

**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), 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 with 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 a greater number of impact acres than its corresponding segment in the BNSF Alternative. Negative (-) differences indicate that the alternative alignment results in a smaller number of impact acres than its corresponding segment in the BNSF Alternative.

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**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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>									
Heartscale <i>Atriplex cordulata</i> CNPS 1B.2	Project	0.67	—	—	—	—	—	0.004 / +0.004	— / -0.63	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Little mouse tail <i>Myosurus minimus</i> ssp. <i>apus</i> CNPS 3.1	Project	0.48	—	—	—	—	—	—	— / -0.21	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Unsurveyed potential suitable habitat that could support special-status plant species	Project	401.31	42.94 / +0.56	50.96 / +8.59	55.26 / +12.88	88.31 / +45.94	125.98 / +88.00	112.25 / +74.27	159.71 / -45.13	32.48 / +9.98	42.65 / +11.69	39.64 / +8.68
	Construction	241.47	15.13 / +11.36	10.43 / +6.65	31.20 / +27.43	8.64 / +4.86	2.63 / -2.47	9.86 / +4.76	64.97 / +60.56	24.95 / +14.33	202.03 / -6.71	205.05 / -3.68
<b>Total Impacts</b>	<b>Project</b>	<b>402.45</b>	<b>42.94 / +0.56</b>	<b>50.96 / +8.59</b>	<b>55.26 / +12.88</b>	<b>88.31 / +45.94</b>	<b>125.99 / +88.01</b>	<b>112.25 / +74.27</b>	<b>159.71 / -45.97</b>	<b>32.48 / +9.98</b>	<b>42.65 / +11.69</b>	<b>39.64 / +8.68</b>
	<b>Construction</b>	<b>241.47</b>	<b>15.13 / +11.36</b>	<b>10.43 / +6.65</b>	<b>31.20 / +27.43</b>	<b>8.64 / +4.86</b>	<b>2.63 / -2.47</b>	<b>9.86 / +4.76</b>	<b>64.97 / +60.56</b>	<b>24.95 / +14.33</b>	<b>202.03 / -6.71</b>	<b>205.05 / -3.68</b>

Notes:  
 — = No impact or not applicable  
<sup>a</sup> 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

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**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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>									
<b>Federally and State-Listed Species</b>													
Vernal pool fairy shrimp ( <i>Branchinecta lynchi</i> ) FT	Vernal pools/seasonal wetlands	Project	16.49	0.01 / +0.01	0.27 / +0.27	—	0.27 / +0.27	1.21 / -0.39	1.34 / -0.27	6.02 / -7.1	—	0.51 / -0.11	0.51 / -0.11
		Construction	1.73	0.05 / +0.05	—	0.04 / +0.04	—	1.91 / +1.24	0.07 / -0.61	0.03 / -0.55	—	—	—
		Indirect	98.81	1.11 / +0.69	1.23 / +0.81	1.12 / +0.70	1.22 / +0.80	6.68 / -0.84	1.34 / -6.18	31.45 / -48.91	—	0.09 / -0.04	0.09 / -0.04
Valley elderberry longhorn beetle ( <i>Desmocerus californicus dimorphus</i> ) FT	Elderberry shrubs ( <i>Sambucus</i> 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 ( <i>Lepidurus packardii</i> ) FE	Vernal pools/seasonal wetlands	Project	16.49	0.01 / +0.01	0.27 / +0.27	—	0.27 / +0.27	1.21 / -0.39	1.34 / -0.27	6.02 / -7.1	—	0.51 / -0.11	0.51 / -0.11
		Construction	1.73	0.05 / +0.05	—	0.04 / +0.04	—	1.91 / +1.24	0.07 / -0.61	0.03 / -0.55	—	—	—
		Indirect	98.81	1.11 / +0.69	1.23 / +0.81	1.12 / +0.70	1.22 / +0.80	6.68 / -0.84	1.34 / -6.18	31.45 / -48.91	—	0.09 / -0.04	0.09 / -0.04
California tiger salamander ( <i>Ambystoma californiense</i> ) FT, ST	Aquatic: man-made lacustrine feature in Corcoran Irrigation Water District	Project	16.82	— / -16.82	— / -16.82	3.96 / -12.86	18.14 / +1.32	—	—	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>
		Construction	—	—	—	14.18 / +14.18	—	—	—	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>
	UPLAND: ASC, AGS, PAS, VOW surrounding vernal pools/seasonal wetlands in Corcoran Irrigation Water District <sup>d</sup>	Project	15.12	— / -15.1	<0.01 / -15.1	4.46 / -10.64 <sup>d</sup>	6.77 / -8.34 <sup>d</sup>	2.40 / +2.38	4.93 / +4.91	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>
	Construction	0.02	0.01 / -0.01	— / -0.02	2.32 / +2.30 <sup>d</sup>	0.05 / +0.03 <sup>d</sup>	—	—	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	
Blunt-nosed leopard lizard ( <i>Gambelia [=Crotaphytus] sila</i> ) FE, SE/FP	ASC, AGS, BAR, VRI	Project	104.77	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	33.67 / -71.10	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>
		Construction	2.19	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	2.07 / -0.12	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>
Golden eagle ( <i>Aquila chrysaetos</i> ) FP	ASC, AGS, BAR, CRP, FEW, IRH, PAS, URB, VRI, VOW	Project	2521.68	510.55 / +42.60	539.99 / +72.04	556.22 / +88.27	603.91 / +135.96	333.54 / +76.27	326.59 / +69.33	282.16 / -43.47	318.67 / -170.25	279.96 / -31.51	260.63 / -50.84
		Construction	1213.19	85.21 / -328.08	75.88 / -337.41	94.38 / -318.91	142.59 / -270.70	222.76 / +15.67	202.37 / -4.73	82.62 / +31.71	92.68 / -30.66	271.65 / +2.13	293.99 / +24.46

