

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
2	Prospecting	Access road use	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
3			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
4			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
5			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
6			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
7			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
8			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
9			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
10			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
11			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
12			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
13	Prospecting	Erect temporary meteorological (MET) towers	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
14			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
15			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
16			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	none identified	
17			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	none identified	
18			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	none identified	
19			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
20			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		Worker education for standard BMPs	none identified	
21			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		BMP trash collection	none identified	
22			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
23			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
24	Prospecting	Operating / maintaining MET towers	obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Require free standing towers	none identified	
25			obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Replace tower with sodar or lidar or other technology (if feasible)	What is the effectiveness of these alternatives for data collection. Is this a feasible option?	
26			obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
27			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Require free standing towers	none identified	
28			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
29			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Replace tower with sodar or lidar or other technology	What are the effectiveness of these alternatives for data collection?	
30			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
31			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
32			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
33			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
34			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
35			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		Worker education for standard BMPs	none identified	
36			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		BMP trash collection	none identified	
37			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
38			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
39	Siting and Development	Access road use	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
40			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
41			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
42			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	

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43			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
44			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
45			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
46			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced genetic diversity	low	high		Worker education, speed limit	none identified	
47			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
48			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		Worker education for standard BMPs	none identified	
49			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		BMP trash collection	none identified	
50			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
51			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
52	Siting and Development	Erect temporary meteorological (MET) towers	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
53			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
54			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
55			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
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59			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced genetic diversity	low	high		Worker education, speed limit	none identified	
60			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
61			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		Worker education for standard BMPs	none identified	
62			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		BMP trash collection	none identified	
63			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
64			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
65	Siting and Development	Operating / maintaining MET towers	obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Require free standing towers	none identified	
66			obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Replace tower with sodar or lidar or other technology (if feasible)	What is the effectiveness of these alternatives for data collection. Is this a feasible option?	
67			obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
68			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		require free standing towers	none identified	
69			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
70			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Replace tower with sodar or lidar or other technology	effectiveness of these alternatives for data collection.	
71			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
72			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
73			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
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76			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		Worker education for standard BMPs	none identified	
77			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		BMP trash collection	none identified	
78			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced genetic diversity	low	high		Worker education, speed limit	none identified	
79			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
80			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
81			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
82	Siting and Development	Survey crews	helicopter use	collision	free-flying	mortality	reduced population	low	high		Employ trained observer and pilot	Develop protocols to address proper helicopter use and flight in vicinity of condors.	
83			helicopter use	collision	free-flying	mortality	reduced population	low	high		Pre-flight update on locations	none identified	

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84			helicopter use	collision	free-flying	mortality	reduced population	low	high		Cease flight to avoid disruption.	none identified	
85			helicopter use	collision	free-flying	mortality	reduced population	low	high		Coordination of flights to minimize flyovers	none identified	
86			helicopter use	disruption of nesting	free-flying	distress	unknown	low	medium		Buffer any nests from flyovers	What is the necessary buffer to avoid disturbance?	
87			helicopter use	disruption of nesting	free-flying	distress	unknown	low	medium		Cease flight to avoid disruption.	none identified	
88			helicopter use	disruption of nesting	free-flying	distress	unknown	low	medium		Coordination of flights to minimize flyovers	none identified	
89			helicopter use	disruption of nesting	nestlings	stress	unknown	low	low		Buffer any nests from flyovers	What is the necessary buffer to avoid disturbance?	
90			helicopter use	disruption of nesting	nestlings	stress	unknown	low	low		Cease flight to avoid disruption.	none identified	
91			helicopter use	disruption of nesting	nestlings	stress	unknown	low	low		Coordination of flights to minimize flyovers	none identified	
92			helicopter use	disruption of roosting	free-flying	distress	unknown	low	medium		Buffer known roost sites to avoid disturbance	What is the necessary buffer to avoid disturbance?	
