Appendix 3.7-B

Comparison of Impacts on Biological Resources by Alternative

Attachment 1
Comparison of Impacts on Special-Status Plant Species by Alternative

Special-Status Plant Species (Common Name / Scientific Name / Status)	Impact Type	High-Speed Train Alternatives					
		BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
			Impact Acreage / Difference Compared to Corresponding BNSF Area[A]				
Heartscale *Atriplex cordulata* CNPS 1B.2	Project	0.56	—	—	— / -0.56	—	—
	Construction	*0.20*	—	—	*— / -0.13*	—	—
Little mouse tail *Myosurus minimus* ssp. *apus* CNPS 3.1	Project	0.45	—	—	— / -0.19	—	—
	Construction	—	—	—		—	—
Unsurveyed potential suitable habitat that could support special-status plant species	Project	112.49	3.79 / -1.41	45.75 / +20.67	102.22 / +74.01	14.55 / +0.87	8.56 / +0.63
	Construction	*29.25*	*2.32 / +2.24*	*2.57 / +2.24*	*25.02 / +20.03*	*14.28 / +2.58*	*7.67 / +0.33*
Total Impacts	Project	113.51	3.79 / -1.41	45.75 / +20.67	102.22 / +73.27	14.55 / +0.87	8.56 / +0.63
	Construction	*29.45*	*2.32 / +2.24*	*2.57 / +2.24*	*25.02 / +19.91*	*14.28 / +2.58*	*7.67 / +0.33*

Notes:
— = No impact or not applicable
[a] The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.
Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.
All impacts were calculated based on 15% engineering design construction footprint.
CNPS Status
1B: Rare, threatened, or endangered in California and elsewhere
2: Rare, threatened, or endangered in California, but more common elsewhere
3: More information is needed
4: Limited distribution or infrequent throughout California
0.1: Seriously endangered in California
0.2: Fairly endangered in California
0.3: Not very endangered in California
Abbreviations:
CNPS = California Native Plant Society

Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name / Scientific Name / Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
Federally and State Listed								
Vernal pool fairy shrimp (*Branchinecta lynchi*) FT	Vernal pools/seasonal wetlands	Project	22.02	—	2.46 / -0.48	4.56 / -13.99	—	— / -0.26
		Construction	*0.88*	—	*0.63 / +0.63*	*— / -0.35*	—	—
Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)* FT	Elderberry shrubs (*Sambucus* spp.)	Project	2	(P) —	(P) —	(P) —	(P) —	(P) —
		Construction	—	*(P) —*	*(P) —*	*(P) —*	*(P) —*	*(P) —*
Vernal pool tadpole shrimp (*Lepidurus packardi*) FE	Vernal pools/seasonal wetlands	Project	22.02	—	2.46 / -0.48	4.56 / -13.99	—	— / -0.26
		Construction	*0.88*	—	*0.63 / +0.63*	*— / -0.35*	—	—
California tiger salamander (*Ambystoma californiense*) FT, ST	Aquatic: vernal pools/seasonal wetlands in Corcoran Irrigation Water District	Project	—	—	—	—[c]	—[c]	—[c]
		Construction	—	—	—	—[c]	—[c]	—[c]

Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
California tiger salamander *(cont'd.)*	UPLAND: ASC, AGS, PAS surrounding vernal pools/seasonal wetlands in Corcoran Irrigation Water District	Project	—	—	5.43 / +5.43	— [c]	— [c]	— [c]
		Construction	—	—	—	— [c]	— [c]	— [c]
Blunt-nosed leopard lizard (*Gambelia* [=*Crotaphytus*] *sila*) FE, SE/FP	ASC, AGS, BAR, VRI	Project	56.88	—	—	21.85 / -35.03	—	— [c]
		Construction	*0.12*	—	—	*1.34 / +1.22*	—	— [c]
Golden eagle (*Aquila chrysaetos*) FP	ASC, AGS, BAR, CRP, FEW, IRH, PAS, URB, VRI	Project	1651.25	47.56 / -53.64	327.64 / -20.38	161.76 / -8.44	233.76 / -49.48	166.24 / -67.57
		Construction	*1167.03*	*13.13 / +9.78*	*408.88 / -2.09*	*79.76 / +27.35*	*54.22 / -51.99*	*218.18 / +5.12*
Swainson's hawk (*Buteo swainsoni*) ST	AGS, BAR, CRP, IRH, PAS, URB, VRI	Project	1622.93	47.56 / -53.64	327.64 / -20.38	155.53 / +9.38	233.76 / -49.48	157.88 / -71.64
		Construction	*1165.37*	*13.13 / +9.78*	*408.88 / -2.09*	*79.76 / +27.35*	*54.22 / -51.99*	*217.3 / +5.91*

Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
Western snowy plover *(Charadrius alexandrinus nivosus)* FT, CSC	LAC	Project	10.86	— / -0.42	0.04 / -0.80	12.82 / +3.44	0.01 / -0.34	—
		Construction	*0.37*	—	*0.02 / +0.02*	*2.32 / +2.04*	*0.10 / 0.00*	—
White-tailed kite (*Elanus leucurus*) FP	ASC, AGS, CRP, BAR, DOR, DGR, EOR, FEW, IRH, IRF, IGR, URB, VRI, VIN	Project	2834.91	47.56 / -53.64	527.36 / -62.01	342.69 / +32.7	481.67 / +9.13	165.74 / -67.20
		Construction	*1934.77*	*13.13 / +9.78*	*419.24 / +3.48*	*150.84 / -6.61*	*503.01 / -50.57*	*218.18 / +5.12*
American peregrine falcon *(Falco peregrinus anatum)* Delisted, SE/FP	AGS, BAR, CRP, FEW, IGR, IRH, LAC, RIV, URB, VRI	Project	1938.46	49.71 / -55.41	419.44 / -113.29	206.27 / +46.96	264.22 / -29.07	160.93 / -71.86
		Construction	*1228.25*	*13.17 / +9.82*	*419.89 / +1.53*	*82.65 / +29.88*	*55.98 / -51.45*	*219.63 / +6.42*
Greater sandhill crane (*Grus Canadensis tabida*) ST/FP	AGS, DGR, CRP, FEW, IGR, IRH, IRF, LAC, VRI	Project	934.35	10.68 / -20.65	305.55 / -45.16	174.93 / +98.62	180.54 / +102.11	2.26 / -1.45
		Construction	*551.51*	*0.71 / +0.26*	*171.67 / +4.78*	*82.01 / +41.48*	*42.35 / +0.07*	*13.48 / +0.35*

Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
Bald eagle (*Haliaeetus leucocephalus*) Delisted, SE/FP	AGS, BAR, FEW, LAC, RIV, VRI	Project	211.59	11.61 / -8.55	50.89 / +1.39	73.02 / +6.53	15.64 / -11.66	9.30 / -1.19
		Construction	*278.01*	*1.01 / +1.01*	*4.46 / +1.15*	*7.16 / +4.72*	*2.69 / -0.27*	*177.88 / +0.33*
Nelson's (San Joaquin) antelope squirrel (*Ammospermophilus nelsoni*) ST	ASC, AGS, BAR, PAS	Project	96.47	—[c]	—[c]	38.06 / -23.54	12.63 / -11.03	14.31 / +3.10
		Construction	*179.14*	—[c]	—[c]	*1.28 / +1.27*	*1.75 / +0.02*	*176.18 / -1.22*
Fresno kangaroo rat *(Dipodomys nitratoides exilis)* FE, SE	ASC, AGS, BAR, PAS	Project	8.14	—[c]	—[c]	—[c]	—[c]	—[c]
		Construction	—	—[c]	—[c]	—[c]	—[c]	—[c]
Tipton kangaroo rat *(Dipodomys nitratoides nitratoides)* FE, SE	ASC, AGS, BAR, PAS	Project	130.42	—[c]	—[c]	60.46 / -18.42	12.63 / -11.03	14.31 / +3.1
		Construction	*181.86*	—[c]	—[c]	*4.65 / +2.82*	*1.75 / +0.02*	*176.18 / -1.22*

Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name / Scientific Name / Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
San Joaquin kit fox (*Vulpes macrotis mutica*) FE, ST	ASC, AGS, BAR, PAS	Project	214.91	9.46 / -6.78	41.2 / +10.20	60.46 / -18.42	12.63 / -11.03	14.31 / +3.10
		Construction	*272.38*	*0.97 / +0.97*	*0.28 / +0.28*	*4.65 / +2.82*	*1.75 / +0.02*	*176.18 / -1.22*
	URB (Bakersfield)	Project	223.00	—	—	—	0.98 / 0.00	150.81 / -71.21
		Construction	*36.26*	—	—	—	*0.63 / 0.00*	*41.71 / +6.09*
Kern brook lamprey (*Lampetra hubbsi*) CSC	Friant-Kern Canal (Bakersfield)	Project	0.03	—	—	—	—	0.32 / +0.28
		Construction	*0.07*	—	—	—	—	*0.01 / -0.06*
Western spadefoot (Spea [=*Scaphiopus] hammondii*) CSC	ASC, AGS, FEW, RIV	Project	179.36	3.87 / -9.76	47.07 / +10.05	64.90 / -15.74	14.27 / -0.93	11.21 / +2.74
		Construction	*26.24*	*0.75 / +0.75*	*4.35 / +1.04*	*4.71 / +2.80*	*2.03 / +0.05*	*12.87 / -0.37*
Western pond turtle (Actinemys [=*Clemmys| Emys] marmorata*) CSC	AGS, FEW, LAC, PAS, RIV, URB, VRI	Project	1266.33	33.01 / -45.23	175.44 / -37.81	102.63 / -47.18	137.01 / -97.8	155.36 / -72.66
		Construction	*494.52*	*12.91 / +10.01*	*250.06 / -1.40*	*7.74 / -6.86*	*54.64 / -51.34*	*55.72 / +6.85*

Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
Silvery legless lizard (*Anniella pulchra pulchra*) CSC	VRI	Project	4.52	—	0.53 / +0.03	0.91 / +0.40	—	0.31 / +0.13
		Construction	*0.27*	—	*0.09 / +0.09*	*0.14 / -0.11*	—	*0.25 / +0.25*
San Joaquin whipsnake (*Masticophis flagellum ruddocki*) CSC	ASC, AGS, PAS, VRI	Project	177.17	1.72 / -8.41	38.48 / +18.12	61.36 / -18.02	12.63 / -0.10	9.38 / +2.80
		Construction	*22.42*	*0.71 / +0.71*	*0.38 / +0.38*	*4.79 / +2.71*	*1.75 / +0.02*	*12.56 / -0.54*
Coast (California) horned lizard *(Phrynosoma coronatum frontale)* CSC	ASC, AGS, VRI	Project	115.83	1.72 / -8.41	37.28 / +17.22	61.09 / -14.76	— [c]	0.19 / +0.11
		Construction	*2.82*	*0.71 / +0.71*	*0.38 / +0.38*	*4.73 / +2.8*	— [c]	*0.25 / +0.25*
Western burrowing owl (*Athene cunicularia*) CSC	ASC, AGS, PAS, BAR, URB	Project	1286.5	38.6 / -41.82	169 / -36.88	90.07 / -70.23	134 / -108.1	165.1 / -67.57
		Construction	*738.71*	*13.13 / +10.23*	*245.88 / -2.27*	*5.23 / -8.76*	*53.7 / -51.05*	*217.9 / +4.87*
SPECIAL-STATUS RAPTOR SPECIES	ASC, AGS, CRP, PAS, VRI, DGR, IGR, IRH, IRF	Project	974.15	10.68 / -20.23	305.51 / -44.36	167.1 / +74.21	179.17 / +101.90	10.22 / +2.80
		Construction	*550.66*	*0.71 / +0.26*	*171.65 / +4.76*	*79.69 / +39.44*	*41.69 / +0.39*	*12.59 / -0.54*

Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
SPECIAL-STATUS PASSERINE SPECIES	ASC, AGS, CRP, PAS, VRI, FEW, LAC, RIV, DGR, IGR, IRH, IRF	Project	1019.91	12.83 / -22.00	314.68 / -53.20	184.36 / +78.42	182.18 / +101.27	13.76 / +2.22
		Construction	*558.10*	*0.75 / +0.3*	*175.74 / +5.53*	*82.07 / +41.46*	*42.62 / +0.10*	*14.92 / -0.03*
SPECIAL-STATUS WADING BIRDS, SHOREBIRDS, AND DUCK SPECIES	ASC, AGS, CRP, PAS, DGR, IGR, IRH, IRF, RIV, FEW, LAC	Project	1015.39	12.83 / -22.00	314.15 / -53.23	183.46 / +78.02	182.18 / +101.27	13.45 / +2.09
		Construction	*557.82*	*0.75 / +0.30*	*175.65 / +5.44*	*81.93 / +41.57*	*42.62 / +0.10*	*14.67 / -0.28*
Pallid bat (*Antrozous pallidus*) CSC	ASC, AGS, BAR, CRP, DGR, IGR, IRH, IRF, PAS, RIV, URB, VRI, VIN	Project	2175.18	37.72 / -51.73	436.53 / -95.15	246.4 / +85.27	307.62 / +44.92	156.56 / -67.61
		Construction	*1475.79*	*5.01 / +2.57*	*418.88 / +2.93*	*150.42 / +27.15*	*127.78 / -42.1*	*216.12 / +5.53*
Dulzura pocket mouse *(Chaetodipus californicus femoralis)* CSC	AGS	Project	32.86	—[c]	—[c]	28.03 / -4.83	—[c]	—[c]
		Construction	*0.01*	—[c]	—[c]	*1.28 / +1.27*	—[c]	—[c]
Townsend's big-eared bat (*Corynorhinus townsendii*) CSC	ASC, AGS, BAR, CRP, IGR, IRH, IRF, PAS, VRI, URB, VIN RIV	Project	2340.78	49.71 / -54.99	440.00 / -105.89	246.77 / +61.33	306.69 / -13.01	168.88 / -67.61
		Construction	*1521.52*	*13.17 / +9.82*	*420.59 / +2.24*	*150.42 / +23.83*	*148.54 / -51.37*	*218.74 / +5.53*

Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
Western mastiff bat (*Eumops perotis californicus*) CSC	ASC, AGS, BAR, CRP, FEW, IGR, IRH, IRF, PAS, URB, VRI, VIN	Project	851.84	—[c]	—[c]	—[c]	103.47 / -11.51	166.24 / -67.57
		Construction	*377.95*	—[c]	—[c]	—[c]	*35.50 / +13.13*	*218.18 / +5.12*
Western red bat (*Lasiurus blossevillii*) CSC	AGS, FEW, IRH, LAC, PAS, RIV, URB, VRI	Project	1434.62	40.64 / -41.04	302.15 / -1.94	150.5 / -5.82	156.49 / -86.96	155.36 / -72.66
		Construction	*559.79*	*12.91 / +10.01*	*278.65 / -0.87*	*8.95 / -5.66*	*54.64 / -51.35*	*55.72 / +6.85*
Tulare grasshopper mouse (*Onychomys torridus tularensis*) CSC	ASC, AGS, VRI	Project	151.78	1.72 / -8.41	38.47 / +18.12	61.36 / -16.11	12.63 / -0.10	8.88 / +3.17
		Construction	*22.00*	*0.71 / +0.71*	*0.38 / +0.38*	*4.79 / +2.71*	*1.75 / +0.02*	*12.56 / -0.54*
American badger (*Taxidea taxus*) CSC	ASC, AGS, BAR, PAS, VRI	Project	219.42	9.46 / -6.78	41.73 / +10.23	61.36 / -18.02	12.63 / -11.03	14.62 / +3.23
		Construction	*272.66*	*0.97 / +0.97*	*0.38 / +0.38*	*4.79 / +2.71*	*1.75 / +0.02*	*176.43 / -0.97*

Attachment 2

Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				

Notes:

— = No impact or not applicable (e.g., alterative does not overlap species range)

(P) = Impacts could occur, elderberry shrubs have not been identified but could occur in natural areas where permission to enter was not available.

Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.

All impacts were calculated based on 15% engineering design construction footprint.

[a] The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.

[b] Represents the number of locations where elderberry shrubs may be removed.

[c] Alternative does not overlap species range.

