Appendix 3.7-B

Comparison of Impacts on Biological Resources by Alternative

Explanation of the Impact Comparison Tables

For each biological resource type (e.g., special-status plant species, special-status wildlife species, etc.) a table has been produced to report the acres of impact resulting from construction and project-related activities. The tables are formatted as follows:

- The column labeled "BNSF Impact Acreage" presents the acres of impact for the entire BNSF Alternative.

- The columns labeled as alternative alignments segments (e.g. Hanford West Bypass 1—At-grade) present two values for each alternative alignment. The value to the left of the slash is the acres of impact within that alternative alignment alone. The number to the right of the slash represents the "Difference Compared to Corresponding BNSF Area." This value 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.

This page intentionally left blank

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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area[a]										
Heartscale *Atriplex cordulata* CNPS 1B.2	Project	0.64	—	—	—	—	—	—	— / -0.63	—	—	—
	Construction	*0.07*	–	–	–	–	–	–	–	–	–	–
Little mouse tail *Myosurus minimus* ssp. *apus* CNPS 3.1	Project	0.47	—	—	—	—	—	—	— / -0.20	—	—	—
	Construction	*<0.01*	—	—	—	—	—	—	—	—	—	—
Unsurveyed potential suitable habitat that could support special-status plant species	Project	224.71	34.37 / +19.84	36.01 / +21.49	41.36 / +26.83	43.00 / +28.48	60.88 / +33.20	52.16 / +24.48	92.76 / -2.49	35.19 / +15.13	23.21 / +1.83	21.71 / +0.33
	Construction	*212.75*	*15.83 / +14.19*	*13.97 / +12.34*	*18.10 / +16.46*	*16.24 / +14.61*	*1.04 / +0.96*	*0.57 / +0.49*	*65.36 / +63.11*	*20.46 / +9.53*	*189.67 / -1.91*	*191.45 / -0.13*
Total Impacts	**Project**	**225.82**	**34.37 / +19.84**	**36.01 / +21.49**	**41.36 / +26.83**	**43.00 / +28.48**	**60.88 / +33.20**	**52.16 / +24.48**	**92.76 / -3.33**	**35.19 / +15.13**	**23.21 / +1.83**	**21.71 / +0.33**
	Construction	***212.83***	***15.83 / +14.19***	***13.97 / +12.34***	***18.10 / +16.46***	***16.24 / +14.61***	***1.04 / +0.96***	***0.57 / +0.49***	***65.36 / +63.11***	***20.46 / +9.53***	***189.67 / -1.91***	***191.45 / -0.13***