93			helicopter use	disruption of roosting	free-flying	distress	unknown	low	medium		Cease flight to avoid disruption.	none identified	
94			helicopter use	disruption of roosting	free-flying	distress	unknown	low	medium		Coordination of flights to minimize flyovers	none identified	
95			helicopter use	disruption of feeding	free-flying	distress	unknown	low	medium		Employ trained observer and pilot	Develop protocols to address proper helicopter use and flight in vicinity of condors.	
96			helicopter use	disruption of feeding	free-flying	distress	unknown	low	medium		Cease flight to avoid disruption.	none identified	
97			helicopter use	disruption of feeding	free-flying	distress	unknown	low	medium		Coordination of flights to minimize flyovers	none identified	
98			helicopter use	disruption of feeding	free-flying	distress	unknown	low	medium		Establish buffer to avoid disruption	What is the appropriate buffer?	
99			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
100			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
101			vehicular traffic	disruption of roosting	free flying	stress	none	medium	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
102			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
103			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
104			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
105			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
106			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
107			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
108	Construction / Commissioning	Access road construction	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
109			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
110			vehicular traffic	disruption of roosting	free flying	stress	none	medium	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
111			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
112			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
113			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
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115			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
116			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
117			road development	loss of nesting habitat	free flying	distress - inability to reproduce	reduced population	low	high		Avoid building roads in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
118			road development	loss of nesting habitat	free flying	distress - reproductive disruption	reduced range and distribution	low	high		Avoid building roads in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
119			road development	loss of nesting habitat	nestling	mortality	reduced population	low	high		Avoid building roads in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
120			road development	loss of roosting habitat	free flying	stress	reduced range and distribution	low	medium		Avoid or minimize the loss of roosting habitat when developing roads	What constitutes roosting habitat? Habitat modeling.	
121			road development	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Cease construction when feeding event is observed	none identified	
122			road development	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
123			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
124			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
125			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	

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126			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
127	Construction / Commissioning	Access road use	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
128			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
129			vehicular traffic	disruption of roosting	free flying	stress	none	high	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
130			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
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132			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
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134			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	high	high		Worker education, speed limit	none identified	
135			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	high	unknown		Worker education, speed limit	none identified	
136	Construction / Commissioning	Operating / maintaining temp MET towers	obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Require free standing towers	none identified	
137			obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Replace tower with sodar or lidar or other technology (if feasible)	What is the effectiveness of these alternatives for data collection. Is this a feasible option?	
138			obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
139			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		require free standing towers	none identified	
140			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
141			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Replace tower with sodar or lidar or other technology	effectiveness of these alternatives for data collection.	
142			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
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147			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		Worker education for standard BMPs	none identified	
148			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		BMP trash collection	none identified	
149			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
150			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
151	Construction / Commissioning	Survey crews	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
152			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
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159			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
160	Construction / Commissioning	Ground clearing	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
161			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
162			vehicular traffic	disruption of roosting	free flying	stress	none	medium	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
163			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
164			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
165			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
166			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
167			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
168			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
169			blading of pads and facilities	loss of nesting habitat	free flying	distress - inability to reproduce	reduced population	low	high		Avoid building pads and facilities in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
170			blading of pads and facilities	loss of nesting habitat	free flying	distress - reproductive disruption	reduced range and distribution	low	high		Avoid building pads and facilities in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
171			blading of pads and facilities	loss of nesting habitat	nestling	mortality	reduced population	low	high		Avoid building pads and facilities in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
172			blading of pads and facilities	loss of roosting habitat	free flying	stress	reduced range and distribution	low	medium		Avoid or minimize the loss of roosting habitat when siting pads and facilities	What constitutes roosting habitat? Habitat modeling.	
