

Appendix R2.7

Biological Resources

Appendix R2.7 Biological Resources

This appendix presents data supporting the analysis in Volume IV, Chapter IV.7. This appendix is organized as follows.

- DRECP Analysis of Golden Eagle Territories
- Preferred Alternative Data Tables for Species Habitat and Natural Communities Impact and Conservation
- Alternative 1 Data Tables for Species Habitat and Natural Communities Impact and Conservation
- Alternative 2 Data Tables for Species Habitat and Natural Communities Impact and Conservation
- Alternative 3 Data Tables for Species Habitat and Natural Communities Impact and Conservation
- Alternative 4 Data Tables for Species Habitat and Natural Communities Impact and Conservation

Note on Rounding of Data

The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

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Introduction

In order to analyze the potential impact of renewable energy and transmission development planned under the DRECP on golden eagles, the wildlife agencies took a territory-based approach. The following describes this territory-based approach and summarizes the results used in the DRECP.

Approach

There are three main components to the territory-based approach:

1. Assembly of a multi-source golden eagle nest location dataset
2. Identification of territories from the nest location dataset
3. Analysis of effects within buffered territories

The following describes the method for each of these components.

Golden Eagle Nest Location Dataset Assembly

The golden eagle nest location dataset (filename from Databasin: “BLM_Eagle_Nests”) includes golden eagle (*Aquila chrysaetos*) nest occurrences within 12 km of the DRECP Plan Area. This dataset was created by the Conservation Biology Institute (CBI) by merging the “DRAFT_BRC_EagleNest_Data” and “Golden_Eagle_DFG” layers, which were provided to CBI by the BLM. These data represent nest locations recorded by various California State agencies and their contractors during 2008, 2010, 2012 and potentially other unknown time periods. The merged dataset includes data from multiple sources collected over different time periods with varying attributes and geospatial accuracy.

Some of the data layers merged into the dataset contain territory numbers indicating multiple nests within a single territory; however, a majority of the data do not have attributes signifying territories. Additionally, it is clear from the data that several datasets included nests from same territory collected during separate surveys over a different period.

Golden Eagle Territory Identification

Given that the nest location data was collected during different survey efforts over different periods using varying collection methods, the merged nest location dataset includes nest points that may be duplicative (i.e., data point for the same nest collected during different surveys but geospatially different in the merged data due to accuracy or collection method variances) or outdated (i.e., territory or individual nest is now abandoned). In addition to these merged dataset complexities, golden eagles are known to use multiple nests within

the same territory. Therefore, golden eagle territories may, in many cases, be comprised of multiple nest point locations from the merged nest location dataset.

The following method was used to attribute the merged nest location dataset with territory numbers for the DRECP:

1. GIS was used to display the merged nest location dataset over aerial imagery
2. For each of the nest point locations, the following was reviewed:
 - a. Existing territory attribute information (if available)
 - b. Geospatial relationship to other nest point locations in the dataset
3. A new attribute was added to the golden eagle nest location dataset: GOEA_Territory. Nest locations determined to be in the same territory were given the same territory number. This determination was based on the following:
 - a. If the existing territory attribute in the nest location dataset signified that multiple nest points were in the same territory, these points were grouped in the same territory
 - b. If nest points without existing territory attributes were geographically located within other nest points with existing territory attributes, these points were grouped in the same territory
 - c. A single nest location separated by more than 2 miles from any other nest location with no existing territory attribute information was considered a territory.
 - d. Multiple nest location within 2 miles of each other with no existing territory attribute information were grouped in the same territory. In order to prevent creating a single territory from many points in tightly packed or overlapping territories, territories were considered to be comprised of no more than 8 nest locations. Grouping of nest location points into territories was based on proximity to each other and landscape features interpreted from aerial imagery.

Buffered Territory Analysis

Each territory (comprised of one or more nest locations as described above) was individually buffered by two buffer distances for purposes of the analysis, as described below.

- 1-mile Golden Eagle Territory Buffer: Each territory was buffered (individually from any other overlapping territory buffer) by 1 mile for an analysis of effects within

breeding areas. If any substantial impact (greater than 100 acres) occurred within the 1-mile territory buffer, the territory could be considered lost.