**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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>									
Swainson's hawk ( <i>Buteo swainsoni</i> ) ST	AGS, BAR, CRP, IRH, PAS, URB, VRI, VOW	Project	2467.46	510.55 / +42.60	539.99 / +72.04	556.22 / +88.27	603.91 / +135.96	333.54 / +76.27	326.59 / +69.33	274.48 / -9.82	318.67 / -170.25	268.27 / -30.32	248.93 / -49.66
		Construction	1210.07	85.21 / -328.08	75.88 / -337.41	94.38 / -318.91	142.59 / -270.70	222.76 / +15.67	202.37 / -4.73	82.62 / +32.29	92.68 / -30.66	268.97 / +1.99	291.30 / +24.32
Western snowy plover ( <i>Charadrius alexandrinus nivosus</i> ) FT, CSC	LAC	Project	57.27	0.12 / -18.07	0.12 / -18.06	4.26 / -13.92	19.83 / +1.65	8.85 / -0.49	8.73 / -0.60	26.79 / +0.09	1.71 / -0.41	—	—
		Construction	7.38	—	—	15.79 / +15.79	1.76 / +1.76	— / -0.03	0.01 / -0.02	1.60 / -3.67	0.49 / -1.60	—	—
White-tailed kite ( <i>Elanus leucurus</i> ) FP	ASC, AGS, CRP, BAR, DOR, DGR, EOR, FEW, IRH, IRF, IGR, URB, VRI, VIN, VOW	Project	4583.01	927.90 / -267.53	989.03 / -206.40	934.00 / -261.43	1056.66 / -138.76	411.37 / -1.65	452.62 / +39.59	552.27 / -77.24	733.93 / -254.07	278.32 / -32.00	258.99 / -51.33
		Construction	2178.78	154.29 / -431.10	147.35 / -438.05	159.11 / -426.28	218.84 / -366.55	380.53 / +15.25	366.22 / +0.94	157.25 / +3.57	392.11 / -254.56	271.57 / +2.15	293.90 / +24.48
American peregrine falcon ( <i>Falco peregrinus anatum</i> ) Delisted, SE/FP	AGS, BAR, CRP, FEW, IGR, IRH, LAC, RIV, URB, VRI, VOW	Project	3022.59	703.66 / -72.90	731.97 / -44.58	714.01 / -62.55	815.47 / +38.92	421.58 / +11.99	397.34 / -12.25	358.32 / +10.56	367.87 / -140.52	277.60 / -28.64	258.86 / -47.38
		Construction	1296.02	106.11 / -371.47	99.00 / -378.58	126.35 / -351.23	163.79 / -313.78	225.04 / +14.78	204.29 / -5.97	86.13 / +29.94	101.79 / -25.66	271.58 / +1.37	293.86 / +23.65
Greater sandhill crane ( <i>Grus Canadensis tabida</i> ) ST/FP	AGS, DGR, CRP, FEW, IGR, IRH, IRF, LAC, VRI	Project	1666.98	487.07 / -173.92	515.41 / -145.58	497.29 / -163.70	593.38 / -67.60	227.18 / -30.23	262.01 / +4.60	330.02 / +51.24	280.87 / +75.73	9.93 / +1.94	6.99 / -1.00
		Construction	641.72	72.08 / -269.87	62.28 / -279.67	89.38 / -252.58	132.03 / -209.92	173.04 / +8.46	183.21 / +18.62	81.80 / +37.04	38.87 / +20.19	34.73 / -4.12	37.68 / -1.17
Bald eagle ( <i>Haliaeetus leucocephalus</i> ) Delisted, SE/FP	AGS, BAR, FEW, LAC, RIV, VRI, VOW	Project	470.61	57.83 / +0.95	66.05 / +9.18	74.19 / +17.31	111.59 / +54.71	130.78 / +72.44	137.50 / +79.16	148.85 / -37.83	34.84 / -14.39	32.12 / +11.92	29.71 / +9.51
		Construction	324.07	18.29 / -71.15	14.05 / -75.38	34.09 / -55.35	12.41 / -77.03	10.90 / +5.14	3.75 / -2.01	6.76 / -2.01	6.97 / +1.67	194.53 / -7.90	197.50 / -4.93
Nelson's (San Joaquin) antelope squirrel ( <i>Ammospermophilus nelsoni</i> ) ST	ASC, AGS, BAR, PAS	Project	184.12	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	59.35 / -60.04	26.30 / -13.21	33.79 / +8.56
		Construction	206.00	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	2.63 / +0.43	3.62 / +1.47	194.30 / -7.35
Ringtail ( <i>Bassariscus astutus</i> )	AGS, RIV, VRI	Project	0.21	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	0.70 / +0.49
		Construction	0.10	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>
Fresno kangaroo rat ( <i>Dipodomys nitratooides exilis</i> ) FE, SE	ASC, AGS, BAR, PAS, VOW	Project	28.16	2.50 / +2.50	2.85 / +2.85	2.50 / +2.50	2.85 / +2.85	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>
		Construction	4.52	0.17 / -4.32	0.05 / -4.44	0.17 / -4.32	0.05 / -4.44	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>



