

# Birds at Lair o' the Bear Park Over the Last Decade

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**Abstract.** During 2016 I carried out a yearlong avian survey at Lair o' the Bear Park in Jefferson County, Colorado. Abundance and breeding status of the species identified were noted, as were their various habitat affiliations during different seasons. To gain a more accurate estimate of species richness and the breeding status of the birds at the site, I used two other sets of records that provided overlapping data for the previous ten years. Between 2007 and 2016 the three sources found 143 species. Sixty-three were confirmed breeders, 22 probable, and 25 possible. The other 33 showed no breeding behavior at the site.

## Introduction

As a volunteer naturalist for Jefferson County's Open Space programs, I lead birding trips to several of the sites in the system. I decided to do a yearlong survey during 2016 at one of those sites to document the species in each season, to observe whether birds chose different habitats in different seasons, and to discover which species breed at the site.

I chose Lair o' the Bear because it shows broad similarities to other Open Space sites with respect to habitats, as well as the geography, geology, and plant life of a Front Range foothills ecosystem. A major reason for undertaking this study was to encourage other naturalists who share broad interests in ecology to undertake similar avian studies in other sites within a Front Range foothills ecosystem. The results of this survey can serve as a point of reference for those other studies.

## Study Area

Lair o' the Bear Park is one of 28 public parks managed by Jefferson County Open Space. It consists of 319 acres of mostly sloped land, the north boundary of which closely parallels both State Highway 74 and Bear Creek. The southern boundary runs along the high ridges to the south. In the Bear Creek corridor, Lair o' the Bear lies between two Denver Mountain Parks: Little Park, to the east, and Corwina Park, to the west. Elevation varies from a little less than 6,600 feet to a little over 7,200 feet. The Park became a part of Open Space in 1987. Prior to that, produce was grown from the early 1900s. Limited grazing replaced farming in the 1930s, which encouraged both native and invasive plants to reclaim habitat (Park Map 2015).

Underlying the Park are some of the same dark Precambrian gneissic rocks, abundantly laced with feldspar, found throughout the Front Range. Igneous pegmatite intrudes into the gneiss at several locations, notably at the dramatic outcrop along Bruin Bluff Trail (a dike), also along the Creekside Trail, about 0.5 mile from the western border of the Park, just east of the unnamed bridge. The pegmatite displays crystals of such Precambrian minerals as quartz, feldspar, biotite, and hornblende (Derby 2016).

The dominant biome of the park is forest, covering most of the extensive slopes to the south of Bear Creek and surrounding the creek itself. Shrubs mingle with the forest, mostly close to the creek, where willow and alder also grow, but mountain mahogany flourishes on the higher slopes in full sun. Other shrubs include Rocky Mountain maple, serviceberry, buckbrush, honeysuckle, chokecherry, Rocky Mountain ninebark, golden currant, wax currant, gooseberry, and snowberry. Meadows (mountain grassland) exist in the valley bottom, surrounding and east of the parking area, also upstream, to the south of Dipper Bridge. The meadows boast of downy brome and blue grama grasses, in addition to numerous wildflowers. Some of the more familiar are blue flax, pussytoes, harebell, paintbrush, larkspur, cow parsnip, and chickweed (Little 2016).

The main birding habitats are mixed conifer (consisting mostly of Douglas fir, but also ponderosa pine, blue spruce, and various junipers), montane shrub, montane grassland (meadow), montane deciduous (cottonwoods, box elder, and willows surround the riparian corridor and encroach onto adjacent meadows), mid-elevation carr, montane riparian, open water stream, and urban park. Douglas fir and ponderosa pine stands are frequent enough to be included as birding habitats. The few surviving aspen groves are surrounded by mixed conifer. Spruce trees may be mixed in with fir in the upper portions of the Park, but it is difficult to know as no trails penetrate the highest slopes.