- 4-mile Golden Eagle Territory Buffer: Each territory was buffered (individually from any other overlapping territory buffer) by 4 miles for an analysis of effects within foraging areas. If more than 25% of suitable habitat within the 4-mile territory buffer were impacted, the territory could be considered lost.

Results

Golden Eagle Nest Locations

In or around the DRECP Plan Area, there are 436 points in the merged dataset of which 420 are golden eagle nest point locations (16 data points in the dataset were non-nesting points).

Golden Eagle Territories

In or around the DRECP Plan Area, a total of 175 golden eagle territories were identified from the 420 nest locations using the approach described above. Of the 175 territories, 161 golden eagle territories occur within the Plan Area in available lands (i.e., the entire Plan Area excluding military lands, tribal lands, and BLM Open OHV Lands). Figure R2.7-1 shows the golden eagle territories within the nest buffers.

Effects with Golden Eagle Buffered Territories

The following provides an analysis of effects to buffered territories for the DRECP Alternatives.

Analysis of Effects within 1-mile of Golden Eagle Nests by Territory

The area within 1 mile of known nests was used to represent the core breeding area for each golden eagle territory. A territory-by-territory analysis of impacts within 1-mile of known nests was conducted for the draft DRECP alternatives. The presence of modeled nesting or foraging habitat within the 1-mile buffer was not considered in this analysis. Prior to the application of any avoidance and minimization conservation and management actions (CMAs), the analysis identified the following for the draft DRECP alternatives:

- Preferred Alternative: 32 territories occur within 1 mile of DFAs or transmission corridors
- Alternative 1: 26 territories occur within 1 mile of DFAs or transmission corridors
- Alternative 2: 42 territories occur within 1 mile of DFAs or transmission corridors

- Alternative 3: 33 territories occur within 1 mile of DFAs or transmission corridors
- Alternative 4: 32 territories occur within 1 mile of DFAs or transmission corridors

The CMAs for golden eagles (Section II.3.1.2.5) and the approach to golden eagles (see Appendix H) describes how the impact to golden eagles would be avoided, minimized, and compensated. Based on the golden eagle CMAs, renewable energy and transmission development would not be sited or construction within 1 mile of an active golden eagle nest. Therefore, Covered Activities would not result in impacts within 1 mile of these territories. The golden eagle CMAs also specify that no more than 15 golden eagles per year would be allowed to be taken within the Plan Area, which would be reassessed annually.

Analysis of Effects within 4-miles of Golden Eagle Nests Territory

The area within 4 miles of known nests was used to represent the use area for each golden eagle territory. A territory-by-territory analysis of ground disturbance impacts to nesting or foraging habitat from Covered Activities within 4 miles of known nests is provided in Table 1 for the DRECP alternatives. The exact location of Covered Activity development within DFAs is not known, so the proportional impact analysis approach described in IV.7.1 was used to estimate impacts. Under this impact analysis approach, impacts within 4 miles of a golden eagle territory never exceed 25% of the territory; however, impact could exceed 25% of a golden eagle territory for any territory with greater than 25% of the territory within a DFA. The territory-by-territory impact will ultimately depend upon project-specific siting and impacts. Prior to the application of any avoidance and minimization CMAs, the analysis identified the following for the draft DRECP alternatives:

- Preferred Alternative: 63 territories occur within 4 mile of DFAs or transmission corridors
- Alternative 1: 55 territories occur within 4 mile of DFAs or transmission corridors
- Alternative 2: 81 territories occur within 4 mile of DFAs or transmission corridors
- Alternative 3: 65 territories occur within 4 mile of DFAs or transmission corridors
- Alternative 4: 65 territories occur within 4 mile of DFAs or transmission corridors

The CMAs for golden eagles (Section II.3.1.2.5) and the approach to golden eagles (see Appendix H) describes how the impact to golden eagles would be avoided, minimized, and compensated. No more than 15 golden eagles per year would be allowed to be taken within the Plan Area, which would be reassessed annually.

