



## GREAT BASIN BIRD OBSERVATORY

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# Crescent Dunes Solar Energy Project

## Monitoring Narrative

April 2016

Prepared By Great Basin Bird Observatory

Great Basin Bird Observatory (GBBO) is engaged in a cooperative agreement with the Bureau of Land Management (BLM) to conduct avian use and mortality surveys at the Crescent Dunes Solar Energy Project facility, hereafter “the facility”, which is a concentrated solar power facility located near Tonopah, NV. The function of this monitoring effort is to complement the existing Crescent Dunes Avian and Bat Protection Plan (ABPP), which is implemented by Stantec Consulting Services Inc. (Stantec). This monitoring narrative summarizes the results of mortality and avian use surveys conducted by GBBO during April 2016.

Survey cycles were completed in two-week intervals, as specified for the spring migration season in our work agreement. The scope of a complete survey cycle consists of eighty plot-based mortality surveys in the facility and in the surrounding 2-mile buffer zone, as well as surveys along the entire facility fence line and around the three waste water ponds. Avian use surveys include sixty randomly distributed point count points within the buffer zone and the facility, four regional ten-point transects, and an inventory of individuals using the ponds once during the cycle. Two survey cycles were completed in April 2016.

Six avian and fifteen mammalian mortalities were discovered by GBBO during mortality surveys and incidentally in the facility and buffer zone during April 2016. Mortalities were identified as a European Starling, Horned Lark, Common Raven, an Eared Grebe, a Ring-billed Gull, and an unknown water bird. The Common Raven was injured when first discovered, walking with what looked like a broken wing, but was dead within the hour when the surveyor returned with a container to collect the bird. The cause of death of the gull was predation, and the raven likely sustained its injury by collision. The cause of death for the other mortalities was unknown, but none of the feathers appeared to be singed. There was one additional mortality, a House Finch, discovered and reported by Stantec, but collected by GBBO, as outlined in the protocol due to collection permitting. All avian mortalities are described in Table 1.

ID Num	Species	Date	Location	Comments
1	Horned Lark	4/6/2016	Buffer- Incidental	Part of a wing
2	Eared Grebe	4/7/2016	North Pond	Early decomposition
3	Unknown Waterfowl	4/11/2016	Facility	Part of a wing
4	European Starling	4/19/2016	Fence Line	Feather spot
5	Ring-billed Gull	4/20/2016	Middle Pond	Predation; head in body cavity missing
6	Common Raven	4/23/2016	Facility- Incidental	Wing injury with open wound

Table 1. Avian mortalities discovered by GBBO April 2016

The mammalian mortalities discovered included two black-tailed jackrabbits, eleven kangaroo rats, and two mice. Both of the jack rabbits were discovered in the buffer zone. Nine of the kangaroo rats were found in the facility, one in the buffer zone, and one was located during fence line surveys. Both mouse mortalities, an American deer mouse and a Great Basin pocket mouse, were found in the facility. Detailed information on each GBBO mortality along with a photo can be found in Appendix 1, and locations are plotted in Figure 1. The mortalities discovered and recorded by Stantec are also included in Figure 1. All UTM's are recorded in NAD83.

Point counts were conducted in the facility, in the buffer zone, and regionally. Abundance was highest on regional point counts, though similar to that of the facility when adjusted for survey effort (30 points in the facility vs. 40 regionally). Species richness was highest in the facility. During facility point counts, 387 birds were recorded representing 29 species (Table 2). Nine of these species were only recorded at the two point count locations adjacent to the ponds, leaving 20 species observed within the heliostat field. Brown-headed Cowbirds (*Molothrus ater*) and Common Ravens were the most abundant species recorded contributing to 11.4% and 10.9% of total observations respectively.

Fifteen species were recorded in the buffer zone with a total of 194 records. Horned Larks made up 47.9% of all observations and Common Ravens comprised of 24.9% of observations. There were 387 birds recorded on regional transects, representing eleven species. Horned Larks and Black-throated Sparrows were the most abundant species, and together made up over 80% of all detections. A summary of observations recorded during point counts can be found in Table 2.

The three waste water collection ponds located in the southwestern quadrant of the facility were surveyed twice during the month of April. There were 226 birds were recorded in total, representing 28 species. Richness at the ponds was similar to facility point counts and higher than both the buffer zone and regional point counts. Eared Grebe, Ruddy Ducks, and Ring-billed and California Gulls were the most abundant species recorded. A summary of all detections recorded at each pond is included in Table 3.

As outlined in the GBBO Crescent Dunes Monitoring proposal, a comprehensive seasonal report will be produced following the completion of each monitoring season. This report will include the results of avian use surveys, mortality surveys, as well as searcher efficiency and scavenger removal trials.

