

**Bird Surveys on Davidson Mesa,  
Aquarius, and Walnut**

**Properties**

**June 2016**

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## **Western Meadowlark**

**(Dr. Kerrie Bryan, Longmont, CO)**

## **Introduction**

Quantitative bird surveys were conducted on three Louisville Open Space properties in late June of 2016: Walnut, Aquarius, and Davidson Mesa. These surveys were done in order to determine what species are foraging and (or) breeding in these areas. Late spring to early summer is the best time to census birds, because most resident and migrant (those that winter to the south and return to Colorado to breed in the summer) birds are nesting and raising their young.

All surveys began within one-half hour of sunrise and ended about 7:15 AM, because birds are most active in the early morning- whether singing, building a nest, or feeding young. The transect method of counting birds was used in all three areas. All birds with the exception of nestlings or dependent young that were heard or seen within 100 m of each transect were counted. Birds flying over the observer were also counted. Care was taken not to record the same bird twice.

An unusually high amount of moisture fell in the area during the spring, making it one of the wettest on record.

## **Walnut**

Walnut is a rectangular-shaped, 6.6-acre parcel surrounded by residential property (Fig. 1). A paved trail winds through the area. The Goodhue Ditch, which is lined by shrubs and trees, borders the northern side of the property. The ditch was full and flowing fast on the day of the counts.

Meadows dotted by sparse scattered trees and shrubs constitute about 75% of the property. Trees include cottonwood, apple, spruce, juniper, Russian olive, and mountain ash. Grasses were waist to shoulder high and matted-down areas of grass revealed where deer had bedded down the night before.

## **Bird Counts**

Birds were recorded along two roughly east-west, 183 m transects (Fig. 2 and 3). Transect 1 travels through a grassy meadow with a few, clustered trees and shrubs in the last half. Transect 2 lies parallel to and just south of the northern boundary of the property and goes through relatively thick stands of trees and shrubs for more than half its length.

**Transect 1** produced 47 individuals of 15 species. The most abundant species were the brown-headed cowbird, European starling, and lesser goldfinch. The female cowbird is opportunistic as she lays her eggs in almost any available nest. Lesser goldfinches were flocking and foraging in the area preliminary to their breeding in the foothills during July. Along **transect 2**, 69 individuals of 16 species were counted. Robins and house finches were, by far, the most common species. The cormorant was seen flying towards Harper Lake, and the great blue heron was fishing in the irrigation ditch.

A total of 119 individuals of 23 bird species were recorded during both transects (Table 1). The Swainson's hawk seen at dawn was nesting in a large pine on Jackson Circle, just north of the property. Two juvenile great-horned owls that were sitting in a Russian olive had fledged from a nest on Hoover Street, a block west of the property.

A spotted towhee and a black-capped chickadee are shown on Figures 5 and 6.

### **Discussion**

The fact that 23 species were found in Walnut during the breeding season attests to the diversity and richness of the habitat and the proximity of this property to water. Two nests were found during the count. About 50 percent of the species on Table 1 are thought to breed in the property, because the males were being "territorial" by singing in the area.



**Figure 1.** Bird's eye view of transect 1 (183.5 m), Walnut.



**Figure 2.** Bird's eye view of transect 2 (183.2 m), Walnut.



**Figure 3.** Looking east along transect 1, Walnut.



**Figure 4.** Looking west along transect 2, Walnut.



**Figure 5.** Spotted towhee. (Dr. Kerrie Bryan)



**Figure 6.** Black-capped chickadee.

**Table 1**  
**Walnut Bird Transects**

<b>Species</b>	<b>Transect 1</b>	<b>Transect 2</b>	<b>Breeding*</b>
Double-crested cormorant		1	
Great blue heron		1	
Swainson's hawk	1		
American kestrel	1		?
Eurasian collared-dove	3		x
Mourning dove	1		x
Downy woodpecker		1	x
Northern flicker		1	x
Blue Jay		6	x
American crow	6	1	
Black-capped chickadee		3	x
White-breasted nuthatch	1		x
House wren	1	3	x
American robin		14	x
European starling	9	3	x
Spotted towhee		1	x
Red-winged blackbird	1		
Common grackle	2	8	
Brown-headed cowbird	9	4	x
House finch	2	14	x
Lesser goldfinch	8		
American goldfinch	1	5	
House sparrow	1	3	