173			blading of pads and facilities	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Cease construction when feeding event is observed	none identified	
174			blading of pads and facilities	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
175			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
176			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
177			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
178			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
179	Construction / Commissioning	Trenching and laying cables	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
180			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
181			vehicular traffic	disruption of roosting	free flying	stress	none	high	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
182			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
183			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
184			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
185			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
186			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	high	high		Worker education, speed limit	none identified	
187			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	high	unknown		Worker education, speed limit	none identified	
188			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
189			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
190			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
191			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
192	Construction / Commissioning	Establishment of on-site concrete batch plant	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
193			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
194			vehicular traffic	disruption of roosting	free flying	stress	none	medium	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
195			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
196			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
197			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
198			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
199			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
200			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
201			blading of batch site	loss of nesting habitat	free flying	distress - inability to reproduce	reduced population	low	high		Avoid building batch site in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
202			blading of batch site	loss of nesting habitat	free flying	distress - reproductive disruption	reduced range and distribution	low	high		Avoid building batch site in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
203			blading of batch site	loss of nesting habitat	nestling	mortality	reduced population	low	high		Avoid building roads in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
204			blading of batch site	loss of roosting habitat	free flying	stress	reduced range and distribution	low	medium		Avoid or minimize the loss of roosting habitat when siting batch site	What constitutes roosting habitat? Habitat modeling.	
205			blading of batch site	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Cease construction when feeding event is observed	none identified	
206			blading of batch site	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

1	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
207			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
208			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
209			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
210			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
211	Construction / Commissioning	Pouring turbine foundations	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
212			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
213			vehicular traffic	disruption of roosting	free flying	stress	none	medium	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
214			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
215			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
216			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
217			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
218			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
219			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
220			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
221			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
222			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
223			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
224	Construction / Commissioning	Construct distribution and transmission power lines	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
225			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
226			vehicular traffic	disruption of roosting	free flying	stress	none	medium	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
227			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
228			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
229			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
230			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
231			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
232			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
233			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
234			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
235			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
236			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
237			helicopter use	collision	free-flying	mortality	reduced population	low	high		Employ trained observer and pilot	Develop protocols to address proper helicopter use and flight in vicinity of condors.	
238			helicopter use	collision	free-flying	mortality	reduced population	low	high		Pre-flight update on locations	none identified	
239			helicopter use	collision	free-flying	mortality	reduced population	low	high		Cease flight to avoid disruption.	none identified	
240			helicopter use	collision	free-flying	mortality	reduced population	low	high		Coordination of flights to minimize flyovers	none identified	
241			helicopter use	disruption of nesting	free-flying	distress	unknown	low	medium		Buffer any nests from flyovers	What is the necessary buffer to avoid disturbance?	
242			helicopter use	disruption of nesting	free-flying	distress	unknown	low	medium		Cease flight to avoid disruption.	none identified	
243			helicopter use	disruption of nesting	free-flying	distress	unknown	low	medium		Coordination of flights to minimize flyovers	none identified	
244			helicopter use	disruption of nesting	nestlings	stress	unknown	low	low		Buffer any nests from flyovers	What is the necessary buffer to avoid disturbance?	
245			helicopter use	disruption of nesting	nestlings	stress	unknown	low	low		Cease flight to avoid disruption.	none identified	
246			helicopter use	disruption of nesting	nestlings	stress	unknown	low	low		Coordination of flights to minimize flyovers	none identified	
247			helicopter use	disruption of roosting	free-flying	distress	unknown	low	medium		Buffer known roost sites to avoid disturbance	What is the necessary buffer to avoid disturbance?	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
248			helicopter use	disruption of roosting	free-flying	distress	unknown	low	medium		Cease flight to avoid disruption.	none identified	
249			helicopter use	disruption of roosting	free-flying	distress	unknown	low	medium		Coordination of flights to minimize flyovers	none identified	
250			helicopter use	disruption of feeding	free-flying	distress	unknown	low	medium		Employ trained observer and pilot	Develop protocols to address proper helicopter use and flight in vicinity of condors.	