Table 2. Summary of avian use point count surveys at Crescent Dunes April 2016. Results of two survey cycles are combined.

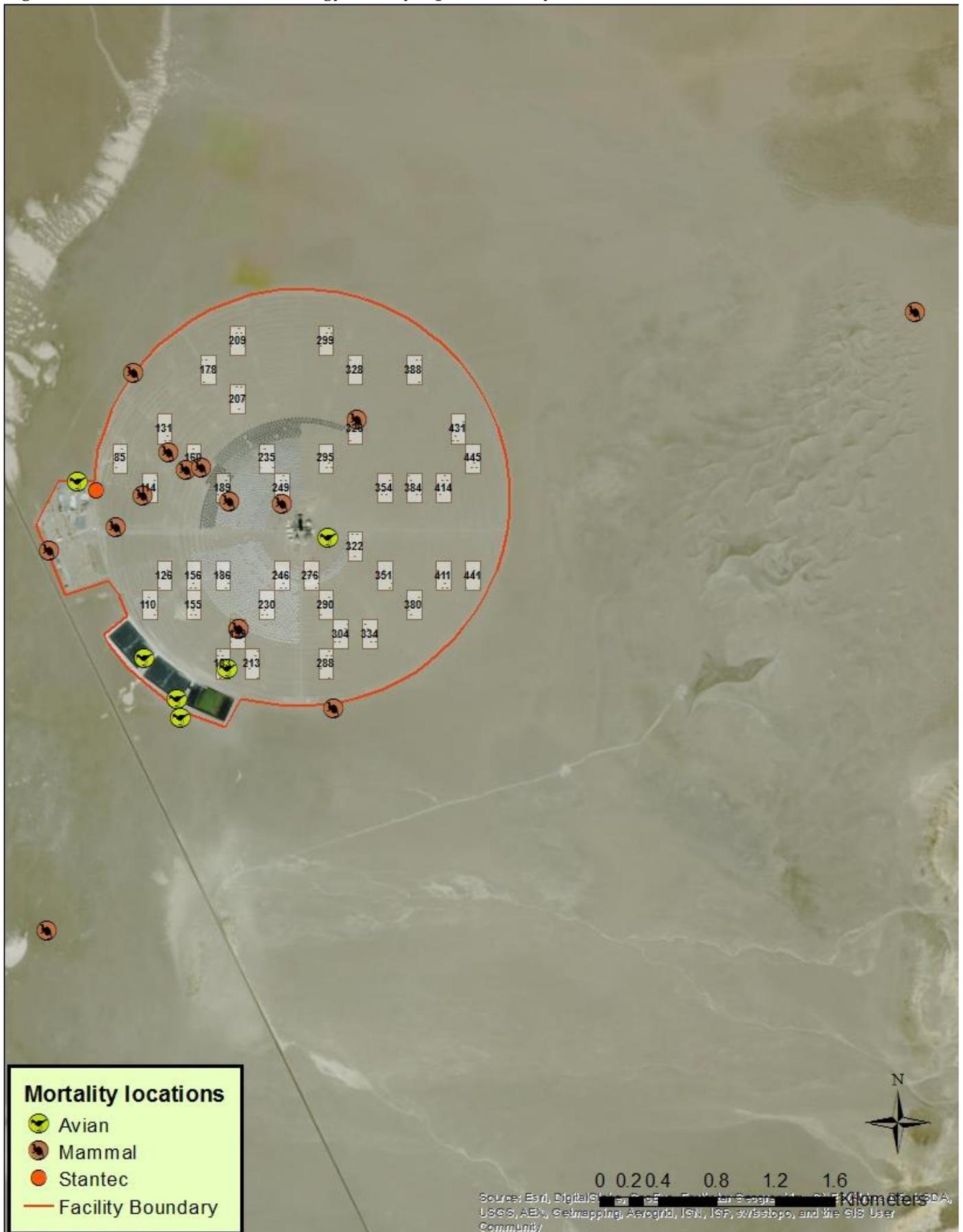
<b>Species</b>	<b>Buffer</b>	<b>Facility</b>	<b>Regional Transect</b>
American Kestrel			1
Black Phoebe			1
Black-Throated Sparrow	11		120
Brewer's Blackbird		8	
Brewer's Sparrow	2		33
Brown-headed Cowbird		44	
Bufflehead		1	
California Gull		3	
Cinnamon Teal		1	
Common Raven	48	42	8
Dark-Eyed Junco		2	
Eared Grebe		25	
Eurasian-collared Dove		7	
European Starling		8	
Franklin's Gull		1	
Great-tailed Grackle		1	
Horned Lark	93	24	191
House Finch		17	
House Sparrow	1	28	
Killdeer	1	2	
Long-billed Curlew			1
Northern Flicker		1	
Peregrine Falcon		1	
Red-tailed Hawk	1	2	
Ring-billed Gull	3	1	
Ring-necked Duck		1	
Rock Pigeon		2	
Rock Wren			7
Ruddy Duck		32	
Sage Thrasher	1		3
Sagebrush Sparrow	3		20
Say's Phoebe	4	25	
Tree Swallow	8	8	
Ring-billed Gull	3		
Unidentified Passerine	1		
Unidentified Gull	5	1	
Unidentified Sandpiper	1	10	
Unidentified Swallow	1		
Violet-green Swallow	2		
Western Sandpiper		2	
White-crowned Sparrow			2
Wilson's Phalarope		2	
Yellow-headed Blackbird		1	
Yellow-rumped Warbler	5	2	

