
2018 Avian Surveys
**Bullhead Gulch, Harper Lake, and North Open
Space**
City of Louisville, Colorado

prepared for:

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1. Introduction

The City of Louisville, Colorado Open Space Division contracted Wildlife Specialties LLC to conduct avian surveys at three Open Space Properties: Bullhead Gulch, Harper Lake and North Open Space (Figure 1) in the late spring/early summer of 2018. All three Open Spaces surveyed are surrounded on all sides by residential and commercial development; North Open Space is the largest of the three and therefore feels more ‘wild’ than the other two. Of the three, Harper Lake is the only property that has wildlife habitat connectivity to other Open Space properties – Davidson Mesa to the west across North McCaslin Boulevard and Coyote Run to the east. All of the properties are heavily used for recreation and exercise. Almost all of the activity occurs on the designated trails. Some social trails are present at both Harper Lake and North Open Space; none are present at Bullhead Gulch.

2. Methods

The City of Louisville Request for Proposals for conducting the surveys called for the number and type of avian survey used at each Open Space. Two survey methods were used in the 2018 surveys: point counts ($n = 7$) and line transects ($n = 3$). Both the point counts and the line transects were surveyed twice with approximately seven (7) days between the two surveys. Two avian line transect surveys were conducted at North Open Space and one at Bullhead Gulch; no line transect surveys were conducted at Harper Lake. Two point count locations were at Bullhead Gulch and five were at Harper Lake; no point counts were conducted at North Open Space.

Point count strengths and weaknesses are as follows:

- Time is available to spot and identify shy and/or hard to observe species.
- Adaptable to species specific surveys (e.g. Southwestern Willow Flycatchers) and habitats (more dense and diverse habitats).
- Double counting (counting the same bird twice) is a concern (a bird could be detected visually or aurally in one location and move, undetected, to a different location where it is then again unknowingly detected and recorded as a new detection).
- Time is “lost” while moving between point count stations.

Line transect have their strengths and weaknesses as well:

- More area is surveyed more quickly as the surveyor slowly walks each transect.
- Adaptable to species and habitats (better for more open habitats).
- Double counting is a minor problem.
- Adequate for habitat studies.

The main assumption of line transect surveys is that detectability remains constant (Bibby et al. 2000). Line transects are often done in large open areas with little cover. This is preferred over point counts in open areas because more birds are observed over the same unit of time while moving. Transect location is usually based on access and are often systematically located to provide a representative sample of the survey area. Preselecting transect locations allowed for positioning the transects to intersect with as many habitat types as possible while maintaining sufficient distance between transects so there would be less chance of double counting birds. Each transect was slowly walked with the surveyor being observant of avian activity within 150 meters (parallel) to each transect. Detections beyond that distance were not recorded. When a bird was observed ahead of the surveyor the distance was estimated from the transect, not from the observer. All distance was measured using a Leupold© LASER range finder.

Although line transects can provide advantages over fixed radius point counts, point counts are more applicable in situations where auditory detections will be incorporated into the analysis, such as in denser habitats where a bird may be heard but not visible. Counts were conducted at each location for 5 minutes. The linear distance from the observer to each bird detected was measured.

Distance sampling was incorporated into the data collections because it is an efficient way to estimate bird density and can provide a measure of bird 'detectability'. However, good density estimates require 60-80 bird detections for line transects and 80-100 detections for point transects. Marsden (1999) stated that a reasonable number of detections are required for adequate analysis. Buckland et al. (1993) recommended at least 60-80 detections be required for fitting the detection function in program DISTANCE. Numbers lower than 60 may be vulnerable to stochastic factors such as a total of 20 detections of one species all occurring very close to the point; this 'spike' in sighting distance would be problematic in analysis. If the data are of high quality, then reliable estimates may be possible for smaller detection samples (Rosenstock et al., 2002).

3. Environmental Setting

The three Open Space properties have all been converted from native shortgrass prairie into agricultural lands (likely both as rangeland or dryland/irrigated farming) and there is no native habitat present. All surrounding lands are modified as well with commercial and residential development, roads, etc. Irrigation ditches and stormwater drainage structures provide aquatic and riparian habitat where none originally occurred. A description of each property is provided below:

3.1. Bullhead Gulch Open Space

Bullhead Gulch is principally a storm water drainage feature. The two point count locations are landscaped in a 'natural' style, with berms and evergreen trees planted in small clumps. The dominant species is the non-native invasive grass smooth brome (*Bromus inermis*) intermixed with crested wheatgrass (*Agropyron cristatum*). The gulch in which the line transect is located is dominated by smooth brome but it also features Russian olive (*Elaeagnus angustifolia*) and cattails (*Typha* sps) (Photo 1). At the east and west ends of Bullhead Gulch are concrete box culverts (CBC) that allow drainage under roads. These CBCs provide excellent Cliff Swallow (*Petrochelidon pyrrhonota*) nesting habitat. Nearby homes offer habitat for avian species commonly found near homes (e.g. House Wren - *Troglodytes aedon*). Figure 2 shows the point count and line transect locations.