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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area[a]									
Federally and State Listed Species												
Vernal pool fairy shrimp (*Branchinecta lynchi*) FT	Vernal pools/seasonal wetlands	Project	12.91	0.01 / +0.01	0.01 / +0.01	—	—	1.14 / -0.41	1.62 / +0.07	1.17 / -8.80	—	0.01 / -0.11	0.01 / -0.12
		Construction	0.82	—	—	—	—	—	—	— / -0.16	—	—	—
		Indirect	102.63	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	8.67 / +0.41	1.68 / -6.58	24.06 / -58.96	—	0.55 / -0.08	0.55 / -0.08
Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)* FT	Elderberry shrubs (*Sambucus* spp.)	Project	1	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —
		Construction	—	*(P)* —	*(P)* —	*(P)* —	*(P)* —	*(P)* —	*(P)* —	*(P)* —	*(P)* —	*(P)* —	*(P)* —
Vernal pool tadpole shrimp (*Lepidurus packardi*) FE	Vernal pools/seasonal wetlands	Project	12.91	0.01 / +0.01	0.01 / +0.01	—	—	1.14 / -0.41	1.62 / +0.07	1.17 / -8.80	—	0.01 / -0.11	0.01 / -0.12
		Construction	0.82	—	—	—	—	—	—	— / -0.16	—	—	—
		Indirect	102.63	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	8.67 / +0.41	1.68 / -6.58	24.06 / -58.96	—	0.55 / -0.08	0.55 / -0.08
California tiger salamander (*Ambystoma californiense*) FT, ST	Aquatic: vernal pools/seasonal wetlands in Corcoran Irrigation Water District	Project	—	—	—	—	—	—	—	— [c]	— [c]	— [c]	— [c]
		Construction	—	—	—	—	—	—	—	— *[c]*	— *[c]*	— *[c]*	— *[c]*
California tiger salamander *(cont'd.)*	UPLAND: ASC, AGS, PAS, VOW surrounding vernal pools/seasonal wetlands in Corcoran Irrigation Water District	Project	0.34	— / -0.32	— / -0.32	4.32 / +3.99	4.32 / +3.99	1.17 / +1.17	1.17 / +1.17	— [c]	— [c]	— [c]	— [c]
		Construction	—	—	—	—	—	—	—	— *[c]*	— *[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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area[a]										
Blunt-nosed leopard lizard (*Gambelia* [=*Crotaphytus*] *sila*) FE, SE/FP	ASC, AGS, BAR, VRI	Project	98.06	— [c]	— [c]	— [c]	— [c]	— [c]	— [c]	25.17 / -72.89	— [c]	— [c]	— [c]
		Construction	—	— [c]	— [c]	— [c]	— [c]	— [c]	— [c]	1.4 / +1.4	— [c]	— [c]	— [c]
Golden eagle (*Aquila chrysaetos*) FP	ASC, AGS, BAR, CRP, FEW, IRH, PAS, URB, VRI, VOW	Project	2157.63	467.94 / +82.34	419.50 / +33.89	472.79 / +87.19	424.35 / +38.75	215.13 / -29.24	196.50 / -47.86	222.44 / -32.62	294.25 / -118.88	231.45 / -58.53	236.81 / -53.17
		Construction	1114.33	69.67 / -294.13	61.58 / -302.22	147.80 / -216.00	139.71 / -224.09	199.56 / +23.82	206.40 / +30.66	78.50 / +35.18	67.34 / -45.82	277.28 / -0.32	287.00 / +9.41
Swainson's hawk (*Buteo swainsoni*) ST	AGS, BAR, CRP, IRH, PAS, URB, VRI, VOW	Project	2112.66	467.94 / +82.34	419.50 / +33.89	472.79 / +87.19	424.35 / +38.75	215.13 / -29.24	196.50 / -47.86	215.65 / +0.02	294.25 / -118.88	224.36 / -60.09	229.72 / -54.73
		Construction	1109.74	69.67 / -294.13	61.58 / -302.22	147.80 / -216.00	139.71 / -224.09	199.56 / +23.82	206.40 / +30.66	78.50 / +35.18	67.34 / -45.82	273.23 / +0.23	282.96 / +9.95
Western snowy plover (*Charadrius alexandrinus nivosus*) FT, CSC	LAC	Project	27.48	0.10 / +0.10	0.10 / +0.10	0.07 / +0.07	0.07 / +0.07	4.00 / -0.78	3.64 / -1.14	16.28 / -3.97	0.14 / -1.38	—	—
		Construction	3.01	—	—	—	—	—	3.55 / +3.55	2.45 / +1.14	0.53 / -1.17	—	—
White-tailed kite (*Elanus leucurus*) FP	ASC, AGS, CRP, BAR, DOR, DGR, EOR, FEW, IRH, IRF, IGR, URB, VRI, VIN, VOW	Project	3841.60	866.98 / -131.18	819.88 / -178.28	842.00 / -156.16	794.90 / -203.26	253.88 / -139.77	271.37 / -122.27	446.96 / -86.33	629.60 / -148.82	230.83 / -58.26	236.19 / -52.90
		Construction	2041.38	110.01 / -400.26	101.95 / -408.32	201.08 / -309.19	193.02 / -317.25	358.41 / +23.93	369.39 / +34.92	152.17 / +12.39	350.72 / -285.72	277.04 / -0.31	286.77 / +9.42
American peregrine falcon (*Falco peregrinus anatum*) Delisted, SE/FP	AGS, BAR, CRP, FEW, IGR, IRH, LAC, RIV, URB, VRI, VOW	Project	2534.67	633.66 / +28.74	584.55 / -20.37	606.57 / +1.65	557.47 / -47.46	257.31 / -132.17	221.44 / -168.04	275.97 / +18.73	342.77 / -87.50	228.65 / -60.21	234.71 / -54.16
		Construction	1171.80	70.63 / -344.18	62.55 / -352.27	154.49 / -260.33	146.40 / -268.41	200.57 / +23.95	213.96 / +37.34	81.50 / +36.85	68.63 / -47.27	276.57 / -0.21	286.25 / +9.47
Greater sandhill crane (*Grus Canadensis tabida*) ST/FP	AGS, DGR, CRP, FEW, IGR, IRH, IRF, LAC, VRI	Project	1338.15	448.27 / -87.76	445.41 / -90.62	427.18 / -108.85	424.32 / -111.71	114.21 / -124.27	145.29 / -93.19	259.05 / +59.89	253.63 / +107.38	10.04 / +0.97	7.93 / -1.14
		Construction	594.11	54.02 / -258.15	46.14 / -266.03	135.29 / -176.88	127.41 / -184.76	161.88 / +0.39	195.58 / +34.09	80.78 / +41.72	27.01 / +9.50	34.87 / -3.17	36.89 / -1.14