**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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid	
				Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>										
Tipton kangaroo rat ( <i>Dipodomys nitratooides nitratooides</i> ) FE, SE	ASC, AGS, BAR, PAS, VOW	Project	284.54	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	117.68 / -75.34	27.68 / -12.87	33.79 / +8.56	30.78 / +5.56
		Construction	208.73	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	— <sup>c</sup>	3.84 / +0.60	4.53 / +2.38	194.30 / -7.35	197.32 / -4.33
San Joaquin kit fox ( <i>Vulpes macrotis mutica</i> ) FE, ST	Natural (ASC, AGS, BAR, PAS, VOW)	Project	424.34	49.64 / +14.44	57.80 / +22.60	57.43 / +22.23	81.01 / +45.82	101.88 / +67.25	113.21 / +78.58	117.68 / -75.34	27.68 / -12.87	33.79 / +8.56	30.78 / +5.56	
		Construction	310.03	13.78 / -79.22	8.82 / -84.18	14.36 / -78.64	5.87 / -87.13	8.59 / +5.65	1.55 / -1.39	3.84 / +0.60	4.53 / +2.38	194.30 / -7.35	197.32 / -4.33	
	Agricultural (CRP, DGR, DOR, EOR, IGR, IRF, IRH, VIN)	Project	2721.08	670.35 / -283.41	726.13 / -227.63	665.90 / -287.87	765.42 / -188.34	151.65 / -85.83	204.69 / -32.79	399.39 / +35.85	549.80 / -63.09	—	—	
		Construction	1458.41	108.52 / -332.78	104.29 / -337.01	109.48 / -331.82	175.20 / -266.10	328.06 / +7.34	345.44 / +24.72	150.07 / +11.08	324.22 / -201.50	—	—	
	Bakersfield (URB)	Project	239.23	—	—	—	—	—	—	—	—	197.33 / -41.90	182.83 / -56.39	
		Construction	61.23	—	—	—	—	—	—	—	—	69.97 / +8.75	89.65 / +28.42	
<b>Other Special-Status Species</b>														
Kern brook lamprey ( <i>Lampetra hubbsi</i> ) CSC	Friant-Kern Canal (Bakersfield)	Project	0.11	—	—	—	—	—	—	—	—	—	0.40 / +0.29	0.40 / +0.29
		Construction	0.09	—	—	—	—	—	—	—	—	—	—	0.07 / -0.03
Western spadefoot toad ( <i>Spea [= Scaphiopus] hammondi</i> ) CSC	ASC, AGS, FEW, RIV, VOW	Project	406.32	53.78 / +19.38	62.24 / +27.83	60.13 / +25.73	80.72 / +46.31	95.32 / +54.08	120.07 / +78.84	129.27 / -70.92	30.38 / -3.61	24.69 / +1.68	22.26 / -0.75	
		Construction	62.19	17.29 / +15.16	12.77 / +10.64	17.39 / +15.25	9.64 / +7.50	4.85 / +0.73	3.34 / -0.78	5.15 / +1.32	4.65 / +3.43	37.45 / -2.74	40.44 / +0.25	
Western pond turtle ( <i>Actinemys [= Clemmys/Emys] marmorata</i> ) CSC	AGS, FEW, LAC, PAS, RIV, URB, VRI, VOW	Project	1937.42	282.37 / -7.70	290.12 / +0.04	284.74 / -5.33	329.40 / +39.33	262.01 / +68.72	267.65 / +74.36	183.72 / -83.02	191.29 / -183.07	264.41 / -36.34	245.69 / -55.06	
		Construction	492.33	49.97 / -14.36	47.30 / -17.03	69.13 / +4.81	49.41 / -14.92	48.73 / +2.96	22.86 / -22.91	10.09 / -9.87	70.33 / -52.70	113.38 / +5.53	135.64 / +27.79	
Silvery legless lizard ( <i>Anniella pulchra pulchra</i> ) CSC	VRI, VOW	Project	2.90	3.30 / +2.24	3.79 / +2.73	3.30 / +2.24	3.79 / +2.73	0.47 / -0.04	0.50 / 0.00	0.47 / -0.66	—	0.70 / +0.49	0.70 / +0.49	
		Construction	0.81	0.91 / +0.59	0.99 / +0.66	0.91 / +0.59	0.99 / +0.66	0.08 / -0.04	0.29 / +0.17	0.02 / -0.24	—	0.30 / +0.21	0.30 / +0.21	
San Joaquin whipsnake ( <i>Masticophis flagellum ruddocki</i> ) CSC	ASC, AGS, PAS, VRI, VOW	Project	376.78	49.11 / +15.20	57.99 / +24.08	51.04 / +17.14	73.85 / +39.95	76.20 / +48.33	105.52 / +77.65	118.15 / -75.99	27.68 / -3.44	19.66 / +0.86	16.68 / -2.12	
		Construction	58.20	14.62 / +8.27	9.55 / +3.20	15.27 / +8.92	6.86 / +0.50	2.70 / +1.14	1.72 / +0.16	3.85 / +0.35	4.53 / +3.45	36.32 / -2.96	39.32 / +0.04	