251			helicopter use	disruption of feeding	free-flying	distress	unknown	low	medium		Cease flight to avoid disruption.	none identified	
252			helicopter use	disruption of feeding	free-flying	distress	unknown	low	medium		Coordination of flights to minimize flyovers	none identified	
253			helicopter use	disruption of feeding	free-flying	distress	unknown	low	medium		Establish buffer to avoid disruption	What is the appropriate buffer?	
254	Construction / Commissioning	Erect permanent MET towers	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
255			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
256			vehicular traffic	disruption of roosting	free flying	stress	none	medium	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
257			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
258			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
259			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
260			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
261			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
262			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
263			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
264			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
265			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
266			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
267	Construction / Commissioning	Erect wind turbines	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
268			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
269			vehicular traffic	disruption of roosting	free flying	stress	none	medium	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
270			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
271			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
272			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
273			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
274			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
275			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
276			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
277			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
278			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
279			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
280			large crane	collision and entanglement	free-flying	Injury	unknown	medium	unknown		Secure all entanglement opportunities, elimiate perch availability.	none identified	
281			large crane	collision and entanglement	free-flying	mortality	reduced population	medium	high		Secure all entanglement opportunities, elimiate perch availability.	none identified	
282	Construction / Commissioning	Construction of permanent operations headquarters	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
283			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
284			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
285			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
286			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
287			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
288			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

1	A	B	C	D	E	F	G	H	I	J	K	L	M
	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
289			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
290			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
291			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
292			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
293			grading	loss of nesting habitat	free flying	distress - inability to reproduce	reduced population	low	high		Avoid grading areas that result in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
294			grading	loss of nesting habitat	free flying	distress - reproductive disruption	reduced range and distribution	low	high		Avoid grading areas that result in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
295			grading	loss of nesting habitat	nestling	mortality	reduced population	low	high		Avoid grading areas that result in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
296			grading	loss of roosting habitat	free flying	stress	reduced range and distribution	low	medium		Avoid or minimize the loss of roosting habitat when siting any facilities requiring grading	What constitutes roosting habitat? Habitat modeling.	
297			grading	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Cease construction when feeding event is observed	none identified	
298			grading	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
299			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
300			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
301			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
302			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
303	Construction / Commissioning	Substation construction	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
304			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
305			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
306			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
307			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
308			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
309			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
310			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
311			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
312			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
313			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
314			transformer contaminants - a spill or from oiled trash	mineral oil ingestion	free flying	mortality	reduced population	low	high		Worker education for standard BMPs	What types of materials go into a substation? Is there a less toxic fluid that could be used?	
315	Construction / Commissioning	Biological and cultural monitoring	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
316			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
317			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
318			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
319			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
320			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
321			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
322			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
323			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
324			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
325			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
326	Operations	Access road maintenance and use (repeat from siting and development)	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

1	A	B	C	D	E	F	G	H	I	J	K	L	M
	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
327			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
328			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
329			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
330			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
331			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
332			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
333			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
334			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
335			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
336			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
337		opening of inaccessible habitat because of increase road density	increased unauthorized human presence	increased lead	free flying	mortality	reduced population	medium	high		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
338			increased unauthorized human presence	direct shooting	free flying	mortality	reduced population	medium	high		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
339			increased unauthorized human presence	disruption of feeding	free flying	distress	unknown	medium	medium		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
340			increased unauthorized human presence	disruption of feeding	nestling	distress	unknown	medium	medium		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
341			increased unauthorized human presence	increased micro trash	nestlings	mortality	reduced population	high	high		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
342			increased unauthorized human presence	increase road kill (condor)	free flying	mortality	reduced population	medium	high		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
343			increased unauthorized human presence	increase road kill (food)	free flying	habituation	unknown	medium	unknown		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
344			increased unauthorized human presence	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
345			increased unauthorized human presence	entanglement items	free flying	injury	unknown	medium	unknown		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
346			increased unauthorized human presence	entanglement items	free flying	mortality	reduced population	medium	high		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
347			increased unauthorized human presence	disruption of breeding	free flying	distress - reproductive disruption	reduced range and distribution	low	high		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
348			increased unauthorized human presence	disruption of breeding	nestling	mortality	reduced population	low	high		Limit unauthorized access - public lands increased enforcement - public education	Does the increase of access affect the abundance of native or non-native food abundance for the condor?	
