
spiny-sepaled button-celery	10.37	10.71	10.89	--	--	10.37 to 10.89
Hoover's calycadenia	46.81	48.47	54.43	7.65	0.08	46.89 to 62.08
Coulter's goldfields	10.51	12.01	11.68	--	--	10.51 to 12.01
Hartweg's golden sunburst	3.69	3.69	3.93	--	--	3.69 to 3.93
Wright's trichocoronis	10.95	12.36	11.68	--	--	10.95 to 12.36
Heckard's peppergrass	4.37	4.36	4.69	--	--	4.36 to 4.69
caper-fruited tropidocarpum	3.69	3.69	3.93	--	--	3.69 to 3.93
dwarf downingia	7.12	7.37	6.96	--	--	6.96 to 7.37
heartscale	5.61	5.60	5.93	--	--	5.60 to 5.93
brittlescale	10.37	10.71	10.89	--	--	10.37 to 10.89
San Joaquin spearscale	10.37	10.71	10.89	--	--	10.37 to 10.89
lesser saltscale	10.37	10.71	10.89	--	--	10.37 to 10.89
vernal pool smallscale	10.37	10.71	10.89	--	--	10.37 to 10.89
subtle orache	3.69	3.69	3.93	--	--	3.69 to 3.93

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Lost Hills crownscale	10.37	10.71	10.89	--	--	10.37 to 10.89
Hoover's spurge	10.37	10.71	10.89	--	--	10.37 to 10.89
alkali milk-vetch	10.37	10.71	10.89	--	--	10.37 to 10.89
Merced phacelia	3.69	3.69	3.93	--	--	3.69 to 3.93
Keck's checkerbloom	15.17	16.54	16.45	--	--	15.17 to 16.54
beaked clarkia	4.93	4.93	5.17	--	--	4.93 to 5.17
Henderson's bent grass	7.12	7.37	6.96	--	--	6.96 to 7.37
California satintail	3.83	4.99	4.72	--	--	3.83 to 4.99
Colusa grass	7.12	7.37	6.96	--	--	6.96 to 7.37
San Joaquin Valley Orcutt grass	7.12	7.37	6.96	--	--	6.96 to 7.37
hairy Orcutt grass	7.12	7.37	6.96	--	--	6.96 to 7.37
Greene's tuctoria	7.12	7.37	6.96	--	--	6.96 to 7.37
pincushion navarretia	7.12	7.37	6.96	--	--	6.96 to 7.37
shining navarretia	10.81	11.06	10.90	--	--	10.81 to 11.06
prostrate vernal pool navarretia	10.81	11.06	10.90	--	--	10.81 to 11.06
recurved larkspur	4.93	4.94	5.38	--	--	4.94 to 5.38
little mousetail	7.12	7.37	6.96	--	--	6.96 to 7.37

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
succulent owl's-clover	7.12	7.37	6.96	--	--	6.96 to 7.37
palmate-bracted bird's-beak	3.69	3.69	3.93	--	--	3.69 to 3.93
Boggs Lake hedge-hyssop	7.12	7.37	6.96	--	--	6.96 to 7.37

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D1-2
Special-Status Plant Species Potentially Affected During the Construction Period of the BNSF and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North–South Alignment with Ave 24 Wye	BNSF North–South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
Sanford's arrowhead	8.11	6.45	4.17	4.47	6.39	5.49	--	--	12.28 to 14.49	10.62 to 12.84	10.62 to 14.49
Delta button-celery	8.26	7.44	3.43	3.69	6.35	5.66	--	--	11.69 to 14.61	10.87 to 13.79	10.87 to 14.61
spiny-sepaled button-celery	10.05	9.71	19.81	19.94	25.67	31.10	--	--	29.86 to 41.16	29.52 to 40.81	29.52 to 41.16
Hoover's calycadenia	43.06	42.45	20.05	23.03	40.52	29.52	7.65	0.08	63.19 to 91.23	62.57 to 90.61	62.57 to 91.23
Coulter's goldfields	8.26	7.44	3.43	3.69	6.35	5.66	--	--	11.69 to 14.61	10.87 to 13.79	10.87 to 14.61
Hartweg's golden sunburst	4.34	4.29	16.48	16.47	20.16	26.48	--	--	20.82 to 30.83	20.76 to 30.77	20.76 to 30.83
Wright's trichocoronis	8.26	7.45	3.43	3.69	6.50	5.81	--	--	11.69 to 14.76	10.88 to 13.95	10.88 to 14.76
Heckard's peppergrass	4.89	4.86	19.60	19.71	25.03	30.23	--	--	24.49 to 35.13	24.46 to 35.09	24.46 to 35.13
caper-fruited tropidocarpum	4.34	4.29	16.48	16.47	20.16	26.48	--	--	20.82 to 30.83	20.76 to 30.77	20.76 to 30.83
dwarf downingia	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.08
heartscale	6.14	6.10	19.60	19.71	25.03	30.23	--	--	25.74 to 36.37	25.70 to 36.33	25.70 to 36.37
brittlescale	10.05	9.71	19.81	19.94	25.67	31.10	--	--	29.86 to 41.16	29.52 to 40.81	29.52 to 41.16
San Joaquin spearscale	10.05	9.71	19.81	19.94	25.67	31.10	--	--	29.86 to 41.16	29.52 to 40.81	29.52 to 41.16
lesser saltscale	10.05	9.71	19.81	19.94	25.67	31.10	--	--	29.86 to 41.16	29.52 to 40.81	29.52 to 41.16
vernal pool smallscale	10.05	9.71	19.81	19.94	25.67	31.10	--	--	29.86 to 41.16	29.52 to 40.81	29.52 to 41.16
subtle orache	4.34	4.29	16.48	16.47	20.16	26.48	--	--	20.82 to 30.83	20.76 to 30.77	20.76 to 30.77
Lost Hills crownscale	10.05	9.71	19.81	19.94	25.67	31.10	--	--	29.82 to 41.16	29.52 to 40.81	29.52 to 41.16
Hoover's spurge	10.05	9.71	19.81	19.94	25.67	31.10	--	--	29.82 to 41.16	29.52 to 40.81	29.52 to 41.16
alkali milk-vetch	10.05	9.71	19.81	19.94	25.67	31.10	--	--	29.82 to 41.16	29. 52 to 40.81	29.52 to 41.16
Merced phacelia	4.34	4.29	16.48	16.47	20.16	26.48	--	--	20.82 to 30.83	20.76 to 30.77	20.76 to 30.83
Keck's checkerbloom	13.40	12.59	19.91	20.16	26.28	31.91	--	--	33.31 to 45.31	32.49 to 44.49	32.49 to 45.31
beaked clarkia	5.59	5.53	16.48	16.47	20.16	26.48	--	--	22.06 to 32.07	22.00 to 32.02	22.00 to 32.07
Henderson's bent grass	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.36
California satintail	2.55	2.02	0.10	0.23	0.84	1.04	--	--	2.65 to 3.59	2.12 to 3.07	2.12 to 3.59
Colusa grass	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.36

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North–South Alignment with Ave 24 Wye	BNSF North–South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
San Joaquin Valley Orcutt grass	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.36
hairy Orcutt grass	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.36
Greene's tuctoria	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.36
pincushion navarretia	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.36
shining navarretia	10.05	9.72	19.81	19.94	25.82	31.25	--	--	29.86 to 41.30	29.53 to 40.97	29.53 to 41.30
prostrate vernal pool navarretia	10.05	9.72	19.81	19.94	25.82	31.25	--	--	29.86 to 41.30	29.53 to 40.97	29.53 to 41.30
recurved larkspur	4.04	5.28	16.48	17.02	20.16	26.63	--	--	20.52 to 30.67	21.76 to 31.91	20.52 to 31.91
little mousetail	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.36
succulent owl's-clover	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.36
palmate-bracted bird's-beak	3.68	4.96	16.48	16.47	20.16	26.48	--	--	20.15 to 30.16	21.43 to 31.44	20.15 to 31.44
Boggs Lake hedge-hyssop	5.71	5.43	3.33	3.47	5.66	4.77	--	--	9.04 to 11.36	8.76 to 11.08	8.76 to 11.36

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D1-3
Special-Status Plant Species Potentially Affected During the Construction Period of the Hybrid and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Sanford's arrowhead	10.74	10.57	--	--	10.57 to 10.74
Delta button-celery	10.01	10.38	--	--	10.01 to 10.38
spiny-sepaled button-celery	10.01	10.03	--	--	10.01 to 10.03
Hoover's calycadenia	33.25	43.02	7.65	0.08	33.33 to 50.67
Coulter's goldfields	10.01	10.38	--	--	10.01 to 10.38
Hartweg's golden sunburst	3.69	3.93	--	--	3.69 to 3.93
Wright's trichocoronis	10.46	10.40	--	--	10.40 to 10.46
Heckard's peppergrass	4.09	4.10	--	--	4.09 to 4.10
caper-fruited tropidocarpum	3.69	3.93	--	--	3.69 to 3.93
dwarf downingia	6.76	6.11	--	--	6.11 to 6.76
heartscale	5.33	5.34	--	--	5.33 to 5.34
brittlescale	10.01	10.03	--	--	10.01 to 10.03
San Joaquin spearscale	10.01	10.03	--	--	10.01 to 10.03
lesser saltscale	10.01	10.03	--	--	10.01 to 10.03
vernal pool smallscale	10.01	10.03	--	--	10.01 to 10.03
subtle orache	3.69	3.93	--	--	3.69 to 3.93
Lost Hills crownscale	10.01	10.03	--	--	10.01 to 10.03
Hoover's spurge	10.01	10.03	--	--	10.01 to 10.03
alkali milk-vetch	10.01	10.03	--	--	10.01 to 10.03
Merced phacelia	3.69	3.93	--	--	3.69 to 3.93
Keck's checkerbloom	14.88	15.35	--	--	14.88 to 15.35
beaked clarkia	4.93	5.17	--	--	4.93 to 5.17
Henderson's bent grass	6.76	6.11	--	--	6.11 to 6.76
California satintail	3.70	4.29	--	--	3.70 to 4.29

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Colusa grass	6.76	6.11	--	--	6.11 to 6.76
San Joaquin Valley Orcutt grass	6.76	6.11	--	--	6.11 to 6.76
hairy Orcutt grass	6.76	6.11	--	--	6.11 to 6.76
Greene's tuctoria	6.76	6.11	--	--	6.11 to 6.76
pincushion navarretia	6.76	6.11	--	--	6.11 to 6.76
shining navarretia	10.45	10.04	--	--	10.04 to 10.45
prostrate vernal pool navarretia	10.45	10.04	--	--	10.04 to 10.45
recurved larkspur	4.93	5.38	--	--	4.93 to 5.38
little mousetail	6.76	6.11	--	--	6.11 to 6.76
succulent owl's-clover	6.76	6.11	--	--	6.11 to 6.76
palmate-bracted bird's-beak	3.69	3.93	--	--	3.69 to 3.93
Boggs Lake hedge-hyssop	6.76	6.11	--	--	6.11 to 6.76

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D1-4
Special-Status Plant Species Potentially Affected During the Construction Period of the HMF Alternatives (acres[a])

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
Sanford's arrowhead	0.84	--	0.05	0.15	0.37
Delta button-celery	0.24	--	--	0.15	0.54
spiny-sepaled button-celery	0.17	--	--	0.15	0.72
Hoover's calycadenia	8.26	0.67	--	--	0.89
Coulter's goldfields	0.24	--	--	0.15	0.54
Hartweg's golden sunburst	--	--	--	--	0.35
Wright's trichocoronis	0.69	--	--	0.15	0.54
Heckard's peppergrass	0.41	--	--	--	0.29
caper-fruited tropidocarpum	--	--	--	--	0.35
dwarf downingia	0.62	--	--	0.15	0.35
heartscale	--	--	--	--	0.29
brittlescale	0.17	--	--	0.15	0.72
San Joaquin spearscale	0.17	--	--	0.15	0.72
lesser saltscale	0.17	--	--	0.15	0.72
vernal pool smallscale	0.17	--	--	0.15	0.72
subtle orache	--	--	--	--	0.35
Lost Hills crownscale	0.17	--	--	0.15	0.72
Hoover's spurge	0.17	--	--	0.15	0.72

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
alkali milk-vetch	0.17	--	--	0.15	0.72
Merced phacelia	--	--	--	--	0.35
Keck's checkerbloom	0.24	--	--	0.15	0.89
beaked clarkia	--	--	--	--	0.35
Henderson's bent grass	0.62	--	--	0.15	0.37
California satintail	0.07	--	--	--	0.17
Colusa grass	0.62	--	--	0.15	0.37
San Joaquin Valley Orcutt grass	0.62	--	--	0.15	0.37
hairy Orcutt grass	0.62	--	--	0.15	0.37
Greene's tuctoria	0.62	--	--	0.15	0.37
pincushion navarretia	0.62	--	--	0.15	0.37
shining navarretia	0.62	--	--	0.15	0.72
prostrate vernal pool navarretia	0.62	--	--	0.15	0.72
recurved larkspur	0.44	--	--	--	0.35
little mousetail	0.62	--	--	0.15	0.37
succulent owl's-clover	0.62	--	--	0.15	0.37
palmate-bracted bird's-beak	--	--	--	--	0.35
Boggs Lake hedge-hyssop	0.62	--	--	0.15	0.37

[a] All non-zero values are rounded to the nearest one-hundredth acre.

