

The Bear Creek Watershed Breeding Bird Atlas, 2008–2018



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Photo Credit: Cordilleran Flycatcher, Kay Niyo

Breeding bird atlases have become a useful and broadly applied method to document the distribution of breeding birds in a specific region. Most breeding bird atlas efforts in the United States occur at the state scale, such as in Colorado (Colorado Breeding Bird Atlas Partnership 2016). However, atlases have been conducted at county scales in the United States (Shuford 1993) and England (Sitters 1988). Regardless of scale, the objective of an atlas is to provide information on bird distribution, and sometimes abundance, and evaluate changes in distribution in the future (e.g., 20-year periods for state atlases). The area search method of atlas projects provides a more complete inventory of the avifauna of an area over other methods, such as point counts (Smith *et al.* 2001). Besides the biological value, atlases also provide educational and recreational value for volunteer participants.

Beginning in 2008, Evergreen Audubon launched the Bear Creek Watershed Breeding Bird Atlas project, with the purpose of providing information on distribution, abundance and breeding status of birds on public lands at the watershed scale. The Bear Creek drainage lies west of Denver, Colorado, in the mountains, foothills and plains of Jefferson and Clear Creek Counties. Data from our breeding bird atlas surveys can provide a reference point for public land managers and conservation groups to evaluate changes in distribution and abundance attributable to natural perturbations and human activities, including climate change. Information gained through the breeding bird atlas can also be incorporated into educational programs of Evergreen Audubon, other local conservation groups and community schools within the Bear Creek Watershed and greater Front Range region.

Study Area and Methods

The Bear Creek Watershed drainage, which lies in the South Platte River Basin, extends from mountain peaks surrounding Summit Lake in the west to the confluence of Bear Creek and the South Platte River in the east. The watershed descends a gradient of >8,900 feet over a distance of 34.5 miles and comprises 160,506 acres (Figure 1). Because of the steep gradient, the watershed consists of five different ecological regions (Level IV Ecoregions of the U. S. Environmental Protection Agency; Chapman *et al.* 2006), ranging

from alpine dwarf-shrub and graminoid tundra to prairie grasslands (Table 1). Much (80%) of the Bear Creek Watershed consists of mid-elevation and subalpine coniferous forests.

Within the watershed, there are about 69,600 acres of public lands (Figure 1), which are managed by Jefferson County Open Space (10,013 acres), Denver Mountain Parks (9,718 acres), City of Lakewood (5,845 acres), Colorado Parks and Wildlife/State Land Board (5,045 acres), and USDA Forest Service (38,980 acres). We initially targeted about 45% of accessible public lands for breeding bird surveys. A set of about 8-10 public land sites were selected and surveyed each year, generally with a repeated survey of the same sites after five years.

Surveys commenced in the summer of 2008. The core survey period, which corresponded to the main breeding season, was generally defined as extending from 15 May to 15 July; for elevations above 10,000 feet, the period was extended generally to 31 July. Volunteers from Evergreen Audubon and surrounding areas were recruited to conduct surveys at specific sites each year.

An initial effort objective was set to have observers spend at least 20 hours at each site over the two years of surveys. However, we adjusted the target upwards to 30 to 40 hours at each site in 2017 and added an additional year (2018) to try to achieve this higher effort objective. Within a season, observers were encouraged to spread visits out across the entire survey period to ensure early and late breeders were represented at each site. Observers were also encouraged to visit sites prior to the core survey period to confirm breeding of early-season nesting species, such as owls, and after the core period to confirm any species they suspected was breeding on the site but was not confirmed during core-period surveys.

Unlike many state atlases that have a grid-based design, observers for the Bear Creek Watershed atlas were allowed to choose specific areas to be covered at each site but were encouraged to cover all vegetation cover types present at each site. Observers mapped the specific routes they covered on each survey. At each site during each visit, the following data were

recorded: observer name(s), amount of effort (party-hours), bird species, counts of all adult individuals of each species, evidence of breeding based on bird behavior (Table 2) and primary vegetation cover types where species were encountered (Table 3). Party-hours are a measure of the effort of an entire group of observers and are not the number of observers times the number of hours. No analysis of the vegetation component of breeding bird observations is presented in this report.

Breeding evidence and habitat definitions follow those developed for the Colorado Breeding Bird Atlases I and II (Kingery and Leukering 2007, Nelson and Leukering 2007, Colorado Breeding Bird Atlas Partnership 2016). Detailed methods were compiled into a manual, and data forms were provided to observers prior to surveys (available at <http://www.bcwbba.org/>). A website was constructed to provide access to the methods manual and data forms, allow for online data entry and provide immediate progress feedback (see [http:// www.bcwbba.org](http://www.bcwbba.org)). Observers generally entered their observations online and quality assurance was provided by the authors.

After data were collected, entered online and proofed, counts of adult birds observed during core survey period visits were used to construct a categorical description of abundance (Andres *et al.* 2004). To account for differences in effort among sites, counts were adjusted by party-hours to determine an encounter rate (number of adult birds/10 party-hours) at a site, within an ecoregion and across the watershed. To determine bounds of abundance categories, watershed-wide abundances (birds/10 party-hours) were partitioned into five discreet abundance categories that provided a good fit to a log-series function ($R^2 = 0.992$). The log-series function was found to perform well for describing patterns of bird abundance (Baldrige *et al.* 2016).

Breeding evidence and average abundance for each species were summarized for each ecoregion and abundance of each species was determined for all surveyed sites. Distribution across the entire watershed and within elevation zones (foothills, montane, and alpine) was assessed by calculating the proportion of sites where a species occurred, mainly during the core period, as: local (recorded at $\leq 25\%$ of the sites), scattered (26-

74% of the sites) or widespread ($\geq 75\%$ of the sites). These three elevation zones are used to categorize distribution of birds in Evergreen Audubon's Bear Creek Watershed Bird Checklist (see <http://www.evergreenaudubon.org/>). Average abundance across all sites in the watershed was also calculated. Primary occurrence in an elevation zone was indicated if abundance there was twice as great as abundance in other zones. Occurrence in elevation zones was described as equitable if abundance in one zone was less than twice the abundance in any other zone.

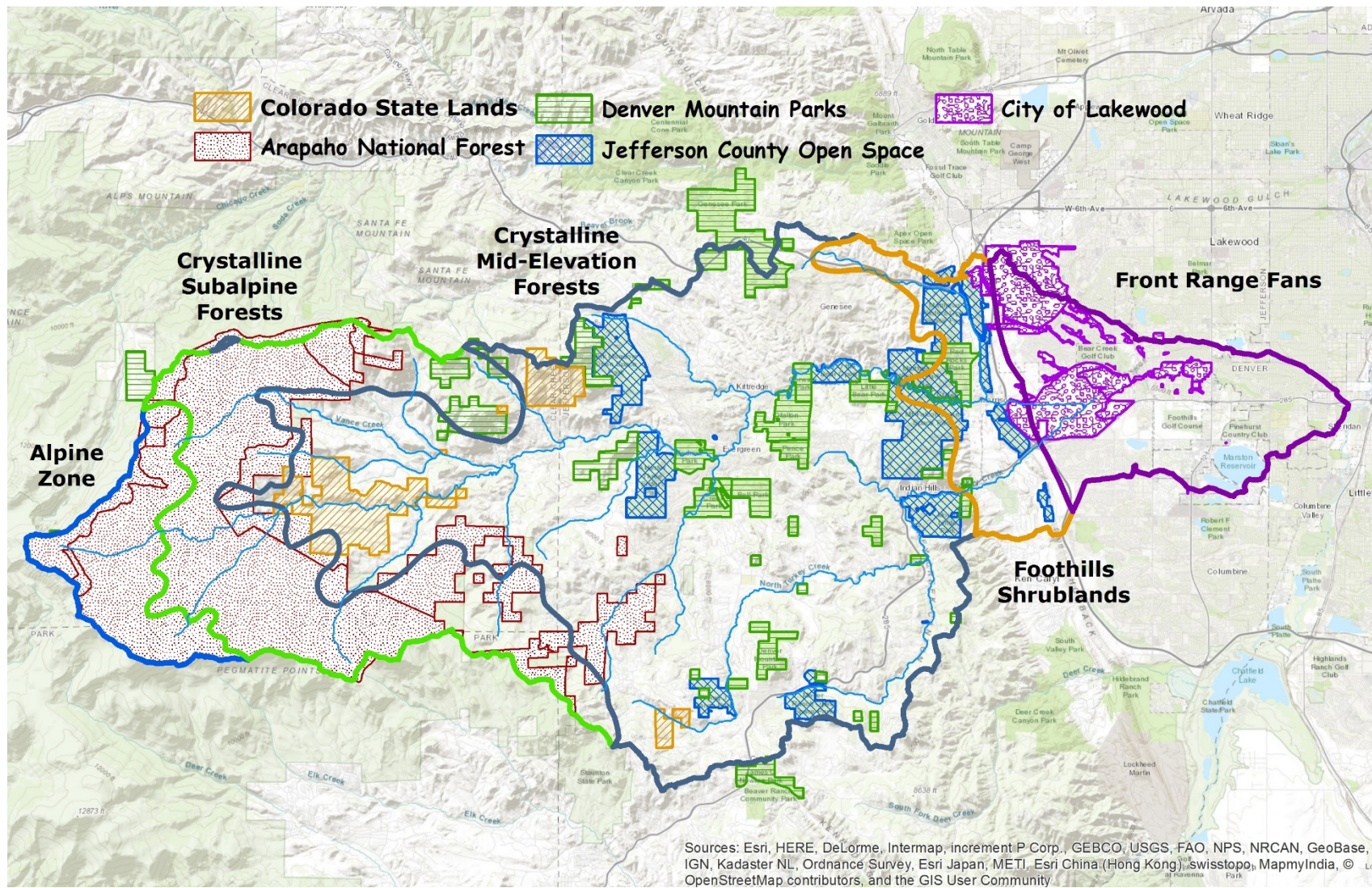


Figure 1. Boundaries of the Bear Creek Watershed, indication of public land ownership and delineation of Level IV ecoregions.

Table 1. Descriptions, sizes and elevation ranges of Level IV ecoregions found in the Bear Creek Watershed, modified from Chapman *et al.* (2006).

Elevation Zone
<i>Level IV Ecoregion</i>
Vegetation, Elevation and Acreage
Foothills
<i>Front Range Fans</i>
Shortgrass and mixed grass prairie with typical grasses. Interspersed with yucca and prickly pear. Riparian areas contain cottonwoods, willows and herbaceous species. 5,200'–5,800'. 11,533 acres
<i>Foothill Shrublands</i>
Open Ponderosa pine, juniper woodland and foothill-mountain grasslands. Areas of shrublands, including Gambel oak, mountain mahogany and serviceberry. Shrublands and woodlands are often interspersed with small shrubs and various grasses. Cliffs and rock faces are a dominant feature. 5,800'–8,000'. 11,344 acres.
Montane
<i>Crystalline Mid-Elevation Forests</i>
Ponderosa pine forest with areas of Douglas fir forest. Understory may include shrubs, grasses and various sedges. Montane meadows occur in areas of human or natural disturbances. Riparian areas contain cottonwoods, alder and willow shrubs, and herbaceous species. 6,800'–9,000'. 96,179 ac
<i>Crystalline Subalpine Forests</i>
Subalpine forests dominated by Engelmann spruce and subalpine fir. Often interspersed with aspen groves, lodgepole pine forest, or mountain meadows, and with Douglas-fir at lower elevations. May include limber pine and Rocky Mountain bristlecone pine. Understory is dominated by dwarf shrubs. 8,500'–11,500'. 32,162 acres.
Alpine
<i>Alpine Zone</i>
Alpine meadows. Dominated by forbs, grasses and various sedges. Trees if present are krummholz (dwarf and/or prostrate shrubs) and include spruce, fir and pine. Some wetlands and glacial lakes. Willow thickets occur in depressions and wet meadows. >11,200'. 9,288 ac.