349	Operations	power line [above ground collection (internal) and genetic (connection to transmission from substation)] operation and maintenance	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
350			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
351		inspection and maintenance crews	vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
352			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
353			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
354			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
355			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
356			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
357			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
358			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
359			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

1	A	B	C	D	E	F	G	H	I	J	K	L	M
	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
360		Power line [above ground collection (internal) and gen-tie (connection to transmission from substation)] operation and maintenance	obstacle to flight	collision with collection, supply or gen-tie line	free flying birds	mortality	reduced population	medium	high		Place lines underground	What is the feasibility of placing gen-tie lines underground?	
361			obstacle to flight	collision with collection, supply or gen-tie line	free flying birds	mortality	reduced population	medium	high		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
362			obstacle to flight	collision with gen-tie line	free flying birds	injury	various*	unknown	unknown		Place lines underground	What are potential flight diversion techniques?	
363		Insulator spacing on Towers	exposed connections within wingspan (9.5 ft)	electrocution	free flying birds	mortality	reduced population	medium	high		Follow APLIC guidelines	Effectiveness of perch excluders? Different designs?	
364	Operations	MET tower operation and maintenance	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
365			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
366			obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		require free standing towers	none identified	
367			obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Replace tower with sodar or lidar or other technology (if feasible)	What is the effectiveness of these alternatives for data collection. Is this a feasible option?	
368			obstacle to flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
369			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Require free standing towers	none identified	
370			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
371			obstacle to flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Replace tower with sodar or lidar or other technology	What is the effectiveness of these alternatives for data collection?	
372			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
373			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
374			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
375			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
376			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
377			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		Worker education for standard BMPs	none identified	
378			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		BMP trash collection	none identified	
379			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
380			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
381		inspection and maintenance crews	vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
382			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
383			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
384			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
385			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
386			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
387			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
388			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
389			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
390	Operations	Substation operation and maintenance	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
391			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
392			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
393			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
394			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
395			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
396			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
397			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
398			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
399			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
400			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
401			non-insulated wires	electrocution	free flying birds	mortality	reduced population	medium	high		Follow APLIC guidelines	none identified	
402			non-insulated wires	electrocution	free flying birds	mortality	reduced population	medium	high		Cover station	Is it feasible to cover site?	
403			non-insulated wires	electrocution	free flying birds	mortality	reduced population	medium	high		Auditory deterrence (believed to need to be associated with visual)	What is the maximum heights this is effective at? Is visual stimulus needed as well?	
404	Operations	Wind turbine operation and maintenance	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
405			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
406			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
407			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
408			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
409			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
410			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
411			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
412			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
413			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
414			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
415			Rotation of turbine blades	change in foraging patterns	free-flying	stress-avoidance	decrease in distribution and range	low/unknown	unknown		Conservation and/enhancement of additional lands	Is this actually an effect.	
416			Rotation of turbine blades	selection of alternative nest site	free-flying	distress	decrease in distribution and range	low/unknown	high		Buffer all nests from turbines	Is there a buffer distance that would decrease the likelihood of nest abandonment?	
417			Rotation of turbine blades	selection of alternative roost site	free-flying	distress	decrease in distribution and range	low/unknown	medium		Buffer all roosts from turbines	Is there a buffer distance that would decrease the likelihood of roost abandonment?	
418			Rotation of turbine blades	change in foraging patterns	free-flying	distress	decrease in distribution and range	low/unknown	unknown		Conservation and/enhancement of additional lands	Is this actually an effect.	