Table 1
Impacts to Golden Eagle Nesting and Foraging Habitat within 4-miles of
Known Nests by Golden Eagle Territory for the DRECP Alternatives

Golden Eagle Territory ID	Total Acres of Nesting or Foraging Habitat within 4 Miles of Known Nests in Available Lands¹	Preferred Alternative Total Impacts	Alternative 1 Total Impacts	Alternative 2 Total Impacts	Alternative 3 Total Impacts	Alternative 4 Total Impacts
2	38	-	-	-	-	-
4	1,328	1	1	1	1	2
5	8,253	49	56	30	56	73
6	32,808	-	-	-	-	-
7	48,833	-	-	1,173	-	-
8	15,717	-	-	-	-	-
9	23,597	-	-	28	-	-
10	14,036	1	1	1	1	1
11	19,971	49	80	32	57	53
12	26,118	-	-	-	-	-
13	22,217	309	544	242	423	416
14	10,858	254	182	75	142	220
15	33,617	222	130	187	153	211
16	48,230	78	-	193	-	85
17	20,930	86	35	176	81	115
18	42,970	393	-	409	198	432
19	5,331	-	-	39	64	-
20	25,210	-	-	11	-	-
21	28,508	-	-	-	-	-
22	23,597	-	-	-	-	-
23	25,495	-	-	-	-	-

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Golden Eagle Territory ID	Total Acres of Nesting or Foraging Habitat within 4 Miles of Known Nests in Available Lands ¹	Preferred Alternative Total Impacts	Alternative 1 Total Impacts	Alternative 2 Total Impacts	Alternative 3 Total Impacts	Alternative 4 Total Impacts
24	41,926	664	-	792	243	782
25	26,991	0	0	2	0	0
26	45,998	-	-	-	-	-
27	21,424	-	-	147	-	-
28	47,340	170	-	52	-	-
29	31,986	-	-	-	-	-
30	29,266	-	-	-	-	-
31	30,249	176	287	210	225	180
32	26,315	0	0	0	0	0
33	14,219	-	-	-	-	-
34	18,218	-	-	-	-	-
35	14,183	-	-	-	-	-
36	11,880	-	-	-	-	-
37	2,246	-	-	-	-	-
38	22,917	67	86	170	85	72
39	21,766	76	97	189	94	81
40	19,263	-	-	-	-	-
41	19,253	79	83	242	78	68
42	5,289	-	-	-	-	-
43	2,250	-	-	-	-	-
45	6,041	-	-	-	-	-

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Golden Eagle Territory ID	Total Acres of Nesting or Foraging Habitat within 4 Miles of Known Nests in Available Lands ¹	Preferred Alternative Total Impacts	Alternative 1 Total Impacts	Alternative 2 Total Impacts	Alternative 3 Total Impacts	Alternative 4 Total Impacts
46	22,743	-	-	-	-	-
47	10,657	-	398	156	226	211
48	8,396	0	173	119	101	83
53	2,331	-	-	-	-	-
54	4,441	-	-	-	-	-
55	25,922	95	99	86	113	117
56	14,304	128	160	89	150	186
57	10,919	252	50	90	117	116
58	33,162	-	-	-	-	-
59	27,904	148	140	146	184	212
60	36,816	725	87	802	326	807
61	52,870	96	71	39	81	78
62	27,799	130	135	61	125	107
63	17,548	237	-	49	-	118
64	35,906	62	20	138	62	73
65	31,720	-	-	-	-	-
66	64,201	-	-	-	-	-
67	73,407	-	-	18	-	-
68	26,514	-	-	-	-	-
69	44,641	-	-	-	-	-
70	29,995	-	-	-	-	-

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Golden Eagle Territory ID	Total Acres of Nesting or Foraging Habitat within 4 Miles of Known Nests in Available Lands ¹	Preferred Alternative Total Impacts	Alternative 1 Total Impacts	Alternative 2 Total Impacts	Alternative 3 Total Impacts	Alternative 4 Total Impacts
71	83,352	-	-	-	-	-
72	31,672	452	536	275	526	493
73	17,484	9	11	12	61	9
74	35,758	79	0	85	123	97
75	25,732	47	62	111	78	50
76	5,236	34	-	285	72	4
77	8,245	347	-	606	529	109
78	30,778	-	-	-	-	-
79	33,612	-	31	170	29	-
80	33,759	102	60	212	-	70
81	33,080	-	-	-	-	-
82	1,929	-	-	-	-	-
83	1,493	-	-	-	-	-
84	2,511	-	-	-	-	-
85	27	-	-	-	-	-
87	38,262	-	-	19	-	-
88	31,524	-	-	-	-	-
89	5,844	71	215	93	115	101
90	4,369	27	43	104	38	28
91	4,482	35	49	132	45	36
92	2,914	-	-	-	-	-