ATTACHMENT 2

Special-Status Wildlife Species Potentially Affected During the Construction Period

Table D2-1
Special-Status Wildlife Species Potentially Affected During the Construction Period of the UPRR/SR 99 and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Alternative			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Conservancy fairy shrimp	0.82	0.97	1.07	--	--	0.82 to 1.07
vernal pool fairy shrimp	0.82	0.97	1.07	--	--	0.82 to 1.07
vernal pool tadpole shrimp	0.82	0.97	1.07	--	--	0.82 to 1.07
valley elderberry longhorn beetle	3.82	4.98	4.71	--	--	3.82 to 4.98
Kern brook lamprey	6.00	6.36	6.20	--	--	6.00 to 6.36
Central Valley steelhead	6.00	6.36	6.20	--	--	6.00 to 6.36
Central Valley spring-run Chinook salmon	6.00	6.36	6.20	--	--	6.00 to 6.36
Chinook salmon - Central Valley fall / late fall-run ESU	6.00	6.36	6.20	--	--	6.00 to 6.36
hardhead	6.00	6.36	6.20	--	--	6.00 to 6.36
San Joaquin roach	6.00	6.36	6.20	--	--	6.00 to 6.36
California tiger salamander	0.68	0.67	0.76	--	--	0.67 to 0.76
western spadefoot	3.69	3.69	3.93	--	--	3.69 to 3.93
western pond turtle	12.87	15.04	14.75	--	--	12.87 to 15.04
fulvous whistling-duck	14.74	17.35	16.63	--	--	14.74 to 17.35
redhead	14.74	17.35	16.63	--	--	14.74 to 17.35

	Impacts by Project Alternative			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
American white pelican	9.82	11.34	10.90	--	--	9.82 to 11.34
least bittern	7.63	8.34	7.33	--	--	7.33 to 8.34
white-tailed kite	309.39	352.36	310.83	7.65	0.08	311.56 to 355.50
bald eagle	9.83	11.36	11.12	--	--	9.83 to 11.36
northern harrier	298.31	339.76	298.46	7.65	0.08	298.39 to 347.40
Swainson's hawk	308.64	352.64	306.89	7.65	0.08	306.97 to 360.29
golden eagle	234.18	272.08	225.68	--	--	225.68 to 272.08
American peregrine falcon	481.24	551.43	505.69	28.05	3.54	484.78 to 579.48
lesser sandhill crane	197.86	231.24	184.75	--	--	184.75 to 231.24
greater sandhill crane	197.86	231.24	184.75	--	--	184.75 to 231.24
snowy plover	7.19	7.99	7.31	--	--	7.19 to 7.99
mountain plover	124.34	120.57	112.69	7.65	0.08	112.77 to 131.98
whimbrel	1.19	1.64	1.12	--	--	1.12 to 1.64
long-billed curlew	4.88	5.33	5.05	--	--	4.88 to 5.33
marbled godwit	1.19	1.64	1.12	--	--	1.12 to 1.64
red knot	1.19	1.64	1.12	--	--	1.12 to 1.64
short-billed dowitcher	1.19	1.64	1.12	--	--	1.12 to 1.64
black tern	53.58	66.77	48.69	--	--	48.69 to 66.77

	Impacts by Project Alternative			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
western burrowing owl	369.37	419.66	375.35	28.02	3.49	372.85 to 447.68
long-eared owl	286.37	334.07	286.62	--	--	286.37 to 334.07
short-eared owl	115.12	146.20	126.83	--	--	115.12 to 146.20
Costa's hummingbird	252.77	303.93	282.20	0.03	0.05	252.80 to 303.98
loggerhead shrike	363.36	413.30	369.15	28.02	3.49	366.85 to 441.33
least Bell's vireo	3.82	4.98	4.71	--	--	3.82 to 4.98
yellow-billed magpie	399.98	460.46	405.00	17.10	3.30	403.28 to 477.56
purple martin	110.83	117.77	112.94	17.13	3.35	114.18 to 134.90
bank swallow	3.82	4.98	4.71	--	--	3.82 to 4.98
yellow warbler	3.82	4.98	4.71	--	--	3.82 to 4.98
yellow-breasted chat	3.82	4.98	4.71	--	--	3.82 to 4.98
spotted towhee	148.52	181.04	176.96	0.03	0.05	148.54 to 181.09
Oregon vesper sparrow	110.28	112.63	103.54	3.27	0.11	103.64 to 115.91
Belding's savannah sparrow	1.87	2.31	1.88	--	--	1.87 to 2.31
grasshopper sparrow	66.81	93.53	79.25	--	--	66.81 to 93.53
song sparrow ("Modesto" population)	4.23	5.25	5.06	--	--	4.23 to 5.25
tricolored blackbird	65.85	88.56	58.09	--	--	58.09 to 88.56
yellow-headed blackbird	153.53	198.39	165.08	--	--	153.53 to 198.39

	Impacts by Project Alternative			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Lawrence's goldfinch	227.23	269.58	275.91	10.95	0.24	227.47 to 286.86
western red bat	451.18	511.55	465.36	24.77	3.43	454.61 to 536.32
pallid bat	349.66	405.36	363.35	7.65	0.08	349.74 to 413.00
western mastiff bat	451.18	511.55	465.36	24.77	3.43	454.61 to 536.32
San Joaquin kit fox	307.30	333.99	324.64	28.05	3.54	310.84 to 362.04
American badger	214.53	231.07	220.13	7.67	0.13	214.66 to 238.74

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D2-2
Special-Status Wildlife Species Potentially Affected During the Construction Period of the BNSF and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North-South Alignment with Ave 24 Wye	BNSF North-South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
Conservancy fairy shrimp	0.69	0.68	3.18	3.29	5.01	3.75	--	--	3.87 to 5.70	3.86 to 5.68	3.86 to 5.70
vernal pool fairy shrimp	0.69	0.68	3.18	3.29	5.01	3.75	--	--	3.87 to 5.70	3.86 to 5.68	3.86 to 5.70
vernal pool tadpole shrimp	0.69	0.68	3.18	3.29	5.01	3.75	--	--	3.87 to 5.70	3.86 to 5.68	3.86 to 5.70
valley elderberry longhorn beetle	2.55	2.02	0.10	0.23	0.84	1.04	--	--	2.65 to 3.59	2.12 to 3.07	2.12 to 3.59
Kern brook lamprey	5.13	4.81	0.21	0.23	0.64	0.87	--	--	5.34 to 5.99	5.02 to 5.68	5.02 to 5.99
Central Valley steelhead	5.13	4.81	0.21	0.23	0.64	0.87	--	--	5.34 to 5.99	5.02 to 5.68	5.02 to 5.99
Central Valley spring-run Chinook salmon	5.13	4.81	0.21	0.23	0.64	0.87	--	--	5.34 to 5.99	5.02 to 5.68	5.02 to 5.99
Chinook salmon - Central Valley fall / late fall-run ESU	5.13	4.81	0.21	0.23	0.64	0.87	--	--	5.34 to 5.99	5.02 to 5.68	5.02 to 5.99
hardhead	5.13	4.81	0.21	0.23	0.64	0.87	--	--	5.34 to 5.99	5.02 to 5.68	5.02 to 5.99
San Joaquin roach	5.13	4.81	0.21	0.23	0.64	0.87	--	--	5.34 to 5.99	5.02 to 5.68	5.02 to 5.99
California tiger salamander	0.55	0.57	3.12	3.24	4.87	3.75	--	--	3.67 to 5.42	3.69 to 5.43	3.67 to 5.43
western spadefoot	4.34	4.29	16.48	16.47	20.16	26.48	--	--	20.82 to 30.83	20.76 to 30.77	20.76 to 30.83
western pond turtle	8.98	7.31	1.02	1.32	1.95	2.39	--	--	10.00 to 11.37	8.33 to 9.71	8.33 to 11.37
fulvous whistling-duck	10.22	8.07	4.27	4.70	6.85	6.14	--	--	14.49 to 17.06	12.34 to 14.92	12.34 to 17.06
redhead	10.22	8.07	4.27	4.70	6.85	6.14	--	--	14.49 to 17.06	12.34 to 14.92	12.34 to 17.06
American white pelican	7.71	6.87	0.31	0.45	1.49	1.91	--	--	8.02 to 9.62	7.18 to 8.78	7.18 to 9.62
least bittern	5.81	5.02	0.34	0.36	0.82	1.02	--	--	6.15 to 6.83	5.36 to 6.04	5.36 to 6.83
white-tailed kite	225.81	144.37	47.73	51.99	68.59	61.51	7.65	0.08	273.62 to 302.04	192.18 to 220.60	192.18 to 302.04
bald eagle	7.73	6.86	0.31	1.00	1.49	2.06	--	--	8.03 to 9.78	7.17 to 8.92	7.17 to 9.78
northern harrier	216.84	136.26	47.42	50.99	67.10	59.46	7.65	0.08	264.34 to 291.59	183.76 to 211.01	183.76 to 291.59
Swainson's hawk	224.97	141.24	46.29	51.88	67.39	61.45	10.47	18.16	271.34 to 300.00	187.61 to 216.28	187.61 to 300.00
golden eagle	148.51	86.11	39.98	41.57	40.01	44.54	--	--	188.48 to 193.04	126.09 to 130.64	126.09 to 193.04
American peregrine falcon	425.42	274.35	91.02	103.68	123.35	112.87	28.05	3.54	519.98 to 576.82	368.91 to 425.75	368.91 to 576.82

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North-South Alignment with Ave 24 Wye	BNSF North-South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
lesser sandhill crane	133.40	74.23	36.99	37.91	35.16	40.64	--	--	168.55 to 174.04	109.39 to 114.88	109.39 to 174.04
greater sandhill crane	133.40	74.23	36.99	37.91	35.16	40.64	--	--	168.55 to 174.04	109.39 to 114.88	109.39 to 174.04
snowy plover	5.78	4.97	0.34	0.36	0.67	0.87	--	--	6.12 to 6.65	5.31 to 5.84	5.31 to 6.65
mountain plover	88.48	68.73	25.28	29.65	47.12	33.83	7.65	0.08	113.84 to 143.25	94.09 to 123.50	94.09 to 143.25
whimbrel	0.68	0.19	0.13	0.13	0.03	--	--	--	0.69 to 0.82	0.20 to 0.33	0.20 to 0.82
long-billed curlew	5.03	4.48	16.61	16.60	20.19	26.49	--	--	21.63 to 31.52	21.09 to 30.97	21.09 to 31.52
marbled godwit	0.68	0.19	0.13	0.13	0.03	--	--	--	0.69 to 0.82	0.20 to 0.33	0.20 to 0.82
red knot	0.68	0.19	0.13	0.13	0.03	--	--	--	0.69 to 0.82	0.20 to 0.33	0.20 to 0.82
short-billed dowitcher	0.68	0.19	0.13	0.13	0.03	--	--	--	0.69 to 0.82	0.20 to 0.33	0.20 to 0.82
black tern	17.89	5.93	6.25	3.35	1.21	2.42	--	--	19.10 to 24.14	7.14 to 12.17	7.14 to 24.14
western burrowing owl	164.68	119.87	51.84	57.20	73.10	64.78	28.02	3.49	339.88 to 385.67	237.51 to 283.30	237.51 to 385.67
long-eared owl	273.30	154.52	70.65	83.29	81.77	96.74	--	--	343.95 to 370.03	225.18 to 251.26	225.18 to 370.03
short-eared owl	74.28	36.18	33.06	29.64	29.44	36.32	--	--	103.72 to 110.60	65.62 to 72.50	65.62 to 110.60
Costa's hummingbird	245.48	143.23	70.36	76.30	79.68	93.31	0.08	0.12	315.87 to 338.84	213.62 to 236.59	213.62 to 338.84
loggerhead shrike	279.42	177.37	51.61	56.95	72.43	63.88	48.74	70.30	334.52 to 379.88	232.47 to 277.83	232.47 to 379.88
least Bell's vireo	2.55	2.02	0.10	0.23	0.84	1.04	--	--	2.65 to 3.59	2.12 to 3.07	2.12 to 3.59
yellow-billed magpie	359.73	211.21	79.08	90.56	89.87	103.67	17.10	3.30	442.10 to 480.50	293.58 to 331.98	293.58 to 480.50
purple martin	111.56	73.18	13.02	11.81	16.82	20.75	17.13	3.35	126.72 to 149.44	88.34 to 111.06	88.34 to 149.44
bank swallow	2.55	2.02	0.10	0.23	0.84	1.04	--	--	2.65 to 3.59	2.12 to 3.07	2.12 to 3.59
yellow warbler	2.55	2.02	0.10	0.23	0.84	1.04	--	--	2.65 to 3.59	2.12 to 3.07	2.12 to 3.59
yellow-breasted chat	2.55	2.02	0.10	0.23	0.84	1.04	--	--	2.65 to 3.59	2.12 to 3.07	2.12 to 3.59
spotted towhee	203.09	116.44	47.27	55.24	56.02	61.88	0.03	0.05	250.39 to 265.02	163.74 to 178.37	163.74 to 265.02

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North-South Alignment with Ave 24 Wye	BNSF North-South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
Oregon vesper sparrow	63.71	42.82	26.60	28.53	36.17	35.94	3.27	0.11	90.42 to 103.15	69.53 to 82.27	69.53 to 103.15
Belding's savannah sparrow	1.20	0.72	3.25	3.38	4.89	3.75	--	--	4.45 to 6.09	3.98 to 5.61	3.98 to 6.09
grasshopper sparrow	72.01	42.66	26.95	28.06	28.55	33.97	--	--	98.96 to 105.98	69.61 to 76.63	69.61 to 105.98
song sparrow ("Modesto" population)	2.69	2.24	3.22	3.47	5.47	4.56	--	--	5.91 to 8.17	5.46 to 7.71	5.46 to 8.17
tricolored blackbird	40.31	25.07	25.94	24.92	27.37	33.77	--	--	65.23 to 74.08	49.99 to 58.84	49.99 to 74.08
yellow-headed blackbird	100.72	55.74	16.71	14.94	9.61	9.91	--	--	110.33 to 117.43	65.35 to 72.45	65.35 to 117.43
Lawrence's goldfinch	262.23	172.92	69.30	81.23	101.74	93.80	10.95	0.24	331.78 to 374.92	242.46 to 285.61	242.46 to 374.92
western red bat	409.11	263.30	86.13	97.71	113.79	107.43	24.77	3.43	498.67 to 547.67	352.87 to 401.87	352.87 to 547.67
pallid bat	303.30	194.02	74.05	87.12	98.31	88.21	7.65	0.08	377.43 to 409.26	268.16 to 299.98	268.16 to 409.26
western mastiff bat	409.11	263.30	86.13	97.71	113.79	107.43	24.77	3.43	498.67 to 547.67	352.87 to 401.87	352.87 to 547.67
San Joaquin kit fox	255.33	171.06	49.38	52.70	74.60	61.14	28.05	3.54	308.25 to 357.99	223.98 to 273.71	223.98 to 357.99
American badger	183.08	119.86	41.56	44.04	64.51	54.26	7.67	0.13	224.77 to 255.26	161.54 to 192.04	161.54 to 255.26