3.2. Harper Lake Open Space

The Harper Lake Open Space is dominated by the lake with a green belt around the lake separating it from the surrounding homes and McCaslin Boulevard. The green belt is dominated by smooth brome but it also has several large and smaller regenerating plains cottonwood (*Populus deltoides*) and chokecherry (*Prunus virginiana*) trees (Photo 2). Near Point Count Station 05 there was a large patch of Canada thistle (*Cirsium arvense*). Landscaping at nearby homes was diverse and offered habitat for avian species commonly found near homes. Figure 3 shows the point count locations.

3.3. North Open Space

North Open Space is the largest of the three Open Space properties surveyed this year. It too is dominated by smooth brome but there are several wooded areas dominated by plains cottonwood trees intermixed with small stands of chokecherry and the occasional Chinese elm (*Ulmus parvifolia*) (Photo 3). The diversity of the Open Space in general is increased because of the presence of the Goodhue Ditch which provides foraging habitat for species such as swallows. The ditch also

provides water to support tree and shrub growth near the ditch in the process diversifying the habitat and making it attractive to a greater number of species. Figure 4 shows the North Open Space line transect locations.

4. Results

Surveys were conducted on June 15 and 22, 2018 at each Open Space property. All surveys were conducted from 30 minutes before sunrise until no later than 8:00 AM to maximize survey time during periods of high avian activity (Buskirk and McDonald, 1995; Sogge et al., 1997).

On both dates environmental conditions were optimal for conducting avian surveys. The reported temperature at 0438 hours on June 15 was 58°F with wind speeds between 0-4 miles per hour (mph) and visibility of 10 miles. On June 22 at 0441 hours it was 58° F with wind speeds between 0-4 mph and visibility of 10 miles. Both mornings were quiet with little traffic noise or other noises because of the early start time. Copies of the original data sheets are provided in Appendix A. Detection numbers were too low at each Open Space property to conduct distance sampling analysis.

4.1. Bullhead Gulch Open Space

The point count locations and line transect at Bullhead Gulch Open Space are shown in Figure 2. Table 1 provides the species detected and the number of individuals of each species detected during both surveys.

- Point Count Station BullGul01: Over the two surveys 28 individuals representing eleven species were detected; the dominant species was the Cliff Swallow (*Petrochelidon pyrrhonota*).
- Point Count Station BullGul02: Over the two surveys 25 individuals representing eleven species were detected; the dominant species was the American Robin (*Turdus migratorius*).
- Transect BullGul01: Bullhead Gulch transect 01 runs from east to west and at the nearest point on the south side of the transect homes are within approximately 20 meters. Species diversity was not as high as at the two point count stations. The dominant species, the Cliff Swallow, nest in CBCs located both east and west of the transect ends. Several hundred swallows could be seen on the wing at any one time, thus, it was not possible to attempt to determine accurately the number seen. A similar problem, but not with hundreds of individuals, existed in accurately counting the number of Red-winged Blackbirds (*Agelaius phoeniceus*). As the surveyor walked the transect from west to east adult and juvenile Red-winged Blackbirds would swarm the surveyor. Numbers of individuals following and harassing the surveyor increased as he traveled. To attempt to guard against double-counting of individuals the surveyor only recorded individuals observed directly in front of the surveyor. The number of individual Red-winged Blackbirds shown in Table 2 is a fair estimate. Over the two surveys 41 individuals (not counting Cliff Swallows) representing seven species were detected.

Table 1. Bullhead Gulch Open Space 2018 Avian Survey Results.

Transect or Point	Species	Number
Point 01	American Goldfinch <i>Spinus tristis</i>	3
	American Kestrel <i>Falco sparverius</i>	2
	American Robin <i>Turdus migratorius</i>	6
	Brewer’s Blackbird <i>Euphagus cyanocephalus</i>	2

Table 1. Bullhead Gulch Open Space 2018 Avian Survey Results.

Transect or Point	Species	Number
	Cliff Swallow <i>Petrochelidon pyrrhonota</i>	9
	Eurasian Collared Dove <i>Streptopelia decaocto</i>	1
	House Finch <i>Haemorhous mexicanus</i>	1
	House Wren <i>Troglodytes aedon</i>	1
	Mourning Dove <i>Zenaida macroura</i>	1
	Rock Dove <i>Columba livia</i>	1
	Spotted Towhee <i>Pipilo maculatus</i>	1
Point 02	American Goldfinch <i>Spinus tristis</i>	2
	American Robin <i>Turdus migratorius</i>	5
	Barn Swallow <i>Hirundo rustica</i>	4
	Brewer's Blackbird <i>Euphagus cyanocephalus</i>	1
	Eurasian Collared Dove <i>Streptopelia decaocto</i>	1
	European Starling <i>Sturnus vulgaris</i>	4
	Great-horned Owl <i>Bubo virginianus</i>	1
	House Finch <i>Haemorhous mexicanus</i>	1
	House Wren <i>Troglodytes aedon</i>	1
	Mourning Dove <i>Zenaida macroura</i>	3
	Rock Dove <i>Columba livia</i>	2
	Bullhead Gulch Transect No. 1	Cliff Swallow <i>Petrochelidon pyrrhonota</i>
House Finch <i>Haemorhous mexicanus</i>		1
Mourning Dove <i>Zenaida macroura</i>		4
Red-winged Blackbird <i>Agelaius phoeniceus</i>		31
Rock Dove <i>Columba livia</i>		3

Table 1. Bullhead Gulch Open Space 2018 Avian Survey Results.		
Transect or Point	Species	Number
	Say's Phoebe <i>Sayornis saya</i>	1
	Western Wood Peewee <i>Contopus sordidulus</i>	1

4.2. Harper Lake Open Space

The point count locations at Harper Lake Open Space are shown in Figure 3. Table 2 provides the species detected and the number of individuals of each species detected during both surveys.