Table 2. Codes and behavior descriptions for levels of breeding evidence for birds encountered during the Bear Creek Watershed Breeding Bird Atlas, Colorado, 2008–2018.

General Breeding Evidence

Breeding Behavior Categories

Observed (OBS)

Migrants, species beyond normal breeding range, or in unlikely breeding habitat, species flying over, or those that exhibit no breeding behaviors.

Possible Breeding (POS)

Male or female bird observed, or breeding calls heard in appropriate habitat.

Less than seven different singing males heard.

Probable Breeding (PRB)

More than seven different singing males heard in one day, primarily songbirds.

Male and female observed in behavior suggesting a pair.

Defense of a territory, chasing other birds, or singing in same location on occasions at least a week apart; singing male(s) responding directly to other singing male(s).

Courtship behavior (displaying, exchanging food or copulating).

Agitated behavior or anxiety calls of adult, indicating nest site or young in vicinity.

Visiting a probable nest site frequently, but showing no confirmed nesting behaviors.

Nest building by Bald Eagles, House and Marsh Wrens, or woodpeckers.

Confirmed Breeding (CON)

Nest building by all other species, carrying nesting material to a suitable location.

Distraction display or feigning an injury to lead predators away from a possible nest site.

Bird sitting on nest, or flying in and out of a likely nest that cannot be seen.

Eggs seen in a nest.

Carrying food to a suitable nesting site, but nestlings or fledglings are not seen; raptors, corvids, shrikes, jays, chickadees and nuthatches may carry food some distance before eating or caching.

Nestling seen in the nest or heard begging even if the nest is not located.

Adult seen feeding a recently fledged bird (one not yet capable of sustained flight).

A young bird incapable of sustained flight is observed, but is not a juvenile that may have flown in from a distant location.

Adult carrying away a fecal sac, usually not far from the nest.

Used nest or egg shells, if they can be reliably linked to a species.

Table 3. Habitat types and descriptions for the Bear Creek Watershed Breeding Bird Atlas, Colorado, 2008–2018.

Grasslands (dominated by grass and low shrubs)
shortgrass prairie (grasses, low shrubs, some yucca)
taller grassland in low-elevation areas
montane meadow (grasses, some low shrubs)
alpine tundra (meadows, grasses, forbs above timberline)
Shrublands (woody plants <20' in height, trees <10%)
oak scrub (oak brush, tree-like oak woodlands)
montane shrubland (mountain mahogany, serviceberry, chokecherry)
low-elevation shrubland (taller shrublands not defined above)
mid-elevation carr (willow and alders, moist ground, overstory of riparian trees)
higher-elevation carr (willow thickets, moist ground, overstory lacking)
krummholz (conifer shrubland, short or even prostrate)
clear cut areas, forest type indicated
burned areas, forest type indicated
Woodland (<30% crown cover by trees)
scattered Rocky Mountain junipers
woodland dominated by Ponderosa pine
Forest (>30% crown cover by trees)
riparian deciduous (cottonwoods, boxelders)
riparian coniferous (blue spruce, Douglas fir)
mixed aspen-conifer forest, <50% conifer
pure aspen, <5% conifer
Wetlands
emergent marshes (saturated soil with cattails, bulrushes, sedges)
submerged or floating mats of vegetation
open shores of streams or lakes with little vegetation
open water, lakes, ponds
open water, streams
Urban and Other
residential (includes parks and industrial areas)
rural (scattered farm buildings, with/without plantings)
barren ground (plowed fields, blowouts, dunes)
cliffs (but not talus, scree, or rock piles)
dirt or clay bank (natural or human-made)
bridges and culverts (nest location only)
power poles and transmission towers (for nests) but not fence posts
miscellaneous (anything not above)

Table 4. Descriptive categories of abundance based on encounter rates (number of adults/10 party-hours) used in the Bear Creek Watershed Breeding Bird Atlas, Colorado, 2008–2018. Ten party-hours were used to scale the encounter rates toward whole birds. The generalized index was constructed to provide a more tangible index of abundance. Both indices can be interpreted as the average number of individuals, by species, you would encounter spending 10 hours of observation among a set of sites representative of all the ecoregions in the watershed.

Abundance category	Code	Individuals per 10 Hours of Observation	
		quantitative index	generalized index
Rare	RA	0.001–0.650	maybe 1 bird
Uncommon	UN	0.651–2.600	between 1 and 3 birds
Fairly Common	FC	2.601–4.700	between 3 and 5 birds
Common	CO	4.701–8.500	between 5 and 9 birds
Abundant	AB	≥8.501	9 or more birds

Results

Between 2008 and 2018, 47 public land sites were surveyed in the Bear Creek Watershed. Volunteer observers made 900 trips to surveyed sites and spent 2,731 party-hours of observation, of which 2,052 hours were made in the core period (Table 5). The initial effort objective of ≥20 party-hours in the core period was met at 93% of all sites, and volunteers spent ≥30 hours of observation in the core period at 87% of the sites and ≥40 hours at 64% of the sites (Figure 2). The two sites that had <20 hours of observation (Bergen and Little Parks) were not included in overall watershed and ecoregional analyses.

Most surveyed sites (25; 55%) occurred in Crystalline Mid-Elevation Forests (Table 5). This ecoregion is characterized by a Ponderosa pine community, has many public land units and represents 60% of the total area of the Bear Creek Watershed. In general, the sampling of sites and observer effort during the core survey period within Level IV Ecoregions was proportional to the representation in the watershed, with slight over-sampling of Foothills Shrublands and some under-sampling of the Crystalline Mid-Elevation

Forests. Two of the Alpine Zone sites included subalpine transition forests, and we modified this ecoregion type as Alpine (Transition) Zone. Only Summit Lake was entirely above tree line.

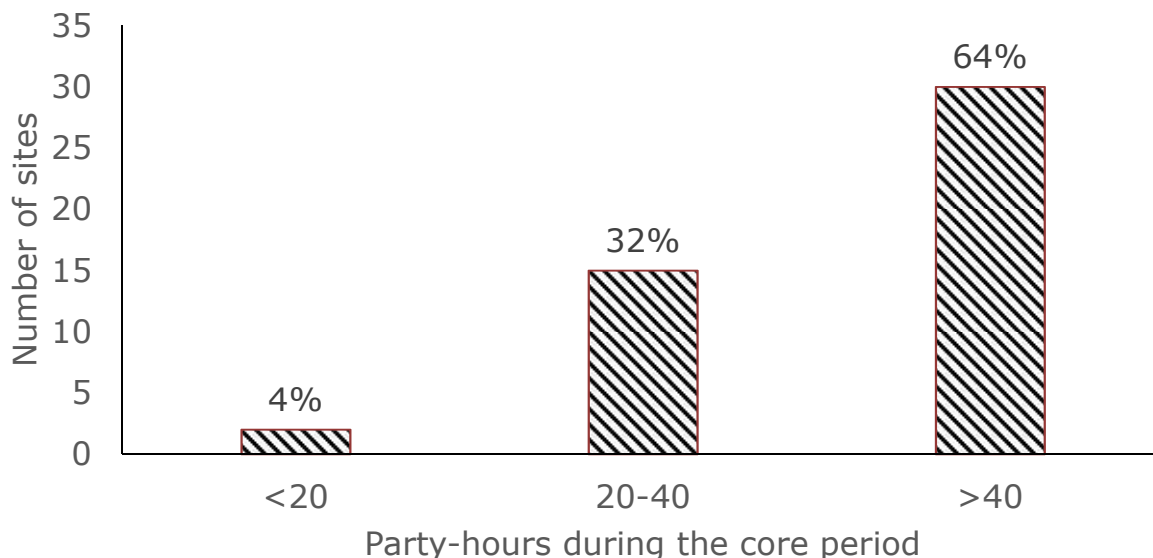


Figure 2. Number of party-hours of observation spent during the core survey period at sites in the Bear Creek Watershed Breeding Bird Atlas, Colorado, 2008–2018.

Observers recorded 139 bird species that were suspected of breeding (possible, probable or confirmed breeding evidence) in the Bear Creek Watershed (Tables 6, 7). Twenty-nine additional species observed but were not suspected of breeding are known to breed in the vicinity (≤ 30 miles) of the watershed (Table 8). Migrant bird species observed during surveys (i.e., those not known to breed in the vicinity of the watershed) are not reported here.

Because of the high proportion of Crystalline Mid-Elevation Forests in the watershed and corresponding high levels of effort, this ecoregion had the highest number of suspected breeding species (121). Although almost three times larger and having two times the number of surveyed sites, the Crystalline Subalpine Forests had the same number of species as the Foothills Shrublands (83 species) and slightly fewer suspected breeding species than the Front Range Fans (87 species; Table 5). The Alpine

(Transition) Zone had the fewest number of species suspected of breeding (44 species).

Twenty-two species were found across all elevation zones (Table 6). Distributions of 62 breeding species were centered in the foothills elevation zone (Front Range Fans and Foothills Shrublands), and 6 species were equitably distributed among sites in the foothills and montane forests. Distributions of 36 species primarily fell within montane forests, 6 species occurred equitably between montane forest and alpine sites, and seven species were restricted to the alpine transition zone.

Several breeding waterbirds (Wood Duck, Northern Shoveler, Gadwall, American Coot, Killdeer and Black-crowned Night-Heron) were restricted to the sites in the Front Range Fans ecoregion and two songbird species (Eastern Kingbird and Blue Grosbeak) were only observed in the foothills elevation zone (Table 7). Green-winged Teal and Barrow's Goldeneyes bred only in subalpine forests. Northern Pygmy Owl, Bank Swallow, Ovenbird and Prairie Warbler were suspected of breeding only in mid-elevation forests, and Pine Grosbeak and Fox Sparrow bred only in subalpine forests and the alpine transition zone. Only three species were recorded exclusively above tree line (White-tailed Ptarmigan, American Pipit and Brown-capped Rosy-Finch). Distribution maps of species that exemplify these patterns of distribution are provided in Appendix 1. Maps for all species are available at <www.bcwbbba.org>.

Although we achieved adequate effort coverage for many sites in the watershed, some bird groups are likely under-represented in the Bear Creek Atlas. Specifically, we believe owl and nightjar species are more abundant in the watershed than reported here. Some species, such as Turkey Vulture alluded breeding confirmation. Although observers differed in their ability to detect and enumerate species, we believe the calculation of categorical abundance and multiple year visits to sites reduces these sources of bias and variation. Although surveys were conducted multiple years, surveys at a specific site may not have captured the annual variation in breeding of nomadic or irruptive species, such as Red Crossbill. For many of the diurnal

landbirds, however, we believe the atlas provides a good description of their distribution and abundance in the watershed.

Appendices 2-5 provide abundances of species recorded at each of the 47 sites during the core survey period; sites are grouped by Level IV Ecoregions (Chapman et al. 2006). Breeding evidence of species was pooled across Bear Creek Watershed sites within Colorado Breeding Bird Atlas blocks and was sent to atlas organizers for inclusion in the Colorado Breeding Bird Atlas II.

We plan to distribute digital data and hard copy reports to all public land managers in the watershed. This report will be uploaded onto our website (www.evergreenaudubon.org), and raw data will be archived with Evergreen Audubon. We also plan to upload all Bear Creek Atlas observations into eBird over the next year and all maps prepared by observers will be uploaded onto the Bear Creek Atlas website (www.bcwbba.org). Please send the authors any additional observation of confirmed breeding by any species not indicated so in this report.

Table 5. Effort and number of species recorded at Bear Creek Watershed Breeding Bird Atlas sites, Colorado, 2008–2018, with public land managers indicated. Core hours used to calculate abundance are generally those from 15 May to 15 July, and to 31 July at high elevations.