Impacts on all special-status wildlife species are based on the CWHR determinations of habitats and range, except as follows:

{vernal pool tadpole shrimp and vernal pool fairy shrimp} Disturbances based on vernal pools/seasonal wetlands in the Wetland Study Area.

{elderberry longhorn beetle} Data presented as number of identified elderberry shrubs within Plant Study Area.

{California tiger salamander} Potential aquatic habitat limited to the Corcoran Irrigation Water District; potential upland habitat determined by identifying associated vegetation communities within a 1.24-mile radius of potential aquatic habitat.

{Fresno kangaroo rat} Range limited to the San Joaquin and Kings rivers based on distribution data provided by Brian Cypher, ESRP (Cypher 2010, Personal Communication) and areas potentially suitable to support this species within that range.

{Tipton kangaroo rat} Range data taken from the Endangered Species Recovery Program distribution data. *Tipton Kangaroo Rat* (Dipodomys nitratoides nitratoides) *5-Year Review: Summary and Evaluation* (USFWS 2010)

{San Joaquin kit fox} Disturbances are provided separately for urban communities in the vicinity of Bakersfield. Range is based on CWHR.

{Kern brook lamprey} Impacts are based on disturbances to the Friant-Kern Canal in Bakersfield.

{silvery legless lizard} Potential habitat determined to be all VRI habitat in the Habitat Study Area.

{coast horned lizard } The coast horned lizard was observed in the Allensworth Bypass Alternative during the 2010 field surveys; due to these observations, the species' range has been extended beyond the range map provided by the CWHR to include both the Corcoran Bypass and Allensworth Bypass alternatives because of the presence of natural habitat areas in these alternatives.

Attachment 2

Comparison of Impacts on Special-Status Wildlife Species by Alternative

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives					
			BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				

Acronyms and Abbreviations:

AGS: Annual grassland (includes vernal pools)
ASC: Alkali desert scrub (includes vernal pools)
BAR: Barren
CRP: Cropland
DGR: Dryland grain crops
DOR: Deciduous orchard
EOR: Evergreen orchard
FEW: Fresh emergent wetland
IGR: Irrigated grain crops
IRF: Irrigated row and field crops
IRH: Irrigated hayfield
LAC: Lacustrine
PAS: Pasture
VRI: Valley foothill riparian

Federal Status
FE – Endangered
FT – Threatened
CH – Critical Habitat designated by the U.S. Fish and Wildlife Service
BCC – Birds of Conservation Concern designated by the U.S. Fish and Wildlife Service

State Status
SE – Endangered
ST – Threatened
CSC – California Species of Special Concern designated by the California Department of Fish and Game
FP – Fully Protected species designated by the California Department of Fish and Game

Attachment 3
Comparison of Impacts on Special-Status Plant Communities by Alternative

Special-Status Plant Community Type (Common Name/Scientific Name/Status)	Impact Type	High-Speed Train Alternatives					
		BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
		Impact Acreage / Difference Compared to Corresponding BNSF Area[A]					
Iodine bush scrub/*Allenrolfea occidentalis* Shrubland Alliance G4, S3	Project	3.89	—	—	2.42 / -1.47	—	—
	Construction	—	—	—	—	—	—
Alkali goldenbush scrub/*Isocoma acradenia* Shrubland Alliance Not ranked	Project	0.07	—	—	— / -0.07	—	—
	Construction	—	—	—	—	—	—
Bush seepweed scrub/*Suaeda moquinii* Shrubland Alliance G5, S3.2	Project	7.22	—	—	0.40 /-4.91	—	—
	Construction	*0.48*	—	—	*— / -0.48*	—	—
Saltgrass flats/*Distichlis spicata* Herbaceous Alliance G5, S4	Project	2.24	—	0.05 / 0.00	2.42 / +1.86	—	—
	Construction	—	—	—	—	—	—
Fremont cottonwood forest/*Populus fremontii* Forest Alliance G4, S3.2	Project	0.12	—	—	— / -0.12	—	—
	Construction	*0.09*	—	—	*— / -0.09*	—	—
Black willow thickets/*Salix goodingii* Woodland Alliance G3, S3	Project	2.77	—	0.24 / <-0.01	1.05 / +1.05	—	0.00 / -2.53
	Construction	—	—	*0.12 / +0.12*	—	—	—
Red willow thickets/*Salix laevigata* Woodland Alliance G3, S3	Project	0.10	—	—	— / -0.10	—	—
	Construction	*0.08*	—	—	*— / -0.08*	—	—
Potential suitable habitat that could support special-status plant communities	Project	112.49	3.79 / -1.41	45.75 / +20.67	102.22 / +74.01	14.55 / +0.87	8.56 / +0.63
	Construction	*29.25*	*2.32 / +2.24*	*2.57 / +2.24*	*25.02 / +20.03*	*14.28 / +2.58*	*7.67 / +0.33*
Total Impact	Project	128.89	3.79 / -1.41	46.04 / +20.67	108.50 / +70.26	14.55 / +0.87	8.56 / -1.89
	Construction	*29.89*	*2.32 / +2.24*	*2.70 / +2.36*	*25.02 / +19.39*	*14.28 / +2.58*	*7.67 / +0.33*