- Point Count Station HarpLake01: Harper Lake Point Count Station 01 (HarpLake01) is located between Harper Lake and McCaslin Boulevard north of the Harper Lake parking lot. Most avian activity observed at this location was birds flying from or to the lake from west of McCaslin Boulevard. A large flock (approximately 143 counted on June 22) of resident Canada Geese (*Brantus canadensis*) was observed within 150 meters of HarpLake01. These individuals were also within 150 meters of HarpLake02. These were not counted again. Aside from the geese, the European Starling was the most observed species. These were frequently seen flying from a nest tree near HarpLake02 and private land west of McCaslin Boulevard.
- Point Count Station HarpLake02: Harper Lake Point Count Station 02 (HarpLake02) is located between Harper Lake and homes to the south. A total of 34 individuals representing 11 species were identified. Of these, the European Starling was the most observed species.
- Point Count Station HarpLake03: Harper Lake Point Count Station 03 (HarpLake03) is located between Harper Lake and homes to the south and east of HarpLake02. A total of 24 individuals representing 11 species were identified. Of these, the Barn Swallow was the most observed species.
- Point Count Station HarpLake04: Harper Lake Point Count Station 04 (HarpLake04) is located between Harper Lake and homes to the south and east of HarpLake03. A total of 23 individuals representing 9 species were identified. Of these, the Barn Swallow was the most observed species. A Cooper's Hawk (*Accipiter cooperii*) was observed in a conifer tree at the edge of the open space located approximately 55 yards south southwest of the point. In urban settings Cooper's Hawks will nest in conifers and it is possible that this one was or did nest at that location.
- Point Count Station HarpLake05: Harper Lake Point Count Station 05 (HarpLake05) is located between Harper Lake and homes to the east and north of HarpLake04. A total of 15 individuals representing seven species were identified. Of these, the Mourning Dove (*Zenaida macroura*) was the most observed.

Table 2. Harper Lake Open Space 2018 Avian Survey Results.		
Transect or Point	Species	Number
HarpLake01	American Robin	2

Table 2. Harper Lake Open Space 2018 Avian Survey Results.

Transect or Point	Species	Number
	<i>Turdus migratorius</i>	
	Barn Swallow <i>Hirundo rustica</i>	2
	Black-capped Chickadee <i>Poecile atricapillus</i>	1
	Canada Goose <i>Branta canadensis</i>	143
	European Starling <i>Sturnus vulgaris</i>	6
	House Finch <i>Haemorhous mexicanus</i>	2
	Western Meadowlark <i>Sturnella neglecta</i>	1
HarpLake02	American Goldfinch <i>Spinus tristis</i>	1
	Barn Swallow <i>Hirundo rustica</i>	4
	Black-capped Chickadee <i>Poecile atricapillus</i>	2
	Brewer's Blackbird <i>Euphagus cyanocephalus</i>	4
	Common Grackle <i>Quiscalus quiscula</i>	3
	Eurasian Collared Dove <i>Streptopelia decaocto</i>	3
	European Starling <i>Sturnus vulgaris</i>	6
	House Finch <i>Haemorhous mexicanus</i>	4
	House Wren <i>Troglodytes aedon</i>	1
	Mourning Dove <i>Zenaidura macroura</i>	2
	Osprey <i>Pandion haliaetus</i>	1
	HarpLake03	Barn Swallow <i>Hirundo rustica</i>
Blue Jay <i>Cyanocitta cristata</i>		1
Canada Goose <i>Branta canadensis</i>		1
Cliff Swallow <i>Petrochelidon pyrrhonota</i>		1
Common Grackle <i>Quiscalus quiscula</i>		1
European Starling		1

Table 2. Harper Lake Open Space 2018 Avian Survey Results.		
Transect or Point	Species	Number
	<i>Sturnus vulgaris</i>	
	House Finch <i>Haemorhous mexicanus</i>	3
	House Wren <i>Troglodytes aedon</i>	2
	Mourning Dove <i>Zenaida macroura</i>	2
	Red-winged Blackbird <i>Agelaius phoeniceus</i>	3
HarpLake04	American Robin <i>Turdus migratorius</i>	5
	Barn Swallow <i>Hirundo rustica</i>	8
	Blue Jay <i>Cyanocitta cristata</i>	3
	Brewer's Blackbird <i>Euphagus cyanocephalus</i>	1
	Canada Goose <i>Branta canadensis</i>	1
	Cooper's Hawk <i>Accipiter cooperii</i>	1
	House Wren <i>Troglodytes aedon</i>	1
	Mourning Dove <i>Zenaida macroura</i>	2
	Red-winged Blackbird <i>Agelaius phoeniceus</i>	1
	HarpLake05	American Robin <i>Turdus migratorius</i>
Barn Swallow <i>Hirundo rustica</i>		1
Brewer's Blackbird <i>Euphagus cyanocephalus</i>		1
House Finch <i>Haemorhous mexicanus</i>		1
House Wren <i>Troglodytes aedon</i>		2
Mourning Dove <i>Zenaida macroura</i>		4
Red-winged Blackbird <i>Agelaius phoeniceus</i>		3

4.3. North Open Space

- The line transects at North Open Space are shown in Figure 4. Table 3 provides the species detected and the number of individuals of each species detected during both surveys.