**Total species:**      **23**                      15                      16  
**Total individuals:** **116**                      47                      69

**25-Jun-16**                                      5:30-6:00 AM    6:05-6:55 AM  
Partly cloudy, calm, 17-18 deg. C

\* Probable breeder



## Davidson Mesa Open Space

On Davidson Mesa, approximately 246 acres of grassland designated as Open Space, lie on a relatively flat pediment surface that is blanketed by coarse gravel and pebbly alluvium of Verdos age. The Verdos alluvium has been dated as being ~ 600,000 yr. old by radiometric age determinations on the Lava Creek B volcanic ash, which is a thin layer in the alluvium (Riihimaki et al., 2002). The Upper Cretaceous Fox Hills Sandstone underlies the Verdos alluvium. The alluvium has been covered by a veneer of material, which was excavated to form the Harper Lake basin across McCaslin Boulevard, over much of the eastern part of the Open Space property.

A mixture of native and non-native grasses has developed on the allocthonous material. Native grasses are dominated by western wheatgrass and include other grasses, such as wild buckwheat, slender wheatgrass, and fringed sage. Intermediate wheatgrass dominates the non-native species and is locally joined by smooth brome, Japanese brome, alfalfa, orchard grass, crested wheatgrass, yellow sweetclover, field bindweed, and Kentucky bluegrass (Dave Buckner, personal communication, 2016).

Soil developed in the Verdos alluvium north of the disturbed area contains abundant cobbles and pebbles from the Fox Hills Sandstone. Grasses typical of xeric tall grass prairie, such as big blue stem, needle-and-thread, Colorado green thread, wild buckwheat, fringed sage, june grass, Pacific sage, grow in the soil. Yucca and prickly pear cactus are scattered in the grasslands. Non-native species include cheatgrass, Canada bluegrass, mullein, alyssum, and Dalmatian toadflax.

### **Bird counts**

Three 200-meter transects were laid out in the eastern part of the mesa (Figs. 7 and 8). Due to large amounts of rain during the spring, many grasses were waist to shoulder high when the bird counts were done. Results of the three bird counts are shown on (Table 2).

The beginning of **transect 1** is about 50 m southwest of the parking lot for Davidson Mesa and 25 m west of the trail, which heads west from the parking lot. This transect lies entirely on the transported material. Not one tree and only one small wild rose bush are in the transect area. The end of transect 1 is by a power pole on which there is an American kestrel box (Fig. 9).

Fifty-three individuals of 17 species were observed, including a pair of starlings nesting in the kestrel box. Western meadowlark is the only species that was actually nesting in the grassland. The rest were visitors that were breeding in areas adjacent to the Open Space. At dawn, many birds (i.e., Say's phoebes, western kingbirds, and barn swallows) were hawking insects just over the tops of the grasses.

**Transect 2** lies on soil developed in undisturbed Verdos alluvium, and the wide variety of native grasses and forbs reflect this change in substrate (Fig. 10).

Fifty-six individuals of 19 bird species were recorded during the count. Three of these species -- western meadowlark, vesper sparrow and grasshopper sparrow -- were nesting, and the rest were visitors. A small colony of grasshopper sparrows was nesting where mullein provided perches from which males could sing. Two pairs of vesper sparrows had placed their nests under small bushes. Singing and foraging meadowlarks were plentiful. Just west of the transect, a pair of Swainson's hawks was nesting in an evergreen on private property. The hawks hunted for insects, snakes, and an occasional prairie dog in the grasslands.