Level IV Ecoregion	Land Manager¹	No. Trips²		No. Party-hr		No. Spp. Breed³
Site		core	total	core	total	
<i>Front Range Fans (4 sites)</i>		67	105	163	250	87
Bear Creek Greenbelt East	LAKE	16	22	34.1	52.4	50
Bear Creek Greenbelt West	LAKE	19	32	37.5	59.1	58
Bear Creek Lake Park	LAKE	14	28	43.5	77.8	68
Hayden Green Mountain Park	LAKE	18	23	47.7	60.8	54
<i>Foothills Shrublands (5 sites)</i>		69	99	202	269	83
Dinosaur Ridge North	JCOS	10	13	33.5	43.5	49
Dinosaur Ridge South	JCOS	14	17	40.0	49.5	59
Matthews/Winters Park	JCOS	15	21	38.6	49.1	65
Mount Glennon	JCOS	14	16	40.0	42.8	71
Red Rocks Park	DMP	16	32	49.5	84.0	69
<i>Crystalline Mid-Elevation Forests (25 sites)</i>		350	496	1,127	1,527	121
Aldefer/Three Sisters Park	JCOS	18	26	50.0	72.2	48
Bell Park	DMP	18	27	64.4	86.9	50
Bergen Park ⁴	DMP	8	9	10.5	11.8	38
Bergen Peak/SWA	CPW/DMP	16	24	57.0	84.2	58
Berrian Mountain	DMP	14	18	47.5	61.3	49
Birch Hill	DMP	16	28	60.1	93.5	53
Captain Mountain South	DMP/ANF	10	15	55.8	80.3	45
Corwina Park	DMP	15	18	44.7	51.6	74
Cub Creek Park	DMP	20	30	63.6	85.6	64
Dedisse Park	DMP	13	15	36.5	39.5	65
Elephant Butte	DMP	12	13	42.8	43.8	54
Elk Meadow Park	JCOS	15	17	45.4	48.9	63
Filius Park	DMP	10	13	24.2	31.5	46
Flying J Ranch	JCOS/DMP	12	15	43.6	50.1	69
Genesee Park	DMP	15	17	40.3	45.6	70
Lair O' the Bear Park	JCOS	23	46	65.0	119.9	75
Little Park ⁴	DMP	3	6	4.5	11.0	22
Maxwell Falls Trail	ANF	11	16	33.4	43.8	46
Meyer Ranch	JCOS	11	12	43.3	48.3	52
Mount Evans SWA	CPW	10	14	49.7	68.1	52
Mount Falcon Park	JCOS	30	46	73.0	111.7	87
Mount Lindo	JCOS/DMP	9	17	38.9	70.0	66
Mount Pence	DMP	14	14	53.8	53.8	41

Level IV Ecoregion Site	Land Manager¹	No. Trips²		No. Party-hr		No. Spp. Breed³
		core	total	core	total	
O'Fallon Park	DMP	13	19	41.5	58.8	66
Pence Park	DMP	14	21	37.7	55.1	59
<i>Crystalline Subalpine Forests (10 sites)</i>		<i>132</i>	<i>161</i>	<i>456</i>	<i>561</i>	<i>83</i>
Beartrack Lakes Trail	LAKE	9	10	42.3	48.8	48
Beaver Meadows	LAKE	14	18	61.4	79.2	51
Chief/Squaw Mountains	ANF	18	20	48.7	55.2	31
Cub Creek Trail	ANF	11	16	31.1	46.4	41
Echo Lake - Beaverdam Creek	ANF/DMP	14	14	49.5	49.5	47
Hicks Mountain	DMP	16	23	68.4	99.2	56
Mount Judge	DMP	18	22	46.9	55.9	32
Resthouse Meadows Trail	ANF	6	7	27.3	29.4	35
Snyder Mountain	DMP	10	12	41.2	49.5	45
Squaw Pass Picnic Areas	ANF	16	19	39.5	47.5	25
<i>Alpine (Transition) Zone (3 sites)</i>		<i>34</i>	<i>39</i>	<i>104</i>	<i>125</i>	<i>43</i>
Lincoln Lake	ANF	6	6	26.8	26.8	32
Mount Goliath	ANF	17	20	49.8	62.0	39
Summit Lake	ANF	11	13	27.3	35.9	11
<i>All Sites</i>		<i>652</i>	<i>900</i>	<i>2,052</i>	<i>2,731</i>	<i>139</i>

¹ Public land managers include: Arapaho National Forest (ANF), City of Lakewood (LAKE), Colorado Parks and Wildlife (CPW), Denver Mountain Parks (DMP), and Jefferson County Open Space (JCOS).

² Includes trips only ≥ 1 hour.

³ Likely breeding includes possible, probable or confirmed breeding evidence.

⁴ These sites not included in analysis of watershed or ecoregion patterns.

Table 6. Distribution and abundance of breeding birds throughout the entire Bear Creek Watershed, Colorado, and primary occurrence by elevation zone (2008–2018).

Species	Watershed Overall		Elevation Zone Occurrence³		
	abundance¹	distribution²	foothills	montane	alpine
Canada Goose	fairly common	scattered	XX	X	
Wood Duck	rare	local	XX		
Blue-winged Teal	rare	local	XX	X	
Northern Shoveler	rare	local	XX		
Gadwall	rare	local	XX		
Mallard	fairly common	scattered	XX	X	
Green-winged Teal	rare	local		XX	
Barrow's Goldeneye	rare	local		XX	
White-tailed Ptarmigan	rare	local			XX
Dusky Grouse	rare	scattered		XX	XX
Wild Turkey	rare	local		XX	
Rock Pigeon	uncommon	local	XX	X	
Band-tailed Pigeon	rare	local		XX	
Eurasian Collared-Dove	rare	scattered	XX	X	
Mourning Dove	common	widespread	XX	X	
Common Nighthawk	rare	local	XX	X	
Common Poorwill	rare	local	XX	XX	
White-throated Swift	uncommon	local	XX	X	
Black-chinned Hummingbird	rare	scattered	XX	XX	
Broad-tailed Hummingbird	abundant	widespread	X	XX	X
Sora	rare	local	XX	XX	
American Coot	rare	local	XX		
Killdeer	rare	local	XX		
Wilson's Snipe	rare	local		XX	
Spotted Sandpiper	rare	local	XX	XX	
Great Blue Heron	rare	scattered	XX	X	
Black-crowned Night-Heron	rare	local	XX		
Turkey Vulture	uncommon	widespread	XX	X	
Sharp-shinned Hawk	rare	local	XX	X	
Cooper's Hawk	rare	scattered	XX	X	
Northern Goshawk	rare	local		XX	

Species	Watershed Overall		Elevation Zone Occurrence³		
	abundance¹	distribution²	foothills	montane	alpine
Swainson's Hawk	rare	local	XX		
Red-tailed Hawk	uncommon	widespread	XX	X	X
Golden Eagle	rare	scattered	XX	X	X
Barn Owl	rare	local	XX		
Great Horned Owl	rare	local	XX	X	
Northern Pygmy-Owl	rare	local		XX	
Northern Saw-whet Owl	rare	local		XX	
Belted Kingfisher	rare	local	XX	X	
Williamson's Sapsucker	uncommon	scattered		XX	
Red-naped Sapsucker	rare	scattered		XX	
Downy Woodpecker	uncommon	scattered	XX	X	
Hairy Woodpecker	fairly common	widespread		XX	X
American Three-toed Woodpecker	rare	scattered		XX	XX
Northern Flicker	common	widespread	XX	X	X
American Kestrel	rare	local	XX	X	
Peregrine Falcon	rare	local	XX	XX	XX
Prairie Falcon	rare	local	XX	X	X
Olive-sided Flycatcher	rare	scattered		XX	X
Western Wood-Pewee	fairly common	widespread	XX	XX	X
Hammond's Flycatcher	uncommon	scattered		XX	
Dusky Flycatcher	rare	scattered	X	XX	XX
Cordilleran Flycatcher	common	widespread	X	XX	X
Say's Phoebe	rare	scattered	XX	X	
Western Kingbird	uncommon	scattered	XX	X	
Eastern Kingbird	rare	local	XX	X	
Plumbeous Vireo	uncommon	scattered	X	XX	
Warbling Vireo	fairly common	widespread	X	XX	
Canada Jay	uncommon	scattered		XX	XX
Steller's Jay	common	widespread		XX	X
Blue Jay	uncommon	local	XX	X	
Woodhouse's Scrub-Jay	uncommon	local	XX	X	
Clark's Nutcracker	uncommon	scattered		XX	XX

Species	Watershed Overall		Elevation Zone Occurrence³		
	abundance¹	distribution²	foothills	montane	alpine
Black-billed Magpie	common	scattered	XX	X	
American Crow	common	widespread	X	XX	
Common Raven	common	widespread	X	X	XX
Tree Swallow	fairly common	scattered	XX	X	
Violet-green Swallow	abundant	widespread	XX	XX	X
Northern Rough-winged Swallow	uncommon	scattered	XX	X	
Bank Swallow	rare	local		XX	
Cliff Swallow	common	scattered	XX	X	
Barn Swallow	uncommon	scattered	XX	X	
Black-capped Chickadee	fairly common	scattered	XX	X	X
Mountain Chickadee	abundant	widespread	X	XX	X
Bushtit	rare	local	XX	X	
Red-breasted Nuthatch	fairly common	widespread		XX	X
White-breasted Nuthatch	fairly common	widespread	X	XX	X
Pygmy Nuthatch	abundant	scattered		XX	
Brown Creeper	uncommon	scattered		XX	X
Rock Wren	rare	scattered	XX	X	XX
Canyon Wren	rare	local	XX	X	
House Wren	abundant	widespread	XX	X	X
Blue-gray Gnatcatcher	fairly common	scattered	XX	X	
American Dipper	rare	local	X	XX	
Golden-crowned Kinglet	rare	scattered		XX	
Ruby-crowned Kinglet	common	widespread		XX	X
Western Bluebird	fairly common	scattered	X	XX	
Mountain Bluebird	uncommon	scattered	X	X	XX
Townsend's Solitaire	uncommon	widespread	X	XX	X
Swainson's Thrush	rare	local		XX	
Hermit Thrush	common	widespread	X	XX	X
American Robin	abundant	widespread	XX	XX	X
Gray Catbird	uncommon	scattered	XX	X	
Northern Mockingbird	rare	local	XX	X	
European Starling	uncommon	scattered	XX	X	

Species	Watershed Overall		Elevation Zone Occurrence³		
	abundance¹	distribution²	foothills	montane	alpine
Cedar Waxwing	rare	local	XX	XX	
House Sparrow	rare	local	XX	X	
American Pipit	fairly common	local			XX
Evening Grosbeak	rare	local		XX	
Pine Grosbeak	rare	local		XX	XX
Brown-capped Rosy-Finch	rare	local			XX
House Finch	common	scattered	XX	X	
Cassin's Finch	uncommon	scattered		XX	
Red Crossbill	fairly common	widespread		XX	X
Pine Siskin	abundant	widespread		XX	XX
Lesser Goldfinch	fairly common	scattered	XX	X	
American Goldfinch	uncommon	scattered	XX	X	
Green-tailed Towhee	fairly common	scattered	XX	XX	
Spotted Towhee	abundant	scattered	XX	X	
Chipping Sparrow	common	widespread	X	XX	X
Vesper Sparrow	uncommon	scattered	XX	X	
Lark Sparrow	rare	local	XX	X	
Savannah Sparrow	uncommon	local	X	XX	
Fox Sparrow	rare	local		X	XX
Song Sparrow	fairly common	scattered	XX	X	
Lincoln's Sparrow	uncommon	scattered		X	XX
White-crowned Sparrow	fairly common	scattered		X	XX
Dark-eyed Junco	abundant	widespread		XX	XX
Yellow-breasted Chat	uncommon	local	XX	X	
Western Meadowlark	uncommon	local	XX	X	
Bullock's Oriole	fairly common	scattered	XX	X	
Red-winged Blackbird	common	scattered	XX	X	
Brown-headed Cowbird	fairly common	widespread	XX	X	
Brewer's Blackbird	uncommon	local	XX	X	
Common Grackle	uncommon	scattered	XX	X	
Great-tailed Grackle	rare	local	XX		
Ovenbird	rare	local		XX	

Species	Watershed Overall		Elevation Zone Occurrence³		
	abundance¹	distribution²	foothills	montane	alpine
Virginia's Warbler	rare	local	XX	X	
MacGillivray's Warbler	rare	scattered		XX	
Common Yellowthroat	rare	local	XX	X	
Yellow Warbler	common	scattered	XX	X	
Yellow-rumped Warbler	abundant	widespread	X	XX	X
Prairie Warbler	rare	local		XX	
Wilson's Warbler	uncommon	scattered		X	XX
Western Tanager	fairly common	widespread	X	XX	
Black-headed Grosbeak	fairly common	scattered	XX	X	
Blue Grosbeak	rare	local	XX		
Lazuli Bunting	uncommon	scattered	XX	X	
Indigo Bunting	rare	local	XX	X	

¹ see Table 4 for abundance definitions.