- North01: North Transect 01 runs north-south and is located on the west side of the Open Space. The plant community is more diverse in this area; several large trees give a taller overstory which is intermixed with smaller shrubs and the dense smooth brome open areas. The dominant species was the Brewer’s Blackbird (*Euphagus cyanocephalus*) which was seen in the wooded areas of the transect.
- North02: North Transect 02 runs north-south and is located on the east side of the Open Space. Most of this transect is dominated by dense smooth brome but the presence of trees and clumps of shrubs adds to the diversity of the Open Space. Prior to conducting both surveys a Blue Grosbeak (*Passerina caerulea*) was seen approximately 45 meters north of the transect at the same general location both days.

Table 3. North Open Space 2018 Avian Survey Results.

Transect or Point	Species	Number
North Transect No. 1	American Kestrel <i>Falco sparverius</i>	1
	Black-billed Magpie <i>Pica pica</i>	6
	Blue Jay <i>Cyanocitta cristata</i>	1
	Brewer’s Blackbird <i>Euphagus cyanocephalus</i>	16
	European Starling <i>Sturnus vulgaris</i>	1
	House Finch <i>Haemorhous mexicanus</i>	4
	House Wren <i>Troglodytes aedon</i>	2
	Mourning Dove <i>Zenaida macroura</i>	2
	Northern Flicker <i>Colaptes auratus</i>	1
	Spotted Towhee <i>Pipilo maculatus</i>	1
	Western Meadowlark <i>Sturnella neglecta</i>	1
	Western Wood Pewee <i>Contopus sordidulus</i>	1
North Transect No. 2	American Goldfinch <i>Spinus tristis</i>	1
	American Robin <i>Turdus migratorius</i>	4
	Barn Swallow <i>Hirundo rustica</i>	1
	Blue Jay <i>Cyanocitta cristata</i>	2
	Black-capped Chickadee <i>Poecile atricapillus</i>	1

Table 3. North Open Space 2018 Avian Survey Results.		
Transect or Point	Species	Number
	Brewer's Blackbird <i>Euphagus cyanocephalus</i>	18
	Cliff Swallow <i>Petrochelidon pyrrhonota</i>	3
	House Wren <i>Troglodytes aedon</i>	6
	Mourning Dove <i>Zenaida macroura</i>	4
	Spotted Towhee <i>Pipilo maculatus</i>	3
	Western Meadowlark <i>Sturnella neglecta</i>	2
	Western Wood Pewee <i>Contopus sordidulus</i>	3

5. Species Abundance and Richness

Species abundance is the number of individuals detected; species richness is the number of species detected. The Shannon-Weaver diversity index number measures the order (or disorder) within a community. The diversity index combines two quantifiable measures: the species richness (number of species within the community) and species equitability (a measure of how similar the abundances of different species are). A species diversity index (SDI) value near zero would indicate that a community is not diverse in its species composition; a higher value would indicate greater diversity. An evenness (E) value near zero would indicate that the sample was dominated by a large group of individuals representing one species; a higher value indicates that there is a more equal chance of occurrence for each species in equal numbers. Table 4 provides the species diversity index and evenness for each point count and transect location.

Table 4. Shannon-Weaver Species Diversity Indices and Evenness for each point count and transect.		
Transect or Point	SDI	Evenness
BullGul01	2.09	0.87
BullGul02	2.2	0.92
Transect BullGul01	1.64	0.92
HarpLake01	0.46	0.24
HarpLake02	2.26	0.94
HarpLake03	1.96	0.85
HarpLake04	1.84	0.84
HarpLake05	1.83	0.94
North Transect01	1.96	0.79
North Transect02	2.05	0.82

Overall the species diversity and evenness for the Open Space properties surveyed in 2018 are fairly close and suggest that each of the Open Space properties are capable of supporting a wide number of species. The one exception in Table 4 is Harper Lake Point Count location 01. The reason that diversity is low at this location was because of the high number of Canada Goose detections,

without this high value the SDI would likely be similar to the other properties. If the Cliff Swallows were included in the analysis of Bullhead Gulch Transect 01, the values would be skewed as well.

6. Conclusions & Recommendations

Four hundred twenty individuals representing twenty-six avian species (all Open Space properties combined) were detected at three Open Space properties surveyed in 2018. Aside from the Cliff Swallow (counted at all locations except at the Bullhead Gulch transect because of two large colonial nesting areas) and the Canada Goose (a large resident population is at Harper Lake), the Red-winged and Brewer's Blackbirds were dominant throughout the Open Space properties surveys. In areas where there was greater plant diversity (in composition and structure) more detections occurred.