**Transect 3** extends from the northern edge of Davidson Mesa downslope to a flat area and then on to the Davidson Ditch (Fig. 11). It is mapped as "native grassland – nearly intact" (Louisville Master Plan, 2004).

On the rocky slope, native grasses, such as needle- and-thread grass, Indian rice grass, hairy grama, blue grama, Junegrass, sunsedge, Canada bluegrass, cord grass, green milkweed, little bluestem, big bluestem, and purple threeawn can be found (Louisville Open Space Master Plan, 2004; Steve Jones, personal communication, 2016). Abundant yucca and prickly pear cactus are present. Invasive grasses include Kentucky bluegrass, crested wheatgrass, Japanese brome, and cheatgrass.

At the base of the slope where the terrain flattens, varying non-native mixtures of crested wheatgrass, Canada bluegrass, Kentucky bluegrass, and mullein are found as well as a few medium-sized bushes and small trees. Baltic rush, tall fescue, Canada thistle, and broadleaf cattail occur in wetlands just before the Davidson Ditch, which borders the northern edge of the open space. Mature cottonwoods grow next to the ditch.

Ninety individuals of 30 species were observed along transect 3-- many more than on the other transects. Western meadowlark, vesper sparrow, ring-necked pheasant, and mourning dove were the only species nesting in the grassland. House finches foraging in the grasses were again the most abundant species. The pair of pheasants was probably nesting in the area, because pheasants have consistently been seen in this area in past years. These birds may be progeny of pheasants released (along with other game birds) in the 1980s by a farmer who lived about 0.8 km to the north along Eggleston Road west of 76<sup>th</sup> Street. Two fledgling great horned owls were observed in a cottonwood tree along the ditch after the count.



**Figure 9.** Transect 1 goes from the white stake in the center of the picture to the pole with a light-colored bird house on its side.



**Figure 10.** Transect 2 proceeds from the white stake to the evergreens. A Swainson's hawk nested in the pines.



**Figure 11.** Looking downslope along transect 3 towards the northwest. Long's Peak is the highest peak in the distance. The transect ends at the dark brown field.

## Discussion

Most birds using the grassland along transect 3 reflect the wide variety of trees and shrubs and the presence of water adjacent to the northern end of the Open Space. These species are visitors to the grasslands and nest in the residential areas bordering the Open Space. Many of these species were seen catching insects (i.e., Say's phoebes, western kingbirds, and swallows) in the grassland. Others (i.e., orioles, magpies, house sparrows, house finches) were eating seeds of various grasses and perching on stalks of yucca or mullein.

### Comparison of Results: 2016 vs. 2012

There was a large difference in the amount of precipitation from January 1st to June 30 in 2016 vs. 2012. In 2016, the total precipitation was 33.88 cm as compared to a scant 14.73 cm recorded during the same period in 2012 (NOAA, 2016). Only 0.03 cm of precipitation fell in March of 2012, the least amount on record since 1893. On the other hand, the 9.75 cm of precipitation that accumulated in March 2016 was well above the March average (NOAA, Earth System Research Laboratory, 2016).

Grasses were waist to head high in June 2016 as a result of abundant spring moisture. In contrast, grasses were barely knee-high in June 2012 due to a dry spring.

Despite differences in moisture, the number (27) of bird species tallied in 2012 vs. 2016 was identical (Table 4). This coincidence is probably due to the fact that many species were visitors from properties adjacent to the grasslands. Differences in precipitation did not affect these visitors, because residential areas are watered artificially in addition to receiving natural precipitation.

Oddly, the count from each year has seven species that were not recorded in the other year's count. For instance, double-crested cormorant, tree swallow, pine siskin, American kestrel, yellow warbler, blue grosbeak, and downy woodpecker were recorded in 2012, but not 2016. The first four species were "flyovers" and the last three were nesting in the area. American crow, ring-necked pheasant, grasshopper sparrow, Swainson's hawk, black-capped chickadee, and brown-headed cowbird were recorded in 2016, but not 2012. The crow was a flyover; the pheasant and grasshopper sparrow were nesting in the grassland; and the Swainson's hawk (Fig. 12), chickadee, and cowbird were nesting on private property adjacent to the Open Space. The grasshopper sparrow is a grassland species that apparently reacted favorably to the more prolific vegetation in 2016.