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Golden Eagle Territory ID	Total Acres of Nesting or Foraging Habitat within 4 Miles of Known Nests in Available Lands ¹	Preferred Alternative Total Impacts	Alternative 1 Total Impacts	Alternative 2 Total Impacts	Alternative 3 Total Impacts	Alternative 4 Total Impacts
93	8,461	-	-	7	12	25
94	1,477	-	-	-	-	-
95	11,191	-	-	-	-	-
96	22,295	58	74	91	70	62
99	72	-	-	-	-	-
100	27,341	-	-	-	-	-
101	10,669	325	380	324	634	280
102	7,267	206	2	260	253	28
103	1,834	-	-	-	-	-
104	4,192	390	-	275	13	-
106	46	-	-	-	-	-
107	24,809	-	-	-	-	-
108	13,448	69	72	36	72	84
109	21,154	101	104	52	104	117
110	31,704	24	23	11	23	24
111	4,015	-	-	-	-	-
112	32,035	-	-	-	-	-
113	32,316	-	-	-	-	-
115	35,940	-	-	-	-	-
116	36,761	-	-	-	-	-
117	29,236	-	-	-	-	-

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118	29,422	-	-	-	-	-
119	28,003	-	-	-	-	-
120	24,771	122	130	56	121	98
121	39,646	-	-	-	-	-
122	34,393	5	5	3	5	7
123	5,026	542	911	470	684	534
124	328	-	-	-	-	-
125	5,380	-	-	-	-	-
126	8,010	846	2,283	769	1,190	1,138
127	13,542	1,075	3,057	1,052	1,634	1,520
128	16,919	1,074	3,074	1,052	1,638	1,525
130	13,980	1,034	2,899	942	1,467	1,439
131	16,347	-	-	-	-	-
132	30,007	-	-	-	-	-
133	23,270	-	-	-	-	-
134	25,184	0	0	73	10	0
135	21,085	311	-	407	394	276
136	24,092	271	219	248	348	254
137	24,893	-	-	131	-	-
138	29,165	183	217	111	213	200
139	17,886	349	858	365	661	290