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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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>									
Coast (California) horned lizard ( <i>Phrynosoma coronatum frontale</i> ) CSC	ASC, AGS, VRI, VOW	Project	262.40	- / -13.88	- / -13.88	4.37 / -9.52	6.67 / -7.21	76.20 / +49.23	103.46 / +76.49	117.67 / -70.79	- <sup>c</sup>	3.73 / +3.38	0.70 / +0.34
		Construction	30.37	- / -0.02	- / -0.02	2.32 / +2.30	0.05 / +0.03	2.70 / +1.14	1.58 / +0.01	3.85 / +0.60	- <sup>c</sup>	20.77 / -2.70	23.77 / +0.29
Western burrowing owl ( <i>Athene cunicularia</i> ) CSC	ASC, AGS, PAS, BAR, URB, VOW	Project	1900.33	266.13 / +10.46	272.29 / +16.61	271.24 / +15.56	298.61 / +42.94	259.26 / +83.31	249.49 / +73.55	152.47 / -116.48	184.13 / -190.98	279.26 / -32.00	259.93 / -51.34
		Construction	725.24	45.20 / -104.11	42.20 / -107.12	49.06 / -100.26	42.76 / -106.56	52.38 / +7.94	20.63 / -23.81	7.16 / -7.26	67.90 / -53.06	271.35 / +1.92	293.68 / +24.26
SPECIAL-STATUS RAPTOR SPECIES	ASC, AGS, CRP, PAS, VRI, DGR, IGR, IRH, IRF, VOW	Project	1697.35	498.24 / -158.75	528.39 / -128.60	498.88 / -158.11	584.64 / -72.35	218.33 / -30.64	255.34 / +6.37	310.97 / +13.45	276.42 / +77.08	19.66 / +0.86	16.68 / -2.12
		Construction	638.97	72.43 / -275.08	62.39 / -285.11	73.93 / -273.57	130.35 / -217.15	173.04 / +8.49	183.34 / +18.79	80.2 / +40.13	36.56 / +20.88	36.32 / -2.96	39.32 / +0.04
SPECIAL-STATUS PASSERINE SPECIES	ASC, AGS, CRP, PAS, VRI, FEW, LAC, RIV, DGR, IGR, IRH, IRF, VOW	Project	1836.22	515.01 / -177.67	546.03 / -146.65	518.77 / -173.91	622.59 / -70.09	246.76 / -26.32	281.19 / +8.11	349.43 / +13.91	283.58 / +75.56	30.63 / +3.04	28.25 / +0.65
		Construction	661.01	76.36 / -272.80	66.76 / -282.40	93.10 / -256.06	136.01 / -213.15	175.27 / +8.01	185.40 / +18.14	83.12 / +37.18	39.00 / +20.17	39.01 / -3.60	41.96 / -0.65
SPECIAL-STATUS WADING BIRDS, SHOREBIRDS, AND DUCK SPECIES	ASC, AGS, CRP, PAS, DGR, IGR, IRH, IRF, RIV, FEW, LAC	Project	1833.32	511.71 / -179.91	542.24 / -149.38	515.47 / -176.15	618.80 / -72.83	246.29 / -26.28	280.69 / +8.11	348.96 / +14.57	283.58 / +75.56	29.93 / +2.54	27.54 / +0.16
		Construction	660.20	75.44 / -273.39	65.77 / -283.06	92.18 / -256.65	135.03 / -213.81	175.19 / +8.05	185.11 / +17.97	83.10 / +37.43	39.00 / +20.17	38.71 / -3.81	41.66 / -0.86
Pallid bat ( <i>Antrozous pallidus</i> ) CSC	ASC, AGS, BAR, CRP, DGR, IGR, IRH, IRF, PAS, RIV, URB, VRI, VIN, VOW	Project	3518.84	730.68 / -265.57	760.59 / -235.66	716.90 / -279.35	809.47 / -186.78	393.88 / +12.15	404.13 / +22.41	436.57 / +37.67	440.38 / -67.99	279.02 / -28.92	260.24 / -47.70
		Construction	1392.47	105.95 / -414.64	98.14 / -422.45	107.56 / -413.04	164.93 / -355.66	208.98 / +6.37	204.20 / +1.59	155.10 / +31.94	92.00 / -35.63	263.38 / +1.90	285.70 / +24.23
Dulzura pocket mouse ( <i>Chaetodipus californicus femoralis</i> ) CSC	AGS, VOW	Project	66.06	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	44.17 / -21.89	- <sup>c</sup>	- <sup>c</sup>
		Construction	1.36	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	2.63 / +1.27	- <sup>c</sup>	- <sup>c</sup>
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> ) CSC	ASC, AGS, BAR, CRP, IGR, IRH, IRF, PAS, VRI, URB, VIN RIV, VOW	Project	3651.50	752.66 / -222.38	782.09 / -192.95	755.44 / -219.60	849.40 / -125.65	412.73 / +11.58	409.10 / +7.95	418.42 / +22.75	427.84 / -144.19	287.33 / -29.71	268.55 / -48.50
		Construction	1430.61	108.04 / -419.79	101.00 / -426.83	112.19 / -415.64	171.75 / -356.08	225.04 / +14.81	204.58 / -5.64	154.8 / +29.20	102.09 / -35.72	273.17 / +2.53	295.50 / +24.86