419			Rotation of turbine blades	disruption of wind patterns (wake effect)	free-flying	Stress- loss of foraging area, change in available wind corridors	reduction in range, population decline	unknown	high		Eliminate negative element of wake effect	Will the wake effect have an impact of condor flight behavior?	
420			Rotation of turbine blades	disruption of wind patterns (wake effect)	free-flying	distress- loss of large foraging area or large change in wind corridors	reduction in range, population decline	unknown	unknown		Eliminate negative element of wake effect	Will the wake effect have an impact of condor flight behavior?	
421			Rotation of turbine blades	disruption of wind patterns (wake effect)	free-flying	mortality	reduced population	unknown	high		Eliminate negative element of wake effect	Will the wake effect have an impact of condor flight behavior?	
422			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Minimize and avoid the potential for collision?	Is there a turbine design that would reduce likelihood or mortality?	
423			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Eliminate collision risk	Is there a visual or auditory deterrent that could be deployed?	
424			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Eliminate collision risk	Is there reliable means to detect condors and curtail turbines?	
425			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Eliminate collision risk	Can we identify and select areas of lower probability for condor occurrence?	
426			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Eliminate collision risk	Is managing the foraging base effective in deterring condor use at the project level?	
427			large crane	collision and entanglement	free-flying	Injury	unknown	medium	unknown		Secure all entanglement opportunities, eliminate perch availability.	none identified	
428			large crane	collision and entanglement	free-flying	mortality	reduced population	medium	high		Secure all entanglement opportunities, eliminate perch availability.	none identified	
429		turbine combustion (increased in old break system) or any fire starting activity	fire	fire	free-flying	distress - displacement- loss of foraging area, possible loss of roosting or nesting habitat	reduction in range, population decline	low/medium	medium to high		Human component: education and proper BMPs; All: establish water facilities in proximity, fire control on site, fuels management, brushing roads, fire breaks; turbine component: install fire suppression unit on nacells; repower/newer turbines	none identified	

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430			fire	fire	free-flying	mortality	reduced population	low/medium	high		Human component: education and proper BMPs; All: establish water facilities in proximity, fire control on site, fuels management, brushing roads, fire breaks.; turbine component: install fire	none identified	
431			fire	fire	nestlings	mortality	reduced population	low/medium	high		Human component: education and proper BMPs; All: establish water facilities in proximity, fire control on site, fuels management, brushing roads, fire breaks.; turbine component: install fire	none identified	
432	Repowering	Access road use	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
433			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
434			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
435			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
436			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
437			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
438			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
439			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
440			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
441			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
442			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
443	Repowering	Ground clearing	blading of pads and facilities	loss of nesting habitat	free flying	distress - inability to reproduce	reduced population	low	high		Avoid blading for pads or facilities in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
444			blading of pads and facilities	loss of nesting habitat	free flying	distress - reproductive disruption	reduced range and distribution	low	high		Avoid blading for pads or facilities in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
445			blading of pads and facilities	loss of nesting habitat	nestling	mortality	reduced population	low	high		Avoid blading for pads or facilities in an areas that resulted in a loss of active, historic, or likely nesting habitat.	How do you determine what is likely nesting habitat? Habitat suitability modeling?	
446			blading of pads and facilities	loss of roosting habitat	free flying	stress	reduced range and distribution	low	medium		Avoid or minimize the loss of roosting habitat when siting any facilities requiring grading	What constitutes roosting habitat? Habitat modeling.	
447			blading of pads and facilities	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Cease construction when feeding event is observed	none identified	
448			blading of pads and facilities	loss of foraging area	free flying	stress	reduced range and distribution	low	low		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
449			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
450			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
451			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
452			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
453	Repowering	MET tower operation and maintenance	obstacle flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		require free standing towers	none identified	
454			obstacle flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Replace tower with sodar or lidar or other technology (if feasible)	What is the effectiveness of these alternatives for data collection. Is this a feasible option?	