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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]									
Bald eagle (*Haliaeetus leucocephalus*) Delisted, SE/FP	AGS, BAR, FEW, LAC, RIV, VRI, VOW	Project	361.21	51.82 / +33.18	50.55 / +31.91	58.45 / +39.81	57.17 / +38.54	49.13 / -0.29	57.63 / +8.22	104.86 / -33.80	29.27 / -23.84	19.67 / +2.95	18.26 / +1.53
		Construction	306.83	15.86 / -70.80	14.01 / -72.65	18.19 / -68.47	16.33 / -70.33	14.24 / +13.36	5.29 / +4.42	6.79 / +3.84	2.30 / -1.55	199.33 / -4.80	201.31 / -2.83
Nelson's (San Joaquin) antelope squirrel (*Ammospermophilus nelsoni*) ST	ASC, AGS, BAR, PAS	Project	175.94	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	52.66 / -61.25	23.74 / -20.57	22.02 / +4.29	19.91 / +2.18
		Construction	205.92	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	1.27 / +1.27	1.10 / -<0.01	199.69 / -5.13	201.70 / -3.13
Ringtail (Bassariscus astutus)	AGS, RIV, VRI	Project	0.12	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	0.46 / +0.34	0.46 / +0.34
		Construction	0.12	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	0.34 / +0.22	0.36 / +0.24
Fresno kangaroo rat *(Dipodomys nitratoides exilis)* FE, SE	ASC, AGS, BAR, PAS, VOW	Project	25.60	2.60 / +2.60	2.60 / +2.60	2.60 / +2.60	2.60 / +2.60	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]
		Construction	4.79	— / -4.49	— / -4.49	— / -4.49	— / -4.49	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]
Tipton kangaroo rat *(Dipodomys nitratoides nitratoides)* FE, SE	ASC, AGS, BAR, PAS, VOW	Project	244.83	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	89.19 / -65.20	24.49 / -20.57	22.02 / +4.29	19.91 / +2.18
		Construction	207.80	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	4.07 / +2.48	1.10 / -<0.01	199.69 / -5.13	201.70 / -3.13

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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area[a]										
San Joaquin kit fox (*Vulpes macrotis mutica*) FE, ST	Natural (ASC, AGS, BAR, PAS, VOW)	Project	353.82	41.61 / +24.90	45.32 / +28.61	46.69 / +29.98	50.40 / +33.68	35.22 / +5.54	47.49 / +17.81	89.19 / -65.20	24.49 / -20.57	22.02 / +4.29	19.91 / +2.18
		Construction	305.03	14.52 / -76.95	12.67 / -78.80	16.75 / -74.73	14.89 / -76.58	13.34 / +13.34	0.11 / +0.11	4.07 / +2.48	1.10 / -<0.01	199.69 / -5.13	201.70 / -3.13
	Agricultural (CRP, DGR, DOR, EOR, IGR, IRF, IRH, VIN)	Project	2232.62	644.47 / -181.22	642.52 / -183.17	617.57 / -208.12	615.62 / -210.07	90.82 / -133.47	140.89 / -83.40	328.85 / +14.46	463.63 / +18.44	—	—
		Construction	1402.72	78.81 / -322.98	72.82 / -328.97	157.69 / -244.10	151.70 / -250.10	320.26 / +0.04	350.60 / +30.38	147.30 / +14.71	306.68 / -218.83	—	—
	Bakersfield (URB)	Project	272.41	–	–	–	–	–	–	—	0.26 / 0.00	208.98 / -63.16	216.45 / -55.69
		Construction	73.28	–	–	–	–	–	–	—	0.63 / 0.00	77.24 / +4.59	84.95 / +12.30
Other Special-Status Species													
Kern brook lamprey (*Lampetra hubbsi*) CSC	Friant-Kern Canal (Bakersfield)	Project	0.06	–	–	–	–	–	–	–	–	0.25 / +0.19	0.25 / +0.19
		Construction	0.11	–	–	–	–	–	–	–	–	0.08 / -0.03	0.08 / -0.03
Western spadefoot toad (Spea [=*Scaphiopus*] *hammondii*) CSC	ASC, AGS, FEW, RIV, VOW	Project	314.77	44.47 / +31.01	47.46 / +34.00	45.74 / +32.28	48.73 / +35.27	33.93 / -3.05	49.87 / +12.88	95.10 / -61.64	26.47 / -3.62	17.96 / +2.44	16.54 / +1.02
		Construction	52.10	14.99 / +14.19	13.14 / +12.34	17.37 / +16.56	15.51 / +14.71	1.26 / +0.38	1.27 / +0.40	4.17 / +2.56	1.16 / +0.11	38.34 / -3.08	40.30 / -1.12
Western pond turtle (Actinemys [=*Clemmys*/*Emys*] *marmorata*) CSC	AGS, FEW, LAC, PAS, RIV, URB, VRI, VOW	Project	1630.13	246.67 / +51.88	199.39 / +4.61	234.79 / +40.00	187.52 / -7.27	165.77 / -16.02	140.97 / -40.82	133.63 / -78.51	170.75 / -151.72	222.75 / -62.54	228.80 / -56.49
		Construction	400.68	31.86 / +3.27	29.80 / +1.20	44.21 / +15.61	42.14 / +13.55	26.06 / +10.93	23.51 / +8.38	7.41 / -1.10	45.24 / -68.37	114.02 / +1.62	123.70 / +11.30
Silvery legless lizard (*Anniella pulchra pulchra*) CSC	VRI, VOW	Project	4.08	4.99 / +2.53	0.92 / -1.54	4.99 / +2.53	0.92 / -1.54	0.38 / -0.01	0.24 / -0.15	0.28 / -0.83	–	0.46 / +0.34	0.46 / +0.34
		Construction	0.24	0.82 / +0.74	0.82 / +0.74	0.82 / +0.74	0.82 / +0.74	—	0.47 / +0.47	0.17 / +0.14	–	0.34 / +0.22	0.36 / +0.24
San Joaquin whipsnake	ASC, AGS, PAS, VRI, VOW	Project	303.84	44.78 / +27.44	44.41 / +27.08	44.47 / +27.13	44.10 / +26.77	24.78 / +1.97	43.84 / +21.03	89.47 / -66.03	24.49 / -1.75	15.94 / +2.58	13.83 / +0.47