Attachment 3

Comparison of Impacts on Special-Status Plant Communities by Alternative

Special-Status Plant Community Type (Common Name/Scientific Name/Status)	Impact Type	High-Speed Train Alternatives					
		BNSF Impact Acreage	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
			Impact Acreage / Difference Compared to Corresponding BNSF Area[A]				

Notes:
— = No impact or not applicable

[a] The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.

Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.

All impacts were calculated based on 15% engineering design construction footprint.

Global Rank
G1 = Less than 6 viable element occurrences (EOs) OR less than 2,000 acres.
G2 = 6-20 EOs OR 2,000-10,000 acres.
G3 = 21-100 EOs OR 10,000-50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

State Rank
S1 = Less than 6 EOs OR less than 2,000 acres
S1.1 = very threatened
S1.2 = threatened
S1.3 = no current threats known
S2 = 6-20 EOs OR 2,000-10,000 acres
S2.1 = very threatened
S2.2 = threatened
S2.3 = no current threats known
S3 = 21-100 EOs OR 10,000-50,000 acres
S3.1 = very threatened
S3.2 = threatened
S3.3 = no current threats known
S4 - Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat. NO THREAT RANK.
S5 - Demonstrably secure to ineradicable in California. NO THREAT RANK.

Attachment 4
Comparison of Impacts on Wetlands and Other Waters by Alternative

Wetlands and Other Waters (TYPE/HST water type)	Impact Type	High-Speed Train Alternatives					
		BNSF	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
		Impact Acreage	Impact Acreage / Difference Compared to Corresponding BNSF Area[A]				
WETLANDS TOTAL	Project	10.97	—	1.23 / -0.24	2.28 / -6.96	—	— / -0.13
	Construction	*0.44*	—	*0.31 / +0.31*	*—/ -0.17*	—	—
Seasonal wetland	Project	3.67	—	0.48 / -0.08	0.49 / -2.41	—	— / -0.13
	Construction	*0.18*	—	*0.03 / +0.03*	*—/ -0.17*	—	—
Vernal pool	Project	4.04	—	— / -0.80	0.22 / -3.02	—	—
	Construction	—	—	—	—	—	—
Vernal pool (potential)	Project	0.01	—	—	—/ -0.01	—	—
	Construction	—	—	—	—	—	—
Vernal swale	Project	1.02	—	0.75 / +0.64	1.57 / +0.72	—	—
	Construction	*0.26*	—	*0.28 / +0.28*	—	—	—
Vernal pool and swale complex	Project	2.23	—	—	— / -2.23	—	—
	Construction	—	—	—	—	—	—
OTHER WATERS OF THE U.S. TOTAL	Project	42.68	2.09 / -1.59	8.21 / -8.50	16.00 / +4.26	2.78 / -0.64	3.58 / -0.43
	Construction	*7.35*	*0.04 / +0.04*	*4.09 / +0.77*	*2.38 / +2.11*	*0.92 / -0.30*	*2.35 / +0.53*