Though just north of the Park's boundary, the south-facing slopes rising above Bear Creek are a natural part of the valley's ecosystem and were included in the avian survey. Among the flora on this drier, warmer habitat were needle-and-thread, crested wheatgrass, rabbitbrush, American vetch, and field milkvetch (Little 2016). Raptors often perched on the power poles or wires above this habitat, or soared above the ridge top, where they were sometimes joined by White-throated Swifts.

## Methods

Three sources were used for this study:

- (1) Ninety-two individuals participated on my survey for 123.3

hours during 2016; we located 77 species. I organized visits to the Park on 38 different days during the year: five times during May (to better capture the large number of migrating and neotropical species) and three times during each of the other eleven months. I took part in all 38 visits, and 91 other individuals participated on 28 of those occasions, for a combined total of 220 person-visits for the year. (Hereafter, Foster 2016.)

(2) Twenty-six individuals working on the Bear Creek Watershed Breeding Bird Atlas, an ongoing project of Evergreen Audubon, visited the site for 129.6 hours and found 92 species between 2008 and 2014. They visited the site 61 times on 54 days: 9 trips in 2008, 44 in 2013, and one in 2014. The emphasis was on May (16 visits), June (12), and July (16). There were two visits in February, three in March, and five in April. (Hereafter, Evergreen 2008–2014.)

(3) eBird provides information about which avian species have been found at particular locations, on what dates, and in what numbers. But in identifying each of the species at particular hotspots, it fails to show how many birders found each species, on how many different dates, and over how many hours of effort. Therefore its records are not strictly comparable to those of the other two sources.

eBird shows the actual species found by various birders at the site, making it valuable for determining the overall species richness at Lair o' the Bear. To be consistent with the 10 years of this study, I have examined eBird records for the years 2007–2016, which document 118 species, 35 of which were not noted by the other two sources. As with Evergreen 2008–2014, there was an emphasis on the warmer months. For example, in 2016 visits covered all months, but unequally: May (5 visits), June (14), July (6), August (9), September (8), and October (6), but only 7 for the six remaining months of January–April and November–December. The same pattern exists for 2007–2015. (Hereafter, eBird 2007–2016.)

Foster 2016 was the only source to provide readily gathered information on the routes birders followed in the Park. Because the main habitats are obvious and accessed by trails, it is assumed that the other two sources followed similar routes.

Visits of Foster 2016 began by heading east from the parking area along Bear Creek to Ouzel Bridge, crossed the creek there, then took Bruin Bluff Trail to its junction with Castor Cutoff, took the Cutoff to Dipper Bridge, then regained Bruin Bluff, looped southwest up the ridge, then eastward back down to the picnic area at Ouzel Bridge. On five occasions I varied the standard route by going up the ridge on Bruin Bluff Trail first, then coming back east to the Ouzel Bridge area along Castor Cutoff.

Icy trails and low bird counts at higher elevations in the wintry months persuaded me to create an alternate route, which began like the standard route to Ouzel Bridge, but then took Bruin Bluff only to its junction with Castor Cutoff, then followed Castor Cutoff to Dipper Bridge, then west along Creekside Trail as far as conditions warranted, then back to the parking lot. As conditions improved with warmer weather, the alternate route continued farther west from Dipper Bridge, sometimes as far as the third, unnamed bridge, which crosses the creek on Creekside Trail about 0.5 mile from the western border of the Park.

Foster 2016 participants followed the standard route 21 times, and some version of the alternate route 17 times. How far west we went from Dipper Bridge depended on how many birds we were finding, which in turn depended on the weather. Regardless of weather, we made sure to visit all the main habitats during each visit (see Study Area).

## Results

Table 1 identifies the species that were found by all three sources during their visits. Foster 2016 found 77, Evergreen 2008–2014 found 92, and eBird 2007–2016 found 118. (Because of the peculiar way eBird records list species at particular hotspots, like Lair o' the Bear, 12 of the species undoubtedly found by eBird 2007–2016 are only shown during 2017.)