The major difference between the two years is that 199 individuals were counted in 2016 vs. only 98 in 2012. The house finch was the most common bird in both years; however, the total number of finches is quite disparate — 56 were seen in 2016 vs. 15 in 2012.

The low number of individual birds in 2012 was probably the result of drought conditions, whereas the relatively high number in 2016 was, at least in part, the result of extraordinarily wet spring conditions.

At least two small colonies of grasshopper sparrows (Fig. 13) nested on the Mesa in 2016, but not in 2012. This is very good news, for between 1966 and 2014, this sparrow suffered a cumulative decline of 75% as reported by the North American Breeding Bird Survey (USGS Patuxent Wildlife Research Center, 2014). This sparrow was also listed as “A Common Bird in Steep Decline” in 2014 (North American Bird Conservation Initiative, 2014).

Later in the summer lark buntings and sage thrashers, two keystone grassland species, visited the relatively intact grassland along transect 2 during their post-breeding migration.



**Figure 12.** A Swainson's hawk straddles a prairie dog on Davidson Mesa.



**Figure 13.** Grasshopper sparrow.  
(VIREO photo)

**Table 2**

**Davidson Mesa**

<b>Species</b>	<b>Transect 1</b>	<b>Transect 2</b>	<b>Transect 3</b>	<b>Breeder*</b>
Ring-necked pheasant			2	x
Swainson's hawk		1		
Eurasian collared-dove	5	5	4	
Mourning dove			3	x
Northern flicker			2	
Say's phoebe	2	1		
Western kingbird	2	1	1	
Blue jay	1		2	
Black-billed magpie	3	5	4	
American crow	1			
Barn swallow	1		2	
Black-capped chickadee			2	
House wren		2	2	
American robin	3	3	7	
European starling	6	3	2	
Spotted towhee		1	1	
Vesper sparrow	1	3	1	x
Grasshopper sparrow	1	3		x
Red-winged blackbird	1	2	1	
Western meadowlark	8	9	2	x
Common grackle	1	1	3	
Brown-headed cowbird		2	1	?
Bullock's oriole	1	1	1	
House finch	15	12	29	
Lesser goldfinch	1	1	4	
American goldfinch			8	
House sparrow		3	6	

**Total species: 27                      17                      19                      23**  
**Total individuals: 199                      53                      56                      90**

5:30-6:15 AM                      5:15 AM-7:15 AM  
6/27/2016                                      6/26/2016  
18 degrees C                                      14 -18 degrees C

\* Probable breeder

## Aquarius Open Space

At 34.5 acres, Aquarius is one of the smallest Louisville Open Space properties (Fig. 14). It is located south of Empire Road, just north of highway 42. It is bordered by other Open Space properties on the east, north, and west, on the south by the Colorado Technical Center, and on the southeast by the Louisville and Coal Creek Cemeteries.

Two types of native grasslands are found at Aquarius: (1) the grassland on the north-facing slope that is dominated by needle-and-thread grass, and (2) the grassland on the lower slopes that is characterized by western wheatgrass (Louisville Open Space Master Plan, 2004). A prairie dog town lies in a thin strip along the northern border of the property from the western edge two-thirds of the way to the eastern edge. Yucca and prickly pear cactus are common along transect 1. Invasive species include cheatgrass, Scotch thistle, diffuse knapweed, chicory, and Japanese brome. A few large cottonwood trees lie at the end of transect 2.

### Bird counts

Birds were surveyed along two roughly east-west transects, each 200 m in length. (see Fig. 14). The results of the bird counts are shown on Table 3.

Thirty-one species and 121 individuals were recorded along transect 1 (Fig. 15). Of these, only the western meadowlark, vesper sparrow, and western kingbird were nesting in the Open Space grassland.