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D2-3
Special-Status Wildlife Species Potentially Affected During the Construction Period of the Hybrid and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Conservancy fairy shrimp	0.50	0.45	--	--	0.45 to 0.50
vernal pool fairy shrimp	0.50	0.45	--	--	0.85 to 0.50
vernal pool tadpole shrimp	0.50	0.45	--	--	0.85 to 0.50
valley elderberry longhorn beetle	3.69	4.28	--	--	3.69 to 4.28
Kern brook lamprey	5.92	5.93	--	--	5.92 to 5.93
Central Valley steelhead	5.92	5.93	--	--	5.92 to 5.93
Central Valley spring-run Chinook salmon	5.92	5.93	--	--	5.92 to 5.93
Chinook salmon - Central Valley fall / late fall-run ESU	5.92	5.93	--	--	5.92 to 5.93
hardhead	5.92	5.93	--	--	5.92 to 5.93
San Joaquin roach	5.92	5.93	--	--	5.92 to 5.93
California tiger salamander	0.40	0.17	--	--	0.17 to 0.40
western spadefoot	3.69	3.93	--	--	3.69 to 3.93
western pond turtle	12.43	13.99	--	--	12.43 to 13.99
fulvous whistling-duck	13.93	14.62	--	--	13.93 to 14.62
redhead	13.93	14.62	--	--	13.93 to 14.62
American white pelican	9.61	10.21	--	--	9.61 to 10.21
least bittern	7.46	6.41	--	--	6.41 to 7.46
white-tailed kite	279.33	250.40	7.65	0.08	250.49 to 286.97
bald eagle	9.63	10.43	--	--	9.63 to 10.43
northern harrier	268.46	238.73	7.65	0.08	238.81 to 276.11

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Swainson's hawk	279.77	246.98	7.65	0.08	247.06 to 287.42
golden eagle	217.46	181.77	--	--	181.77 to 217.46
American peregrine falcon	439.40	438.68	28.05	3.54	442.22 to 467.45
lesser sandhill crane	200.58	164.44	--	--	164.44 to 200.58
greater sandhill crane	200.58	164.44	--	--	164.44 to 200.58
snowy plover	7.03	6.40	--	--	6.40 to 7.03
mountain plover	104.08	99.52	7.65	0.08	99.60 to 111.73
whimbrel	1.10	0.47	--	--	0.47 to 1.10
long-billed curlew	4.79	4.40	--	--	4.40 to 4.79
marbled godwit	1.10	0.47	--	--	0.47 to 1.10
red knot	1.10	0.47	--	--	0.47 to 1.10
short-billed dowitcher	1.10	0.47	--	--	0.47 to 1.10
black tern	60.65	45.15	--	--	45.15 to 60.65
western burrowing owl	330.71	314.41	28.02	3.49	317.90 to 358.74
long-eared owl	300.08	277.32	--	--	277.32 to 300.08
short-eared owl	117.67	108.03	--	--	108.03 to 117.67
Costa's hummingbird	251.23	254.27	0.03	0.05	251.26 to 254.32
loggerhead shrike	324.79	308.48	28.02	3.49	311.96 to 352.81
least Bell's vireo	3.69	4.28	--	--	3.69 to 4.28
yellow-billed magpie	381.50	354.58	17.10	3.30	357.88 to 398.60

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
purple martin	98.99	95.82	17.13	3.35	99.17 to 116.11
bank swallow	3.69	4.28	--	--	3.69 to 4.28
yellow warbler	3.69	4.28	--	--	3.69 to 4.28
yellow-breasted chat	3.69	4.28	--	--	3.69 to 4.28
spotted towhee	162.98	178.90	0.03	0.05	163.01 to 178.95
Oregon vesper sparrow	89.52	92.45	3.27	0.11	89.62 to 95.72
Belding's savannah sparrow	1.50	0.63	--	--	0.63 to 1.50
grasshopper sparrow	70.02	63.73	--	--	63.73 to 70.02
song sparrow ("Modesto" population)	4.02	4.23	--	--	4.02 to 4.23
tricolored blackbird	80.15	53.91	--	--	53.91 to 80.15
yellow-headed blackbird	144.46	122.36	--	--	122.36 to 144.46
Lawrence's goldfinch	214.26	257.43	10.95	0.24	214.50 to 268.38
western red bat	421.45	407.69	24.77	3.43	411.12 to 446.23
pallid bat	331.33	321.65	7.65	0.08	321.73 to 338.98
western mastiff bat	421.45	407.69	24.77	3.43	411.12 to 446.23
San Joaquin kit fox	257.41	271.11	28.05	3.54	260.95 to 299.16
American badger	193.65	191.16	7.67	0.13	191.29 to 201.33

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D2-4
Special-Status Wildlife Species Potentially Affected During the Construction Period of HMF Alternatives (acres[a])

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
Conservancy fairy shrimp	--	--	--	--	0.01
vernal pool fairy shrimp	--	--	--	--	0.01
vernal pool tadpole shrimp	--	--	--	--	0.01
valley elderberry longhorn beetle	0.07	--	--	--	0.17
Kern brook lamprey	0.17	--	--	0.14	0.18
Central Valley steelhead	0.17	--	--	0.14	0.18
Central Valley spring-run Chinook salmon	0.17	--	--	0.14	0.18
Chinook salmon - Central Valley fall / late fall-run ESU	0.17	--	--	0.14	0.18
hardhead	0.17	--	--	0.14	0.18
San Joaquin roach	0.17	--	--	0.14	0.18
California tiger salamander	--	--	--	--	0.01
western spadefoot	--	--	--	--	0.35
western pond turtle	0.27	--	0.05	0.14	0.35
fulvous whistling-duck	0.46	--	0.05	0.15	0.54
redhead	0.46	--	0.05	0.15	0.54
American white pelican	0.24	--	--	0.15	0.53
least bittern	0.82	--	--	0.15	0.37
white-tailed kite	14.94	0.95	3.70	0.29	1.69
bald eagle	0.68	--	--	0.14	0.35

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
northern harrier	14.25	0.95	3.70	0.14	1.35
Swainson's hawk	14.92	0.95	3.70	0.29	1.69
golden eagle	5.25	0.28	3.44	0.14	0.81
American peregrine falcon	44.50	0.95	4.60	0.54	20.39
lesser sandhill crane	5.01	0.28	3.44	0.14	0.80
greater sandhill crane	5.01	0.28	3.44	0.14	0.80
snowy plover	0.36	--	--	0.14	0.18
mountain plover	11.60	0.67	0.07	0.14	0.89
whimbrel	0.20	--	--	0.00	0.19
long-billed curlew	0.20	--	--	0.00	0.53
marbled godwit	0.20	--	--	0.00	0.19
red knot	0.20	--	--	0.00	0.19
short-billed dowitcher	0.20	--	--	0.00	0.19
black tern	0.52	--	0.50	0.00	0.19
western burrowing owl	43.38	0.95	4.60	0.28	1.33
long-eared owl	6.49	0.28	3.70	0.40	19.48
short-eared owl	1.49	0.28	0.50	0.00	0.80
Costa's hummingbird	3.48	0.28	0.76	0.40	19.65
loggerhead shrike	43.21	0.95	4.60	0.14	1.15
least Bell's vireo	0.07	--	--	--	0.07
yellow-billed magpie	34.30	0.28	4.60	0.40	19.48

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
purple martin	29.34	--	1.16	0.14	0.35
bank swallow	0.07	--	--	--	0.17
yellow warbler	0.08	--	--	--	0.17
yellow-breasted chat	0.08	--	--	--	0.17
spotted towhee	1.84	0.28	0.26	0.26	18.86
Oregon vesper sparrow	4.51	--	0.07	0.14	0.35
Belding's savannah sparrow	0.20	--	--	--	0.01
grasshopper sparrow	1.16	0.28	2.86	--	0.61
song sparrow ("Modesto" population)	0.08	--	--	--	0.36
tricolored blackbird	0.60	--	3.37	--	0.71
yellow-headed blackbird	1.68	0.28	3.37	--	0.45
Lawrence's goldfinch	11.88	0.95	0.26	0.40	19.93
western red bat	42.43	0.95	4.59	0.54	20.38
pallid bat	13.38	0.95	3.48	0.40	20.20
western mastiff bat	42.43	0.95	4.59	0.54	20.38
San Joaquin kit fox	43.25	0.95	1.18	0.14	1.34
American badger	14.14	0.95	0.33	0.14	1.32

[a] All non-zero values are rounded to the nearest one-hundredth acre.

ATTACHMENT 3

Special-Status Plant Species Potentially Affected During the Project Period

Table D3-1
Special-Status Plant Species Potentially Affected During the Project Period of UPRR/SR 99 and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Sanford's arrowhead	36.41	30.71	29.78	--	--	29.78 to 36.41
Delta button-celery	18.43	13.82	9.23	--	--	9.23 to 18.43
spiny-sepaled button-celery	21.12	19.09	18.14	--	--	18.14 to 21.12
Hoover's calycadenia	113.94	115.78	134.06	12.40	18.16	126.34 to 152.23
Coulter's goldfields	18.43	13.82	9.23	--	--	9.23 to 18.43
Hartweg's golden sunburst	11.91	11.70	12.66	--	--	11.70 to 12.66
Wright's trichocoronis	22.96	17.95	9.88	--	--	9.88 to 22.96
Heckard's peppergrass	13.35	13.01	14.39	--	--	13.01 to 14.39
caper-fruited tropidocarpum	11.91	11.70	12.66	--	--	11.70 to 12.66
dwarf downingia	13.49	11.28	5.89	--	--	5.89 to 13.49
heartscale	13.99	13.65	15.02	--	--	13.65 to 15.02
brittlescale	21.12	19.09	18.14	--	--	18.14 to 21.12
San Joaquin spearscale	21.12	19.09	18.14	--	--	18.14 to 21.12
lesser saltscale	21.12	19.09	18.14	--	--	18.14 to 21.12
vernal pool smallscale	21.12	19.09	18.14	--	--	18.14 to 21.12

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
subtle orache	11.91	11.70	12.66	--	--	11.70 to 12.66
Lost Hills crownscale	21.12	19.09	18.14	--	--	18.14 to 21.12
Hoover's spurge	21.12	19.09	18.14	--	--	18.14 to 21.12
alkali milk-vetch	21.12	19.09	18.14	--	--	18.14 to 21.12
Merced phacelia	11.91	11.70	12.66	--	--	11.70 to 12.66
Keck's checkerbloom	30.68	25.69	22.09	--	--	22.09 to 30.68
beaked clarkia	12.55	12.33	13.29	--	--	12.33 to 13.29
Henderson's bent grass	13.49	11.28	5.89	--	--	5.89 to 13.49
California satintail	9.47	6.67	3.99	--	--	3.99 to 9.47
Colusa grass	13.49	11.28	5.89	--	--	5.89 to 13.49
San Joaquin Valley Orcutt grass	13.49	11.28	5.89	--	--	5.89 to 13.49
hairy Orcutt grass	13.49	11.28	5.89	--	--	5.89 to 13.49
Greene's tuctoria	13.49	11.28	5.89	--	--	5.89 to 13.49
pincushion navarretia	13.49	11.28	5.89	--	--	5.89 to 13.49
shining navarretia	25.40	22.98	18.55	--	--	18.55 to 25.40
prostrate vernal pool navarretia	25.40	22.98	18.55	--	--	18.55 to 25.40
recurved larkspur	12.55	12.33	13.72	--	--	12.33 to 13.72
little mousetail	13.49	11.28	5.89	--	--	5.89 to 13.49

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
succulent owl's-clover	13.49	11.28	5.89	--	--	5.89 to 13.49
palmate-bracted bird's-beak	11.91	11.70	12.66	--	--	11.70 to 12.66
Boggs Lake hedge-hyssop	13.49	11.28	5.89	--	--	5.89 to 13.49

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D3-2
Special-Status Plant Species Potentially Affected during the Project Period of BNSF and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North-South Alignment with Ave 24 Wye	BNSF North-South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
Sanford's arrowhead	30.40	28.26	15.37	15.54	9.36	7.84	--	--	38.24 to 45.95	36.10 to 43.80	36.10 to 45.95
Delta button-celery	17.58	13.99	11.08	10.77	9.83	9.40	--	--	26.98 to 28.67	23.39 to 25.07	23.39 to 28.67
spiny-sepaled button-celery	63.63	53.54	74.62	63.34	75.81	38.41	--	--	102.03 to 139.44	91.95 to 129.35	91.95 to 139.44
Hoover's calycadenia	176.96	168.69	115.44	71.10	80.23	39.40	12.40	18.16	228.76 to 310.57	220.49 to 302.29	220.49 to 310.57
Coulter's goldfields	17.58	13.99	11.08	10.77	9.83	9.40	--	--	26.98 to 28.67	23.39 to 25.07	23.39 to 28.67
Hartweg's golden sunburst	52.03	43.01	64.48	53.42	68.51	32.87	--	--	84.90 to 120.54	75.87 to 111.51	75.87 to 120.54
Wright's trichocoronis	18.34	14.39	11.08	10.77	9.83	9.40	--	--	27.74 to 29.42	23.79 to 25.47	23.79 to 29.42
Heckard’s peppergrass	58.00	48.80	72.99	61.49	74.55	36.13	--	--	94.14 to 132.55	84.94 to 123.35	84.94 to 132.55
caper-fruited tropidocarpum	52.03	43.01	64.48	53.42	68.51	32.87	--	--	84.90 to 120.54	75.87 to 111.51	75.87 to 120.54
dwarf downingia	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49
heartscale	59.94	50.74	72.99	61.49	74.55	36.13	--	--	96.07 to 134.49	86.87 to 125.29	86.87 to 134.49
brittlescale	63.63	53.54	74.62	63.34	75.81	38.41	--	--	102.03 to 139.44	91.95 to 129.35	91.95 to 139.44
San Joaquin spearscale	63.63	53.54	74.62	63.34	75.81	38.41	--	--	102.03 to 139.44	91.95 to 129.35	91.95 to 139.44
lesser saltscale	63.63	53.54	74.62	63.34	75.81	38.41	--	--	102.03 to 139.44	91.95 to 129.35	91.95 to 139.44
vernal pool smallscale	63.63	53.54	74.62	63.34	75.81	38.41	--	--	102.03 to 139.44	91.95 to 129.35	91.95 to 139.44
subtle orache	52.03	43.01	64.48	53.42	68.51	32.87	--	--	84.90 to 120.54	75.87 to 111.51	75.87 to 120.54