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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area[a]										
(*Masticophis flagellum ruddocki*) CSC		*Construction*	53.85	15.30 / +9.53	13.44 / +7.67	17.57 / +11.80	15.71 / +9.94	0.36 / +0.36	0.58 / +0.58	4.24 / +2.62	1.10 / +0.07	37.24 / -3.07	39.27 / -1.05
Coast (California) horned lizard (*Phrynosoma coronatum frontale*) CSC	ASC, AGS, VRI, VOW	Project	206.91	— / -0.32	— / -0.32	3.45 / +3.12	3.45 / +3.12	24.78 / +2.14	41.60 / +18.96	89.21 / -59.68	—[c]	2.50 / +2.37	0.39 / +0.26
		Construction	25.53	—	—	—	—	0.36 / +0.36	0.58 / +0.58	4.11 / +2.49	—[c]	21.85 / -1.77	23.87 / +0.25
Western burrowing owl (*Athene cunicularia*) CSC	ASC, AGS, PAS, BAR, URB, VOW	Project	1640.86	227.90 / +45.55	186.21 / +3.86	224.84 / +42.49	183.15 / +0.80	162.68 / -6.46	132.48 / -36.66	117.90 / -104.94	165.97 / -167.26	231.00 / -58.87	236.36 / -53.51
		Construction	644.36	30.47 / -83.32	28.41 / -85.39	42.67 / -71.12	40.60 / -73.19	38.15 / +23.89	18.32 / +4.07	4.70 / -2.46	44.04 / -66.89	276.93 / -0.54	286.64 / +9.17
SPECIAL-STATUS RAPTOR SPECIES	ASC, AGS, CRP, PAS, VRI, DGR, IGR, IRH, IRF, VOW	Project	1385.81	458.12 / -89.38	454.84 / -92.66	432.08 / -115.42	428.80 / -118.7	110.21 / -123.67	143.89 / -89.99	249.64 / +26.25	250.83 / +108.80	15.94 / +2.58	13.83 / +0.47
		Construction	596.97	54.12 / -263.44	46.24 / -271.32	135.39 / -182.18	127.51 / -190.06	161.88 / +0.39	192.03 / +30.54	78.33 / +40.58	25.87 / +11.09	37.24 / -3.07	39.27 / -1.05
SPECIAL-STATUS PASSERINE SPECIES	ASC, AGS, CRP, PAS, VRI, FEW, LAC, RIV, DGR, IGR, IRH, IRF, VOW	Project	1470.05	473.72 / -85.59	468.92 / -90.38	444.24 / -115.06	439.45 / -119.86	123.74 / -129.66	156.04 / -97.37	271.89 / +20.86	255.61 / +105.52	20.87 / +2.18	19.45 / +0.76
		Construction	609.05	54.74 / -263.33	46.86 / -271.21	136.11 / -181.96	128.23 / -189.84	162.78 / +0.42	196.74 / +34.38	80.88 / +41.79	27.07 / +9.54	40.82 / -3.52	42.80 / -1.54
SPECIAL-STATUS WADING BIRDS, SHOREBIRDS, AND DUCK SPECIES	ASC, AGS, CRP, PAS, DGR, IGR, IRH, IRF, RIV, FEW, LAC	Project	1465.97	468.73 / -88.12	468.01 / -88.84	439.26 / -117.59	438.53 / -118.31	123.36 / -129.65	155.80 / -97.21	271.61 / +21.69	255.61 / +105.52	20.41 / +1.84	18.99 / +0.42
		Construction	608.82	53.91 / -264.07	46.04 / -271.95	135.28 / -182.70	127.41 / -190.58	162.78 / +0.42	196.27 / +33.91	80.71 / +41.65	27.07 / +9.54	40.48 / -3.73	42.44 / -1.78
Pallid bat (*Antrozous pallidus*) CSC	ASC, AGS, BAR, CRP, DGR, IGR, IRH, IRF, PAS, RIV, URB, VRI, VIN, VOW	Project	2886.29	670.90 / -140.44	620.90 / -190.44	622.50 / -188.84	572.50 / -238.84	213.08 / -145.66	229.08 / -129.66	349.11 / +38.17	396.97 / -8.75	208.56 / -58.16	214.61 / -52.11