Most bird species counted along transect 2 (Fig. 16) were breeding on adjacent properties. For instance, cliff swallows had nests on the ceilings of the two nearby Coal Creek underpasses under Highway 42. A pair of red-tailed hawks was nesting in a large cottonwood to the west within sight of the Aquarius property. In some years, kingfishers have burrowed into and raised young in the high southern bank of Coal Creek less than 0.4 km upstream from Aquarius. The snowy egret and great blue heron were breeding some distance away, because habitat suitable for their nesting is not locally available.

Black-billed magpies (Fig. 17) and western kingbirds (Fig. 18) were commonly seen perching on tall plants in this grassland habitat.

### Discussion

Although too small an Open Space property to provide nesting habitat for many birds, Aquarius provides prime foraging areas for many species, because insects, seeds, small mammals, amphibians, and reptiles are found there. Even water birds use the grasslands as foraging areas, for the great blue heron is known to occasionally nab a baby prairie dog (Hansley, personal observation, 2014), and mallards commonly graze on grass.





**Figure 14.** Aquarius Open Space is outlined in blue and transects 1 and 2 appear as red lines. Coal Creek, which is lined with bushes and trees, is part of the northwestern Open Space boundary. The Coal Creek Trail is the sinuous white-gray line that cuts through the middle of the property. The parking lot is a pentagonal white area just above Highway 42.



**Figure 15.** Looking west along transect 1 that lies left of the trail.



**Figure 16.** Transect 2 heads east toward the trees.



**Figure 17.** Black-billed magpie on yucca. (Lynda Kithil, Louisville)



**Figure 18.** Western kingbird on mullein. (Lynda Kithil, Louisville)

**Table 3  
Aquarius**

Species	Transect 1	Transect 2	Breeder*
Mallard		1	
Great blue Heron	1		
Snowy egret	1		
Red-tailed hawk	1	1	
American kestrel	1		
Killdeer	2	1	
Mourning dove	2		x
Eurasian collared-dove	3	6	
Belted kingfisher	1		
Northern flicker	1	1	
Western kingbird	1	2	x
Blue jay	4	2	x
Black-billed magpie	2	1	
American crow	2	3	
Violet-green swallow	2		
Cliff swallow	2	5	
Barn swallow	1		
Black-capped chickadee	1		
House wren	2	1	
American robin	3	3	
European starling	2		
Vesper sparrow	1	3	x
Blue grosbeak		1	
Red-winged blackbird	1	13	
Western meadowlark	5	2	x
Common grackle	3		
Brown-headed cowbird		1	x
Bullock's oriole	1	1	x
House finch	2	15	
American goldfinch	3	3	
House sparrow	2	4	
<b>Total Species</b>	<b>31</b>	<b>21</b>	
<b>Total Individuals</b>	<b>123</b>	<b>70</b>	