The table shows breeding status of each species, according to the possible, probable, and confirmed criteria of Kingery (1998) and Wickersham (2016). Only the highest breeding status found is mentioned for any species. The legend at the bottom of Table 1 provides the key to abbreviations for breeding codes (the same codes are used in Table 2). In all three tables common names and species order follow AOU (2016).

Table 1 lists 61 species; 46 were confirmed as breeders (75%), 8 as probable (13%), and 7 as possible (11%).

Table 2 presents the 82 other species identified by the three sources. Breeding estimates by Foster 2016 and Evergreen 2008–2014 are based on deliberate observations. Because eBird 2007–2016 gives few breeding records for its species, estimates of breeding from this source were made by noting which species were located in the approximate location of Lair o' the Bear Park in the Evergreen block of Wickersham (2016). However, field workers in Wickersham (2016) did not routinely indicate where in the priority block they found birds. While Lair o' the Bear is an obvious hotspot to search, other nearby locations within that priority block were also searched. Also, the lo-

cation of Lair o' the Bear on Wickersham's maps is not precisely determinable. (From study of comparable maps I placed it in the second full block down from the north boundary, and the first full block left from the eastern boundary, of Jefferson County.)

For these reasons the breeding estimates of the 35 species from eBird 2007–2016 in Table 2 are educated guesses. They provide the best available information, and are shown in *italic* print on the table. Wanting to use a breeding symbol for these 35 species that is distinct from the standard ones of Wickersham (2016), I have inserted a "+" in the appropriate column of the table. The letter O (for Observed) indicates those species found by eBird 2007–2016 that showed no breeding activity, according to the criteria described in the previous paragraph. For additional evidence on the likely presence and/or breeding status of some birds I referred to Andrews and Righter (1992). I dropped only one species (Ferruginous Hawk) from the many mentioned in eBird 2007–2016, and that only after conferring with the individuals who recorded it.

Table 3 illustrates habitat affiliations of the 77 species located by Foster 2016. eBird 2007–2016 does not show such affiliations. Though records of Evergreen 2008–2014 list species by habitat, they do not easily yield information about the annual movements of species within habitats.

Table 3's "Total" column gives the total observed abundance of each species for the year. The next 12 columns indicate observed abundance of each species for each month. Months, in the first horizontal row, are abbreviated by first letter followed by a number telling how many visits were made that month. The next three columns indicate habitat affiliations, divided into three sections, which accord more accurately with avian presence than the traditional four seasons. Thus Dec–Mar encompasses late winter and early spring; Apr–July is high spring and early summer; Aug–Nov is late summer, autumn, and early winter.

## Discussion

In general, the results show what every experienced birder knows: that even after multiple trips to the same location, different species continue to turn up. Therefore no list of species at a site can ever be considered complete. The results of this study are useful in providing data that can be compared to other similar sites, or at the same site at different times.

The three sources identified 143 species, but only 61 of those (43%) were found by all three sources. That shows a high degree of avian diversity at Lair o' the Bear, which is consistent with the vari-

ety of its habitats, and the large number of seasonal migrants that did not stay to breed. That the three sources recorded a total of 82 unique species (57%)—that is, found by only one of the three sources—reinforces the same conclusion.

In Study Area, I listed species of trees, shrubs, and flowers, to provide a sample of the flora of the area. The flora mentioned are based on two unpublished lists produced by Pam Little during 2016. The first is a list of 124 trees, shrubs, flowering plants, and other miscellaneous flora for the Park itself. She also documented 43 plants on the dry slope north of the Park, outside the Park boundary but a part of the ecosystem of Bear Creek watershed, which was included in the avian survey of Foster 2016. Pam's lists are based on observations over many years. The sample flora mentioned does not assume any specific relationships between particular flora and particular birds noted in or near the same habitats.