		Construction	1287.15	62.57 / -397.91	54.48 / -406.00	149.05 / -311.43	140.96 / -319.52	198.58 / +22.53	210.67 / +34.62	148.13 / +31.56	59.41 / -55.39	277.54 / -0.37	287.22 / +9.31
Dulzura pocket mouse (*Chaetodipus californicus femoralis*) CSC	AGS, VOW	Project	61.26	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	37.38 / -23.88	—[c]	—[c]	—[c]
		Construction	—	—[c]	—[c]	—[c]	—[c]	—[c]	—[c]	1.27 / +1.27	—[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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area[a]									
Townsend's big-eared bat (*Corynorhinus townsendii*) CSC	ASC, AGS, BAR, CRP, IGR, IRH, IRF, PAS, VRI, URB, VIN RIV, VOW	Project	3063.64	680.04 / -112.02	630.90 / -161.17	647.85 / -144.22	598.70 / -193.37	253.31 / -131.57	233.81 / -151.07	331.35 / +23.71	389.89 / -84.40	234.55 / -58.61	240.61 / -52.56
		Construction	1312.18	70.73 / -397.38	62.64 / -405.47	162.03 / -306.08	153.94 / -314.17	200.57 / +23.95	211.11 / +34.49	148.13 / +31.08	68.67 / -58.26	278.95 / -0.12	288.63 / +9.56
Western mastiff bat (*Eumops perotis californicus*) CSC	ASC, AGS, BAR, CRP, FEW, IGR, IRH, IRF, PAS, URB, VRI, VIN, VOW	Project	1066.92	— / -90.19	— / -90.19	— / -90.19	— / -90.19	—[c]	—[c]	—[c]	137.68 / +5.12	231.45 / -58.53	236.81 / -53.17
		Construction	439.06	— / -3.79	— / -3.79	— / -3.79	— / -3.79	—[c]	—[c]	—[c]	53.27 / +36.80	277.28 / -0.32	287.00 / +9.41
Western red bat (*Lasiurus blossevillii*) CSC	AGS, FEW, IRH, LAC, PAS, RIV, URB, VOW, VRI	Project	1904.96	420.40 / +99.13	373.90 / +52.63	418.02 / +96.76	371.52 / +50.25	202.38 / -26.27	204.76 / -23.90	209.89 / -25.81	201.06 / -149.40	222.75 / -62.54	228.80 / -56.49
		Construction	467.69	65.33 / -5.45	57.52 / -13.26	143.69 / +72.91	135.88 / +65.10	49.78 / +10.93	74.14 / +35.29	8.61 / +0.10	45.24 / -69.48	114.02 / +1.62	123.70 / +11.30
Tulare grasshopper mouse (*Onychomys torridus tularensis*) CSC	ASC, AGS, VRI	Project	267.88	34.40 / +29.41	34.64 / +29.65	39.07 / +34.08	39.31 / +34.32	24.78 / +2.14	41.60 / +18.96	89.40 / -61.05	24.49 / -1.75	15.32 / +2.85	13.21 / +0.74
		Construction	47.92	15.20 / +14.82	13.34 / +12.97	17.47 / +17.09	15.61 / +15.24	0.36 / +0.36	0.58 / +0.58	4.24 / +2.62	1.10 / +0.07	37.01 / -3.07	39.03 / -1.04
American badger (*Taxidea taxus*) CSC	ASC, AGS, BAR, PAS, VRI, VOW	Project	357.90	46.60 / +27.43	46.24 / +27.06	51.68 / +32.51	51.31 / +32.14	35.60 / +5.52	47.73 / +17.65	89.47 / -66.03	24.49 / -20.57	22.47 / +4.63	20.36 / +2.52
		Construction	305.27	15.35 / -76.21	13.49 / -78.06	17.57 / -73.98	15.71 / -75.84	13.34 / +13.34	0.58 / +0.58	4.24 / +2.62	1.10 / -<0.01	200.03 / -4.91	202.06 / -2.89