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North-South Alignment with Ave 24 Wye	BNSF North-South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
Lost Hills crownscale	63.63	53.54	74.62	63.34	75.81	38.41	--	--	102.03 to 139.44	91.95 to 129.35	91.95 to 139.44
Hoover's spurge	63.63	53.54	74.62	63.34	75.81	38.41	--	--	102.03 to 139.44	91.95 to 129.35	91.95 to 139.44
alkali milk-vetch	63.63	53.54	74.62	63.34	75.81	38.41	--	--	102.03 to 139.44	91.95 to 129.35	91.95 to 139.44
Merced phacelia	52.03	43.01	64.48	53.42	68.51	32.87	--	--	84.90 to 120.54	75.87 to 111.51	75.87 to 120.54
Keck's checkerbloom	69.64	57.16	75.49	64.12	77.89	41.82	--	--	111.46 to 147.53	98.98 to 135.05	98.98 to 147.53
beaked clarkia	53.97	44.94	64.48	53.42	68.51	32.87	--	--	86.83 to 122.47	77.80 to 113.44	77.80 to 122.47
Henderson's bent grass	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49
California satintail	5.99	3.45	0.95	0.85	2.53	3.86	--	--	6.85 to 9.85	4.30 to 7.31	4.30 to 9.85
Colusa grass	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49
San Joaquin Valley Orcutt grass	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49
hairy Orcutt grass	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49
Greene's tuctoria	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49
pincushion navarretia	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49
shining navarretia	64.38	53.95	74.62	63.34	75.81	38.41	--	--	102.79 to 140.20	92.35 to 129.76	92.35 to 140.20
prostrate vernal pool navarretia	64.38	53.95	74.62	63.34	75.81	38.41	--	--	102.79 to 140.20	92.35 to 129.76	92.35 to 140.20
recurved larkspur	54.06	45.03	64.48	53.90	68.51	33.56	--	--	87.61 to 122.56	78.58 to 113.53	78.58 to 122.56
little mousetail	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49
succulent owl's-clover	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North-South Alignment with Ave 24 Wye	BNSF North-South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
palmate-bracted bird's-beak	52.03	43.01	64.48	53.42	68.51	32.87	--	--	84.90 to 120.54	75.87 to 111.51	75.87 to 120.54
Boggs Lake hedge-hyssop	12.35	10.94	10.14	9.92	7.30	5.54	--	--	17.89 to 22.49	16.48 to 21.08	16.48 to 22.49

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D3-3
Special-Status Plant Species Potentially Affected during the Project Period of the Hybrid and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Sanford's arrowhead	36.54	30.13	--	--	30.13 to 36.54
Delta button-celery	17.19	9.80	--	--	9.80 to 17.19
spiny-sepaled button-celery	56.27	53.15	--	--	53.15 to 56.27
Hoover's calycadenia	142.91	158.29	12.40	18.16	155.31 to 176.46
Coulter's goldfields	17.19	9.80	--	--	9.80 to 17.19
Hartweg's golden sunburst	46.18	46.81	--	--	46.18 to 46.81
Wright's trichocoronis	21.28	10.46	--	--	10.46 to 21.28
Heckard's peppergrass	49.57	49.38	--	--	49.38 to 49.57
caper-fruited tropidocarpum	46.18	46.81	--	--	46.18 to 46.81
dwarf downingia	13.93	6.74	--	--	6.74 to 13.93
heartscale	50.26	50.07	--	--	50.07 to 50.26
brittlescale	56.27	53.15	--	--	53.15 to 56.27
San Joaquin spearscale	56.27	53.15	--	--	53.15 to 56.27
lesser saltscale	56.27	53.15	--	--	53.15 to 56.27
vernal pool smallscale	56.27	53.15	--	--	53.15 to 56.27
subtle orache	46.18	46.81	--	--	46.18 to 46.81
Lost Hills crownscale	56.27	53.15	--	--	53.15 to 56.27
Hoover's spurge	56.27	53.15	--	--	53.15 to 56.27
alkali milk-vetch	56.27	53.15	--	--	53.15 to 56.27
Merced phacelia	46.18	46.81	--	--	46.18 to 46.81
Keck's checkerbloom	63.81	56.96	--	--	56.96 to 63.81
beaked clarkia	46.88	47.51	--	--	46.88 to 47.51
Henderson's bent grass	13.93	6.74	--	--	6.74 to 13.93

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
California satintail	7.35	3.71	--	--	3.71 to 7.35
Colusa grass	13.93	6.74	--	--	6.74 to 13.93
San Joaquin Valley Orcutt grass	13.93	6.74	--	--	6.74 to 13.93
hairy Orcutt grass	13.93	6.74	--	--	6.74 to 13.93
Greene's tuctoria	13.93	6.74	--	--	6.74 to 13.93
pincushion navarretia	13.93	6.74	--	--	6.74 to 13.93
shining navarretia	60.11	53.55	--	--	53.55 to 60.11
prostrate vernal pool navarretia	60.11	53.55	--	--	53.55 to 60.11
recurved larkspur	46.96	48.01	--	--	46.96 to 48.01
little mousetail	13.93	6.74	--	--	6.74 to 13.93
succulent owl's-clover	13.93	6.74	--	--	6.74 to 13.93
palmate-bracted bird's-beak	46.18	46.81	--	--	46.18 to 46.81
Boggs Lake hedge-hyssop	13.93	6.74	--	--	6.74 to 13.93

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D3-4
Special-Status Plant Species Potentially Affected During the Project Period of the HMF Alternatives (acres[a])

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
Sanford's arrowhead	8.72	1.53	2.11	3.98	4.06
Delta button-celery	2.66	0.63	0.97	3.67	4.22
spiny-sepaled button-celery	2.42	0.19	0.49	2.62	79.98
Hoover's calycadenia	27.10	3.34	0.02	16.11	79.35
Coulter's goldfields	2.66	0.63	0.97	3.67	4.22
Hartweg's golden sunburst	--	--	--	--	77.05
Wright's trichocoronis	2.66	0.63	0.97	3.67	4.22
Heckard's peppergrass	0.41	--	--	--	78.39
caper-fruited tropidocarpum	--	--	--	--	77.05
dwarf downingia	2.42	0.19	0.96	2.62	2.94
heartscale	0.41	--	--	--	78.39
brittlescale	2.42	0.19	0.49	2.62	79.98
San Joaquin spearscale	2.42	0.19	0.49	2.62	79.98
lesser saltscale	2.42	0.19	0.49	2.62	79.98
vernal pool smallscale	2.42	0.19	0.49	2.62	79.98
subtle orache	--	--	--	--	77.05
Lost Hills crownscale	2.42	0.19	0.49	2.62	79.98
Hoover's spurge	2.42	0.19	0.49	2.62	79.98

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
alkali milk-vetch	2.42	0.19	0.49	2.62	79.98
Merced phacelia	--	--	--	--	77.05
Keck's checkerbloom	2.66	0.19	0.97	2.62	81.26
beaked clarkia	--	--	--	--	77.05
Henderson's bent grass	2.42	0.19	0.96	2.62	2.94
California satintail	0.24	0.44	0.48	1.05	1.28
Colusa grass	2.42	0.19	0.96	2.62	2.94
San Joaquin Valley Orcutt grass	2.42	0.19	0.96	2.62	2.94
hairy Orcutt grass	2.42	0.19	0.96	2.62	2.94
Greene's tuctoria	2.42	0.19	0.96	2.62	2.94
pincushion navarretia	2.42	0.19	0.96	2.62	2.94
shining navarretia	2.42	0.19	0.96	2.62	2.94
prostrate vernal pool navarretia	2.42	0.19	0.96	2.62	2.94
recurved larkspur	0.23	--	--	--	77.05
little mousetail	2.42	0.19	0.96	2.62	2.94
succulent owl's-clover	2.42	0.19	0.96	2.62	2.94
palmate-bracted bird's-beak	--	--	--	--	77.05
Boggs Lake hedge-hyssop	2.42	0.19	0.96	2.62	2.94

[a] All non-zero values are rounded to the nearest one-hundredth acre.

ATTACHMENT 4

Special-Status Wildlife Species Potentially Affected During the Project Period

Table D4-1
Special-Status Wildlife Species Potentially Affected During the Project Period of UPRR/SR 99 and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Conservancy fairy shrimp	2.61	2.65	3.07	--	--	2.61 to 3.07
vernal pool fairy shrimp	2.61	2.65	3.07	--	--	2.61 to 3.07
vernal pool tadpole shrimp	2.61	2.65	3.07	--	--	2.61 to 3.07
valley elderberry longhorn beetle	9.22	6.43	3.75	--	--	3.75 to 9.22
Kern brook lamprey	7.76	6.08	3.76	--	--	3.76 to 7.76
Central Valley steelhead	7.76	6.08	3.76	--	--	3.76 to 7.76
Central Valley spring-run Chinook salmon	7.76	6.08	3.76	--	--	3.76 to 7.76
Chinook salmon - Central Valley fall / late fall-run ESU	7.76	6.08	3.76	--	--	3.76 to 7.76
hardhead	7.76	6.08	3.76	--	--	3.76 to 7.76
San Joaquin roach	7.76	6.08	3.76	--	--	3.76 to 7.76
California tiger salamander	1.44	1.31	1.73	--	--	1.31 to 1.73
western spadefoot	11.91	11.70	12.66	--	--	11.70 to 12.66
western pond turtle	31.57	24.53	25.92	--	--	24.53 to 31.57
fulvous whistling-duck	40.82	32.54	32.44	--	--	32.44 to 40.82
redhead	40.82	32.54	32.44	--	--	32.44 to 40.82

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
American white pelican	16.99	12.51	7.51	--	--	7.51 to 16.99
least bittern	19.88	16.81	9.02	--	--	9.02 to 19.88
white-tailed kite	1,035.05	1,003.81	813.27	12.40	18.16	825.67 to 1,053.22
bald eagle	17.23	12.76	8.18	--	--	8.18 to 17.23
northern harrier	1,017.19	990.42	804.46	12.40	18.16	816.86 to 1,035.35
Swainson's hawk	1,028.33	997.57	792.36	12.40	18.16	804.76 to 1,046.50
golden eagle	846.14	825.87	600.55	--	--	600.55 to 846.14
American peregrine falcon	1,890.91	1,853.30	1,973.82	50.05	70.41	1,903.35 to 2,044.23
lesser sandhill crane	706.62	663.35	502.19	--	--	502.19 to 706.62
greater sandhill crane	706.62	663.35	502.19	--	--	502.19 to 706.62
snowy plover	15.57	12.78	8.55	--	--	8.55 to 15.57
mountain plover	342.79	345.16	303.20	12.40	18.16	315.60 to 363.33
whimbrel	7.81	6.70	4.80	--	--	4.80 to 7.81

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
long-billed curlew	19.72	18.40	17.45	--	--	17.45 to 19.72
marbled godwit	7.81	6.70	4.80	--	--	4.80 to 7.81
red knot	7.81	6.70	4.80	--	--	4.80 to 7.81
short-billed dowitcher	7.81	6.70	4.80	--	--	4.80 to 7.81
black tern	292.51	204.23	145.23	--	--	145.23 to 292.51
western burrowing owl	1,466.54	1,411.43	1,307.43	50.00	70.30	1,357.42 to 1,536.84
long-eared owl	989.91	938.22	1,081.62	--	--	938.22 to 1,081.62
short-eared owl	453.62	419.32	346.76	--	--	346.76 to 453.62
Costa's hummingbird	920.96	897.70	1,058.57	0.05	0.12	897.75 to 1,058.69
loggerhead shrike	1,458.72	1,405.29	1,303.61	50.00	70.30	1,353.61 to 1,529.02
least Bell's vireo	9.22	6.43	3.75	--	--	3.75 to 9.22
yellow-billed magpie	1,380.67	1,335.12	1,414.07	22.33	37.55	1,357.45 to 1,451.62
purple martin	317.84	293.20	306.64	22.38	37.66	315.58 to 355.50

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
bank swallow	9.22	6.43	3.75	--	--	3.75 to 9.22
yellow warbler	9.37	6.57	3.89	--	--	3.89 to 9.37
yellow-breasted chat	9.37	6.57	3.89	--	--	3.89 to 9.37
spotted towhee	461.54	498.34	780.15	0.05	0.12	461.59 to 780.27
Oregon vesper sparrow	615.03	623.33	593.89	15.27	14.59	608.47 to 638.60
Belding's savannah sparrow	9.25	8.01	6.52	--	--	6.52 to 9.25
grasshopper sparrow	199.38	242.24	207.48	--	--	199.38 to 242.24
song sparrow ("Modesto" population)	10.27	7.18	4.94	--	--	4.94 to 10.27
tricolored blackbird	345.81	244.27	164.74	--	--	164.74 to 345.81
yellow-headed blackbird	625.62	602.43	440.79	--	--	440.79 to 625.62
Lawrence's goldfinch	954.66	999.72	1,327.35	27.72	32.87	982.38 to 1,360.22
western red bat	1,504.17	1,460.13	1,561.38	34.78	55.83	1,494.91 to 1,617.21
pallid bat	1,218.82	1,192.97	1,282.58	12.40	18.16	1,205.37 to 1,300.74

	Impacts by Project Combination			Fresno HST Station Alternatives		
	UPRR/SR 99 with West Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 24 Wye	UPRR/SR 99 with East Chowchilla Design Option & Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
western mastiff bat	1,504.17	1,460.13	1,561.38	34.78	55.83	1,494.91 to 1,617.21
San Joaquin kit fox	1,150.34	1,197.52	1,182.86	50.05	70.41	1,200.38 to 1,267.93
American badger	587.95	633.80	588.15	12.45	18.28	600.40 to 652.08