**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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>									
Western mastiff bat ( <i>Eumops perotis californicus</i> ) CSC	ASC, AGS, BAR, CRP, FEW, IGR, IRH, IRF, PAS, URB, VRI, VIN, VOW	Project	1217.47	- / -69.19	- / -69.19	- / -69.19	- / -69.19	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	144.40 / -10.41	279.96 / -31.51	260.63 / -50.84
		Construction	436.40	- / -7.68	- / -7.68	- / -7.68	- / -7.68	- <sup>c</sup>	- <sup>c</sup>	- <sup>c</sup>	71.50 / +50.55	271.65 / +2.13	293.99 / +24.46
Western red bat ( <i>Lasiurus blossevillei</i> ) CSC	AGS, FEW, IRH, LAC, PAS, RIV, URB, VOW, VRI	Project	2283.24	467.08 / +50.90	493.30 / +77.12	504.32 / +88.13	553.89 / +137.70	325.98 / +77.53	344.25 / +95.80	277.53 / -37.12	220.05 / -198.66	264.41 / -36.34	245.69 / -55.06
		Construction	572.01	80.60 / -36.72	74.86 / -42.46	105.16 / -12.16	143.45 / +26.13	72.54 / +2.70	67.34 / -2.50	12.49 / -7.55	73.46 / -49.78	113.38 / +5.53	135.64 / +27.79
Tulare grasshopper mouse ( <i>Onychomys torridus tularensis</i> ) CSC	ASC, AGS, VRI	Project	335.49	37.23 / +18.39	44.80 / +25.97	44.61 / +25.77	62.68 / +43.85	76.20 / +49.23	103.46 / +76.49	118.08 / -71.95	27.68 / -3.44	18.02 / +0.38	15.04 / -2.61
		Construction	52.52	14.28 / +13.47	9.42 / +8.61	14.93 / +14.13	6.75 / +5.95	2.70 / +1.14	1.58 / +0.01	3.85 / +0.35	4.53 / +3.45	36.23 / -2.94	39.23 / +0.06
American badger ( <i>Taxidea taxus</i> ) CSC	ASC, AGS, BAR, PAS, VRI, VOW	Project	427.24	51.05 / +14.79	59.70 / +23.44	58.84 / +22.58	82.92 / +46.66	102.35 / +67.21	113.71 / +78.58	118.15 / -75.99	27.68 / -12.87	34.49 / +9.05	31.48 / +6.05
		Construction	310.84	14.70 / -78.63	9.81 / -83.52	15.27 / -78.05	6.86 / -86.47	8.67 / +5.61	1.84 / -1.22	3.85 / +0.35	4.53 / +2.38	194.61 / -7.14	197.63 / -4.12

Notes:

- = No impact or not applicable (e.g., alternative 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.
- <sup>a</sup> 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.
- <sup>b</sup> Represents the number of locations where elderberry shrubs may be removed.
- <sup>c</sup> Alternative does not overlap species range.
- <sup>d</sup> Habitat was recently converted to a solar energy project and annual grassland habitat is low very limited and fragmented within the construction and project footprint.

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.