In some areas the dense stands of smooth brome are likely limiting the functionality of these areas for avian nesting and foraging. Smooth brome (a non-native introduced species that is aggressive and can be invasive) is good for soil stabilization, aesthetics, can be used for livestock grazing/haying, and does well along the Front Range. For these reasons it is a commonly seeded species. Smooth brome however has a tendency to grow into very thick mats, too thick to nest in and too thick for young chicks to move around. Grazing or mechanical break-up of these areas could help to break down and lessen the thick mat – opening it up for other ground nesting species including Savannah Sparrows and Western Meadowlarks.

The three Open Space areas are important habitat islands for those species which use them. Several times during the survey voles (*Microtus* spp.) were seen moving through the grass/brush at each Open Space property.

7. **Photos**



Photo 1. Looking west along Bullhead Gulch Transect No. 1.



Photo 2. Looking south from Harper Lake 05 towards Harper Lake 04.



Photo 3. Looking south along North Open Space Transect 01.

8. References

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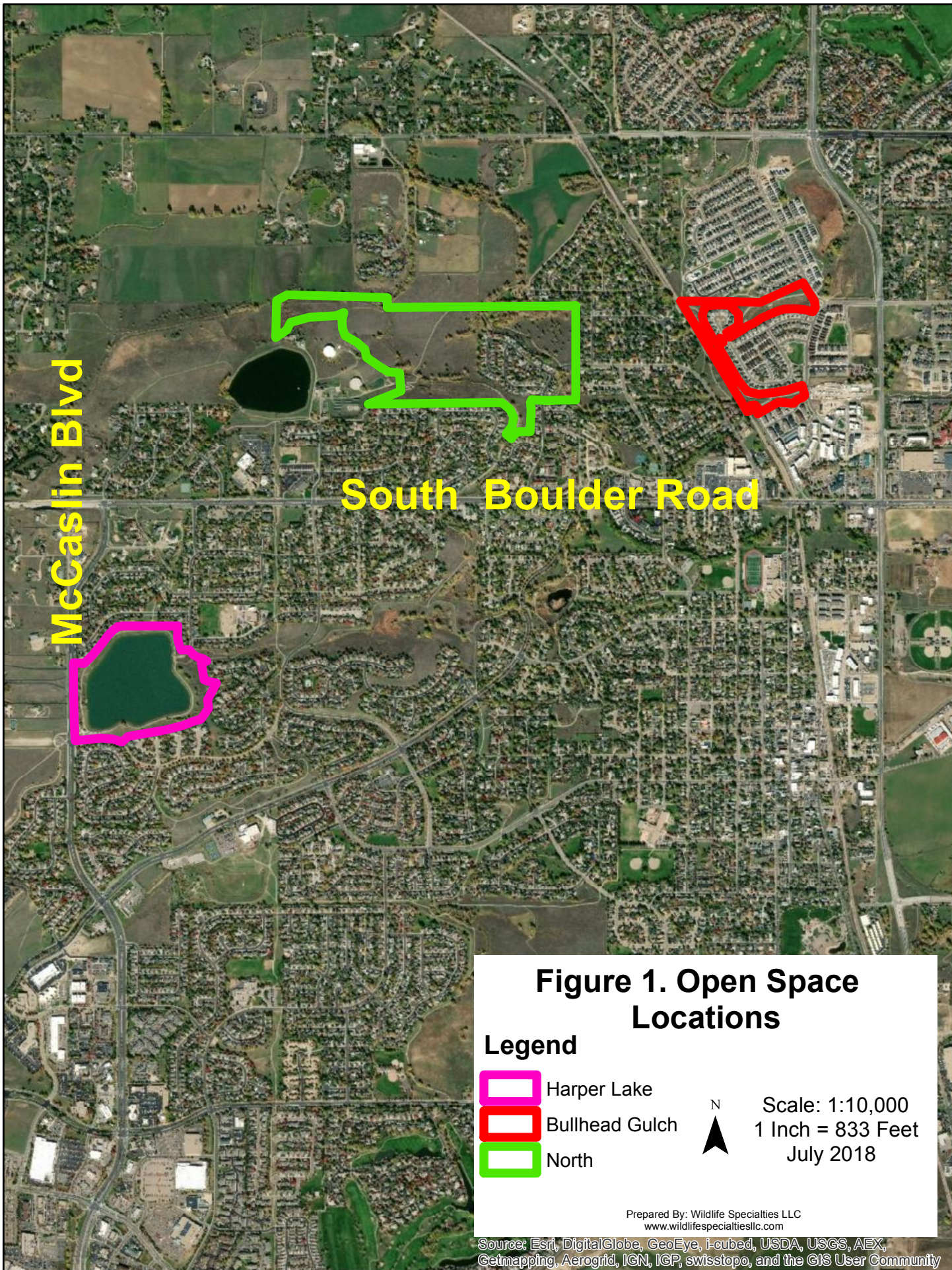







Figure 2. Bullhead Gulch Transect and Point Count Locations.

Legend

-  Avian Point Count
-  Avian Transect
-  Bullhead Gulch



Scale: 1:3,000
1 Inch = 250 Feet
July 2018

Prepared By: Wildlife Specialties LLC
www.wildlifespecialtiesllc.com

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Figure 3. Harper Lake Point Count Locations.