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D4-2
Special-Status Wildlife Species Potentially Affected During the Project Period of BNSF and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North-South Alignment with Ave 24 Wye	BNSF North-South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
Conservancy fairy shrimp	7.88	7.56	9.15	8.65	6.58	3.27	--	--	11.15 to 17.03	10.83 to 16.71	10.83 to 17.03
vernal pool fairy shrimp	7.88	7.56	9.15	8.65	6.58	3.27	--	--	11.15 to 17.03	10.83 to 16.71	10.83 to 17.03
vernal pool tadpole shrimp	7.88	7.56	9.15	8.65	6.58	3.27	--	--	11.15 to 17.03	10.83 to 16.71	10.83 to 17.03
valley elderberry longhorn beetle	5.99	3.45	0.95	0.85	2.53	3.86	--	--	6.85 to 9.85	4.30 to 7.31	4.30 to 9.85
Kern brook lamprey	5.24	4.46	1.61	1.85	1.25	2.26	--	--	6.49 to 7.50	5.70 to 6.71	5.70 to 7.50
Central Valley steelhead	5.24	4.46	1.61	1.85	1.25	2.26	--	--	6.49 to 7.50	5.70 to 6.71	5.70 to 7.50
Central Valley spring-run Chinook salmon	5.24	4.46	1.61	1.85	1.25	2.26	--	--	6.49 to 7.50	5.70 to 6.71	5.70 to 7.50
Chinook salmon - Central Valley fall / late fall-run ESU	5.24	4.46	1.61	1.85	1.25	2.26	--	--	6.49 to 7.50	5.70 to 6.71	5.70 to 7.50
hardhead	5.24	4.46	1.61	1.85	1.25	2.26	--	--	6.49 to 7.50	5.70 to 6.71	5.70 to 7.50
San Joaquin roach	5.24	4.46	1.61	1.85	1.25	2.26	--	--	6.49 to 7.50	5.70 to 6.71	5.70 to 7.50
California tiger salamander	5.97	5.80	8.51	8.07	6.04	3.27	--	--	9.24 to 14.48	9.07 to 14.31	9.07 to 14.48
western spadefoot	52.03	43.01	64.48	53.42	68.51	32.87	--	--	84.90 to 120.54	75.87 to 111.51	75.87 to 120.54
western pond turtle	20.78	17.00	7.31	7.92	5.30	7.43	--	--	26.08 to 28.69	22.30 to 24.92	22.30 to 28.69
fulvous whistling-duck	33.72	29.54	16.24	16.32	11.44	11.25	--	--	44.98 to 50.05	40.79 to 45.86	40.79 to 50.05
redhead	33.72	29.54	16.24	16.32	11.44	11.25	--	--	44.98 to 50.05	40.79 to 45.86	40.79 to 50.05
American white pelican	11.61	8.19	2.57	2.71	3.79	6.13	--	--	14.19 to 17.75	10.76 to 14.32	10.76 to 17.75
least bittern	12.70	11.51	2.03	2.19	1.34	2.81	--	--	14.04 to 15.51	12.86 to 14.32	12.86 to 15.51
white-tailed kite	923.16	820.45	305.18	268.08	195.58	173.57	12.40	18.16	1,109.13 to 1,246.51	1,006.42 to 1,143.80	1,006.42 to 1,246.51
bald eagle	11.33	8.00	2.55	3.18	3.77	6.81	--	--	13.88 to 18.13	10.55 to 14.80	10.55 to 18.13
northern harrier	909.90	810.53	302.63	264.90	191.81	166.76	12.40	18.16	1,089.06 to 1,230.70	989.69 to 1,131.32	989.69 to 1,230.70
Swainson's hawk	885.17	776.29	303.63	267.32	193.27	172.49	12.40	18.16	1,070.06 to 1,206.96	961.18 to 1,098.08	961.18 to 1,206.96
golden eagle	621.63	554.78	239.08	232.91	155.48	127.49	--	--	749.12 to 860.71	682.27 to 793.87	682.27 to 860.71

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North-South Alignment with Ave 24 Wye	BNSF North-South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
American peregrine falcon	2,009.99	1,914.84	443.51	421.24	393.78	395.98	50.05	70.41	2,453.81 to 2,523.91	2,358.66 to 2,428.76	2,358.66 to 2,523.91
lesser sandhill crane	422.86	347.99	222.64	216.36	141.21	116.53	--	--	539.40 to 645.50	464.52 to 570.63	464.52 to 645.50
greater sandhill crane	422.86	347.99	222.64	216.36	141.21	116.53	--	--	539.40 to 645.50	464.52 to 570.63	464.52 to 645.50
snowy plover	11.84	10.91	2.01	2.19	1.33	2.79	--	--	13.17 to 14.64	12.24 to 13.70	12.24 to 14.64
mountain plover	268.70	247.52	166.71	135.70	102.47	70.32	12.40	18.16	351.42 to 453.57	330.24 to 432.40	330.24 to 453.57
whimbrel	6.98	6.73	0.43	0.34	0.10	0.55	--	--	7.08 to 7.53	6.83 to 7.29	6.83 to 7.53
long-billed curlew	59.01	49.74	64.91	53.76	68.60	33.42	--	--	92.43 to 127.62	83.16 to 118.34	83.16 to 127.62
marbled godwit	6.98	6.73	0.43	0.34	0.10	0.55	--	--	7.08 to 7.53	6.83 to 7.29	6.83 to 7.53
red knot	6.98	6.73	0.43	0.34	0.10	0.55	--	--	7.08 to 7.53	6.83 to 7.29	6.83 to 7.53
short-billed dowitcher	6.98	6.73	0.43	0.34	0.10	0.55	--	--	7.08 to 7.53	6.83 to 7.29	6.83 to 7.53
black tern	124.97	95.42	88.16	81.11	31.68	31.52	--	--	156.49 to 213.13	126.95 to 183.58	126.95 to 213.13
western burrowing owl	1,204.83	1,075.79	337.19	286.93	214.99	189.79	50.00	70.30	1,444.62 to 1,612.31	1,315.58 to 1,483.28	1,315.58 to 1,612.31
long-eared owl	1,056.21	969.68	309.65	340.33	320.95	342.07	--	--	1,365.86 to 1,398.28	1,279.34 to 1,311.75	1,279.34 to 1,398.28
short-eared owl	306.50	253.60	169.94	146.99	118.03	78.30	--	--	384.80 to 476.44	331.90 to 423.54	331.90 to 476.44
Costa's hummingbird	1,196.74	1,139.88	272.83	282.37	312.03	314.77	0.12	0.12	1,469.62 to 1,511.63	1,412.76 to 1,454.77	1,412.76 to 1,511.63
loggerhead shrike	1,199.59	1,071.33	335.53	285.02	213.69	187.48	50.00	70.30	1,437.06 to 1,605.41	1,308.81 to 1,477.16	1,308.81 to 1,605.41
least Bell's vireo	6.85	3.45	0.95	0.85	2.53	3.86	--	--	6.85 to 9.85	4.30 to 7.31	4.30 to 9.85
yellow-billed magpie	1,496.37	1,397.73	343.34	372.38	346.03	364.15	22.33	37.55	1,862.04 to 1,906.29	1,763.40 to 1,807.66	1,763.40 to 1,906.29
purple martin	382.07	324.72	33.80	31.43	45.10	52.47	22.38	37.66	435.88 to 472.20	378.53 to 414.86	378.53 to 472.20
bank swallow	5.99	3.45	0.95	0.85	2.53	3.86	--	--	6.85 to 9.85	4.30 to 7.31	4.30 to 9.85

	Impacts by Project Combination		Le Grand Design Options				Fresno HST Station Alternatives		Impact of Components Combined		
	BNSF North-South Alignment with Ave 24 Wye	BNSF North-South Alignment with Ave 21 Wye	Mission Ave	Mission Ave East of Le Grand	Mariposa Way	Mariposa Way East of Le Grand	Mariposa Street Station	Kern Street Station	BNSF Alternative with Ave 24 Wye	BNSF Alternative with Ave 21 Wye	Total Range of Impacts
yellow warbler	5.99	3.45	0.95	0.85	2.53	3.86	--	--	6.85 to 9.85	4.30 to 7.31	4.30 to 9.85
yellow-breasted chat	5.99	3.45	0.95	0.85	2.53	3.86	--	--	6.85 to 9.85	4.30 to 7.31	4.30 to 9.85
spotted towhee	817.01	791.21	106.27	135.64	196.57	237.45	0.05	0.12	923.33 to 1,054.57	897.53 to 1,028.77	897.53 to 1,054.57
Oregon vesper sparrow	483.65	465.49	157.87	146.52	120.95	86.26	15.27	14.59	584.49 to 656.79	566.34 to 638.63	566.34 to 656.79
Belding's savannah sparrow	12.57	12.25	8.91	8.41	6.13	3.80	--	--	16.37 to 21.48	16.06 to 21.16	16.06 to 21.48
grasshopper sparrow	244.22	214.03	87.78	74.43	89.59	55.17	--	--	299.38 to 333.81	269.20 to 303.63	269.20 to 333.81
song sparrow ("Modesto" population)	10.43	7.77	9.40	8.85	8.14	6.70	--	--	17.13 to 19.83	14.46 to 17.17	14.46 to 19.83
tricolored blackbird	245.34	197.17	167.69	151.66	111.92	79.37	--	--	324.70 to 413.02	276.54 to 364.86	276.54 to 413.02
yellow-headed blackbird	516.46	473.81	119.79	110.47	61.08	61.37	--	--	577.54 to 636.25	534.89 to 593.60	534.89 to 636.25
Lawrence's goldfinch	1,329.34	1,298.43	256.93	229.51	302.20	299.01	27.72	32.87	1,586.57 to 1,664.41	1,555.66 to 1,633.50	1,555.66 to 1,664.41
western red bat	1,667.27	1,572.62	398.38	389.24	363.58	372.81	34.78	55.83	2,065.63 to 2,121.47	1,970.98 to 2,026.82	1,970.98 to 2,121.47
pallid bat	1,309.27	1,268.83	370.68	364.21	322.62	326.06	12.40	18.16	1,644.29 to 1,698.11	1,603.85 to 1,657.67	1,603.85 to 1,698.11
western mastiff bat	1,667.27	1,572.62	398.38	389.24	363.58	372.81	34.78	55.83	2,065.63 to 2,121.47	1,970.98 to 2,026.82	1,970.98 to 2,121.47
San Joaquin kit fox	1,091.65	1,006.62	244.14	192.59	184.28	149.18	50.05	70.41	1,290.87 to 1,406.19	1,205.85 to 1,321.17	1,205.85 to 1,406.19
American badger	584.12	510.78	198.85	161.17	149.78	121.52	12.45	18.28	718.09 to 801.25	644.75 to 727.91	644.75 to 801.25

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D4-3
Special-Status Wildlife Species Potentially Affected During the Project Period of the Hybrid and Downtown Fresno Station Alternatives (acres[a])

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
Conservancy fairy shrimp	4.77	3.92	--	--	3.92 to 4.77
vernal pool fairy shrimp	4.77	3.92	--	--	3.92 to 4.77
vernal pool tadpole shrimp	4.77	3.92	--	--	3.92to 4.77
valley elderberry longhorn beetle	7.10	3.47	--	--	3.47 to 7.10
Kern brook lamprey	6.70	3.73	--	--	3.73 to 6.70
Central Valley steelhead	6.70	3.73	--	--	3.73 to 6.70
Central Valley spring-run Chinook salmon	6.70	3.73	--	--	3.73 to 6.70
Chinook salmon - Central Valley fall / late fall-run ESU	6.70	3.73	--	--	3.73 to 6.70
hardhead	6.70	3.73	--	--	3.73 to 6.70
San Joaquin roach	6.70	3.73	--	--	3.73 to 6.70
California tiger salamander	3.39	2.56	--	--	2.56 to 3.39
western spadefoot	46.18	46.81	--	--	46.18 to 46.81
western pond turtle	29.94	26.03	--	--	26.03 to 29.94
fulvous whistling-duck	39.30	32.60	--	--	32.60 to 39.30
redhead	39.30	32.60	--	--	32.60 to 39.30
American white pelican	13.81	7.24	--	--	7.24 to 13.81
least bittern	16.55	8.21	--	--	8.21 to 16.55
white-tailed kite	1,224.01	950.43	12.40	18.16	962.83 to 1,242.17
bald eagle	14.14	7.95	--	--	7.95 to 14.14
northern harrier	1,209.17	941.78	12.40	18.16	954.18 to 1,227.33
Swainson's hawk	1,224.01	950.43	12.40	18.16	962.83 to 1,242.17

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
golden eagle	970.47	695.90	--	--	695.90 to 970.47
American peregrine falcon	2,211.15	2,089.77	50.05	70.41	2,139.82 to 2,281.56
lesser sandhill crane	774.66	553.71	--	--	553.71 to 774.66
greater sandhill crane	774.66	553.71	--	--	553.71 to 774.66
snowy plover	12.68	7.70	--	--	7.70 to 12.68
mountain plover	415.75	351.76	12.40	18.16	364.16 to 433.91
whimbrel	5.98	4.01	--	--	4.01 to 5.98
long-billed curlew	52.16	50.82	--	--	50.82 to 52.16
marbled godwit	5.98	4.01	--	--	4.01 to 5.98
red knot	5.98	4.01	--	--	4.01 to 5.98
short-billed dowitcher	5.98	4.01	--	--	4.01 to 5.98
black tern	324.55	166.45	--	--	166.45 to 324.55
western burrowing owl	1,514.79	1,301.42	50.00	70.30	1,351.42 to 1,585.09
long-eared owl	1,276.52	1,196.95	--	--	1,196.95 to 1,276.52
short-eared owl	505.07	393.72	--	--	393.72 to 505.07
Costa's hummingbird	1,258.44	1,225.28	0.05	0.12	1,225.33 to 1,258.56
loggerhead shrike	1,508.03	1,297.64	50.00	70.30	1,347.64 to 1,578.33
least Bell's vireo	7.10	3.47	--	--	3.47 to 7.10
yellow-billed magpie	1,722.49	1,587.03	22.33	37.55	1,609.36 to 1,760.04
purple martin	353.91	335.25	22.38	37.66	357.63 to 391.57

	Impacts by Project Combination		Fresno HST Station Alternatives		
	Hybrid North-South Alignment with Ave 24 Wye	Hybrid North-South Alignment with Ave 21 Wye	Mariposa Street Station	Kern Street Station	Total Range of Impacts
bank swallow	7.10	3.47	--	--	3.47 to 7.10
yellow warbler	7.25	3.62	--	--	3.62 to 7.25
yellow-breasted chat	7.25	3.62	--	--	3.62 to 7.25
spotted towhee	681.76	850.57	0.05	0.12	681.81 to 850.69
Oregon vesper sparrow	660.71	590.73	15.27	14.59	605.32 to 675.98
Belding's savannah sparrow	9.36	6.53	--	--	6.53 to 9.36
grasshopper sparrow	219.62	240.06	--	--	219.62 to 240.06
song sparrow ("Modesto" population)	10.13	5.62	--	--	5.62 to 10.13
tricolored blackbird	414.59	228.34	--	--	228.34 to 414.59
yellow-headed blackbird	696.06	502.55	--	--	502.55 to 696.06
Lawrence's goldfinch	1,168.24	1,359.44	27.72	32.87	1,195.96 to 1,392.31
western red bat	1,859.36	1,738.96	34.78	55.83	1,773.74 to 1,915.19
pallid bat	1,535.62	1,430.91	12.40	18.16	1,443.31 to 1,553.78
western mastiff bat	1,859.36	1,738.96	34.78	55.83	1,773.74 to 1,915.19
San Joaquin kit fox	1,211.64	1,189.09	50.05	70.41	1,239.14 to 1,282.05
American badger	704.90	667.27	12.45	18.28	679.72 to 723.18

[a] All non-zero values are rounded to the nearest one-hundredth acre.