455			obstacle flight	collision with guy wires	free flying birds	mortality	reduced population	medium	high		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
456			obstacle flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Require free standing towers	none identified	
457			obstacle flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Affix lines with diverters or markings to increase visibility	What is the marking necessary to achieve avoidance? Is marking effective? Weather considerations.	
458			obstacle flight	collision with guy wires	free flying birds	injury	various*	unknown	unknown		Replace tower with sodar or lidar or other technology	What is the effectiveness of these alternatives for data collection?	
459			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
460			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
461			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
462			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
463			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
464			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		Worker education for standard BMPs	none identified	
465			contaminants (wire clippings)	micro trash	nestlings	mortality	reduced recruitment	medium	high		BMP trash collection	none identified	
466			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
467			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

1	A	B	C	D	E	F	G	H	I	J	K	L	M
	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
468	Repowering	Disassemble old wind turbines [general construction (blasting foundations)]	general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
469			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
470			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
471			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
472		Erect new wind turbines-change in hub height	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		Worker education for standard BMPs	none identified	
473			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	high	high		BMP trash collection	none identified	
474			vehicular traffic	disruption of roosting	free flying	stress	none	medium	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
475			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
476			vehicular traffic	disruption of feeding	free flying	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
477			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
478			vehicular traffic	disruption of feeding	nestling	distress	unknown	high	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
479			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
480			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
481			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
482			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
483			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
484			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
485			large crane	collision and entanglement	free-flying	Injury	unknown	medium	unknown		Secure all entanglement opportunities, elimat perch availability.	none identified	
486			large crane	collision and entanglement	free-flying	mortality	reduced population	medium	high		Secure all entanglement opportunities, elimat perch availability.	none identified	
487	Repowering	Operate new wind turbines-change in hub height	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
488			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
489			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
490			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
491			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
492			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
493			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
494			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
495			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
496			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
497			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
498			Rotation of turbine blades	change in foraging patterns	free-flying	stress-avoidance	decrease in distribution and range	low/unknown	unknown		Conservation and/enhancement of additional lands	Is this actually an effect.	
499			Rotation of turbine blades	change in breeding patterns	free-flying	distress	decrease in distribution and range	low/unknown	high		Buffer all nests from turbines	Is there a buffer distance that would decrease the likelihood of nest abandonment?	
500			Rotation of turbine blades	change in roosting patterns	free-flying	distress	decrease in distribution and range	low/unknown	medium		Buffer all roosts from turbines	Is there a buffer distance that would decrease the likelihood of roost abandonment?	
501			Rotation of turbine blades	change in foraging patterns	free-flying	distress	decrease in distribution and range	low/unknown	unknown		Conservation and/enhancement of additional lands	Is this actually an effect.	
502			Rotation of turbine blades	disruption of wind patterns (wake effect)	free-flying	Stress- loss of foraging area, change in available wind corridors	reduction in range, population decline	unknown	high		Eliminate negative element of wake effect	Will the wake effect have an impact of condor flight behavior?	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
503			Rotation of turbine blades	disruption of wind patterns (wake effect)	free-flying	distress- loss of large foraging area or large change in wind corridors	reduction in range, population decline	unknown	unknown		Eliminate negative element of wake effect	Will the wake effect have an impact of condor flight behavior?	
504			Rotation of turbine blades	disruption of wind patterns (wake effect)	free-flying	mortality	reduced population	unknown	high		Eliminate negative element of wake effect	Will the wake effect have an impact of condor flight behavior?	
505			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Minimize and avoid the potential for collision?	Is there a turbine design that would reduce likelihood or mortality?	
506			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Eliminate collision risk	Is there a visual or auditory deterrent that could be deployed?	
507			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Eliminate collision risk	Is there reliable means to detect condors and curtail turbines?	