² local = recorded at ≤25% of the sites, scattered = 26-74% of sites, or widespread = ≥75% of sites.

³ XX = elevation zone of primary occurrence (abundance more than twice other zones) or X = secondary occurrence; foothills = Front Range Fans and Foothills Shrublands, montane = Crystalline Mid-elevation and Subalpine Forests, alpine = Alpine (Transition) Zone; see Table 1 for definitions.

Table 7. Breeding evidence (BREV; OBS = observed, POS = possible, PRB = probable, CON = confirmed) and abundance (AB; RA = rare, UN = uncommon, FC = fairly common, CO = common, AB = abundant) of bird species found at sites (n = number of sites) within Level IV Ecoregions of the Bear Creek Watershed, 2008–2018. See Tables 2 and 4 for definitions of breeding evidence and abundance.

Level IV Ecoregion:	Front Range Fans ($n=4$)		Foothill Shrublands ($n=5$)		Crystalline Mid-Elevation Forests ($n=23$)		Crystalline Subalpine Forests ($n=10$)		Alpine Zone ($n=3$ sites)	
	BREV	AB	BREV	AB	BREV	AB	BREV	AB	BREV	AB
Canada Goose	CON	AB	OBS		CON	UN	OBS			
Wood Duck	CON	RA							OBS	
Blue-winged Teal	POS	RA			PRB	RA	CON	RA		
Northern Shoveler	PRB	RA			OBS					
Gadwall	PRB	UN								
Mallard	CON	AB	POS	RA	CON	FC	CON	UN		
Green-winged Teal	OBS						CON	RA		
Barrow's Goldeneye							CON	UN		
White-tailed Ptarmigan									CON	UN
Dusky Grouse					CON	RA	CON	RA	CON	RA
Wild Turkey	OBS				CON	RA				
Rock Pigeon	CON	UN	CON	AB	PRB	RA				
Band-tailed Pigeon					POS	RA	PRB	RA		
Eurasian Collared-Dove	PRB	UN	PRB	RA	PRB	RA	OBS			
Mourning Dove	CON	AB	CON	AB	CON	FC	POS	RA		
Common Nighthawk	POS	RA			POS	RA				
Common Poorwill	POS	RA	PRB	RA	PRB	RA				
White-throated Swift			CON	AB	PRB	RA	PRB	RA		
Black-chinned Hummingbird	PRB	RA	POS	UN	PRB	RA				
Broad-tailed Hummingbird	CON	FC	CON	AB	CON	AB	CON	AB	POS	FC
Sora	PRB	RA			CON	RA				

Level IV Ecoregion:	Front Range Fans (n=4)		Foothill Shrublands (n=5)		Crystalline Mid- Elevation Forests (n=23)		Crystalline Subalpine Forests (n=10)		Alpine Zone (n=3 sites)	
	BREV	AB	BREV	AB	BREV	AB	BREV	AB	BREV	AB
American Coot	POS	RA			OBS					
Killdeer	CON	UN								
Wilson's Snipe					CON	RA	PRB	RA		
Spotted Sandpiper	CON	RA			CON	RA	CON	RA	OBS	
Great Blue Heron	PRB	UN	POS	RA	CON	RA	POS	RA		
Black-crowned Night-Heron	PRB	UN			OBS					
Turkey Vulture	POS	UN	POS	UN	POS	UN	POS	RA		
Sharp-shinned Hawk	PRB	RA	OBS		CON	RA	POS	RA		
Cooper's Hawk	CON	UN	CON	RA	CON	RA	PRB	RA		
Northern Goshawk			OBS		CON	RA	POS	RA		
Swainson's Hawk	CON	UN	POS	RA	OBS					
Red-tailed Hawk	CON	UN	CON	FC	CON	UN	CON	RA	POS	RA
Golden Eagle	POS	RA	CON	RA	PRB	RA	CON	RA	POS	RA
Barn Owl			CON	RA						
Great Horned Owl	CON	RA	CON	RA	CON	RA	POS	RA		
Northern Pygmy-Owl					PRB	RA				
Northern Saw-whet Owl					CON	RA	POS	RA		
Belted Kingfisher	CON	UN	POS	RA	CON	RA				
Williamson's Sapsucker					CON	UN	CON	UN		
Red-naped Sapsucker					CON	RA	PRB	RA		
Downy Woodpecker	CON	FC	CON	RA	CON	UN	CON	RA		
Hairy Woodpecker	OBS		OBS		CON	FC	CON	FC	CON	UN
Am. Three-toed Woodpecker					CON	RA	CON	UN	CON	RA
Northern Flicker	CON	AB	CON	UN	CON	CO	CON	FC	CON	UN

Level IV Ecoregion:	Front Range Fans (n=4)		Foothill Shrublands (n=5)		Crystalline Mid-Elevation Forests (n=23)		Crystalline Subalpine Forests (n=10)		Alpine Zone (n=3 sites)	
	BREV	AB	BREV	AB	BREV	AB	BREV	AB	BREV	AB
American Kestrel	CON	UN	CON	UN	CON	RA	CON	RA	OBS	
Peregrine Falcon			CON	RA	POS	RA	CON	RA	PRB	RA
Prairie Falcon	POS	RA	CON	RA	POS	RA			POS	RA
Olive-sided Flycatcher	OBS		OBS		CON	RA	CON	UN	POS	RA
Western Wood-Pewee	CON	CO	CON	FC	CON	CO	CON	UN	PRB	RA
Hammond's Flycatcher					CON	UN	POS	RA		
Dusky Flycatcher	POS	RA	POS	RA	CON	RA	POS	RA	PRB	RA
Cordilleran Flycatcher	PRB	UN	CON	UN	CON	CO	CON	FC	POS	RA
Say's Phoebe	POS	UN	CON	FC	CON	RA				
Western Kingbird	CON	CO	CON	CO	CON	RA				
Eastern Kingbird	POS	RA	POS	RA	OBS					
Plumbeous Vireo	POS	RA	POS	RA	CON	UN	POS	RA		
Warbling Vireo	CON	UN	CON	UN	CON	CO	CON	FC		
Canada Jay					CON	RA	CON	FC	PRB	UN
Steller's Jay			OBS		CON	CO	CON	CO	CON	UN
Blue Jay	CON	CO	CON	RA	POS	RA				
Woodhouse's Scrub-Jay	POS	UN	CON	AB	CON	RA				
Clark's Nutcracker					CON	RA	CON	FC	PRB	UN
Black-billed Magpie	CON	AB	CON	AB	CON	FC	CON	UN		
American Crow	PRB	UN	CON	FC	CON	AB	CON	FC		
Common Raven	CON	RA	CON	UN	CON	CO	CON	FC	CON	AB
Tree Swallow	CON	AB	PRB	FC	CON	FC	POS	RA		
Violet-green Swallow	CON	AB	CON	AB	CON	AB	CON	FC	POS	RA
N. Rough-winged Swallow	CON	FC	PRB	RA	CON	UN	OBS			

Level IV Ecoregion:	Front Range Fans (n=4)		Foothill Shrublands (n=5)		Crystalline Mid-Elevation Forests (n=23)		Crystalline Subalpine Forests (n=10)		Alpine Zone (n=3 sites)	
	BREV	AB	BREV	AB	BREV	AB	BREV	AB	BREV	AB
Bank Swallow					PRB	RA				
Cliff Swallow	CON	AB	POS	UN	CON	CO				
Barn Swallow	CON	AB	PRB	RA	CON	UN				
Black-capped Chickadee	CON	AB	CON	CON	CON	UN	CON	RA	CON	RA
Mountain Chickadee			CON	UN	CON	AB	CON	AB	CON	FC
Bushtit	CON	RA	CON	UN	CON	RA				
Red-breasted Nuthatch			OBS		CON	FC	CON	CO	CON	UN
White-breasted Nuthatch	CON	UN	PRB	RA	CON	CO	CON	UN	POS	RA
Pygmy Nuthatch			OBS		CON	AB	CON	UN		
Brown Creeper	OBS				CON	UN	CON	FC	CON	RA
Rock Wren			CON	UN	CON	RA	CON	RA	CON	UN
Canyon Wren			CON	UN	POS	RA	PRB	RA		
House Wren	CON	AB	CON	AB	CON	AB	CON	CO	CON	RA
Blue-gray Gnatcatcher	CON	FC	CON	AB	CON	UN				
American Dipper	CON	RA	POS	RA	CON	RA	CON	RA		
Golden-crowned Kinglet					CON	RA	CON	UN		
Ruby-crowned Kinglet	OBS		OBS		CON	CO	CON	AB	CON	CO
Western Bluebird			POS	RA	CON	CO	PRB	RA		
Mountain Bluebird			PRB	RA	CON	FC	CON	UN	CON	CO
Townsend's Solitaire	OBS		POS	RA	CON	FC	CON	UN	POS	RA
Swainson's Thrush			OBS		POS	RA	POS	RA		
Hermit Thrush			POS	RA	CON	FC	CON	AB	CON	FC
American Robin	CON	AB	CON	AB	CON	AB	CON	AB	CON	AB
Gray Catbird	CON	UN	CON	UN	CON	UN	OBS			

Level IV Ecoregion:	Front Range Fans (n=4)		Foothill Shrublands (n=5)		Crystalline Mid-Elevation Forests (n=23)		Crystalline Subalpine Forests (n=10)		Alpine Zone (n=3 sites)	
	BREV	AB	BREV	AB	BREV	AB	BREV	AB	BREV	AB
Northern Mockingbird	PRB	RA	POS	RA	CON	RA				
European Starling	CON	AB	CON	UN	PRB	RA				
Cedar Waxwing	POS	RA	POS	RA	CON	UN				
House Sparrow	CON	FC	CON	RA	POS	RA				
American Pipit					OBS		OBS		CON	AB
Evening Grosbeak	OBS				CON	RA	POS	RA		
Pine Grosbeak							CON	RA	CON	RA
Brown-capped Rosy-Finch									CON	UM
House Finch	CON	AB	CON	AB	CON	AB	POS	RA		
Cassin's Finch					CON	UN	CON	UN		
Red Crossbill			OBS		CON	FC	CON	FC	PRB	UN
Pine Siskin					CON	AB	CON	AB	PRB	AB
Lesser Goldfinch	PRB	FC	CON	AB	CON	CO				
American Goldfinch	CON	UN	CON	FC	CON	RA				
Green-tailed Towhee	PRB	UN	CON	UN	CON	FC	CON	UN		
Spotted Towhee	CON	AB	CON	AB	CON	FC				
Chipping Sparrow	PRB	UN	CON	UN	CON	AB	CON	FC	POS	RA
Vesper Sparrow	CON	FC	PRB	UN	CON	UN	POS	RA		
Lark Sparrow	POS	RA	CON	UN	POS	RA				
Savannah Sparrow	POS	RA			CON	UN				
Fox Sparrow					OBS		POS	RA	CON	UN
Song Sparrow	PRB	AB	CON	UN	CON	FC	CON	RA		
Lincoln's Sparrow	OBS		OBS		CON	RA	CON	FC	CON	FC
White-crowned Sparrow	OBS		OBS		PRB	RA	CON	FC	CON	AB