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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			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. Indirect impacts are calculated within a 250-foot buffer of the project footprint, which includes areas of permanent and temporary impacts.

{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.

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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area[a]										
Iodine bush scrub/*Allenrolfea occidentalis* Shrubland Alliance G4, S3	Project	5.81	—	—	—	—	—	—	2.90 / -2.91	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Alkali goldenbush scrub/*Isocoma acradenia* Shrubland Alliance Not ranked	Project	<0.01	—	—	—	—	—	—	— / -<0.01	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Bush seepweed scrub/*Suaeda moquinii* Shrubland Alliance G5, S3.2	Project	14.96	0.04 / +0.04	0.04 / +0.04	—	—	—	—	0.54 / -12.78	—	—	—
	Construction	*0.63*	—	—	—	—	—	—	*— / -0.63*	—	—	—
Saltgrass flats/*Distichlis spicata* Herbaceous Alliance G5, S4	Project	2.26	—	—	—	—	0.09 / +0.09	<0.01 / 0.00	2.64 / +0.43	—	—	—
	Construction	*0.17*	—	—	—	—	*0.01 / +0.01*	*0.04 / +0.04*	—	—	—	—
Fremont cottonwood forest/*Populus fremontii* Forest Alliance G4, S3.2	Project	0.37	—	—	—	—	—	—	— / -0.37	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Black willow thickets/*Salix goodingii* Woodland Alliance G3, S3	Project	2.97	—	—	—	—	0.46 / -0.03	0.29 / -0.20	1.22 / +1.22	—	0.17 / -2.32	0.17 / -2.32
	Construction	*1.65*	—	—	—	—	—	*0.18 / +0.18*	—	—	*0.33 / -1.32*	*0.33 / -1.32*
Red willow thickets/*Salix laevigata* Woodland Alliance G3, S3	Project	0.28	—	—	—	—	—	—	— / -0.28	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Potential suitable habitat that could support special-status plant communities	Project	219.84	34.33 / +19.80	35.97 / +21.44	41.36 / +26.83	43.00 / +28.48	60.68 / +33.14	52.03 / +24.49	92.30 / +0.41	35.19 / +15.13	23.21 / +1.83	21.71 / +0.33
	Construction	*212.48*	*15.83 / +14.19*	*13.97 / +12.34*	*18.10 / +16.46*	*16.24 / +14.61*	*1.04 / +0.96*	*0.57 / +0.49*	*65.36 / +63.28*	*20.46 / +9.53*	*189.67 / -1.91*	*191.45 / -0.13*
Total Impact	**Project**	**246.50**	**34.37 / +19.84**	**36.01 / +21.49**	**41.36 / +26.83**	**43.00 / +28.48**	**61.23 / +33.20**	**52.32 / +24.29**	**99.61 / -14.28**	**35.19 / +15.13**	**23.38 / -0.48**	**21.88 / -1.98**
	Construction	***214.93***	***15.83 / +14.19***	***13.97 / +12.34***	***18.10 / +16.46***	***16.24 / +14.61***	***1.05 / +0.97***	***0.79 / +0.71***	***65.36 / +62.66***	***20.46 / +9.53***	***190.00 / -3.23***	***191.78 / -1.45***