<b>Grand Total</b>	194	305	387
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Table 2. Summary of observations at the ponds April 2016. Results of two survey cycles are combined.

<b>Species</b>	<b>North</b>	<b>Middle</b>	<b>South</b>
American Avocet		8	2
American Coot			2
American Pipit			1
American Wigeon		4	
Black-necked Stilt	19		
Bonaparte's Gull		4	
Bufflehead		2	
California Gull	28		
Cinnamon Teal		2	7
Double-crested Cormorant			1
Eared Grebe	1	7	18
Great Egret	6		
Greater Yellowlegs			
Green-winged Teal		10	
Killdeer		2	
Least Sandpiper		12	3
Lesser Scaup			3
Long-billed Curlew		1	
Northern Shoveler		3	
Red-winged Blackbird	1		1
Ring-billed Gull		26	
Ruddy Duck		1	28
Semi-palmated Sandpiper	4		
Spotted Sandpiper	1	1	1
Unidentified Sandpiper	1		
Western Sandpiper	5		
White-faced Ibis	5		
Wilson's Phalarope	1		
Yellow-headed Blackbird	1		
<b>Grand Total</b>	<b>145</b>	<b>22</b>	<b>59</b>

Figure 1. Crescent Dunes Solar Energy Facility April mortality locations



## Appendix 1: GBBO April 2016 Mortalities

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**Horned Lark**

Carcass ID #:	HOLA_INC04062016806	
Date:	4/6/16	
Location:	Buffer Zone- Incidental	
Coordinates in Nad83:	11S 467360 4231115	
Condition:	Feather Spot	
Comments:	Unknown cause of death	

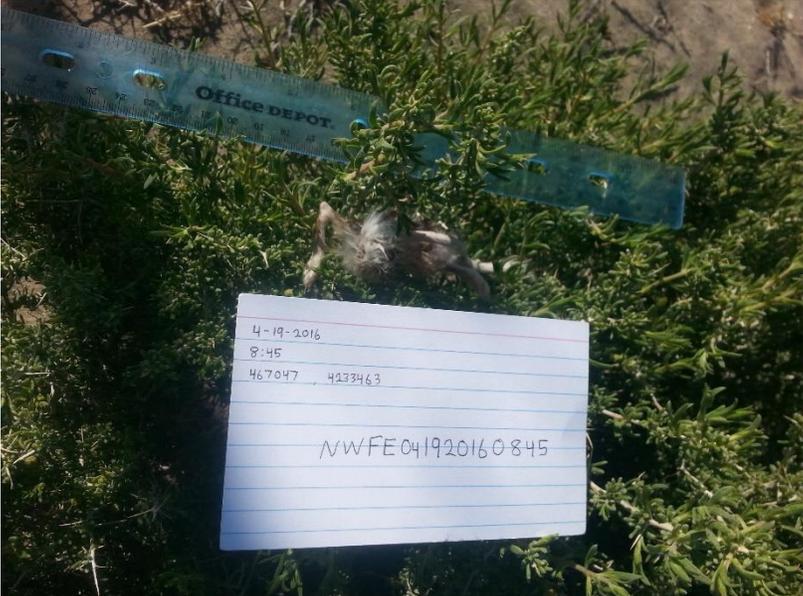
**Eared Grebe**

Carcass ID #:	EAGR_NP040720160740	
Date:	4/7/16	
Location:	North Pond	
Coordinates in Nad83:	11S 467116 4231518	
Condition:	Intact/early Decomposition	
Comments:	Unknown cause of death.	

Unknown Waterfowl

Carcass ID #:	183041120161114	
Date:	4/11/16	
Location:	Facility plot 183	
Coordinates in Nad83:	11S 467684 4231448	
Condition:	Body parts	
Comments:	Part of a wing. No secondaries, but likely a teal based on size. Unknown cause of death	

European Starling

Carcass ID #:	EUST_NWFE041920160812	
Date:	4/19/2016	
Location:	NW Fence line	
Coordinates in Nad83:	11S 466663 4232722	
Condition:	Feather Spot	
Comments:	Unknown cause of death	

Ring-billed Gull

Carcass ID #:	MIPO042020160847	
Date:	4/20/2016	
Location:	Middle Pond	
Coordinates in Nad83:	11S 467336 4231245	
Condition:	Body Parts	
Comments:	First year RBGU. Head and chest cavity eaten-- cause of death predation.	