Level IV Ecoregion:	Front Range Fans (n=4)		Foothill Shrublands (n=5)		Crystalline Mid-Elevation Forests (n=23)		Crystalline Subalpine Forests (n=10)		Alpine Zone (n=3 sites)	
	BREV	AB	BREV	AB	BREV	AB	BREV	AB	BREV	AB
Dark-eyed Junco	OBS		OBS		CON	AB	CON	AB	CON	AB
Yellow-breasted Chat	PRB	CO	CON	CO	CON	RA				
Western Meadowlark	CON	AB	CON	CO	CON	RA				
Bullock's Oriole	CON	AB	CON	AB	CON	UN				
Red-winged Blackbird	CON	AB	PRB	UN	CON	CO	PRB	RA		
Brown-headed Cowbird	CON	CO	CON	AB	CON	CO	PRB	RA		
Brewer's Blackbird	PRB	RA	CON	UN	CON	UN				
Common Grackle	CON	AB	POS	UN	CON	UN				
Great-tailed Grackle	PRB	UN								
Ovenbird					PRB	RA				
Virginia's Warbler			CON	UN	CON	UN				
MacGillivray's Warbler					CON	RA	POS	RA		
Common Yellowthroat	PRB	UN			POS	RA				
Yellow Warbler	CON	AB	CON	AB	CON	FC	POS	RA		
Yellow-rumped Warbler	POS	UN	POS	UN	CON	AB	CON	AB	CON	CO
Prairie Warbler					PRB	RA				
Wilson's Warbler	OBS		OBS		POS	RA	CON	UN	CON	AB
Western Tanager	PRB	RA	CON	FC	CON	CO	CON	UN		
Black-headed Grosbeak	CON	UN	CON	AB	CON	FC	CON	UN		
Blue Grosbeak	PRB	RA	POS	RA						
Lazuli Bunting	CON	UN	CON	CO	CON	RA				
Indigo Bunting	CON	RA	PRB	RA	POS	RA				

Table 8. Species for which no breeding evidence was recorded during the Bear Creek Watershed Breeding Bird Atlas (2008–2018) but was recorded as probable or confirmed breeders within 30 miles of the watershed (Colorado Bird Atlas Partnership. 2016).

Species	Species
Lesser Scaup	Red-headed Woodpecker
Hooded Merganser	Least Flycatcher
Common Merganser	Eastern Phoebe
Ruddy Duck	Loggerhead Shrike
Pied-billed Grebe	Horned Lark
Eared Grebe	Sage Thrasher
Western Grebe	Clay-colored Sparrow
Double-crested Cormorant	Brewer's Sparrow
Snowy Egret	Lark Bunting
White-faced Ibis	Grasshopper Sparrow
Osprey	Yellow-headed Blackbird
Bald Eagle	Orange-crowned Warbler
Northern Harrier	American Redstart
Long-eared Owl	Rose-breasted Grosbeak
Lewis's Woodpecker	

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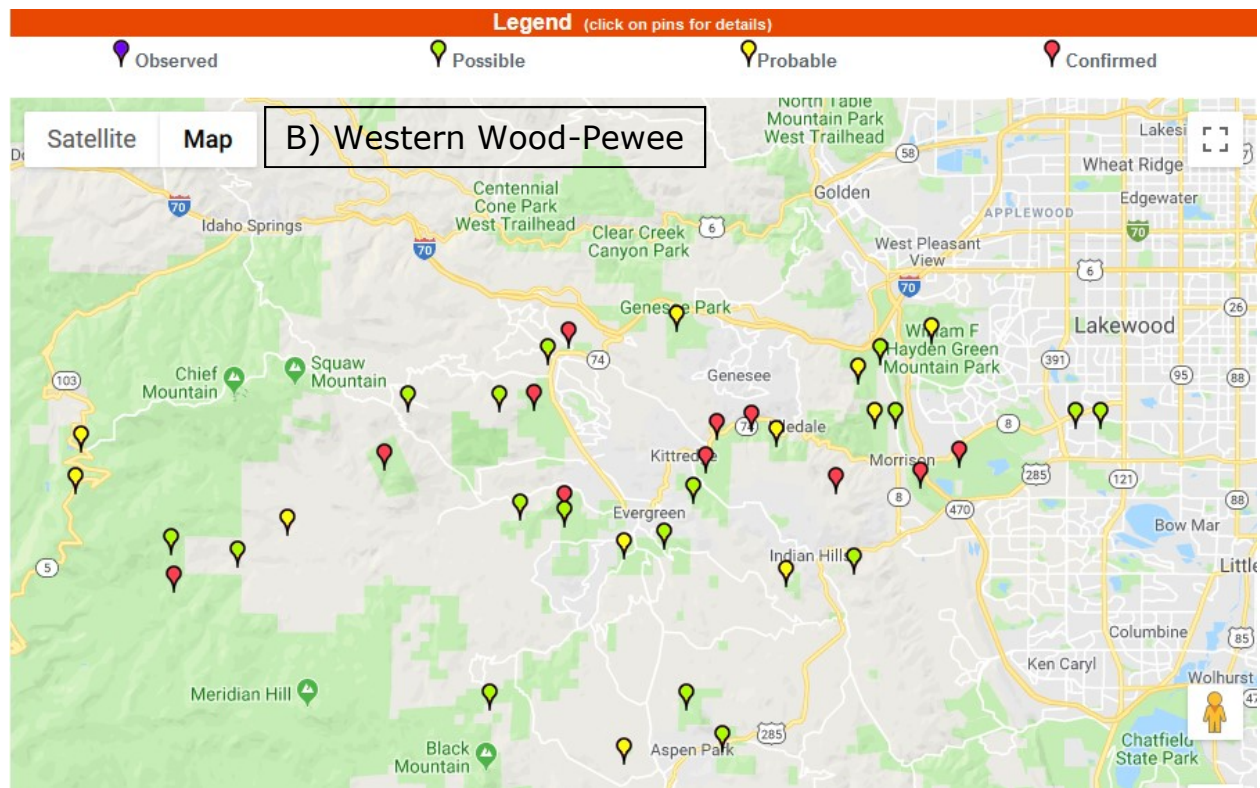
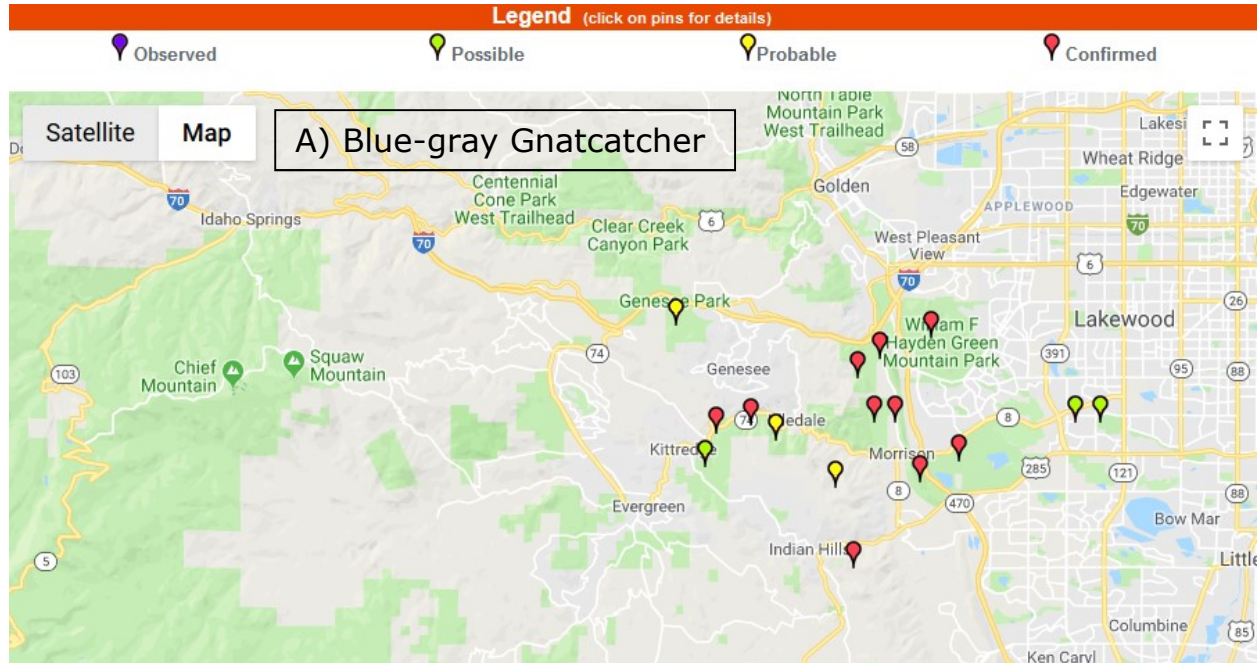
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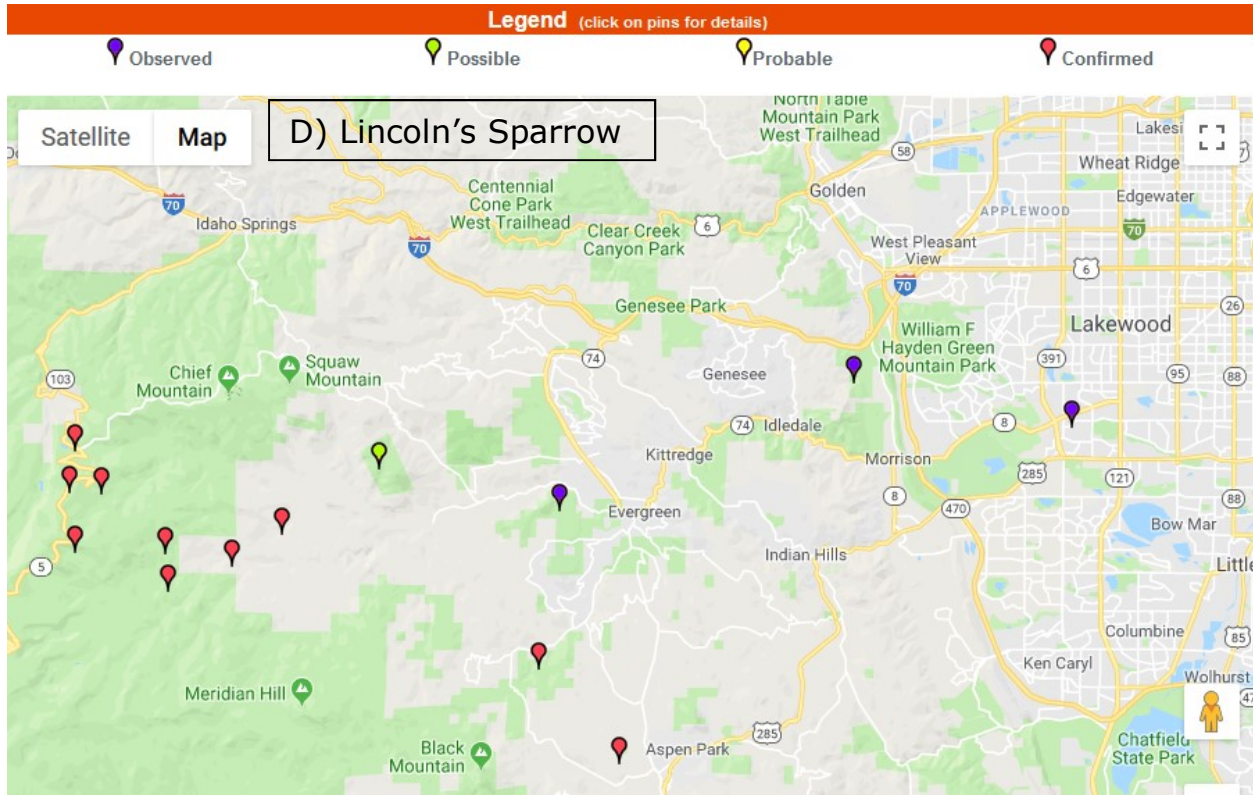
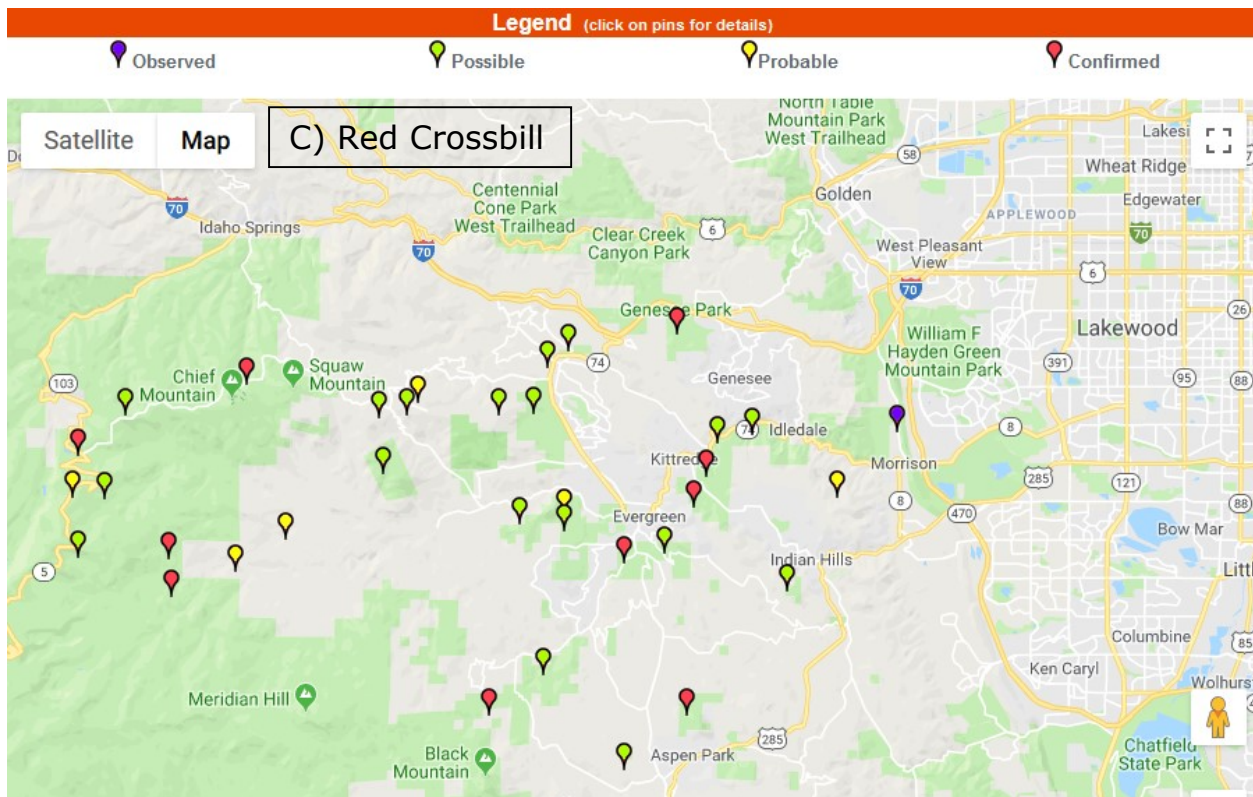
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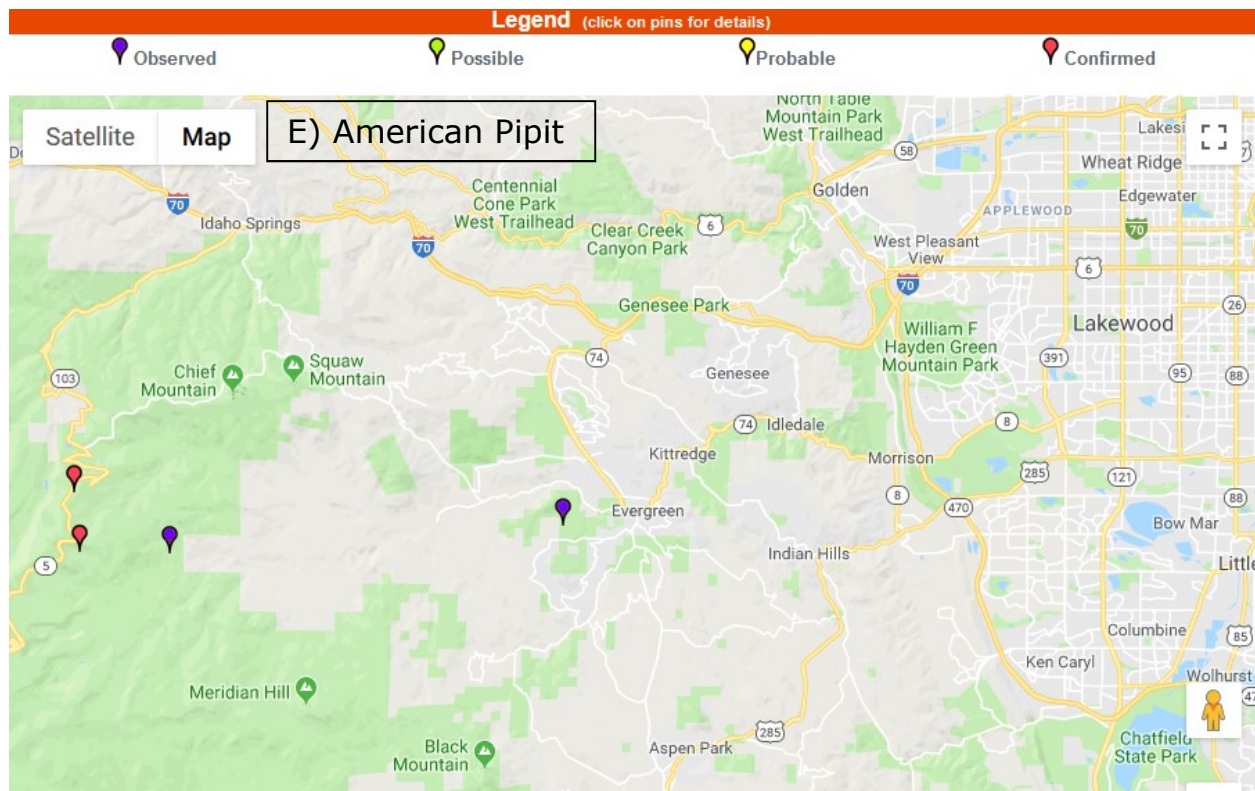
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Appendix 1. Examples of breeding bird distribution in the Bear Creek Watershed: A) Blue-gray Gnatcatcher (foothills), B) Western Wood-Pewee (foothill/montane), C) Red Crossbill (montane), D) Lincoln's Sparrow (montane/alpine), E) American Pipit (alpine).