Legend

 Avian Point Count

 Harper Lake



Scale: 1:3,000
1 Inch = 250 Feet
July 2018

Prepared By: Wildlife Specialties LLC
www.wildlifespecialtiesllc.com

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

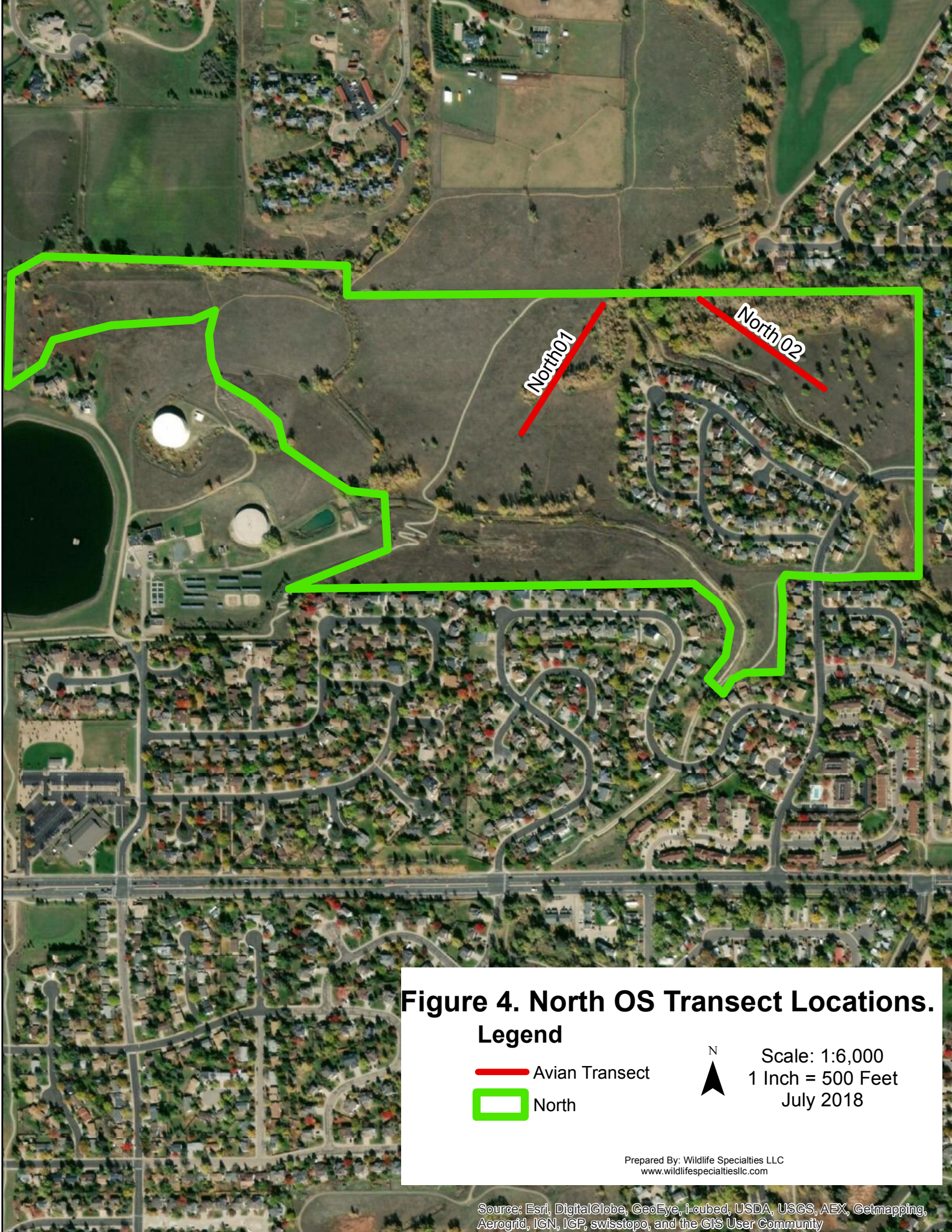




Figure 4. North OS Transect Locations.

Legend

-  Avian Transect
-  North



Scale: 1:6,000
1 Inch = 500 Feet
July 2018

Prepared By: Wildlife Specialties LLC
www.wildlifespecialtiesllc.com

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Appendix A
Data Sheets

2018 City of Louisville Avian Survey Data Sheet

How: V = visual; S = singing; C = calling; D = Drumming; O = other aural detection.

Between Points, point # = 88 Sex: M = male, F = female; U = unknown; J = juvenile

If found, please return to: PO BOX 1231 Lyons CO 80540

Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code	Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code	
	Point #5									0536	Point #2	B A SR F-60		V					2	
JP	AND	M O D O	80	A N U			-	1	-		BRBB	B R B B	F-10		V				4	
0506		A M R O	126	A N M			-	1	1			E U C O	55		V				1	
		H O W R	85	A N U			-	1	1			H O F I	55-R		V				2	
		H O I E	70	A N U			-	1	1			O S P R	F-100		V				1	
		A M R O	80	A N U			-	1	-			B A SR F-10		V					1	
												E U C O	60		V				1	
0516	Point #4	M O D O	70	A N U			-	1	-											
		A M R O	60	A						0547	Point #1	W E M A	62		A				1	
		C A G O	150	A								H O F I	F-10		V				2	
		A M R O	50	A								A M R O	10		V				1	
		B A S B	F-20	V Y			-	2	-			B C C H	F-40		V				1	
		H O W R	60	A								B A SR F-55		V					1	
		C O H A	55	V Y			-	1	-											
		B A SR F-10		V Y																
		B A SR F-30		V Y			-	3	1											
0526	Point #3	B A SR F-30		V					1											
		R W B B	F-65	V					2											
		M O D O	40	A					1											
		B A SR F-50		V					1											
		C A G O	170	V					1											
		H O W R	-60	A					1											
		B A SR F-20		V					1											
		B L J A	80	A					1											
		B A SR F-35		V					1											
		R W B B	F-10	V					1											