Attachment 4
Comparison of Impacts on Wetlands and Other Waters by Alternative

Wetlands and Other Waters (TYPE/HST water type)	Impact Type	High-Speed Train Alternatives					
		BNSF	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
		Impact Acreage	Impact Acreage / Difference Compared to Corresponding BNSF Area[A]				
Canal	Project	7.90	2.06 / -1.03	3.45 / -1.49	—	—	1.69 / +0.90
	Construction	*3.29*	*0.04 / +0.04*	*2.9 / +0.18*	—	—	*0.09 / -0.06*
Culvert water	Project	0.35	< 0.01 / -0.02	0.13 / +0.06	— / -0.01	0.10 / -0.04	0.03 / +0.03
	Construction	*0.02*	*< 0.01 / < +0.01*	*0.01 / 0.00*	*— / -0.01*	*< 0.01 / < +0.01*	*0.02 / +0.02*
Ditch	Project	17.62	0.04 / -0.12	3.93 / -6.26	3.66 / +1.15	1.31 / -0.80	0.02 / 0.00
	Construction	*1.01*	—	*1.00 / +0.52*	—	*0.26 / +0.01*	—
Reservoir	Project	3.36	—	—	6.61 / +3.24	—	—
	Construction	—	—	—	—	—	—
Retention/detention basin	Project	10.01	— / -0.42	0.04 / -0.80	5.61 / -0.13	1.37 / +0.21	0.91 / -0.28
	Construction	*2.82*	—	*0.02 / +0.02*	*2.32 / +2.14*	*0.66 / -0.32*	*1.77 / +0.10*
Seasonal riverine	Project	3.44	—	0.66 / -0.01	0.13 / -0.01	—	0.93 / -1.07
	Construction	*0.20*	—	*0.16 / +0.04*	*0.06 / -0.02*	—	*0.47 / +0.47*
WATERS OF THE STATE TOTAL	Project	7.28	0.01 / -0.02	1.6 / -0.02	0.94 / -0.59	0.33 / -0.03	0.31 / +0.13
	Construction	*0.28*	—	*0.09 / +0.09*	*0.14 / -0.11*	*0.02 / +0.02*	*0.25 / +0.25*

Attachment 4

Comparison of Impacts on Wetlands and Other Waters by Alternative

Wetlands and Other Waters (TYPE/HST water type)	Impact Type	High-Speed Train Alternatives					
		BNSF	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
		Impact Acreage	Impact Acreage / Difference Compared to Corresponding BNSF Area[A]				
Canal	Project	1.21	—	1.02 / 0.00	—	—	—
	Construction	—	—	—	—	—	—
Ditch	Project	1.55	0.01 / -0.02	0.05 / -0.05	0.04 / -1.00	0.33 / -0.03	—
	Construction	—	—	—	—	*0.02 / +0.02*	—
Riparian	Project	4.52	—	0.53 / +0.03	0.91 / +0.40	—	0.31 / +0.13
	Construction	*0.27*	—	*0.09 / +0.09*	*0.14 / -0.11*	—	*0.25 / +0.25*
TOTAL IMPACTS	**Project**	60.94	2.10 / -1.62	11.04 / -8.77	19.22 / -3.30	3.11 / -0.67	3.89 / -0.43
	Construction	*8.06*	*0.04 / +0.04*	*4.50 / +1.18*	*2.51 / +1.83*	*0.94 / -0.29*	*2.60 / +0.78*

Notes:

— = No impact or not applicable

[A] The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.

Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.

All impacts were calculated based on 15% engineering design construction footprint.

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Attachment 5
Comparison of Impacts on Conservation Areas by Alternative