#### **ACKNOWLEDGMENTS**

I want to thank all 91 individuals who assisted me in carrying out avian visits during 2016 on 38 different days. I will not list all the participants, but I should mention a few: Peter Spanberger (14 visits), Felice Lyons (12), Deborah Ostergard (11), Cheryl Ames (9), David Black (9), Karen Eberhardt (7), Pam Little (6), Charlotte Howland, Cynthia Lehr, Barbara Nash, Lorraine Niemela, Jim Wade (each 4), and Susan Krause (3).

As one of the volunteers in my study, and herself a leader of natural history trips for Jefferson County Open Space, Pam Little provided valuable information on the flora of Lair o' the Bear Park.

Jim Derby, my longtime friend and a professional geologist, visited me during part of June 2016, specifically to explore and explain the geology of the Park.

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Table 1

Species	Observed	Possible	Probable	Confirmed
Mallard				FL
Mourning Dove			T	
Black-chinned Hummingbird				FL
Broad-tailed Hummingbird				ON
Great Blue Heron				FL
Turkey Vulture		#		
Cooper's Hawk				FL
Northern Goshawk		#		
Red-tailed Hawk				NY
Golden Eagle			T	
Belted Kingfisher				CF
Downy Woodpecker				CF
Northern Flicker				FL
American Kestrel			T	
Western Wood-Pewee				FL
Cordilleran Flycatcher				FF
Say's Phoebe			T	
Western Kingbird				FL
Plumbeous Vireo				NB
Warbling Vireo				FF
Steller's Jay				FL
Woodhouse's Scrub-Jay		#		
Black-billed Magpie			T	
American Crow				FL
Common Raven			C	
Tree Swallow				CF
Violet-green Swallow				FF
Northern Rough-winged Swallow				FL
Barn Swallow				FF
Black-capped Chickadee				FF
Mountain Chickadee				FL
Red-breasted Nuthatch		X		
White-breasted Nuthatch				FF
Pygmy Nuthatch				CF
House Wren				FF
Blue-gray Gnatcatcher				FL
American Dipper				FL
Ruby-crowned Kinglet				FL
Townsend's Solitaire				FL
American Robin				FL
Gray Catbird				FF
Cedar Waxwing				FF
House Finch				FF

Table 1, continued

Species	Observed	Possible	Probable	Confirmed
Lesser Goldfinch				NY
American Goldfinch				FL
Orange-crowned Warbler				FF
Virginia's Warbler		X		
MacGillivray's Warbler				FL
Yellow Warbler				FL
Yellow-rumped Warbler				NB
Green-tailed Towhee			T	
Spotted Towhee				FL
Chipping Sparrow			T	
Song Sparrow				FF
Dark-eyed Junco		X		
Western Tanager				FF
Black-headed Grosbeak				FL
Lazuli Bunting				FL
Common Grackle		#		
Brown-headed Cowbird				FL
Bullock's Oriole				FF
Breeding Codes				
0 = migrants, nonbreeders at site	T = territorial behavior		ON = occupied nest	
# = in suitable nesting habitat	C = courtship, copulation, feeding		CF = carrying food	
X = < 7 singing males	NB = nest building		FF = feeding fledgling	
M = > 7 or more singing males	FL = fledged recently		NY = nest with young	
P = obvious pair				

Table 2

Species	Observed	Possible	Probable	Confirmed
Canada Goose				FL
<i>Blue-winged Teal</i>			+	
<i>Green-winged Teal</i>	0			
Rock Pigeon		#		
<i>Eurasian Collared-Dove</i>				+
<i>Yellow-billed Cuckoo</i>	0			
Common Nighthawk		#		
White-throated Swift		#		
<i>Calliope Hummingbird</i>	0			
Rufous Hummingbird	0			
Spotted Sandpiper			T	