**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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>									
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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>									
Valley Foothill Riparian (CFGC 1600) <sup>b</sup>	Project	2.90	1.41 / +0.35	1.90 / +0.84	1.41 / +0.35	1.90 / +0.84	0.47 / -0.04	0.50 / -<0.01	0.47 / -0.66	—	0.70 / +0.49	0.70 / +0.49
	Construction	0.81	0.91 / +0.59	0.99 / +0.66	0.91 / +0.59	0.99 / +0.66	0.08 / -0.04	0.29 / +0.17	0.02 / -0.24	—	0.30 / +0.21	0.30 / +0.21
Iodine bush scrub/ <i>Allenrolfea occidentalis</i> Shrubland Alliance G4, S3	Project	6.31	—	—	—	—	—	—	2.90 / -3.42	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Alkali goldenbush scrub/ <i>Isocoma acradenia</i> Shrubland Alliance Not ranked	Project	<0.01	—	—	—	—	—	—	— / -<0.01	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Bush seepweed scrub/ <i>Suaeda moquinii</i> Shrubland Alliance G5, S3.2	Project	15.81	0.24 / +0.24	—	—	—	—	—	0.54 / -13.63	—	—	—
	Construction	0.27	—	—	—	—	—	—	— / -0.27	—	—	—
Saltgrass flats/ <i>Distichlis spicata</i> Herbaceous Alliance G5, S4	Project	2.48	—	—	—	—	0.14 / +0.14	0.04 / +0.04	2.81 / +0.38	—	—	—
	Construction	0.31	—	—	—	—	0.01 / -0.01	0.01 / -0.01	0.06 / +0.06	—	—	—
Fremont cottonwood forest/ <i>Populus fremontii</i> Forest Alliance G4, S3.2	Project	0.37	—	—	—	—	—	—	— / -0.37	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Black willow thickets/ <i>Salix goodingii</i> Woodland Alliance G3, S3	Project	4.73	—	—	—	—	0.46 / -0.07	0.44 / -0.09	1.80 / +1.80	—	0.76 / -3.43	0.76 / -3.43
	Construction	0.91	—	—	—	—	0.08 / -0.04	0.10 / -0.02	0.15 / +0.15	—	— / -0.80	— / -0.80
Red willow thickets/ <i>Salix laevigata</i> Woodland Alliance G3, S3	Project	0.28	—	—	—	—	—	—	— / -0.28	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Potential suitable habitat that could support special-status plant communities	Project	380.57	42.70 / +0.32	50.96 / +8.59	55.26 / +12.88	88.31 / +45.94	112.01 / +74.17	125.77 / +87.93	156.26 / -29.31	32.48 / +9.98	42.65 / +11.69	39.64 / +8.68
	Construction	241.09	15.13 / +11.36	10.43 / +6.65	31.20 / +27.43	8.64 / +4.86	9.78 / +4.80	2.61 / -2.38	64.97 / +60.83	24.95 / +14.33	202.03 / -6.71	205.05 / -3.68
<b>Total Impact on Special Status Plant Communities</b>	<b>Project</b>	<b>410.56</b>	<b>42.94 / +0.56</b>	<b>50.96 / +8.59</b>	<b>55.26 / +12.88</b>	<b>88.31 / +45.94</b>	<b>112.61 / +74.24</b>	<b>126.25 / +87.88</b>	<b>164.32 / -44.82</b>	<b>32.48 / +9.98</b>	<b>43.41 / +8.26</b>	<b>40.40 / +5.25</b>
	<b>Construction</b>	<b>242.59</b>	<b>15.13 / +11.36</b>	<b>10.43 / +6.65</b>	<b>31.20 / +27.43</b>	<b>8.64 / +4.86</b>	<b>9.87 / +4.75</b>	<b>2.72 / -2.40</b>	<b>65.18 / +60.77</b>	<b>24.95 / +14.33</b>	<b>202.03 / -7.50</b>	<b>205.05 / -4.48</b>

**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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South
		Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>									
<p>Notes:</p> <p>— = No impact or not applicable</p> <p><sup>a</sup> 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.</p> <p><sup>b</sup> Valley Foothill Riparian Impacts presented in this table are calculated as the areas above the ordinary high water mark to the outer extent of the riparian vegetation dripline. This calculation does not include riparian areas, below or overhanging the ordinary high water mark</p> <p><sup>c</sup> Excludes Riparian area because of overall with other special-status plants communities.</p> <p>Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.</p> <p>All impacts were calculated based on 15% engineering design construction footprint.</p> <p>Global Rank</p> <p>G1 = Less than 6 viable element occurrences (EOs) OR less than 2,000 acres.</p> <p>G2 = 6-20 EOs OR 2,000-10,000 acres.</p> <p>G3 = 21-100 EOs OR 10,000-50,000 acres.</p> <p>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.</p> <p>G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.</p> <p>State Rank</p> <p>S1 = Less than 6 EOs OR less than 2,000 acres</p> <p>S1.1 = very threatened</p> <p>S1.2 = threatened</p> <p>S1.3 = no current threats known</p> <p>S2 = 6-20 EOs OR 2,000-10,000 acres</p> <p>S2.1 = very threatened</p> <p>S2.2 = threatened</p> <p>S2.3 = no current threats known</p> <p>S3 = 21-100 EOs OR 10,000-50,000 acres</p> <p>S3.1 = very threatened</p> <p>S3.2 = threatened</p> <p>S3.3 = no current threats known</p> <p>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.</p> <p>S5 - Demonstrably secure to ineradicable in California. NO THREAT RANK.</p>											