Protected Land Type	Impact Type	High-Speed Train Alternatives					
		BNSF Alternative	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
		Impact Acreage	Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
Recovery Plan for Vernal Pool Ecosystems in California and Southern Oregon	Project	—	—	—	—	—	—
	Construction	*< 0.01*	—	—	*—/ < -0.01*	—	—
Recovery Plan for Upland Species of the San Joaquin Valley, California (Total)	Project	705.13	0.09 / -0.20	80.25 / -99.38	199.31 / +37.08	69.33 / +14.67	145.33 / -66.56
	Construction	*422.06*	*0.05 / +0.05*	*173.39 / +7.94*	*152.7 / +139.98*	*37.31 / +3.21*	*214.86 / +5.07*
Recovery Plan for Upland Species of the San Joaquin Valley, California (Satellite Area)	Project	634.46	0.09 / -0.2	80.25 / -99.38	128.75 / -17.48	—	145.33 / -66.56
	Construction	*382.27*	*0.05 / +0.05*	*173.39 / +7.94*	*6.37 / -0.66*	—	*214.86 / +5.07*
Recovery Plan for Upland Species of the San Joaquin Valley, California (Linkage Area[b])	Project	70.66	—	—	70.56 / +54.56	69.33 / +14.67	—
	Construction	*39.79*	—	—	*146.33 / +140.64*	*37.31 / +3.21*	—
Allensworth Ecological Reserve	Project	7.60	—	—	— / -7.60	—	—
	Construction	—	—	—	—	—	—
Metropolitan Bakersfield Habitat Conservation Plan	Project	362.62	—	—	—	121.78 / -3.03	169.78 / -68.02
	Construction	*222.72*	—	—	—	*14.25 / +6.41*	*220.51 / +5.63*

Attachment 5
Comparison of Impacts on Conservation Areas by Alternative

Protected Land Type	Impact Type	High-Speed Train Alternatives					
		BNSF Alternative	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
		Impact Acreage	Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				
Draft Valley Floor Habitat Conservation Plan (Total)	Project	515.33	—	—	214.03 / +50.10	362.93 / +11.54	—
	Construction	*697.91*	—	—	*146.85 / -3.94*	*489.85 / -57.27*	—
Draft Valley Floor Habitat Conservation Plan (Red Zone)	Project	12.52	—	—	16.63 / +4.11	—	—
	Construction	—	—	—	—	—	—
Draft Valley Floor Habitat Conservation Plan (Green Zone)	Project	—	—	—	—	—	—
	Construction	—	—	—	—	—	—
Draft Valley Floor Habitat Conservation Plan (White Zone)	Project	502.81	—	—	197.41 / +45.99	362.93 / +11.54	—
	Construction	*697.91*	—	—	*146.85 / -3.94*	*489.85 / -57.27*	—

Attachment 5

Comparison of Impacts on Conservation Areas by Alternative

Protected Land Type	Impact Type	High-Speed Train Alternatives					
		BNSF Alternative	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
		Impact Acreage	Impact Acreage / Difference Compared to Corresponding BNSF Area[a]				

Notes:

— = No impact or not applicable

Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.

All impacts were calculated based on 15% engineering design construction footprint.

[a] The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.

[b] Linkage areas were mapped in the *Recovery Plan for Upland Species of the San Joaquin Valley, California*. The boundaries of these features are rough-landscape scaled approximations.

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Attachment 6
Comparison of Impacts on Protected Trees by Alternative

Protected Tree	Impact Type	High-Speed Train Alternatives					
		BNSF Alternative	**Corcoran Elevated**	**Corcoran Bypass**	**Allensworth Bypass**	**Wasco-Shafter Bypass**	**Bakersfield South**
		Impact Acreage	**Impact Acreage / Difference Compared to Corresponding BNSF Area[a]**				
Cottonwood species	Project	2	—	—	—	— / -2	—
	Construction	—	—	—	—	—	—
Eucalyptus species	Project	2	—	—	—	— / -2	—
	Construction	—	—	—	—	—	—
Landscape, Ornamental, Non-native	Project	26	—	—	—	— / -4	2 / +1
	Construction	*9*	—	—	—	—	—
Oak species	Project	4	—	—	—	— / -4	—
	Construction	—	—	—	—	—	—
Unknown species	Project	94	— / -1	8 / +7	— / -3	52 / +46	72 / +13
	Construction	*18*	—	—	—	—	*15 / +11*
TOTAL IMPACTS	**Project**	**128**	**— / -1**	**8 / +7**	**— / -3**	**52 / +34**	**74 / +14**
	Construction	***27***	**—**	**—**	**—**	**—**	***15 / +11***

Notes:

— = No impact or not applicable

Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.

All impacts were calculated based on 15% engineering design construction footprint.

[A] The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.

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