508			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Eliminate collision risk	Can we identify and select areas of lower probability for condor occurrence?	
509			Rotation of turbine blades	collision	free flying	mortality	reduced population	unknown	high		Eliminate collision risk	Is managing the foraging base effective in deterring condor use at the project level?	
510	Decommissioning	Access road use	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
511			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
512			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
513			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
514			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
515			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
516			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
517			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
518			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
519			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
520			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
521			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
522			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
523			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
524			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
525	Decommissioning	Disassemble wind turbines (reduced collision risk with turbine blades)	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
526			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
527			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
528			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
529			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
530			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
531			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
532			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
533			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
534			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
535			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
536			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
537			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
538			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
539			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

1	A	B	C	D	E	F	G	H	I	J	K	L	M
	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
540	Decommissioning	Remove power lines (reduced risk of collision and electrocution)	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
541			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
542			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
543			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
544			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
545			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
546			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
547			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
548			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
549			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
550			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
551			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
552			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
553			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
554			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
555	Decommissioning	Remove concrete pads (general construction blasting)	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
556			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
557			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
558			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
559			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
560			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
561			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
562			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
563			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
564			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
565			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
566			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
567			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
568			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
569			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
570	Decommissioning	Remove roads (general construction)	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
571			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
572			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
573			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
574			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
575			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
576			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully manage carcass removal on sites?	
577			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	

CALIFORNIA CONDOR WIND ENERGY WORK GROUP - THREAT MATRIX

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Phase	Activity	Stressor	Threat	Resource Affected	Individual Response	Demographic Consequence (population level)	likelihood of threat at this phase	significance of threat event		Conservation Need	Research Questions?	
578			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
579			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
580			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
581			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
582			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
583			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
584			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
585	Decommissioning	Revegetate (increased micro trash from weed)	increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		Worker education for standard BMPs	none identified	
586			increased human presence	increased micro trash	nestlings	mortality	reduced recruitment	low	high		BMP trash collection	none identified	
587			vehicular traffic	disruption of roosting	free flying	stress	none	low	low		Avoid roost sites-monitor access routes and substation sites for future occupancy	What is the buffer needed to avoid disturbing roost?	
588			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
589			vehicular traffic	disruption of feeding	free flying	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
590			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Monitor access routes and substation sites to avoid feeding events.	What is the buffer needed to avoid disturbing feeding event?	
591			vehicular traffic	disruption of feeding	nestling	distress	unknown	low	medium		Remove carcasses from project site	Can we successfully mange carcass removal on sites?	
592			vehicular traffic	increase road kill (condor)	free flying	mortality	reduced population	low	high		Worker education, speed limit	none identified	
593			vehicular traffic	increase road kill (food)	free flying	habituation	unknown	low	unknown		Worker education, speed limit	none identified	
594			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Vehicle maintenance and clean up? Closed storage containers	none identified	
595			vehicular contaminants	poisoning (ethylene glycol)	free flying	mortality	reduced population	low	high		Use of non-toxic alternative?	What other coolants are available?	
596			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Cease construction when roosting is expected to occur (evening/morning/weather conditions not good for flight)	Establish times of day to provide guidance of avoidances and weather?	
597			general construction activities (i.e. noise)	disruption of roosting	free flying	stress	unknown	medium	low		Establish buffer around roosting site to avoid disturbance	What is the buffer needed to avoid disturbing birds from roost?	
598			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Cease construction when feeding event is observed	none identified	
599			general construction activities (i.e. noise)	disruption of feeding	free-flying	distress	unknown	medium	medium		Establish buffer to avoid disruption feeding event	What is the appropriate buffer to avoid disruption of feeding event?	
600													
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602	*1) reduced population - the bird is euthanized due to injury; 2) reduced wild population - bird becomes permanently captive, potentially a contributing breeder; 3) short-term reduction in wild population- individual re-released												
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