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

Wetlands and Other Waters (TYPE/HST water type)	Impact Type <sup>A</sup>	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>B</sup>									
WETLANDS TOTAL	Project	16.79	0.27 / +0.25	0.27 / +0.25	0.41 / +0.4	0.39 / +0.38	1.21 / -0.66	1.01 / -0.87	6.02 / -7.12	—	0.51 / -0.11	0.51 / -0.11
	Construction	1.66	0.01 / +0.01	—	0.05 / +0.05	0.04 / +0.04	1.91 / +1.12	0.35 / -0.45	0.03 / -0.55	—	—	—
	Indirect Bisect	14.60	—	—	—	—	— / -0.01	— / -0.01	11.54 / -3.05	—	—	—
	Indirect	84.57	2.26 / +1.26	2.96 / +1.96	4.42 / +3.43	5.27 / +4.28	6.68 / -0.44	1.73 / -5.39	19.92 / -45.84	—	0.09 / -0.04	0.09 / -0.04
Emergent wetland	Project	0.01	— / -0.01	— / -0.01	— / -0.01	— / -0.01	—	—	—	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
	Indirect	0.60	— / -0.60	0.70 / +0.09	1.75 / +1.15	2.59 / +1.99	—	—	—	—	—	—
Seasonal wetland	Project	4.54	0.27 / +0.27	0.27 / +0.27	0.41 / +0.41	0.39 / +0.39	1.2 / -0.67	1.01 / -0.87	0.41 / -0.52	—	0.51 / -0.11	0.51 / -0.11
	Construction	1.66	0.01 / +0.01	—	0.05 / +0.05	0.04 / +0.04	1.91 / +1.12	0.35 / -0.45	0.03 / -0.55	—	—	—
	Indirect	67.41	2.26 / +1.87	2.26 / +1.87	2.67 / +2.28	2.68 / +2.29	6.68 / -0.44	1.72 / -5.41	8.69 / -40.51	—	0.09 / -0.04	0.09 / -0.04
Vernal pools and swales	Project	12.24	—	—	—	—	0.01 / +0.01	—	5.61 / -6.6	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
	Indirect Bisect	14.60	—	—	—	—	— / -0.01	— / -0.01	11.54 / -3.05	—	—	—
	Indirect	16.56	—	—	—	—	—	0.01 / +0.01	11.23 / -5.33	—	—	—
OTHER WATERS OF THE U.S. TOTAL	Project	122.80	17.77 / -0.07	38.18 / +20.34	17.38 / -0.47	20.96 / +3.11	28.38 / +3.14	14.33 / -10.92	38.46 / +0.46	7.92 / -0.02	11.46 / +3.19	12.11 / +3.84
	Construction	29.71	5.62 / -2.85	7.1 / -1.37	7.38 / -1.08	23.04 / +14.57	1.95 / -1.1	3.17 / +0.12	2.91 / -3.31	1.87 / -1.39	2.43 / -0.85	2.36 / -0.92
	Indirect	284.15	40.96 / -21.71	76.14 / +13.48	39.08 / -23.58	73.27 / +10.61	30.4 / +7.13	30.48 / +7.21	136.68 / +27.03	9.54 / -10.68	29.79 / -8.08	30.11 / -7.76
Canals/Ditches	Project	64.39	16.9 / +6.65	16.31 / +6.07	15.99 / +5.74	14.16 / +3.91	19.03 / +4.36	8.97 / -5.7	11.44 / +0.52	2.99 / -0.08	5.83 / +3.04	6.44 / +3.65
	Construction	9.82	5.12 / +3.69	4.84 / +3.41	6.93 / +5.49	6.79 / +5.36	1.92 / -0.67	3.06 / +0.47	1.28 / +0.58	0.19 / -0.05	1.03 / +0.62	0.99 / +0.58
	Indirect	73.96	24.09 / +11.06	25.02 / +11.99	24.29 / +11.25	24.55 / +11.52	18.6 / +5.62	18.35 / +5.37	24.45 / +1.58	4.53 / -2.65	11.5 / +2.14	12.13 / +2.78
Lacustrine	Project	51.85	0.20 / -4.36	19.93 / +15.36	0.73 / -3.83	4.88 / +0.32	9.07 / -0.5	5.22 / -4.35	26.79 / —	4.93 / +0.06	3.77 / +0.53	3.81 / +0.56
	Construction	18.92	0.03 / -6.82	1.78 / -5.06	— / -6.85	15.79 / +8.94	— / -0.45	0.06 / -0.39	1.6 / -3.8	1.68 / -1.34	1.00 / -1.2	0.97 / -1.23
	Indirect	162.72	9.13 / -16.47	42.67 / +17.06	7.25 / -18.36	40.45 / +14.84	9.98 / +1.32	11.17 / +2.52	110.52 / +25.36	5.00 / -8.02	4.24 / -4.08	3.92 / -4.39