Table D4-4
Special-Status Wildlife Species Potentially Affected During the Project Period of the HMF Alternatives (acres[a])

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
Conservancy fairy shrimp	0.41	0.42	--	0.12	1.34
vernal pool fairy shrimp	0.41	0.42	--	0.12	1.34
vernal pool tadpole shrimp	0.41	0.42	--	0.12	1.34
valley elderberry longhorn beetle	0.24	0.44	0.48	1.05	1.28
Kern brook lamprey	2.01	0.19	0.49	2.56	1.10
Central Valley steelhead	2.01	0.19	0.49	2.56	1.10
Central Valley spring-run Chinook salmon	2.01	0.19	0.49	2.56	1.10
Chinook salmon - Central Valley fall / late fall-run ESU	2.01	0.19	0.49	2.56	1.10
hardhead	2.01	0.19	0.49	2.56	1.10
San Joaquin roach	2.01	0.19	0.49	2.56	1.10
California tiger salamander	0.41	--	--	--	1.34
western spadefoot	--	--	--	--	77.05
western pond turtle	7.75	1.53	1.85	3.92	2.65
fulvous whistling-duck	8.97	1.53	2.13	3.98	5.34
redhead	8.97	1.53	2.13	3.98	5.34
American white pelican	2.25	0.63	0.97	3.67	2.87
least bittern	3.61	0.19	1.24	2.62	1.60
white-tailed kite	200.27	232.35	200.81	297.08	89.79
bald eagle	2.48	0.63	0.97	3.61	2.37

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
northern harrier	197.78	231.72	199.84	293.47	87.42
Swainson's hawk	202.09	231.00	215.58	296.12	89.09
golden eagle	157.94	225.67	198.45	273.67	82.41
American peregrine falcon	310.50	398.75	226.47	379.79	374.84
lesser sandhill crane	158.11	116.10	189.02	36.10	81.07
greater sandhill crane	158.11	116.10	189.02	36.10	81.07
snowy plover	2.82	0.19	0.77	2.56	1.94
mountain plover	68.45	13.01	84.91	32.53	80.04
whimbrel	0.81	--	0.28	0.06	1.34
long-billed curlew	0.81	--	0.28	0.06	78.39
marbled godwit	0.81	--	0.28	0.06	1.34
red knot	0.81	--	0.28	0.06	1.34
short-billed dowitcher	0.81	--	0.28	0.06	1.34
black tern	6.51	103.44	94.65	0.06	0.50
western burrowing owl	305.38	126.90	215.65	71.81	88.43
long-eared owl	169.25	278.40	190.44	108.16	366.45
short-eared owl	117.45	107.78	94.37	20.64	81.07
Costa’s hummingbird	133.35	379.83	106.29	332.83	367.54
loggerhead shrike	303.37	126.71	215.16	69.24	87.34
least Bell’s vireo	0.24	0.44	0.48	1.05	1.28
yellow-billed magpie	257.53	390.22	221.54	352.37	368.27

	Castle Commerce Center	Harris-DeJager	Fagundes	Gordon-Shaw	Kojima Development
purple martin	99.14	2.90	8.52	12.02	5.50
bank swallow	0.24	0.44	0.48	1.05	1.28
yellow warbler	1.04	0.44	0.48	1.05	1.28
yellow-breasted chat	1.04	0.44	0.48	1.05	1.28
spotted towhee	83.42	166.64	2.18	86.40	285.88
Oregon vesper sparrow	62.46	14.67	88.85	25.11	80.42
Belding's savannah sparrow	1.21	--	0.28	--	2.18
grasshopper sparrow	111.75	4.34	9.61	20.59	80.57
song sparrow ("Modesto" population)	1.45	--	0.48	0.06	3.12
tricolored blackbird	7.95	103.87	104.75	1.11	80.16
yellow-headed blackbird	118.26	217.34	113.98	258.21	4.87
Lawrence's goldfinch	132.66	175.17	6.64	113.76	367.66
western red bat	285.05	393.75	207.14	371.10	372.16
pallid bat	192.45	392.20	200.25	360.44	369.06
western mastiff bat	285.05	393.75	207.14	371.10	372.16
San Joaquin kit fox	291.71	23.72	95.26	69.96	87.41
American badger	193.87	19.16	86.62	56.89	86.85

[a] All non-zero values are rounded to the nearest one-hundredth acre.

APPENDIX E

Watercourse Crossings within Eastman Lake – Bear Creek ECA and Modeled Wildlife Corridor – All Alternatives

Table E-1
Eastman Lake – Bear Creek ECA Crossings – UPRR/SR 99 Alternative

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[a]	Riparian Corridor Value & Adjacent Land Use[b]	Crossing Value[c]
West Chowchilla Design Option & Ave 24 Wye	3.6	4	Deadman Creek (200S-DdCk)	Stream (Ephemeral)	At-Grade Single-Span	--	1 IrAg	Moderate
			Dutchman Creek (209S-DtCk-B)	Stream (Intermittent)	At-Grade Multi-Span	--	1 IrAg	High
			Dutchman Creek (762S-DtCk-A)	Stream (Intermittent)	At-Grade Multi-Span	--	1 IrAg	High
			-- (507C-B)	Canal	At-Grade Culvert	--	--	Low
East Chowchilla Design Option & Ave 24 Wye	4.1	4	Deadman Creek (200S-DdCk)	Stream (Ephemeral)	At-Grade Single-Span	--	1 IrAg	Moderate
			Dutchman Creek (210S-DtCk)	Stream (Intermittent)	Elevated Multi-Span	Harris-DeJager HMF	1 ORC/VIN	High
			Dutchman Creek (211S-DtCk)	Stream (Intermittent)	Elevated Single-Span	--	1 ORC/VIN	Moderate
			Dutchman Creek (766S-DtCk-A)	Stream (Intermittent)	At-Grade Multi-Span	--	1 ORC/VIN/ IrAg	High

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[a]	Riparian Corridor Value & Adjacent Land Use[b]	Crossing Value[c]
East Chowchilla Design Option & Ave 21 Wye			Deadman Creek (200S-DdCk)	Stream (Ephemeral)	At-Grade Single-Span	--	1 IrAg	Moderate
			Dutchman Creek (210S-DtCk)	Stream (Intermittent)	Elevated Multi-Span	Harris-DeJager HMF	1 ORC/VIN	Moderate

Notes:

[a] HMFs are being designed at stream locations to accommodate natural watercourse integrity. Consequently, HMFs should not impede wildlife movement. However, HMFs would result in a size reduction of the ECA.

[b] The 'Riparian Corridor' value qualification and adjacent land use are provided only for natural waters within the study area (refer to Appendix K of the Wetland Delineation Report) [0 = No Riparian Habitat; 1 = Limited/Scattered Riparian Habitat; 2 – Well Developed Riparian Habitat] [IrAg = Irrigated Agriculture; ORC = Orchard; VIN = Vineyard; GL = Grassland; RL = Rangeland; UB = Urban; RR = Rural Residential]

[c] The crossing values of High, Moderate, and Low represent a qualitative ranking based on the apparent openness factor reflected by the following: vertical design and design approach; riparian corridor value; and adjacent land use. These rankings do not reflect other, perhaps more severe, impediments in the environment that currently exists on the approach and departure from the crossing (i.e., highways, rails, buildings and development, feral dogs/pets, etc.).

*The inventory of watercourse crossings is based on the 15% Design Hydraulics and Floodplain Technical Report. Any changes/updates to the Hydraulics and Floodplain Technical Report will need to be reflected in this table.

**All watercourse crossings provided in this table meet the openness ratio.

***The greatest linear distance across ECA and the number of crossings were determined via GIS and a comparative visual assessment of maps and figures from the 15% Design Hydraulics Floodplain Technical Report and ESRP Wildlife Linkages BIOS data.

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

Huber, P. 2007. Wildlife Corridors - San Joaquin Valley [ds423]. Calif. Dept. of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://bios.dfg.ca.gov. Last accessed on December 7, 2010.

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Table E-2
Modeled Wildlife Corridor Crossings – UPRR/SR 99 Alternative

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
West Chowchilla Design Option & Ave 24 Wye	5.25	1	-- (620C)	Canal	At-Grade Culvert	--	--	Low
East Chowchilla Design Option & Ave 24 Wye	5.25	0	There are no watercourse crossings within the modeled corridors associated with this design option.					
East Chowchilla Design Option & Ave 21 Wye	7.75	5	32.2 9.9-2.0 (280C-3229)	Canal	At-Grade Culvert	--	--	Low
			32.2 9.9-2.0 (286C-3229-B)	Canal	At-Grade Culvert	--	--	Low
			Califa Lateral B (461C-CLtB)	Canal	At-Grade Culvert	--	--	Low
			32.2-9.9 (890C-3229-A)	Canal	-- No Impact[E]	--	--	Low
			32.2-9.9 (892C-3229-A)	Canal	-- No Impact[E]	--	--	Low

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]

Notes:

[a] Includes Berenda Slough/Berenda Creek, between Schmidt Creek/Fresno River, and San Joaquin River, modeled areas.

[b] HMFs are being designed at stream locations to accommodate natural watercourse integrity. Consequently, HMFs should not impede wildlife movement. However, HMFs would result in a size reduction of the modeled wildlife corridors.

[c] The 'Riparian Corridor' value qualification and adjacent land use are provided only for natural waters within the study area (refer to Appendix K of the Wetland Delineation Report) [0 = No Riparian Habitat; 1 = Limited/Scattered Riparian Habitat; 2 – Well Developed Riparian Habitat] [IrAg = Irrigated Agriculture; ORC = Orchard; VIN = Vineyard; GL = Grassland; RL = Rangeland; UB = Urban; RR = Rural Residential]

[d] The crossing values of High, Moderate, and Low represent a qualitative ranking based on the apparent openness factor reflected by the following: vertical design and design approach; riparian corridor value; and adjacent land use. These rankings do not reflect other, perhaps more severe, impediments in the environment that currently exists on the approach and departure from the crossing (i.e., highways, rails, buildings and development, feral dogs/pets, etc.).

[e] No Impact designation indicates that the watercourse crossing would not be modified by the HST project.

* The inventory of watercourse crossings is based on the 15% Design Hydraulics and Floodplain Technical Report. Any changes/updates to the Hydraulics and Floodplain Technical Report will need to be reflected in this table.

**All watercourse crossings provided in this table meet the openness ratio.

***It should be noted that the modeled wildlife corridors do not always overlap with the riparian crossings.

****The total linear distance across modeled corridors and the number of crossings were determined by a comparative visual assessment of maps and figures from the 15% Design Hydraulics Floodplain Technical Report and ESRP Wildlife Linkages BIOS data.

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

Huber, P. 2007. Wildlife Corridors - San Joaquin Valley [ds423]. Calif. Dept. of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://bios.dfg.ca.gov. Last accessed on December 7, 2010.