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	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		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[A]	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area[B]										
WETLANDS TOTAL	Project	12.91	0.01 / +0.01	0.01 / +0.01	—	—	1.14 / -0.41	1.62 / +0.07	1.17 / -8.80	—	0.01 / -0.11	0.01 / -0.12
	Construction	0.82	—	—	—	—	—	—	— / -0.16	—	—	—
	Indirect Bisect	23.88	—	—	—	—	4.76 / -0.73	— / -5.49	1.73 / -15.52	—	—	—
	Indirect	78.75	1.05 / +1.05	1.05 / +1.05	1.37 / +1.37	1.37 / +1.37	3.92 / +1.14	1.68 / -1.09	22.33 / -43.44	—	0.55 / -0.08	0.55 / -0.08
Emergent wetland	Project	—	—	—	—	—	—	—	—	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
	Indirect	<0.01	0.59 / +0.59	0.59 / +0.59	0.92 / +0.92	0.92 / +0.92	—	—	—	—	— / -<0.01	<0.01 / 0.00
Seasonal wetland	Project	1.32	0.01 / +0.01	0.01 / +0.01	—	—	0.05 / +0.05	0.43 / +0.43	0.12 / -0.43	—	0.01 / -0.11	0.01 / -0.12
	Construction	0.82	—	—	—	—	—	—	— / -0.16	—	—	—
	Indirect	40.13	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	2.14 / -0.05	0.13 / -2.06	10.75 / -22.69	—	0.55 / -0.08	0.55 / -0.08
Vernal pools and swales	Project	11.59	—	—	—	—	1.09 / -0.46	1.19 / -0.36	1.05 / -8.37	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
	Indirect Bisect	23.88	—	—	—	—	4.76 / -0.73	— / -5.49	1.73 / -15.52	—	—	—
	Indirect	38.61	—	—	—	—	1.78 / +1.19	1.56 / +0.97	11.58 / -20.75	—	—	—
OTHER WATERS OF THE U.S. TOTAL	Project	83.96	15.60 / +3.79	14.08 / +2.27	12.17 / +0.36	10.65 / -1.16	13.53 / -5.70	12.14 / -7.09	22.25 / -5.39	4.78 / -3.28	4.92 / -0.40	5.62 / +0.29
	Construction	11.95	0.62 / +0.11	0.62 / +0.11	0.72 / +0.21	0.72 / +0.21	0.90 / +0.02	4.71 / +3.84	2.54 / +1.21	1.16 / -1.46	3.58 / -0.44	3.53 / -0.49
	Indirect	251.47	33.27 / +1.85	26.38 / -5.04	44.54 / +13.12	37.64 / +6.22	31.33 / +8.18	24.95 / +1.79	129.77 / +13.06	12.34 / -7.21	28.64 / -9.48	28.07 / -10.06
Canals/Ditches	Project	44.81	14.35 / +7.45	13.21 / +6.31	10.54 / +3.64	9.40 / +2.50	9.29 / -4.93	8.37 / -5.85	5.84 / -1.28	1.98 / -1.86	2.27 / +0.43	2.96 / +1.12
	Construction	3.50	0.11 / -0.39	0.11 / -0.39	0.21 / -0.29	0.21 / -0.29	0.90 / +0.02	1.02 / +0.14	—	0.06 / +0.04	1.03 / +0.46	0.98 / +0.41
	Indirect	75.18	21.61 / +8.75	20.86 / +8.00	21.53 / +8.68	20.78 / +7.92	19.16 / +8.24	14.13 / +3.20	24.12 / -0.72	5.82 / -1.99	11.89 / +2.26	11.63 / +1.99
Lacustrine	Project	33.27	0.53 / -0.35	0.35 / -0.54	0.51 / -0.37	0.32 / -0.56	4.00 / -0.78	3.64 / -1.14	16.28 / -3.97	2.80 / -1.41	1.82 / -0.32	1.82 / -0.32
	Construction	7.53	—	—	—	—	—	3.55 / +3.55	2.45 / +1.14	1.10 / -1.50	1.91 / -0.64	1.91 / -0.64
	Indirect	139.66	6.34 / +1.91	0.79 / -3.64	17.61 / +13.18	12.05 / +7.62	11.37 / +0.11	8.09 / -3.16	104.37 / +14.06	6.52 / -5.23	4.35 / -4.16	4.04 / -4.47
Seasonal riverine	Project	5.88	0.71 / -3.31	0.52 / -3.50	1.12 / -2.91	0.93 / -3.09	0.24 / 0.00	0.14 / -0.10	0.14 / -0.14	—	0.83 / -0.50	0.83 / -0.50
	Construction	0.92	0.50 / +0.50	0.50 / +0.50	0.50 / +0.50	0.50 / +0.50	—	0.14 / +0.14	0.10 / +0.08	—	0.65 / -0.26	0.64 / -0.26

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

Wetlands and Other Waters (TYPE/HST water type)	Impact Type[A]	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area[B]										
	Indirect	36.63	5.32 / -8.81	4.74 / -9.40	5.40 / -8.73	4.81 / -9.32	0.80 / -0.17	2.72 / +1.75	1.27 / -0.28	—	12.40 / -7.58	12.40 / -7.58
WATERS OF THE STATE TOTAL	Project	4.08	0.86 / -1.60	0.92 / -1.54	0.86 / -1.60	0.92 / -1.54	0.38 / -0.01	0.24 / -0.15	0.28 / -0.83	—	0.46 / +0.34	0.46 / +0.34
	Construction	0.24	0.82 / +0.74	0.82 / +0.74	0.82 / +0.74	0.82 / +0.74	—	0.47 / +0.47	0.17 / +0.14	—	0.34 / +0.22	0.36 / +0.24
	Indirect	30.94	9.09 / -8.56	9.04 / -8.61	9.09 / -8.56	9.04 / -8.61	1.02 / -0.11	1.84 / +0.70	2.59 / -1.40	—	3.67 / -4.49	3.66 / -4.50
Riparian	Project	4.08	0.86 / -1.60	0.92 / -1.54	0.86 / -1.60	0.92 / -1.54	0.38 / -0.01	0.24 / -0.15	0.28 / -0.83	—	0.46 / +0.34	0.46 / +0.34
	Construction	0.24	0.82 / +0.74	0.82 / +0.74	0.82 / +0.74	0.82 / +0.74	—	0.47 / +0.47	0.17 / +0.14	—	0.34 / +0.22	0.36 / +0.24
	Indirect	30.94	9.09 / -8.56	9.04 / -8.61	9.09 / -8.56	9.04 / -8.61	1.02 / -0.11	1.84 / +0.70	2.59 / -1.40	—	3.67 / -4.49	3.66 / -4.50
TOTAL IMPACTS	**Project**	100.95	16.47 / +2.20	15.02 / +0.75	13.03 / -1.24	11.57 / -2.70	15.04 / -6.13	14.00 / -7.17	23.70 / -15.01	4.78 / -3.28	5.39 / -0.18	6.08 / +0.52
	Construction	13.01	1.44 / +0.85	1.44 / +0.85	1.54 / +0.96	1.54 / +0.96	0.90 / +0.02	5.18 / +4.31	2.72 / +1.20	1.16 / -1.46	3.92 / -0.22	3.89 / -0.25
	Indirect Bisect	23.88	—	—	—	—	4.76 / -0.73	— / -5.49	1.73 / -15.52	—	—	—
	Indirect	361.16	43.41 / -5.66	36.47 / -12.61	55.01 / +5.93	48.06 / -1.01	36.27 / +9.21	28.47 / +1.41	154.68 / -31.78	12.34 / -7.21	32.87 / -14.05	32.28 / -14.64