Appendix 2. Abundance (RA = rare, UN = uncommon, FC = fairly common, CO = common, AB = abundant) of birds suspected of breeding at sites within the Front Range Fans ecoregion of the Bear Creek Watershed, Colorado (2008–2018), during the core survey period. See Table 4 for definitions of abundance.

	Bear Creek Greenbelt		Bear Creek Lake Park	Hayden Green Mountain Park
	East	West		
Canada Goose	AB	AB	AB	UN
Wood Duck	UN		RA	
Blue-winged Teal			UN	
Northern Shoveler			UN	
Gadwall	UN	RA	FC	
Mallard	AB	AB	AB	
Rock Pigeon	CO	UN		FC
Eurasian Collared-Dove	UN	CO	RA	UN
Mourning Dove	AB	AB	AB	AB
Common Nighthawk		UN		
Common Poorwill				RA
Black-chinned Hummingbird		RA	UN	
Broad-tailed Hummingbird	FC	UN	FC	FC
Sora			RA	
American Coot			UN	
Killdeer	UN	RA	FC	
Spotted Sandpiper			RA	
Great Blue Heron	UN	UN	CO	
Black-crowned Night-Heron	UN	UN	UN	
Turkey Vulture	FC	FC	UN	UN
Sharp-shinned Hawk		UN		
Cooper's Hawk		UN	RA	RA
Swainson's Hawk	UN	UN	UN	RA
Red-tailed Hawk	FC	UN	UN	UN
Golden Eagle	RA			
Great Horned Owl	RA		UN	RA
Belted Kingfisher	FC	UN	UN	
Downy Woodpecker	UN	CO	FC	RA
Northern Flicker	AB	AB	CO	CO
American Kestrel	FC		UN	FC
Prairie Falcon				RA
Western Wood-Pewee	CO	CO	AB	CO
Dusky Flycatcher				RA
Cordilleran Flycatcher		UN	UN	
Say's Phoebe		UN	RA	UN
Western Kingbird	RA	RA	CO	AB
Eastern Kingbird			RA	
Plumbeous Vireo		RA	RA	

	Bear Creek Greenbelt		Bear Creek Lake Park	Hayden Green Mountain Park
	East	West		
Warbling Vireo	FC		CO	
Blue Jay	AB	AB		UN
Woodhouse's Scrub-Jay				CO
Black-billed Magpie	CO	AB	AB	AB
American Crow	FC	FC	RA	UN
Common Raven		UN	RA	RA
Tree Swallow	AB		AB	AB
Violet-green Swallow	AB	UN	AB	FC
N. Rough-winged Swallow	CO	UN	CO	
Cliff Swallow	AB	AB	AB	CO
Barn Swallow	AB	AB	CO	FC
Black-capped Chickadee	AB	AB	FC	FC
Bushtit		RA		
White-breasted Nuthatch	FC	FC	RA	
House Wren	AB	AB	AB	AB
Blue-gray Gnatcatcher	UN	UN	FC	CO
American Dipper			RA	
American Robin	AB	AB	AB	AB
Gray Catbird	UN	FC	UN	RA
Northern Mockingbird		RA		
European Starling	AB	AB	AB	FC
Cedar Waxwing	UN		RA	
House Sparrow	CO	FC	RA	CO
House Finch	AB	AB	CO	AB
Lesser Goldfinch		RA	FC	AB
American Goldfinch	RA	UN	CO	
Green-tailed Towhee		RA	FC	FC
Spotted Towhee		FC	AB	AB
Chipping Sparrow				FC
Vesper Sparrow			FC	AB
Lark Sparrow			RA	
Savannah Sparrow				RA
Song Sparrow	AB	AB	AB	
Yellow-breasted Chat		UN	CO	AB
Western Meadowlark			AB	AB
Bullock's Oriole	UN	UN	AB	AB
Red-winged Blackbird	AB	AB	AB	RA
Brown-headed Cowbird	FC	UN	AB	AB
Brewer's Blackbird	UN		UN	
Common Grackle	AB	AB	AB	CO
Great-tailed Grackle				FC
Common Yellowthroat		RA	UN	

	Bear Creek Greenbelt		Bear Creek Lake Park	Hayden Green Mountain Park
	East	West		
Yellow Warbler	AB	AB	AB	UN
Yellow-rumped Warbler	CO	UN	UN	
Western Tanager				RA
Black-headed Grosbeak		UN		CO
Blue Grosbeak				RA
Lazuli Bunting		RA	RA	UN
Indigo Bunting			RA	

Appendix 2. Abundance (RA = rare, UN = uncommon, FC = fairly common, CO = common, AB = abundant) of bird species found at sites within the Foothill Shrublands ecoregion of the Bear Creek Watershed, Colorado (2008–2018), during the core survey period. See Table 4 for definitions of abundance.