Common Raven

Carcass ID #:	INC0423161047	
Date:	4/23/16	
Location:	Facility- Incidental	
Coordinates in Nad83:	11S 468362 4232338	
Condition:	Intact, Fresh	
Comments:	First discovered injured with what looked like a broken wing. Died within the hour before it could be collected.	

**Black-tailed jackrabbit**

Carcass ID #:	4447040420160933
Date:	4/4/2016
Location:	Buffer Plot 4447
Coordinates in Nad83:	11S 467361 4233876
Condition:	Body Parts
Comments:	Coyote tracks nearby

**Black-tailed jackrabbit 2**

Carcass ID #:	BTJAINC040620161055
Date:	4/6/2016
Location:	Buffer zone- Incidental
Coordinates in Nad83:	11S 468406 4231177
Condition:	Body Parts
Comments:	Single foot



**Ord's kangaroo rat**

Carcass ID #:	19904072016942	
Date:	4/7/2016	
Location:	Facility plot 199	
Coordinates in Nad83:	11S 467759 4231722	
Condition:	Fresh, Intact	
Comments:	No signs of injury/trauma. Second individual ~2ft away.	

**Ord's kangaroo rat 2**

Carcass ID #:	19904072016947	
Date:	4/7/2016	
Location:	Facility plot 199	
Coordinates in Nad83:	11S 467762 4231723	
Condition:	Fresh, mostly intact	
Comments:	Exposed flesh/injury on neck	

American deer mouse

Carcass ID #:	INC042020161242	No picture available
Date:	4/20/2016	
Location:	Facility- Incidental	
Coordinates in Nad83:	11S 466473 4232250	
Condition:	Fresh, mostly intact	
Comments:	Found by entrance. Collision--serious head injury	

Kangaroo rat sp.

Carcass ID #:	NWFE041920160845	
Date:	4/19/2016	
Location:	NW Fence line	
Coordinates in Nad83:	11S 467047 4233463	
Condition:	Body parts	
Comments:	Carcass in too poor shape to identify to species	

Great Basin pocket mouse

Carcass ID #:	1140421161152	
Date:	4/21/2016	
Location:	Facility plot 114	
Coordinates in Nad83:	11S 467105 4232625	
Condition:	Intact, early decomposition	
Comments:	Unknown cause of death	

Kangaroo rat sp. 2

Carcass ID #:	160042120161030	
Date:	4/21/2016	
Location:	Facility plot 160	
Coordinates in Nad83:	11S 467406 4232800	
Condition:	Scavenged	
Comments:	Unknown cause of death.	

Kangaroo rat sp. 3

Carcass ID #:	160042120161111	
Date:	4/21/2016	
Location:	Facility plot 160	
Coordinates in Nad83:	11S 467505 4232818	
Condition:	Body parts	
Comments:	Scavenged/ predation	

Ord's kangaroo rat 3

Carcass ID #:	189042120160843	
Date:	4/21/2016	
Location:	Facility plot 189	
Coordinates in Nad83:	11S 467700 42325838	
Condition:	Fresh	
Comments:	Unknown cause of death	

**Kangaroo rat sp. 4**

Carcass ID #:	326042116842	
Date:	4/21/2016	
Location:	Facility plot 326	
Coordinates in Nad83:	11S 468563 4233141	
Condition:	Body parts	
Comments:	Four-toed Krat, unknown cause of death	

**Kangaroo rat sp. 5**

Carcass ID #:	INC042120160715	
Date:	4/21/2016	
Location:	Facility- Incidental	
Coordinates in Nad83:	11S 466928 4232415	
Condition:	Body parts, late decomposition	
Comments:	Unknown cause of death	

**Kangaroo rat sp. 6**

Carcass ID #:	INC042120160938	
Date:	4/21/2016	
Location:	Facility- Incidental	
Coordinates in Nad83:	11S 467285 4232923	
Condition:	Body Parts	
Comments:	Unknown cause of death	

**Desert kangaroo rat**

Carcass ID #:	INC042116729	
Date:	4/21/2016	
Location:	Facility- Incidental	
Coordinates in Nad83:	11S 468054 4232569	
Condition:	Body Parts	
Comments:	Scavenged.	

Merriam's kangaroo rat

Carcass ID #:	INC042620161008	
Date:	4/26/2016	
Location:	Buffer- Incidental	
Coordinates in Nad83:	11S 466456 4229666	
Condition:	Fresh	
Comments:	Unknown cause of death	