Table 2, continued

Species	Observed	Possible	Probable	Confirmed
Double-crested Cormorant	0			
American White Pelican	0			
Black-crowned Night-Heron			T	
Osprey	0			
Bald Eagle	0			
Northern Harrier	0			
Sharp-shinned Hawk				FL
Broad-winged Hawk			T	
Swainson's Hawk		#		
Lewis's Woodpecker	0			
<i>Williamson's Sapsucker</i>	0			
<i>Red-naped Sapsucker</i>	0			
Hairy Woodpecker		#		
<i>Amer Three-toed Woodpecker</i>	0			
Merlin	0			
Peregrine Falcon		#		
Prairie Falcon		#		
Olive-sided Flycatcher			T	
<i>Willow Flycatcher</i>	0			
<i>Least Flycatcher</i>			+	
<i>Hammond's Flycatcher</i>	0			
Dusky Flycatcher				FL
<i>Eastern Kingbird</i>			+	
Loggerhead Shrike	0			
<i>Red-eyed Vireo</i>		+		
Blue Jay	0			
<i>Bank Swallow</i>			+	
Cliff Swallow				FF
Juniper Titmouse	0			
Bushtit			M	
Brown Creeper		X		
Rock Wren		#		
<i>Canyon Wren</i>				+
<i>Winter Wren</i>	0			
<i>Golden-crowned Kinglet</i>	0			
Western Bluebird			P	

Table 2, continued

Species	Observed	Possible	Probable	Confirmed
Mountain Bluebird				NY
Swainson's Thrush		#		
Hermit Thrush				FL
<i>Brown Thrasher</i>	0			
<i>Sage Thrasher</i>	0			
<i>European Starling</i>				+
<i>House Sparrow</i>				+
Cassin's Finch		X		
Red Crossbill		X		
Pine Siskin				NB
<i>Evening Grosbeak</i>				+
Ovenbird		X		
<i>Northern Waterthrush</i>	0			
Black-and-white Warbler	0			
<i>Common Yellowthroat</i>			+	
<i>American Redstart</i>			+	
<i>Northern Parula</i>	0			
<i>Prairie Warbler</i>	0			
Townsend's Warbler	0			
<i>Wilson's Warbler</i>	0			
Yellow-breasted Chat				FL
<i>Brewer's Sparrow</i>				+
Vesper Sparrow		X		
Savannah Sparrow		X		
Fox Sparrow	0			
<i>Lincoln's Sparrow</i>	0			
<i>White-throated Sparrow</i>	0			
White-crowned Sparrow	0			
Rose-breasted Grosbeak			T	
<i>Blue Grosbeak</i>				+
Indigo Bunting		X		
Red-winged Blackbird		X		
<i>Western Meadowlark</i>				+
<i>Brewer's Blackbird</i>				+
<i>Great-tailed Grackle</i>			+	

Table 3

Species	Total	J3	F3	M3	A3	M5	J3	J3	A3	S3	O3	N3	D3	Dec-Mar	Apr-Jul	Aug-Nov
Mallard	31			9	2	9	9					2		OWS	OWS SL FO	MR
Mourning Dove	7					3		3	1						MC	MC RT
White-throated Swift	8					8									RT	
BI-chinned Hummingbird	4					1	3								MS MR SMC MC	
BI-tailed Hummingbird	73					19	12	18	21	3					URB MC MS MR MD PP MG	MD MS MR
American White Pelican	3						3								FO	
Great Blue Heron	10					2	4	2	1	1					FO	FO
Turkey Vulture	7				1	3	3								MS FO	
Osprey	1										1					FO
Bald Eagle	1			1										RT		
Northern Harrier	3														MG MS	
Sharp-shinned Hawk	5								3			1	1		MG	MC, MR
Cooper's Hawk	1					1									MC	
Northern Goshawk	1												1		MC	
Swainson's Hawk	1						1								MS	
Red-tailed Hawk	45	2	3	4	3	2	2	5	2	6	6	5	5	MS RT MG MD	RT MS MG	RT MS MC MR, MG
Golden Eagle	3														FO	
Belted Kingfisher	4							1	1	2					MR	MR
Lewis's Woodpecker	1									1						PP
Downy Woodpecker	19			2	3	2	1				7	3	1	MD MC	MC MD MR	MD MR
Northern Flicker	24			4	6	1			1	2	4	5	1	MR MD	MC MR MD	PP MC MD, MG