Harper Lake

Observer: J. Powell

Date: 6/15/18

Project: 2018 City of Louisville

Notes: T of = 58 @ 04:38; Sky - 1; Wind = 1; 05:04 - Wind up to 2-3 but still good
 some. 05:52 - wind stopped or @ 1 on scale

Harper Lake: Hob @ Pt. 5 = mix s. brn, white grass, Co. Thistle. Aves seen be/points
 WSR, OCCO

A = Aural, V = Visual, F = Flying

Osprey caught fish

2018 City of Louisville Avian Survey Data Sheet

How: V = visual; S = singing; C = calling; D = Drumming; O = other aural detection.

Between Points, point # = 88 Sex: M = male, F = female; U = unknown; J = juvenile

If found, please return to: PO BOX 1231 Lyons CO 80540

Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code	Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code
0629	#1	B R B B	F-10	V	Y			1											
		B B M A	60	A				1											
		B L J A	F-30	V				1											
		B R B A	F-40	V				2											
		E U S T	F-40	V				1											
		M O D O	60	A	N			1											
		B R B B	F-40	V				3											
		B B M A	F-10	V				1											
		H O W R	85	A				1											
0640	#2	W U P E	70	V				1											
		B L J A	80	A				1											
		H O W R	60	A				1											
		S P T O	60	A				1											
		W E M E	100	A				1											
		B R B B	30	V				1											
		B R B B	10	V				3											
		A M R O	100	A				1											
		H U W R	63	A				1											
		B R B B	38	V				3											
		M O D O	69	V				3											
		A M R O	42	V				1											
		S P T O	32	V				1											
		A M G O	60-F	V				1											
		B A R L	F-30	V				1											
		S P T O	8	V				1											

Observer: J. Powell

Date: 6/18/18

Project: 2018 City of Louisville Avian Surveys

Notes: North Open Space

T=63°F @ Start. Wind = 0, Tard = 62°F

Both transects in sec of smooth B-ome, cottonwoods, s elm, wild plum, peach tree willow. T2 milkweed

2018 City of Louisville Avian Survey Data Sheet

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Between Points, point # = 88 Sex: M = male, F = female; U = unknown; J = juvenile

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Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code	Start Time	Transect #	Species	Radial Distance	HOW	Visual?	Sex	Migrating?	Cluster Size	Cluster Code
0715	Point #2	A M R O	10	V	Y			1				A M R O	F+15	V				1	
		B A SR	20	F-70	V			1				A M R O	F-10	V				1	
		R O D O	130-F	V				2											
		H O W R	65	A				1											
		H O F I	65	A				1											
		B A SR	30	F-30	V			1											
		B A SR	40	F-40	V			1											
		B A SR	40	F-10	V			1											
		E U S T	F-40	V				4											
		E U C D	65	V				1											
		B R B B	F-30	V				1											
		A M G O	F-50	V				1											
		M O D O	F-40	V				1											
0721	Trans. #7	R W B B	10	V				2											
		R W B B	15	V				2											
		N R S W	F-15	V				1											
		R W B B	10	V				1											
		W W P E	40	A				1											
		R W B B	15	V				2											
		R O D O	23	V				3											
		C L S W	—	V				1											
0748	Point #1	A M R O	127	A				1											
		R O D O	F-30	V				1											
		H O W R	82	A				1											
		A M R O	90	A				1											
		H O F I	57	A				1											
		A M R O	60-F	V				1											
		A M G O	80	A				1											
		A M K E	79	V				1											
		M O D O	64	V				1											
		B R B B	F-40	V				2											
		E U C D	140	V				1											

Observer: J. Powell

Date: 6/15/18

Project: 2018 City of Louisville Avian Surveys - Bull Head Gulch

Notes: T@start=68

S. Brome dominated, cottonwood, S elm (22), R. olive, cattail dom. wetland, cheat, alfalfa, pines, willows
 CLSW nesting in tunnels on east and west side

2018 City of Louisville Avian Survey Data Sheet

How: V = visual; S = singing; C = calling; D = Drumming; O = other aural detection.