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Trittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A strategy for conserving a connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

Table E-3
Eastman Lake – Bear Creek ECA Crossings – BNSF Alternative

Alternative Combination	Greatest Linear Distance Across ECA[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[d]	Riparian Corridor Value & Adjacent Land Use[a]	Crossing Value[c]
Mission Avenue Design Option & Ave 24 Wye	6.8	7	Deadman Creek (201S-DdCk)	Stream (Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Deadman Creek (738S-DdCk-A)	Stream (Ephemeral)	At-Grade Single-Span	--	1 IrAg	Moderate
			Dutchman Creek (740S-DtCk-A)	Stream (Intermittent)	At-Grade Single-Span	--	0 IrAg	Moderate
			Dutchman Creek (206S-DtCk)	Stream (Intermittent)	At-Grade Multi-Span	--	0 IrAg	High
			Chowchilla River (226S-ChRi)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Ash Slough (231S-AsSl)	Stream (Ephemeral)	At-Grade Multi-Span	Kojima HMF	1 GL	High
			Berenda Slough (253S-BeSl)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	Kojima HMF	2 GL	High
Mission Avenue East of Le Grand & Ave 24 Wye	6.4	5	Deadman Creek (207S-DdCk)	Stream (Ephemeral)	Elevated Multi-Span	--	1 IrAg	High
			Dutchman Creek (560S-DtCk)	Stream (Intermittent)	Elevated Multi-Span	--	1 IrAg	High

Alternative Combination	Greatest Linear Distance Across ECA[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[d]	Riparian Corridor Value & Adjacent Land Use[a]	Crossing Value[c]
			Chowchilla River (226S-ChRi)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Ash Slough (231S-AsSl)	Stream (Ephemeral)	At-Grade Multi-Span	Kojima HMF	1 GL	High
			Berenda Slough (253S-BeSl)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	Kojima HMF	2 GL	High
Mariposa Way Design Option & Ave 24 Wye	6.8	7	Deadman Creek (202S-DdCk)	Stream (Ephemeral)	Elevated Multi-Span	--	2 IrAg	High
			Deadman Creek (738S-DdCk-A)	Stream (Ephemeral)	At-Grade Single-Span	--	1 IrAg	Moderate
			Dutchman Creek (740S-DtCk-A)	Stream (Intermittent)	At-Grade Single-Span	--	0 IrAg	Moderate
			Dutchman Creek (222S-DtCk)	Stream (Intermittent)	Elevated Multi-Span	--	0 IrAg	High
			Chowchilla River (226S-ChRi)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Ash Slough (231S-AsSl)	Stream (Ephemeral)	At-Grade Multi-Span	Kojima HMF	1 GL	High
			Berenda Slough (253S-BeSl)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	Kojima HMF	2 GL	High

Alternative Combination	Greatest Linear Distance Across ECA[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[d]	Riparian Corridor Value & Adjacent Land Use[a]	Crossing Value[c]
Mariposa Way East of Le Grand Design Option & Ave 24 Wye	6.1	9	Mariposa Creek (733S-MaCk-A)	Stream	At-Grade Single-Span	--	2 ORC/IrAg	High
			Deadman Creek (205S-DdCk)	Stream	At-Grade Multi-Span	--	0 ORC/IrAg	High
			Dutchman Creek (223S-DtCk)	Stream	At-Grade Single-Span	--	1 IrAg	Moderate
			-- (224S)	Stream	Elevated Multi-Span	--	0 IrAg	High
			-- (217S)	Stream	Elevated Multi-Span	--	0 VIN	High
			-- (219S-B)	Stream	Elevated Multi-Span	--	0 RL	High
			Chowchilla River (226S-ChRi)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Ash Slough (231S-AsSl)	Stream (Ephemeral)	At-Grade Multi-Span	Kojima HMF	1 GL	High
			Berenda Slough (253S-BeSl)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	Kojima HMF	2 GL	High
Mission Avenue Design Option & Ave 21 Wye	6.8	7	Deadman Creek (201S-DdCk)	Stream (Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Deadman Creek (738S-DdCk-A)	Stream (Ephemeral)	At-Grade Single-Span	--	1 IrAg	Moderate

Alternative Combination	Greatest Linear Distance Across ECA[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[d]	Riparian Corridor Value & Adjacent Land Use[a]	Crossing Value[c]
			Dutchman Creek (740S-DtCk-A)	Stream (Intermittent)	At-Grade Single-Span	--	0 IrAg	Moderate
			Dutchman Creek (206S-DtCk)	Stream (Intermittent)	At-Grade Multi-Span	--	0 IrAg	High
			Chowchilla River (226S-ChRi)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Ash Slough (231S-AsSl)	Stream (Ephemeral)	At-Grade Multi-Span	Kojima HMF	1 GL	High
			Berenda Slough (253S-BeSl)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	Kojima HMF	2 GL	High
Mission Avenue East of Le Grand & Ave 21 Wye	6.4	5	Deadman Creek (207S-DdCk)	Stream (Ephemeral)	Elevated Multi-Span	--	1 IrAg	High
			Dutchman Creek (560S-DtCk)	Stream (Intermittent)	Elevated Multi-Span	--	1 IrAg	High
			Chowchilla River (226S-ChRi)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Ash Slough (231S-AsSl)	Stream (Ephemeral)	At-Grade Multi-Span	Kojima HMF	1 GL	High
			Berenda Slough (253S-BeSl)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	Kojima HMF	2 GL	High

Alternative Combination	Greatest Linear Distance Across ECA[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[d]	Riparian Corridor Value & Adjacent Land Use[a]	Crossing Value[c]
Mariposa Way Design Option & Ave 21 Wye	6.8	7	Deadman Creek (202S-DdCk)	Stream (Ephemeral)	Elevated Multi-Span	--	2 IrAg	High
			Deadman Creek (738S-DdCk-A)	Stream (Ephemeral)	At-Grade Single-Span	--	1 IrAg	Moderate
			Dutchman Creek (740S-DtCk-A)	Stream (Intermittent)	At-Grade Single-Span	--	0 IrAg	Moderate
			Dutchman Creek (222S-DtCk)	Stream (Intermittent)	Elevated Multi-Span	--	0 IrAg	High
			Chowchilla River (226S-ChRi)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Ash Slough (231S-AsSl)	Stream (Ephemeral)	At-Grade Multi-Span	Kojima HMF	1 GL	High
			Berenda Slough (253S-BeSl)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	Kojima HMF	2 GL	High
Mariposa Way East of Le Grand Design Option & Ave 21 Wye	6.1	9	Mariposa Creek (733S-MaCk-A)	Stream	At-Grade Single-Span	--	2 ORC/IrAg	High
			Deadman Creek (205S-DdCk)	Stream	At-Grade Multi-Span	--	0 ORC/IrAg	High
			Dutchman Creek (223S-DtCk)	Stream	At-Grade Single-Span	--	1 IrAg	Moderate
			-- (224S)	Stream	Elevated Multi-Span	--	0 IrAg	High

Alternative Combination	Greatest Linear Distance Across ECA[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[d]	Riparian Corridor Value & Adjacent Land Use[a]	Crossing Value[c]
			-- (217S)	Stream	Elevated Multi-Span	--	0 VIN	High
			-- (219S-B)	Stream	Elevated Multi-Span	--	0 RL	High
			Chowchilla River (226S-ChRi)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	--	1 IrAg	High
			Ash Slough (231S-AsSl)	Stream (Ephemeral)	At-Grade Multi-Span	Kojima HMF	1 GL	High
			Berenda Slough (253S-BeSl)	Stream (Intermittent-Ephemeral)	At-Grade Multi-Span	Kojima HMF	2 GL	High

Alternative Combination	Greatest Linear Distance Across ECA[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[d]	Riparian Corridor Value & Adjacent Land Use[a]	Crossing Value[c]

Notes:

[a] Includes Mariposa Creek

[b] The 'Riparian Corridor' value qualification and adjacent land use are provided only for natural waters within the study area (refer to Appendix K of the Wetland Delineation Report) [0 = No Riparian Habitat; 1 = Limited/Scattered Riparian Habitat; 2 – Well Developed Riparian Habitat] [IrAg = Irrigated Agriculture; ORC = Orchard; VIN = Vineyard; GL = Grassland; RL = Rangeland; UB = Urban; RR = Rural Residential]

[c] The crossing values of High, Moderate, and Low represent a qualitative ranking based on the apparent openness factor reflected by the following: vertical design and design approach; riparian corridor value; and adjacent land use. These rankings do not reflect other, perhaps more severe, impediments in the environment that currently exists on the approach and departure from the crossing (i.e., highways, rails, buildings and development, feral dogs/pets, etc.).

[d] HMFs are being designed at stream locations to accommodate natural watercourse integrity. Consequently, HMFs should not impede wildlife movement. However, HMFs would result in a size reduction of the modeled wildlife corridors.

* The inventory of watercourse crossings is based on the 15% Design Hydraulics and Floodplain Technical Report. Any changes/updates to the Hydraulics and Floodplain Technical Report will need to be reflected in this table.

**All watercourse crossings provided in this table meet the openness ratio.

***The greatest linear distance across ECA and the number of crossings were determined via GIS and a comparative visual assessment of maps and figures from the 15% Design Hydraulics Floodplain Technical Report and ESRP Wildlife Linkages BIOS data.

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

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Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Trittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A strategy for conserving a connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

Table E-4
Modeled Wildlife Corridor Crossings – BNSF Alternative

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
Mission Avenue Design Option & Ave 24 Wye	3.6	4	LAT 32.2 (251C-322)	Canal	At-Grade Culvert	--	--	Low
			Califa Canal (466C-CaCa)	Canal	Elevated Multi-Span	--	--	Low
			Califa Canal (464C-CaCa)	Canal	Elevated Multi-Span	--	--	Low
			LAT 32.2 (257C-322-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
Mission Avenue East of Le Grand & Ave 24 Wye	3.6	4	LAT 32.2 (251C-322)	Canal	At-Grade Culvert	--	--	Low
			Califa Canal (466C-CaCa)	Canal	Elevated Multi-Span	--	--	Low
			Califa Canal (464C-CaCa)	Canal	Elevated Multi-Span	--	--	Low

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
			LAT 32.2 (257C-322-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
Mariposa Way Design Option & Ave 24 Wye	3.6	4	LAT 32.2 (251C-322)	Canal	At-Grade Culvert	--	--	Low
			Califa Canal (466C-CaCa)	Canal	Elevated Multi-Span	--	--	Low
			Califa Canal (464C-CaCa)	Canal	Elevated Multi-Span	--	--	Low
			LAT 32.2 (257C-322-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
Mariposa Way East of Le Grand Design Option & Ave 24 Wye	3.6	4	LAT 32.2 (251C-322)	Canal	At-Grade Culvert	--	--	Low
			Califa Canal (466C-CaCa)	Canal	Elevated Multi-Span	--	--	Low
			Califa Canal (464C-CaCa)	Canal	Elevated Multi-Span	--	--	Low

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
			LAT 32.2 (257C-322-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
Mission Avenue Design Option & Ave 21 Wye	9.1	8	LAT 32.2 (251C-322)	Canal	At-Grade Culvert	--	--	Low
			32.2 9.9-2.0 (286C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			32.2-9.9-1.5 (274C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			32.2-9.9-1.0 (276C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			32.2-9.9-0.1 (273C-3229)	Canal	At-Grade Culvert	--	--	Low

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
			32.2-10.2? (275C-3221-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			-- (894C-A)	Canal	Elevated Multi-Span	--	--	Low
			LAT 32.2 (254C-322)	Canal	At-Grade Culvert	--	--	Low
Mission Avenue East of Le Grand & Ave 21 Wye	9.1	8	LAT 32.2 (251C-322)	Canal	At-Grade Culvert	--	--	Low
			32.2 9.9-2.0 (286C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			32.2-9.9-1.5 (274C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			32.2-9.9-1.0 (276C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
			32.2-9.9-0.1 (273C-3229)	Canal	At-Grade Culvert	--	--	Low
			32.2-10.2? (275C-3221-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			-- (894C-A)	Canal	Elevated Multi-Span	--	--	Low
			LAT 32.2 (254C-322)	Canal	At-Grade Culvert	--	--	Low
Mariposa Way Design Option & Ave 21 Wye	9.1	8	LAT 32.2 (251C-322)	Canal	At-Grade Culvert	--	--	Low
			32.2 9.9-2.0 (286C-3229-B)	Canal	At-Grade Culvert	--	--	
			32.2-9.9-1.5 (274C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			32.2-9.9-1.0 (276C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
			32.2-9.9-0.1 (273C-3229)	Canal	At-Grade Culvert	--	--	Low
			32.2-10.2? (275C-3221-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			-- (894C-A)	Canal	Elevated Multi-Span	--	--	Low
			LAT 32.2 (254C-322)	Canal	At-Grade Culvert	--	--	Low
Mariposa Way East of Le Grand Design Option & Ave 21 Wye	9.1	8	LAT 32.2 (251C-322)	Canal	At-Grade Culvert	--	--	Low
			32.2 9.9-2.0 (286C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			32.2-9.9-1.5 (274C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
			32.2-9.9-1.0 (276C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			32.2-9.9-0.1 (273C-3229)	Canal	At-Grade Culvert	--	--	Low
			32.2-10.2? (275C-3221-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			-- (894C-A)	Canal	Elevated Multi-Span	--	--	Low
			LAT 32.2 (254C-322)	Canal	At-Grade Culvert	--	--	Low

Notes:

[a] Includes Berenda Slough/Berenda Creek, between Schmidt Creek/Fresno River, and San Joaquin River, modeled areas.

[b] HMFs are being designed at stream locations to accommodate natural watercourse integrity. Consequently, HMFs should not impede wildlife movement. However, HMFs would result in a size reduction of the modeled wildlife corridors.

[c] The 'Riparian Corridor' value qualification and adjacent land use are provided only for natural waters within the study area (refer to Appendix K of the Wetland Delineation Report) [0 = No Riparian Habitat; 1 = Limited/Scattered Riparian Habitat; 2 – Well Developed Riparian Habitat] [IrAg = Irrigated Agriculture; ORC = Orchard; VIN = Vineyard; GL = Grassland; RL = Rangeland; UB = Urban; RR = Rural Residential]

[d] The crossing values of High, Moderate, and Low represent a qualitative ranking based on the apparent openness factor reflected by the following: vertical design and design approach; riparian corridor value; and adjacent land use. These rankings do not reflect other, perhaps more severe, impediments in the environment that currently exists on the approach and departure from the crossing (i.e., highways, rails, buildings and development, feral dogs/pets, etc.).

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]

* The inventory of watercourse crossings is based on the 15% Design Hydraulics and Floodplain Technical Report. Any changes/updates to the Hydraulics and Floodplain Technical Report will need to be reflected in this table.

**All watercourse crossings provided in this table meet the openness ratio.

***It should be noted that the modeled wildlife corridors do not always overlap with the riparian crossings.

****The total linear distance across modeled corridors and the number of crossings were determined by a comparative visual assessment of maps and figures from the 15% Design Hydraulics Floodplain Technical Report and ESRP Wildlife Linkages BIOS data.