Table 3, continued

Species	Total	J3	F3	M3	A3	M5	J3	J3	A3	S3	O3	N3	D3	Dec-Mar	Apr-Jul	Aug-Nov
American Kestrel	3	1									1	1	MS MG			MS
Merlin	1	1												RT		
Prairie Falcon	1										1					MS
Western Wood-Pewee	18						6	6	6						MC MR MS MD MG	MC MR
Cordilleran Flycatcher	11					1	3	7							MR SL MC	
Say's Phoebe	3										3					MS
Western Kingbird	3					2				1					MS	MS
Plumbeous Vireo	18					1	11	5	1						MC	MC
Warbling Vireo	38					1	28	4	5						MR MC MS	MD
Steller's Jay	52			4	9	2	1	2	9	14	4	6	1	MC MD	PP URB MG MR MC MD	MD MS MC MR
Blue Jay	1										1					MR
Woodhouse's Scrub-Jay	7						1		1	3		2			MR	MC MR MD MS
Black-billed Magpie	38	5	3		1	1	2	1	8		10	3	4	MD MC MS MG	MC MS RT	PP RT MS MD MC
American Crow	113	2	4	9	12	3	4	6	31	24	7	9	2	FO MG	URB FO MC	MD MC URB RT MR MS
Common Raven	28	1	5					1	3	12	6			RT MS MC	MS	RT MG FO
Tree Swallow	10					4		3	3						MR MD	MC
Violet-green Swallow	34					8	20	6							MS MR URB MG	
N. Rough-winged Swallow	6					1	4	1							MR MG	
Barn Swallow	9					3	2	3		1					MR MS MG	MG
Black-capped Chickadee	146	3	12	15	6	20	5	12	12	11	18	23	9	SMC MD MS MR	MD MG MC URB MR	MD MS MC MR
Mountain Chickadee	60	12	3	14	12	8	2		3	3		3		MD PP MC	MD MC	MS MC



Table 3, continued

Species	Total	J3	F3	M3	A3	M5	J3	J3	A3	S3	O3	N3	D3	Dec-Mar	Apr-Jul	Aug-Nov
Yellow-rumped Warbler	9					3	1				5				MD MR	MR
Townsend's Warbler	1									1						PP
Green-tailed Towhee	7					2	3	2							MS URB MD PP	
Spotted Towhee	114			3	18	37	29	14	7	3	1	2		MD MC MS	MR MS MC MD URB MG	MS MR MC
Chipping Sparrow	4						1			1	2				MD	MG MD MS
Song Sparrow	84			13	6	19	7	10	9	7	3	7	3	MR MD MS SMC	MR MC MS MD SMC	MR MS MD
Dark-eyed Junco	67	3	4	5	2						8	45		MR MC MS	MR	MD MS MR MC
Western Tanager	15					5	5	2	3						MR MC MS	MC
Black-headed Grosbeak	42					21	17	3	1						PP MC MD MR	MC
Lazuli Bunting	1					1									MD	
Common Grackle	1														MC	
Brown-headed Cowbird	4					1	1	2							PP MD MC	
Bullock's Oriole	10					4	4	2							MD MR URB MG MC	
Total	2262	309	74	126	118	334	305	231	196	173	166	171	59			
Species, each month		14	14	20	24	53	46	39	34	33	29	25	16			

Habitats
AG = aspen grove
CL = cliff
FO = flying over
MC = mixed conifer
MD = mtn deciduous
MG = mtn grassland
MR = mtn riparian
MS = mtn shrub
MSB = bridge
OWS = stream
PP = ponderosa pine
RT = ridge top
SL = shore line
SMC = mid elevation carr
URB = urban