	Dinosaur Ridge		Matthews Winters Park	Red Rocks Park	Mount Glennon
	North	South			
Mallard		RA	RA	RA	UN
Rock Pigeon		RA	UN	CO	AB
Eurasian Collared-Dove		RA		RA	
Mourning Dove	AB	CO	AB	FC	AB
Common Poorwill					UN
White-throated Swift	FC	AB	UN	AB	AB
Black-chinned Hummingbird		RA	UN	UN	UN
Broad-tailed Hummingbird	CO	AB	AB	AB	AB
Great Blue Heron		RA		RA	RA
Turkey Vulture	UN	UN	UN	UN	FC
Cooper's Hawk	UN	RA	UN	RA	RA
Swainson's Hawk			RA		RA
Red-tailed Hawk	FC	UN	FC	UN	FC
Golden Eagle			RA	RA	UN
Barn Owl				RA	
Great Horned Owl				UN	RA
Belted Kingfisher					RA
Downy Woodpecker			UN	RA	RA
Northern Flicker	UN	UN	FC	FC	UN
American Kestrel	UN	UN	UN	FC	UN
Peregrine Falcon				UN	
Prairie Falcon		UN		UN	RA
Western Wood-Pewee	FC	FC	FC	FC	CO
Dusky Flycatcher			UN	RA	
Cordilleran Flycatcher			UN	FC	UN
Say's Phoebe	RA	RA	UN	CO	FC

	Dinosaur Ridge		Matthews Winters Park	Red Rocks Park	Mount Glennon
	North	South			
Western Kingbird	AB	FC	CO	FC	AB
Eastern Kingbird				RA	
Plumbeous Vireo		RA			
Warbling Vireo	RA	RA	CO	UN	UN
Steller's Jay				RA	
Blue Jay			RA		UN
Woodhouse's Scrub-Jay	AB	AB	AB	AB	AB
Black-billed Magpie	AB	UN	AB	AB	AB
American Crow	RA	UN	UN	AB	UN
Common Raven	UN	UN	RA	FC	UN
Tree Swallow	AB	UN	FC		FC
Violet-green Swallow	AB	AB	FC	AB	AB
N. Rough-winged Swallow	RA				UN
Cliff Swallow	FC	UN		RA	UN
Barn Swallow	RA	UN	RA	RA	UN
Black-capped Chickadee	UN	FC	AB	CO	FC
Mountain Chickadee	FC	UN			RA
Bushtit	UN	RA	UN		RA
White-breasted Nuthatch			UN	RA	RA
Rock Wren	UN	FC	RA	RA	FC
Canyon Wren	UN	UN	RA	FC	UN
House Wren	RA	UN	AB	AB	CO
Blue-gray Gnatcatcher	AB	AB	AB	AB	AB
American Dipper					RA
Western Bluebird			RA	RA	
Mountain Bluebird		RA		RA	
Townsend's Solitaire		RA	RA	RA	RA
Hermit Thrush		RA			RA
American Robin	AB	AB	AB	AB	AB
Gray Catbird			FC	FC	UN
Northern Mockingbird				RA	
European Starling	RA		UN	FC	UN
Cedar Waxwing				UN	UN
House Sparrow			RA		RA
House Finch	CO	CO	FC	AB	AB
Lesser Goldfinch	AB	CO	AB	CO	AB
American Goldfinch	UN	RA	AB	UN	UN
Green-tailed Towhee	CO	RA	FC	RA	UN
Spotted Towhee	AB	AB	AB	AB	AB
Chipping Sparrow	UN	RA	UN	UN	CO
Vesper Sparrow	UN	RA	UN	RA	UN
Lark Sparrow		RA	UN	UN	CO

	Dinosaur Ridge		Matthews Winters Park	Red Rocks Park	Mount Glennon
	North	South			
Song Sparrow			FC	UN	RA
Yellow-breasted Chat		RA	AB	AB	CO
Western Meadowlark	CO	RA	AB	CO	CO
Bullock's Oriole	FC	CO	AB	AB	AB
Red-winged Blackbird	RA	RA	RA		CO
Brown-headed Cowbird	CO	AB	CO	AB	AB
Brewer's Blackbird	FC	RA	UN	CO	
Common Grackle	RA	UN	FC		UN
Virginia's Warbler	UN	UN	FC	RA	UN
Yellow Warbler	UN	RA	AB	AB	AB
Yellow-rumped Warbler	UN	CO		FC	
Western Tanager	CO	FC	UN	FC	UN
Black-headed Grosbeak	AB	CO	AB	AB	AB
Blue Grosbeak			RA	RA	
Lazuli Bunting	FC	UN	AB	AB	FC
Indigo Bunting			RA	UN	RA

Appendix 3. Abundance (RA = rare, UN = uncommon, FC = fairly common, CO = common, AB = abundant) of bird species found at sites within the Crystalline Mid-Elevation Forests ecoregion of the Bear Creek Watershed, Colorado (2008–2018), during the core survey period. See Table 4 for definitions of abundance.

	Alderfer Three Sisters	Bell	Bergen Park	Bergen Peak SWA	Berrian Mount.	Birch Hill	Captain Mount. South	Corwina	Cub Creek Park
Canada Goose								UN	FC
Mallard		RA		RA	UN			AB	UN
Dusky Grouse							RA		
Wild Turkey						RA			
Rock Pigeon									UN
Band-tailed Pigeon				RA					
Eurasian Collared-Dove						RA			RA
Mourning Dove	UN	UN	FC	UN	CO	UN		AB	CO
Common Poorwill				RA					
White-throated Swift						RA			
Black-chinned Hummingbird		RA						UN	RA
Broad-tailed Hummingbird	AB	AB	AB	AB	AB	AB	AB	AB	AB
Spotted Sandpiper								RA	
Great Blue Heron					RA	RA		FC	RA
Turkey Vulture	RA	RA	FC	RA	RA	UN	UN	UN	UN
Sharp-shinned Hawk				RA	RA			RA	
Cooper's Hawk		RA		UN		UN		RA	RA
Northern Goshawk		RA					RA		
Red-tailed Hawk	UN		UN	UN	RA	UN	RA	FC	UN
Golden Eagle				UN					
Great Horned Owl	RA	RA	UN		RA				
Northern Pygmy-Owl		RA							
Northern Saw-whet Owl		UN							
Belted Kingfisher								UN	RA
Williamson's Sapsucker	UN			UN	UN	UN	UN		RA
Red-naped Sapsucker	RA			RA	RA		RA		UN
Downy Woodpecker	FC	RA		UN	UN	UN		UN	UN

	Alderfer Three Sisters	Bell	Bergen Park	Bergen Peak SWA	Berrian Mount.	Birch Hill	Captain Mount. South	Corwina	Cub Creek Park
Hairy Woodpecker	CO	RA	CO	FC	FC	CO	UN	UN	CO
Am. Three-toed Woodpecker				UN	RA	RA	UN		
Northern Flicker	FC	FC	AB	CO	CO	CO	CO	CO	CO
American Kestrel			UN						
Prairie Falcon				RA					
Olive-sided Flycatcher		RA		RA	RA	RA	UN	RA	RA
Western Wood-Pewee	RA	RA	CO	RA	UN	RA	RA	AB	FC
Hammond's Flycatcher		RA	UN	RA		UN	UN	UN	UN
Dusky Flycatcher		RA				UN		RA	
Cordilleran Flycatcher	CO	UN	CO	CO	CO	FC	UN	AB	AB
Say's Phoebe		RA						CO	
Western Kingbird								UN	
Plumbeous Vireo		RA		RA		UN		FC	UN
Warbling Vireo			UN	CO	CO	AB	FC	AB	FC
Canada Jay							RA		
Steller's Jay	FC	FC	CO	AB	CO	AB	CO	CO	AB
Clark's Nutcracker		RA		UN			UN		UN
Black-billed Magpie	CO	UN	AB	AB	UN	UN		UN	UN
American Crow	AB	CO	AB	AB	CO	CO	RA	CO	AB
Common Raven	FC	RA	AB	FC	FC	CO	UN	UN	AB
Tree Swallow	CO		AB	UN	FC	RA	UN	CO	RA
Violet-green Swallow	CO	UN	AB	FC	CO	UN	FC	AB	AB
N. Rough-winged Swallow									RA
Bank Swallow	RA								
Cliff Swallow	FC			RA				AB	
Barn Swallow					RA			AB	
Black-capped Chickadee	UN			RA	UN	FC	RA	FC	UN
Mountain Chickadee	AB	AB	AB	AB	AB	AB	AB	CO	AB
Red-breasted Nuthatch	UN	FC		CO	CO	AB	CO		FC
White-breasted Nuthatch	CO	UN	CO	FC	AB	CO	UN	CO	AB

	Alderfer Three Sisters	Bell	Bergen Park	Bergen Peak SWA	Berrian Mount.	Birch Hill	Captain Mount. South	Corwina	Cub Creek Park
Pygmy Nuthatch	AB	CO	AB	CO	AB	AB	FC	AB	AB
Brown Creeper	FC	UN	UN	RA	UN	FC	UN		UN
Rock Wren							RA	UN	
Canyon Wren				RA	RA				
House Wren	FC	UN	AB	AB	AB	FC	CO	AB	AB
Blue-gray Gnatcatcher								CO	
American Dipper								FC	UN
Golden-crowned Kinglet							UN		
Ruby-crowned Kinglet	FC	CO		CO	CO	CO	AB	UN	CO
Western Bluebird	FC	UN	AB	RA	UN			FC	AB
Mountain Bluebird	CO	RA		UN	FC		UN	CO	RA
Townsend's Solitaire	FC	UN		CO	UN	UN	FC	UN	FC
Hermit Thrush	UN	UN		FC	CO	CO	FC	UN	UN
American Robin	CO	CO	AB	AB	AB	CO	AB	AB	AB
Gray Catbird								CO	
European Starling	RA		CO					RA	
Cedar Waxwing								CO	
House Sparrow									RA
Evening Grosbeak					RA				
House Finch	UN	RA	AB	RA	FC	RA		AB	AB
Cassin's Finch		RA	AB					UN	RA
Red Crossbill	RA	UN	CO	RA	CO	RA	CO	FC	UN
Pine Siskin	AB	AB	AB	CO	AB	AB	AB	AB	AB
Lesser Goldfinch	RA		AB			UN		AB	FC
American Goldfinch						RA		FC	RA
Green-tailed Towhee	UN	RA		AB			UN	AB	RA
Spotted Towhee				UN		CO		AB	
Chipping Sparrow	AB	CO	AB	FC	FC	AB	AB	AB	AB
Vesper Sparrow	FC							UN	RA
Savannah Sparrow	RA							RA	

	Alderfer Three Sisters	Bell	Bergen Park	Bergen Peak SWA	Berrian Mount.	Birch Hill	Captain Mount. South	Corwina	Cub Creek Park
Song Sparrow				RA				AB	AB
White-crowned Sparrow								RA	
Dark-eyed Junco	AB	CO	UN	AB	AB	AB	AB	FC	AB
Western Meadowlark							RA		
Bullock's Oriole								FC	
Red-winged Blackbird	RA		AB	UN				AB	RA
Brown-headed Cowbird	UN	UN	AB	UN	UN	UN		AB	AB
Brewer's Blackbird			CO						
Common Grackle			FC						
Ovenbird						RA			
Virginia's Warbler		RA				FC			
MacGillivray's Warbler							RA	RA	RA
Yellow Warbler								AB	
Yellow-rumped Warbler	CO	UN	CO	CO	CO	CO	FC	CO	CO
Prairie Warbler								RA	
Wilson's Warbler								RA	RA
Western Tanager	UN	FC		AB	UN	CO	UN	AB	UN
Black-headed Grosbeak	UN	RA		CO	UN	FC		AB	CO
Lazuli Bunting						RA		RA	

Appendix 3. Crystalline Mid-Elevation Forests sties (continued).