**26-Jun-16**

5:30-6:10 AM

6:15-6:50 AM

Partly cloudy, calm, 20 - 22 degrees C

\* Probable breeder

## **Discussion and Conclusions**

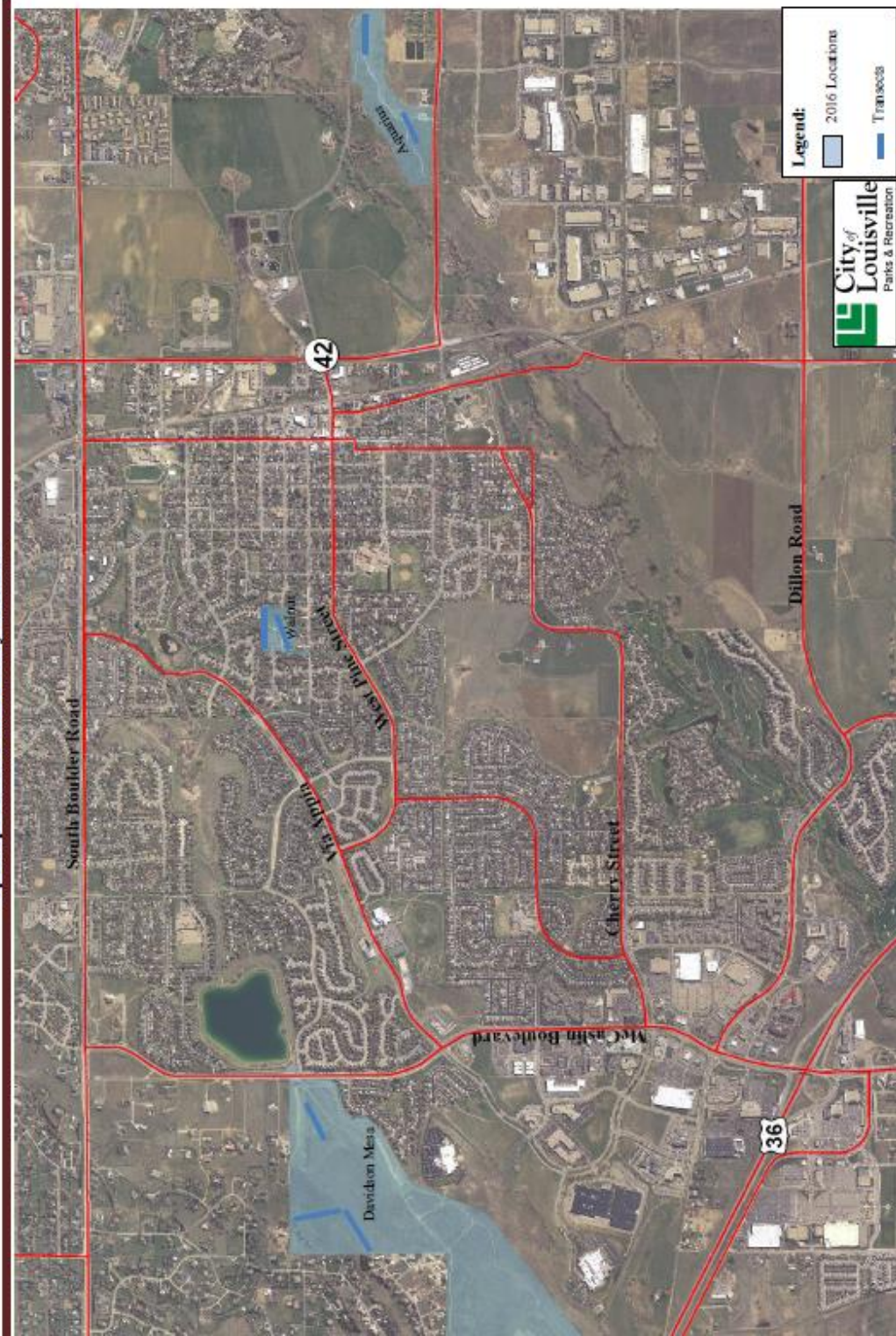
A cooler than average May caused many bird species to nest at least a week late so that the end of June was a perfect time for counting birds. One of the wettest springs on record furnished abundant moisture that ensured optimal growth of vegetation and an abundant food supply.

The average temperature in Boulder County in June 2016 was  $-13.8^{\circ}\text{C}$  higher than normal even though the daily minimum temperature averaged  $-13.9^{\circ}\text{C}$  lower than average. Furthermore, June 2016 was one of the driest on record with precipitation 3.6 cm below average (AccuWeather, 2016).

These favorable weather factors strongly contributed to the excellent numbers of bird species and individuals observed on all three Open Space properties. A comparison can be drawn because there are now two years of bird data for Davidson Mesa so that one now has a better idea of what birds could be expected in June.

There are no bird counts from previous years to use as bases for comparison for the bird counts completed in 2016 on Aquarius and Walnut properties. It would be valuable to have at least another year of bird surveys in the future on these Open Space properties with which to compare the results of 2016.

Open Space 2016 Bird Survey Locations



## References Cited

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