Between Points, point # = 88 Sex: M = male, F = female; U = unknown; J = juvenile

If found, please return to: PO BOX 1231 Lyons CO 80540

Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code	Start Time	Transect #	Species	Radial Distance	HOW	Visual?	Sex	Migrating?	Cluster Size	Cluster Code
0450	Pt. #2	Am	Ro	43	A			1											
		Am	Ro	70	A			1											
		Mo	Do	70	A			1											
		Am	Ro	60	A			1											
		Mo	Do	70	A			1											
		Mo	Do	60	A			1											
		Am	Go	40-F	V			1											
		Am	Ro	42	V			1											
		GH	OW	63	V			1											
0513	Transect 1	CL	SW	13	V			1											
		RWB	L	9	V			2											
		CL	SW	3-F	V			1											
		SAP	H	70	A			1											
		RWB	L	10	V			84											
		CL	SW	12-F	V			1											
		RWB	L	15	V			1											
		Mo	Do	25	V			2											
		Mo	Do	10	V			2											
		RWB	L	23	V			23											
		RWB	L	13	V			2											
		HD	FE	60	A			1											
		RWB	L	40	V			4											
0525	Pt. #1	RS	FD	60	A			1											
		Am	Ro	80	A			1											
		CL	SW	40-F	V			4											
		CL	SW	10-F	V			1											
		CL	SW	60-F	V			2											
		Am	Go	60-F	V			1											
		CL	SW	70-F	V			2											
		Am	Go	60-F	A			1											

Observer: J. Powell

Date: 6/22/18

Project: 2018 City of Louisville Avian Surveys - Bullhead Gulch

Notes: At 4:41 AM, SB of F. No wind, clouds to the E. The traffic is notable in the early AM. GHOW flow from roof top of 2nd house N of point into trees NNE of point. CLSW flying high by the dozens. RTNA seen flying from trees SW of point #1 as surveyor approached point #1. -cottontail

2018 City of Louisville Avian Survey Data Sheet

How: V= visual; S = singing; C = calling; D = Drumming; O = other aural detection.

Between Points, point # = 88 Sex: M = male, F = female; U = unknown; J = juvenile

If found, please return to: PO BOX 1231 Lyons CO 80540

Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code	Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code
0547	Transect 2	B R B B	20	V				4											
		W E M E	70	A				1											
		B R B B	30	V				2											
		W W P E	45	A				1											
		H O W R	40	A				1											
		W W P E	10	V				1											
		H O W R	30	A				1											
		H O W R	8	V				1											
		B C C H	20	A				1											
		B L J W	50-F	V				1											
		C L S W	35-F	V				1											
		B R D B	55	V				2											
		A M R O	33	V				1											
		B R B B	75-F	V				1											
		M U D O	33	V				1											
		C L S W	50-F	V				2											
		H O W R	80	A				1											
		B R B B	100-F	V				4											
		A M R O	100	A				1											
0605	Transect 1	W E M E	100	A				1											
		B R B B	40-F	V				4											
		P B M A	75	V				2											
		W E W E	100	A				1											
		H O W R	45	A				1											
		B R B B	40-F	V				4											
		H O F E	30-F	V				4											
		M U D O	60	A				1											
		N O F L	100	A				1											
		B B M A	100	V				2											
		S P T O	40	A				1											
		A M K E	60	V				1											

Observer: J. Powell

Date: 6/22/18

Project: City of Louisville 2018 Avian Surveys

Notes: SSOF @ Start, No wind, clear above w/ clouds to the East
 BLGR seen @ N end of Transect #1 after the survey was completed
 wild plum.
 AMKE nesting in nest box SSW of end of Transect 1

-North Open Space
 -Transect #2 first done.

2018 City of Louisville Avian Survey Data Sheet

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Between Points, point # = 88 Sex: M = male, F = female; U = unknown; J = juvenile

If found, please return to: PO BOX 1231 Lyons CO 80540

Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code	Start Time	Transect #	Species	Radial Distance	How	Visual?	Sex	Migrating?	Cluster Size	Cluster Code
0701	Point #1	C A G D	80	V	Y			143		0726	Point #4	B R B B	17	V				1	
		E U S T	10-F	V				1				A M R O	63	V				1	
		E U S T	10-F	V				1				A M R O	74	V				1	
		B A R S	20-F	V				1				R W B L	20-F	V				1	
		E U S T	60-F	V				1				M O D O	80	A				1	
		E U S T	20-F	V				1				A M R O	93	V				1	
		E U S T	30-F	V				2				B A R S	45-F	V				1	
		A M R O	30-F	V				1				B L T A	127	V				3	
												B A R S	67-F	V				1	
0710	Point #2	B A R S	20-F	V				4											
		E U S T	10-F	V				1		0736	Point #5	M O D O	80-F	V					2
		A M G F	60-F	V				1				M O D O	43	V				1	
		E U S T	40-F	V				3				H O W R	39	V				1	
		H O F E	60-	A				1				R W B L	50-F	V				1	
		H O W R	50	A				1				B A R S	40-F	V				1	
		C O G R	60	V				3				A M R O	47	V				1	
		E U C O	57	V				1				R W B L	10-F	V				2	
		M O D O	63	V				2				B R B B	40-F	V				1	
		E U S T	15-F	V				2											
		H O P I	10-F	V				1											
		B A R S	10-F	V				1											
		B C C H	47	V				2											
0718	Point #3	B A R S	10-F	V				2											
		H O W R	40	A				1											
		H O F I	35-F	V				3											
		E U S T	40-F	V				1											
		M O D O	20-F	V				1											
		C L S W	45-F	V				1											
		C O G R	25-F	V				1											
		B A R S	30-F	V				1											
		B A R S	40-F	V				2											

Observer: J. Powell

Date: 6/22/18

Project: 2018 City of Louisville Avian Survey

Notes: 56°F @ start, no wind
clouds building to the NW

-Harper Lake