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

Wetlands and Other Waters (TYPE/HST water type)	Impact Type <sup>A</sup>	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>B</sup>									
Seasonal riverine	Project	6.56	0.67 / -2.37	1.94 / -1.09	0.66 / -2.38	1.92 / -1.11	0.28 / -0.72	0.14 / -0.86	0.23 / -0.06	—	1.86 / -0.38	1.86 / -0.38
	Construction	0.97	0.47 / +0.29	0.47 / +0.29	0.46 / +0.27	0.46 / +0.27	0.03 / +0.03	0.05 / +0.05	0.03 / -0.09	—	0.40 / -0.27	0.40 / -0.27
	Indirect	47.47	7.73 / -16.29	8.45 / -15.58	7.55 / -16.47	8.27 / -15.75	1.83 / +0.19	0.96 / -0.68	1.71 / +0.1	—	14.06 / -6.15	14.06 / -6.15
<b>TOTAL IMPACTS</b>	<b>Project</b>	139.59	18.04 / +0.18	38.45 / +20.59	17.78 / -0.07	21.35 / +3.49	29.6 / +2.48	15.34 / -11.78	44.48 / -6.66	7.92 / -0.02	11.97 / +3.08	12.63 / +3.73
	<b>Construction</b>	31.37	5.63 / -2.83	7.10 / -1.37	7.44 / -1.03	23.08 / +14.61	3.86 / +0.02	3.52 / -0.33	2.94 / -3.85	1.87 / -1.39	2.43 / -0.85	2.36 / -0.92
	<b>Indirect Bisect</b>	14.60	—	—	—	—	— / -0.01	— / -0.01	11.54 / -3.05	—	—	—
	<b>Indirect</b>	368.72	43.21 / -20.45	79.1 / +15.44	43.51 / -20.15	78.55 / +14.88	37.08 / +6.69	32.21 / +1.82	156.59 / -18.8	9.54 / -10.68	29.88 / -8.12	30.20 / -7.8

Notes:  
 — = No impact, no change or not applicable  
<sup>A</sup> Indirect impacts are calculated within a 250-foot buffer of the project footprint, which includes areas of permanent and temporary impacts.  
<sup>B</sup> 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	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area <sup>a</sup>										
Recovery Plan for Upland Species of the San Joaquin Valley, California (Total)	Project	1,151.62	—	—	—	—	125.99 / -97.40	119.58 / -103.81	306.06 / -1.89	146.27 / +17.43	241.11 / -28.87	222.35 / -47.62
	Construction	682.43	—	—	—	—	348.41 / -1.75	359.93 / +9.78	151.56 / +135.38	35.17 / -13.61	266.15 / +1.31	288.44 / +23.60
Recovery Plan for Upland Species of the San Joaquin Valley, California (Satellite Area)	Project	982.97	—	—	—	—	125.99 / -97.40	119.58 / -103.81	214.66 / -70.91	—	241.11 / -28.87	222.35 / -47.62
	Construction	642.05	—	—	—	—	348.41 / -1.75	359.93 / +9.78	6.78 / -4.18	—	266.15 / +1.31	288.44 / +23.60
Recovery Plan for Upland Species of the San Joaquin Valley, California (Linkage Area <sup>b</sup> )	Project	168.65	—	—	—	—	—	—	91.41 / +69.02	146.27 / +17.43	—	—
	Construction	40.38	—	—	—	—	—	—	144.78 / +139.57	35.17 / -13.61	—	—
Allensworth Ecological Reserve	Project	14.29	—	—	—	—	—	—	— / -14.29	—	—	—
	Construction	1.29	—	—	—	—	—	—	— / -1.29	—	—	—
Metropolitan Bakersfield Habitat Conservation Plan	Project	542.85	—	—	—	—	—	—	—	222.57 / +28.98	290.94 / -29.34	272.20 / -48.08
	Construction	285.04	—	—	—	—	—	—	—	12.18 / -51.36	274.35 / +1.48	296.63 / +23.77

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.  
<sup>a</sup> 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.  
<sup>b</sup> 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 Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Number / Difference Compared to Corresponding BNSF Area <sup>a</sup>										
Eucalyptus species	Project	—	—	—	—	—	—	—	—	—	—	—
	Construction	1	—	—	—	—	—	—	—	—	—	—
Landscape, Ornamental, Non-native	Project	72	6 / +6	15 / +15	6 / +6	15 / +15	—	—	—	— / -2	38 / +15	22 / -1
	Construction	16	3 / +3	3 / +3	3 / +3	3 / +3	—	—	—	—	3 / 0	8 / +5
Oak species	Project	5	20 / +20	20 / +20	20 / +20	20 / +20	4 / +1	4 / +1	—	— / -2	—	—
	Construction	—	6 / +6	6 / +6	6 / +6	6 / +6	—	—	—	—	—	—
Unknown species <sup>b</sup>	Project	117	29 / +19	29 / +19	29 / +19	29 / +19	8 / -3	8 / -3	2 / -4	39 / +37	48 / +21	31 / +4
	Construction	101	3 / +1	2 / 0	3 / +1	2 / 0	2 / -6	— / -8	— / -2	—	4 / -1	3 / -2
<b>TOTAL IMPACTS</b>	<b>Project</b>	<b>194</b>	<b>55 / +45</b>	<b>64 / +54</b>	<b>55 / +45</b>	<b>64 / +54</b>	<b>12 / -2</b>	<b>12 / -2</b>	<b>2 / -4</b>	<b>39 / +33</b>	<b>86 / +36</b>	<b>53 / +3</b>
	<b>Construction</b>	<b>117</b>	<b>12 / +10</b>	<b>11 / +9</b>	<b>12 / +10</b>	<b>11 / +9</b>	<b>2 / -6</b>	<b>— / -8</b>	<b>— / -2</b>	<b>—</b>	<b>7 / -1</b>	<b>11 / +3</b>

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.  
<sup>a</sup> 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.  
<sup>b</sup> Clumps of trees identified in the field as "numerous unknown" were estimated to represent 4 trees and counted within the "Unknown species" category.

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