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

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Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Trittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A strategy for conserving a connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

Table E-5
Eastman Lake – Bear Creek ECA Crossings – Hybrid Alternative

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[a]	Riparian Corridor Value & Adjacent Land Use[b]	Crossing Value[c]
Hybrid Alternative (Ave 24 Wye)	3.6	3						
			Deadman Creek (200S-DdCk)	Stream (Ephemeral)	At-Grade Single-Span	--	1 IrAg	Moderate
			Dutchman Creek (209S-DtCk-B)	Stream (Intermittent)	At-Grade Multi-Span	--	1 IrAg	High
			Dutchman Creek (762S-DtCk-A)	Stream (Intermittent)	At-Grade Multi-Span	--	1 IrAg	High
Hybrid Alternative (Ave 21 Wye)	4.1	2	Deadman Creek (200S-DdCk)	Stream (Ephemeral)	At-Grade Single-Span	--	1 IrAg	Moderate
			Dutchman Creek (210S-DtCk)	Stream (Intermittent)	Elevated Multi-Span	Harris-DeJager HMF	1 ORC/VIN	High

Notes:

[a] HMFs are being designed at stream locations to accommodate natural watercourse integrity. Consequently, HMFs should not impede wildlife movement. However, HMFs would result in a size reduction of the ECA.

[b] The 'Riparian Corridor' value qualification and adjacent land use are provided only for natural waters within the study area (refer to Appendix K of the Wetland Delineation Report) [0 = No Riparian Habitat; 1 = Limited/Scattered Riparian Habitat; 2 – Well Developed Riparian Habitat] [IrAg = Irrigated Agriculture; ORC = Orchard; VIN = Vineyard; GL = Grassland; RL = Rangeland; UB = Urban; RR = Rural Residential]

[c] The crossing values of High, Moderate, and Low represent a qualitative ranking based on the apparent openness factor reflected by the following: vertical design and design approach; riparian corridor value; and adjacent land use. These rankings do not reflect other, perhaps more severe, impediments in the environment that currently exists on the approach and departure from the crossing (i.e., highways, rails, buildings and development, feral dogs/pets, etc.).

* The inventory of watercourse crossings is based on the 15% Design Hydraulics and Floodplain Technical Report. Any changes/updates to the Hydraulics and Floodplain Technical Report will need to be reflected in this table.

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[a]	Riparian Corridor Value & Adjacent Land Use[b]	Crossing Value[c]

**All watercourse crossings provided in this table meet the openness ratio.

***The greatest linear distance across ECA and the number of crossings were determined via GIS and a comparative visual assessment of maps and figures from the 15% Design Hydraulics Floodplain Technical Report and ESRP Wildlife Linkages BIOS data.

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

Huber, P. 2007. Wildlife Corridors - San Joaquin Valley [ds423]. Calif. Dept. of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://bios.dfg.ca.gov. Last accessed on December 7, 2010.

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Trittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A strategy for conserving a connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

Table E-6
Modeled Wildlife Corridor Crossings – Hybrid Alternative

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
Hybrid Alternative (Ave 24 Wye)	3.6	2	Califa Canal (464C-CaCa)	Canal	Elevated Multi-Span	--	--	Low
			LAT 32.2 (257C-322-B)	Canal	At-Grade Culvert	--	--	Low
Hybrid Alternative (Ave 21 Wye)	5.3	8	32.2 9.9-2.0 (280C-3229)	Canal	At-Grade Culvert	--	--	Low
			32.2 9.9-2.0 (286C-3229-B)	Canal	At-Grade Culvert	--	--	Low
			Califa Lateral B (461C-CLtB)	Canal	At-Grade Culvert	--	--	Low
			32.2-9.9 (890C-3229-A)	Canal	-- No Impact[E]	--	--	Low
			32.2-9.9 (892C-3229-A)	Canal	-- No Impact[E]	--	--	Low
			32.2-9.9-0.1 (273C-3229)	Canal	At-Grade Culvert	--	--	Low

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]
			32.2-9.9-1.0 (276C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low
			32.2-9.9-1.5 (274C-3229-B)	Canal	At-Grade Culvert (Canal Relocated)	--	--	Low

Notes:

[a] Includes Berenda Slough/Berenda Creek, between Schmidt Creek/Fresno River, and San Joaquin River, modeled areas.
[b] HMFs are being designed at stream locations to accommodate natural watercourse integrity. Consequently, HMFs should not impede wildlife movement. However, HMFs would result in a size reduction of the ECA.

[c] The 'Riparian Corridor' value qualification and adjacent land use are provided only for natural waters within the study area (refer to Appendix K of the Wetland Delineation Report) [0 = No Riparian Habitat; 1 = Limited/Scattered Riparian Habitat; 2 – Well Developed Riparian Habitat] [IrAg = Irrigated Agriculture; ORC = Orchard; VIN = Vineyard; GL = Grassland; RL = Rangeland; UB = Urban; RR = Rural Residential]

[d] The crossing values of High, Moderate, and Low represent a qualitative ranking based on the apparent openness factor reflected by the following: vertical design and design approach; riparian corridor value; and adjacent land use. These rankings do not reflect other, perhaps more severe, impediments in the environment that currently exists on the approach and departure from the crossing (i.e., highways, rails, buildings and development, feral dogs/pets, etc.).

[e] No Impact designation indicates that the watercourse crossing would not be modified by the HST project.

* The inventory of watercourse crossings is based on the 15% Design Hydraulics and Floodplain Technical Report. Any changes/updates to the Hydraulics and Floodplain Technical Report will need to be reflected in this table. **All watercourse crossings provided in this table meet the openness ratio.

***It should be noted that the modeled wildlife corridors do not always overlap with the riparian crossings.

****The total linear distance across modeled corridors and the number of crossings were determined by a comparative visual assessment of maps and figures from the 15% Design Hydraulics Floodplain Technical Report and ESRP Wildlife Linkages BIOS data.

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and

Alternative Combination	Total Linear Distance Across Modeled Corridors[a] (mi.)	Crossings						
		Number of Crossings	Watercourse Name (Crossing ID Number)	Watercourse Type (Flow Regime)	Vertical Design & Design Approach	HMFs[b]	Riparian Corridor Value & Adjacent Land Use[c]	Crossing Value[d]

Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

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APPENDIX F

Distance Between Crossings Along Track within Eastman Lake – Bear Creek ECA and Modeled Wildlife Corridor– All Alternatives

Table F-1
Distance Between Crossings Along Track Within Eastman Lake – Bear Creek ECA – UPRR/SR 99 Alternative

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
West Chowchilla Design Option & Ave 24 Wye	3.6	200S-DdCk – 209S-DtCk-	2.23
		209S-DtCk-B – 507C-B	0.74
East Chowchilla Design Option & Ave 24 Wye	4.1	200S-DdCk – 210SDtCK	2.69
		210S-DtCk – 211S-DtCk	0.15
East Chowchilla Design Option & Ave 21 Wye	4.1	200S-DdCk – 210S-DtCk	2.69

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

Huber, P. 2007. Wildlife Corridors - San Joaquin Valley [ds423]. Calif. Dept. of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://bios.dfg.ca.gov. Last accessed on December 7, 2010.

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Table F-2
Distance Between Crossings Along Track Within Modeled Wildlife Corridor – UPRR/SR 99 Alternative

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
West Chowchilla Design Option & Ave 24 Wye	5.25	620C	--[a]
East Chowchilla Design Option & Ave 24 Wye	5.25	There are no watercourse crossings within the modeled wildlife corridors associated with this design option.	
East Chowchilla Design Option & Ave 21 Wye	7.75	461C-CLtB – 286C-3229-B	2.03
		286C-3229-B – 280C-3229	0.15

Notes:

[a] This is an isolated crossing along the track within the modeled wildlife corridor.

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

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Table F-3
Distance Between Crossings Along Track Within Eastman Lake – Bear Creek ECA – BNSF Alternative

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
Mission Avenue Design Option & Ave 24 Wye	6.8	201S-DdCk – 738S-DdCk-A	0.2
		738S-DdCk-A – 740S-DtCk-A	0.12
		740S-DtCk-A – 206S-DtCk	0.3
		206S-DtCk – 226S-ChRi	3.93
		226S-ChRi – 231S-AsSl	1.32
		231S-AsSl – 253S-BeSl	0.25
Mission Avenue East of Le Grand & Ave 24 Wye	6.4	207S-DdCk – 560S-DtCk	0.36
		560S-DtCk – 226S-ChRi	3.74
		226S-ChRi – 231S-AsSl	1.32
		231S-AsSl – 253S-BeSl	0.25
Mariposa Way Design Option & Ave 24 Wye	6.8	202S-DdCk – 738S-DdCk-A	0.2
		738S-DdCk-A – 740S-DtCk-A	0.12
		740S-DtCk-A – 222S-DtCk	0.2
		222S-DtCk – 226S-ChRi	3.96
		226S-ChRi – 231S-AsSl	1.34
		231S-AsSl – 253S-BeSl	0.25
Mariposa Way East of Le Grand Design Option & Ave 24 Wye	6.1	205S-DdCk – 223S-DtCk	0.25
		223S-DtCk – 224S	1.69

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
		224S – 217S	0.38
		217S – 219S-B	0.70
		219S-B – 226S-ChRi	0.96
		226S-ChRi – 231S-AsSl	1.32
		231S-AsSl – 253S-BeSl	0.25
Mission Avenue Design Option & Ave 21 Wye	6.8	201S-DdCk – 738S-DdCk-A	0.2
		738S-DdCk-A – 740S-DtCk-A	0.12
		740S-DtCk-A – 206S-DtCk	0.3
		206S-DtCk – 226S-ChRi	3.93
		226S-ChRi – 231S-AsSl	1.32
		231S-AsSl – 253S-BeSl	0.25
Mission Avenue East of Le Grand & Ave 21 Wye	6.4	207S-DdCk – 560S-DtCk	0.36
		560S-DtCk – 226S-ChRi	3.74
		226S-ChRi – 231S-AsSl	1.32
		231S-AsSl – 253S-BeSl	0.25
Mariposa Way Design Option & Ave 21 Wye	6.8	202S-DdCk – 738S-DdCk-A	0.2
		738S-DdCk-A – 740S-DtCk-A	0.12
		740S-DtCk-A – 222S-DtCk	0.2
		222S-DtCk – 226S-ChRi	3.96
		226S-ChRi – 231S-AsSl	1.34

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
		231S-AsSl – 253S-BeSl	0.25
Mariposa Way East of Le Grand Design Option & Ave 21 Wye	6.1	205S-DdCk – 223S-DtCk	0.25
		223S-DtCk – 224S	1.65
		224S – 217S	0.38
		217S – 219S-B	0.70
		219S-B – 226S-ChRi	0.96
		226S-ChRi – 231S-AsSl	1.32
		231S-AsSl – 253S-BeSl	0.25

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

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Table F-4
Distance Between Crossings Along Track Within Modeled Wildlife Corridor – BNSF Alternative

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
Mission Avenue Design Option & Ave 24 Wye	3.6	251C-322 – 257C-322-B	1.52
		257C-322-B – 464C-CaCa	3.25
		464C-CaCa – 466C-CaCa	0.10
Mission Avenue East of Le Grand & Ave 24 Wye	3.6	251C-322 – 257C-322-B	1.52
		257C-322-B – 464C-CaCa	3.25
		464C-CaCa – 466C-CaCa	0.10
Mariposa Way Design Option & Ave 24 Wye	3.6	251C-322 – 257C-322-B	1.52
		257C-322-B – 464C-CaCa	3.25
		464C-CaCa – 466C-CaCa	0.10
Mariposa Way East of Le Grand Design Option & Ave 24 Wye	3.6	251C-322 – 257C-322-B	1.52
		257C-322-B – 464C-CaCa	3.25
		464C-CaCa – 466C-CaCa	0.10
Mission Avenue Design Option & Ave 21 Wye	9.1	251C-322 – 254C-322	0.25
		254C-322 – 894C-A	3.80
		894C-A – 275C-3221-B	2.58
		275C-3221-B – 273C-3229	0.52
		273C-3229 – 276C-3229-B	0.48
		276C-3229-B – 274C-3229-B	0.50

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
		274C-3229-B – 286C-3229-B	1.01
Mission Avenue East of Le Grand & Ave 21 Wye	9.1	251C-322 – 254C-322	0.25
		254C-322 – 894C-A	3.80
		894C-A – 275C-3221-B	2.58
		275C-3221-B – 273C-3229	0.52
		273C-3229 – 276C-3229-B	0.48
		276C-3229-B – 274C-3229-B	0.50
		274C-3229-B – 286C-3229-B	1.01
Mariposa Way Design Option & Ave 21 Wye	9.1	251C-322 – 254C-322	0.25
		254C-322 – 894C-A	3.80
		894C-A – 275C-3221-B	2.58
		275C-3221-B – 273C-3229	0.52
		273C-3229 – 276C-3229-B	0.48
		276C-3229-B – 274C-3229-B	0.50
		274C-3229-B – 286C-3229-B	1.01
Mariposa Way East of Le Grand Design Option & Ave 21 Wye	9.1	251C-322 – 254C-322	0.25
		254C-322 – 894C-A	3.80
		894C-A – 275C-3221-B	2.58
		275C-3221-B – 273C-3229	0.52
		273C-3229 – 276C-3229-B	0.48

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
		276C-3229-B – 274C-3229-B	0.50
		274C-3229-B – 286C-3229-B	1.01

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

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Table F-5
Distance Between Crossings Along Track Within Eastman Lake – Bear Creek ECA – Hybrid Alternative

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
Hybrid Alternative (Ave 24 Wye)	3.6	200S-DdCk – 209S-DtCk-B	2.23
Hybrid Alternative (Ave 21 Wye)	4.1	200S-DdCk – 210S-DtCk	2.69

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

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Table F-6
Distance Between Crossings Along Track Within Modeled Wildlife Corridor– Hybrid Alternative

Alternative Combination	Greatest Linear Distance Across ECA (mi.)	Crossings Along Track	Distance Between Crossings Along Track (mi.)
Hybrid Alternative (Ave 24 Wye)	3.6	257C-322-B – 464C-CaCa	3.25
Hybrid Alternative (Ave 21 Wye)	5.3	461C-CLtB – 280C-3229	0.15
		280C-3229 – 286C-3229-B	0.11
		286C-3229-B – 274C-3229-B	1.01
		274C-3229-B – 276C-3229-B	0.50
		276C-3229-B – 273C-3229	0.48

Sources:

Endangered Species Recovery Program (ESRP). 1999. Wildlife Linkages - San Joaquin Valley [ds417]. California Department of Fish and Game. Biogeographic Information and Observation System (BIOS). Available online: http://imaps.dfg.ca.gov/viewers/biospublic/app.asp. Accessed December 7, 2010.

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