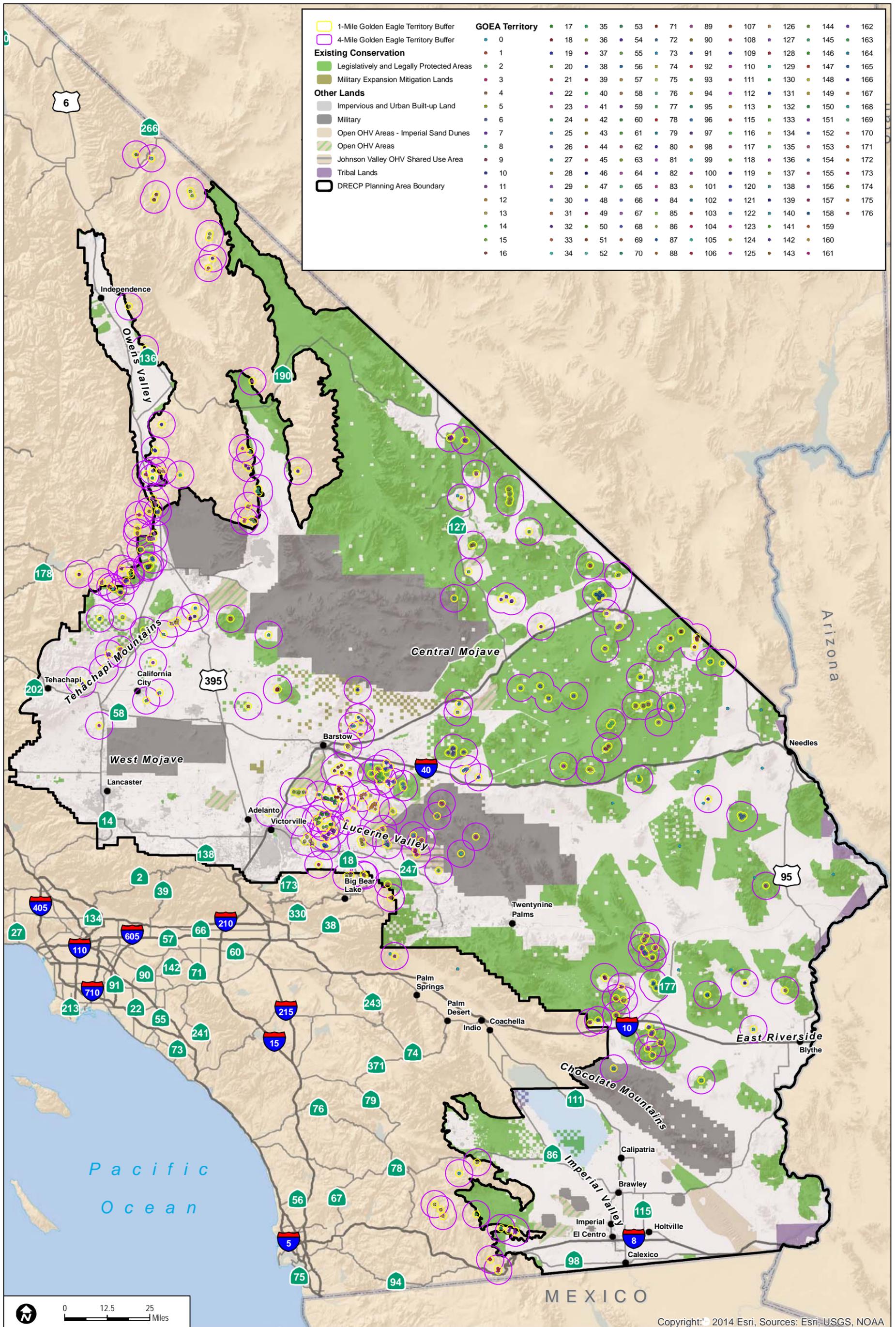
Table 1
Impacts to Golden Eagle Nesting and Foraging Habitat within 4-miles of
Known Nests by Golden Eagle Territory for the DRECP Alternatives

Golden Eagle Territory ID	Total Acres of Nesting or Foraging Habitat within 4 Miles of Known Nests in Available Lands1	Preferred Alternative Total Impacts	Alternative 1 Total Impacts	Alternative 2 Total Impacts	Alternative 3 Total Impacts	Alternative 4 Total Impacts
140	53	-	-	-	-	-
141	5,389	-	-	-	-	-
142	12,722	8	328	104	198	113
143	12,408	-	257	78	151	76
144	33,340	207	201	82	201	205
145	19,767	-	-	-	-	-
146	1,886	-	-	-	-	-
147	493	-	-	-	-	-
150	9,490	-	-	-	-	-
151	16,101	3	3	2	3	3
152	20,788	-	-	4	-	-
153	25,181	-	-	-	-	-
154	35,360	-	-	-	-	-
155	19,874	-	-	-	-	-
156	26,459	-	-	-	-	-
157	32,157	-	-	-	-	-
158	21,846	-	-	-	-	-
159	30,322	-	-	-	-	-
160	25,575	-	-	-	-	-
161	27,811	82	81	39	81	85
162	35,941	527	746	247	595	594

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163	31,820	-	-	-	-	-
164	5,157	-	-	-	-	-
165	32,066	-	-	-	-	-
166	28,808	-	-	-	-	-
167	29,166	458	-	303	-	686
168	30,848	1,038	13	729	521	1,549
169	30,291	-	-	-	-	-
170	15,950	-	-	-	-	-
171	30,072	-	-	-	-	-
172	19,146	5	-	3	8	7
173	12,213	254	425	182	333	329
174	7,681	102	249	85	223	91
175	20,648	-	-	37	-	-
176	10,186	-	-	182	-	-
Total	3,475,566	15,419	20,534	17,108	16,865	17,535

¹ Available lands include the entire Plan Area excluding military lands, tribal lands, and BLM Open OHV Lands.



Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013)

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Figure R2.7-1
Golden Eagle Nests with 1 and 4-Mile Territory Buffer

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