Notes:

— = No impact or not applicable

[A] Indirect impacts are calculated within a 250-foot buffer of the project footprint, which includes areas of permanent and temporary impacts.

[B] 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.

Attachment 5
Comparison of Impacts on Conservation Areas by Alternative

Protected Land Type	Impact Type	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area[a]										
Recovery Plan for Upland Species of the San Joaquin Valley, California (Total)	Project	997.27	—	—	—	—	87.76 / -106.71	73.84 / -120.64	262.94 / -3.23	113.97 / -3.86	196.92 / -56.92	210.07 / -43.78
	Construction	*643.12*	—	—	—	—	*334.79 / +3.46*	*370.96 / +39.63*	*154.25 / +150.71*	*42.31 / +7.44*	*277.25 / +3.86*	*282.85 / +9.47*
Recovery Plan for Upland Species of the San Joaquin Valley, California (Satellite Area)	Project	855.36	—	—	—	—	87.76 / -106.71	73.84 / -120.64	188.07 / -54.03	—	196.92 / -56.92	210.07 / -43.78
	Construction	*608.25*	—	—	—	—	*334.79 / +3.46*	*370.96 / +39.63*	*5.64 / +2.10*	—	*277.25 / +3.86*	*282.85 / +9.47*
Recovery Plan for Upland Species of the San Joaquin Valley, California (Linkage Area[b])	Project	141.91	—	—	—	—	—	—	74.88 / +50.80	113.97 / -3.86	—	—
	Construction	*34.87*	—	—	—	—	—	—	*148.61 / +148.61*	*42.31 / +7.44*	—	—
Allensworth Ecological Reserve	Project	14.24	—	—	—	—	—	—	— / -14.24	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Metropolitan Bakersfield Habitat Conservation Plan	Project	483.74	—	—	—	—	—	—	—	168.52 / -3.17	255.10 / -56.95	268.41 / -43.64
	Construction	*281.17*	—	—	—	—	—	—	—	*36.6 / +30.87*	*279.53 / +4.09*	*284.95 / +9.51*

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.

Attachment 6
Comparison of Impacts on Protected Trees by Alternative

Protected Tree	Impact Type	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1 – Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Number / Difference Compared to Corresponding BNSF Area[a]										
Eucalyptus species	Project	—	—	—	—	—	—	—	—	—	—	—
	Construction	*1*	—	—	—	—	—	—	—	—	—	—
Landscape, Ornamental, Non-native	Project	68	2 / +2	2 / +2	2 / +2	2 / +2	—	—	—	0 / -1	19 / +6	23 / +10
	Construction	*25*	—	—	—	—	—	—	—	—	*12 / +7*	*11 / +6*
Oak species	Project	2	2 / +2	2 / +2	2 / +2	2 / +2	—	—	—	0 / -2	—	—
	Construction	—	*8 / +8*	*8 / +8*	*8 / +8*	*8 / +8*	—	*4 / +4*	—	—	—	—
Unknown species[B]	Project	79	30 / +6	12 / -12	30 / +6	12 / -12	6 / -6	4 / -8	1 / -3	39 / +37	28 / +17	23 / +12
	Construction	*68*	—	—	—	—	*— / -1*	*1 / 0*	*1 / 0*	—	*14 / 0*	*10 / -4*
TOTAL IMPACTS	**Project**	**149**	**34 / +10**	**16 / -8**	**34 / +10**	**16 / -8**	**6 / -6**	**4 / -8**	**1 / -3**	**39 / +34**	**47 / +23**	**46 / +22**
	Construction	***94***	***8 / +8***	***8 / +8***	***8 / +8***	***8 / +8***	***— / -1***	***5 / +4***	***1 / 0***	**—**	***26 / +7***	***21 / +2***

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] Clumps of trees identified in the field as "numerous unknown" were estimated to represent 4 trees and counted within the "Unknown species" category.