	Dedisse	Elephant Butte	Elk Meadow	Fillius	Flying J Ranch	Genesee	Lair O' the Bear	Little
Canada Goose	AB				UN	CO	FC	
Blue-winged Teal	RA							
Mallard	AB	RA			UN	UN	CO	AB
Wild Turkey						RA		
Rock Pigeon						UN	RA	
Eurasian Collared-Dove	FC					RA		

	Dedisse	Elephant Butte	Elk Meadow	Fillius	Flying J Ranch	Genesee	Lair O' the Bear	Little
Mourning Dove	FC	CO	AB	UN	FC	FC	FC	
Common Nighthawk							RA	
Common Poorwill						UN		
Black-chinned Hummingbird							RA	
Broad-tailed Hummingbird	AB	AB	AB	AB	AB	AB	AB	AB
Sora	FC							
Wilson's Snipe	RA		RA		RA			
Spotted Sandpiper	FC				FC	RA	RA	
Great Blue Heron	UN			RA	UN	RA	UN	UN
Turkey Vulture	UN	UN	UN	FC	UN	FC	UN	
Sharp-shinned Hawk	RA					RA		
Cooper's Hawk		RA				RA	UN	
Northern Goshawk		RA						
Red-tailed Hawk	UN	FC	CO	UN	UN	FC	UN	UN
Golden Eagle							RA	
Great Horned Owl			RA		RA			
Northern Saw-whet Owl						RA		
Belted Kingfisher	RA						UN	
Williamson's Sapsucker			UN		FC	CO		
Red-naped Sapsucker					UN			
Downy Woodpecker		RA	UN	UN	UN	UN	UN	
Hairy Woodpecker	FC	FC	FC	FC	CO	CO	RA	
Am. Three-toed Woodpecker					UN			
Northern Flicker	FC	CO	CO	AB	CO	AB	UN	
American Kestrel			UN					
Olive-sided Flycatcher	RA	UN	FC		RA	UN	RA	
Western Wood-Pewee	CO	UN	AB	AB	CO	AB	AB	AB
Hammond's Flycatcher	RA	UN	UN	FC	FC	FC		
Dusky Flycatcher	RA	UN			RA		UN	UN
Cordilleran Flycatcher	FC	AB	FC	CO	FC	AB	CO	AB
Say's Phoebe			RA			UN	RA	
Western Kingbird			RA				FC	

	Dedisse	Elephant Butte	Elk Meadow	Fillius	Flying J Ranch	Genesee	Lair O' the Bear	Little
Plumbeous Vireo	FC	UN	AB	FC		CO	FC	
Warbling Vireo	RA	UN	AB		CO	CO	AB	FC
Canada Jay		RA			RA			
Steller's Jay	UN	CO	AB	FC	CO	CO	CO	
Clark's Nutcracker		UN			RA			
Black-billed Magpie	UN	CO	CO	AB	FC	AB	UN	
American Crow	AB	AB	AB	AB	CO	AB	CO	CO
Common Raven		FC	FC	AB	FC	FC	RA	FC
Tree Swallow	AB	UN	AB	UN	AB	CO	CO	
Violet-green Swallow	AB	CO	AB	AB	CO	AB	AB	AB
N. Rough-winged Swallow					UN	UN	AB	
Bank Swallow					RA			
Cliff Swallow	RA		CO		RA		FC	
Barn Swallow	AB		UN		UN	UN	UN	
Black-capped Chickadee	RA	RA			UN		CO	
Mountain Chickadee	AB	AB	AB	AB	AB	AB	CO	FC
Red-breasted Nuthatch	FC	AB	UN	UN	UN	UN	RA	
White-breasted Nuthatch	UN	FC	CO	AB	CO	AB	UN	
Pygmy Nuthatch	AB	AB	AB	AB	AB	AB	FC	
Brown Creeper		UN	UN	UN	FC	RA		
Rock Wren	RA	RA					RA	
Canyon Wren		UN						
House Wren	AB	AB	AB	AB	AB	AB	AB	AB
Blue-gray Gnatcatcher						FC	AB	FC
American Dipper	UN						FC	FC
Golden-crowned Kinglet			RA					
Ruby-crowned Kinglet	UN	UN	UN	RA	AB	UN	UN	
Western Bluebird	CO	UN	AB	AB	FC	AB		
Mountain Bluebird	RA		AB		CO	CO	UN	
Townsend's Solitaire		AB	FC	CO	UN	UN		
Hermit Thrush		UN	UN	CO	FC	UN	RA	
American Robin	AB	AB	AB	AB	AB	AB	AB	UN

	Dedisse	Elephant Butte	Elk Meadow	Fillius	Flying J Ranch	Genesee	Lair O' the Bear	Little
Gray Catbird							AB	
Northern Mockingbird			RA					
European Starling	UN		UN			CO		
Cedar Waxwing				UN		RA	AB	
House Sparrow	UN			RA				
Evening Grosbeak	AB				UN			
House Finch	AB	UN	AB	AB	AB	AB	AB	
Cassin's Finch	RA		CO	CO	RA	CO		
Red Crossbill	CO	UN	FC	FC	CO	AB	RA	
Pine Siskin	AB	CO	AB	AB	AB	AB	UN	UN
Lesser Goldfinch	CO	RA	CO	AB	UN	AB	AB	AB
American Goldfinch	RA				UN	RA	FC	
Green-tailed Towhee	RA	FC	CO	AB		FC	UN	
Spotted Towhee		RA		UN		UN	AB	UN
Chipping Sparrow	AB	FC	AB	AB	AB	AB	UN	
Vesper Sparrow		RA	AB	UN	CO	CO	RA	
Lark Sparrow			RA					
Savannah Sparrow		RA	AB		CO	UN	RA	
Song Sparrow	AB		UN		CO	FC	AB	
Lincoln's Sparrow	RA				CO			
White-crowned Sparrow	RA		RA					
Dark-eyed Junco	FC	AB	CO	AB	AB	AB	RA	
Yellow-breasted Chat							RA	
Western Meadowlark			CO			RA		
Bullock's Oriole							AB	
Red-winged Blackbird	AB		AB	RA	RA	AB	UN	
Brown-headed Cowbird	CO	UN	AB	AB	CO	AB	CO	
Brewer's Blackbird			AB		UN			
Common Grackle	AB					RA	RA	
Ovenbird							RA	
Virginia's Warbler			RA				RA	
MacGillivray's Warbler					RA		UN	

	Dedissee	Elephant Butte	Elk Meadow	Fillius	Flying J Ranch	Genesee	Lair O' the Bear	Little
Common Yellowthroat	RA	RA						
Yellow Warbler	UN				UN	UN	AB	AB
Yellow-rumped Warbler	CO	CO	CO	AB	CO	AB	CO	
Western Tanager	UN	AB	AB	AB	UN	AB	CO	FC
Black-headed Grosbeak	RA	UN	FC	UN	FC	UN	AB	FC
Lazuli Bunting							AB	
Indigo Bunting							RA	

Appendix 3. Crystalline Mid-Elevation Forests sites (continued).

	Maxwell Falls Trail	Meyer Ranch	Mount Evans SWA	Mount Falcon	Mount Lindo	Mount Pence	O'Fallon	Pence Park
Canada Goose			RA	UN				
Mallard		RA		UN	RA		FC	
Dusky Grouse			RA	RA	RA			
Wild Turkey			UN	FC	RA		RA	
Rock Pigeon				RA				
Eurasian Collared-Dove				RA	UN			
Mourning Dove	UN		UN	CO	FC	RA	CO	CO
Common Nighthawk				UN				
Common Poorwill				UN	UN			
White-throated Swift				FC	UN			
Black-chinned Hummingbird					RA			
Broad-tailed Hummingbird	AB	AB	AB	AB	AB	AB	AB	AB
Wilson's Snipe		UN						
Spotted Sandpiper				RA				
Great Blue Heron	RA			RA			UN	RA
Turkey Vulture		RA	UN	FC	UN	RA	FC	UN
Sharp-shinned Hawk				RA				RA
Cooper's Hawk				RA	RA		RA	RA
Northern Goshawk				RA				
Red-tailed Hawk	RA	UN	UN	UN	UN	RA	UN	FC

	Maxwell Falls Trail	Meyer Ranch	Mount Evans SWA	Mount Falcon	Mount Lindo	Mount Pence	O'Fallon	Pence Park
Golden Eagle				RA				RA
Great Horned Owl					RA			
Northern Pygmy-Owl				RA	RA		RA	
Northern Saw-whet Owl					RA		RA	
Belted Kingfisher							RA	
Williamson's Sapsucker	FC	UN	UN			RA		UN
Red-naped Sapsucker	RA	UN	RA					RA
Downy Woodpecker	FC	FC	RA	RA	RA	RA	RA	RA
Hairy Woodpecker	CO	UN	UN	UN	UN	CO	FC	FC
Am. Three-toed Woodpecker	UN			RA	UN	RA		
Northern Flicker	FC	FC	CO	FC	UN	CO	CO	FC
American Kestrel				UN	RA			
Peregrine Falcon								RA
Olive-sided Flycatcher	RA		FC					RA
Western Wood-Pewee		UN	FC	FC	UN		FC	FC
Hammond's Flycatcher	RA	FC	UN	RA	FC	RA	UN	RA
Dusky Flycatcher	RA	RA	UN	RA	FC		FC	UN
Cordilleran Flycatcher	AB	FC	FC	CO	CO	AB	AB	FC
Say's Phoebe	RA	UN		UN				
Western Kingbird				UN				
Plumbeous Vireo	RA	RA		UN	CO	RA	CO	FC
Warbling Vireo	AB	AB	CO	UN	CO	FC	UN	FC
Canada Jay						UN		
Steller's Jay	AB	FC	FC	CO	AB	CO	AB	CO
Blue Jay					UN			
Woodhouse's Scrub-Jay				CO	UN			
Clark's Nutcracker						UN		RA
Black-billed Magpie	RA			AB	UN	UN	UN	FC
American Crow	FC	FC	UN	AB	FC	FC	AB	AB
Common Raven	UN	FC	FC	FC	CO	AB	FC	CO
Tree Swallow		FC	CO	RA			RA	
Violet-green Swallow	UN	FC	FC	AB	FC	UN	AB	AB

	Maxwell Falls Trail	Meyer Ranch	Mount Evans SWA	Mount Falcon	Mount Lindo	Mount Pence	O’Fallon	Pence Park
N. Rough-winged Swallow				UN			RA	
Cliff Swallow		AB					RA	
Barn Swallow		CO		UN			RA	
Black-capped Chickadee		UN		UN	FC	FC	CO	UN
Mountain Chickadee	AB	AB	CO	CO	AB	AB	AB	AB
Bushtit					RA			
Red-breasted Nuthatch	CO	UN	FC	UN	CO	AB	UN	FC
White-breasted Nuthatch	CO	UN	UN	CO	CO	UN	AB	CO
Pygmy Nuthatch	AB	AB	FC	AB	FC	FC	AB	AB
Brown Creeper	CO	FC	RA	RA	UN	FC	UN	UN
Rock Wren	RA			FC		RA		
Canyon Wren				RA				
House Wren	AB	AB	AB	AB	AB	CO	AB	CO
Blue-gray Gnatcatcher				CO	FC		RA	
American Dipper			RA	UN			UN	
Golden-crowned Kinglet	FC		RA		UN	FC		
Ruby-crowned Kinglet	AB	AB	AB	RA	UN	AB	CO	UN
Western Bluebird		RA	UN	AB	RA		CO	FC
Mountain Bluebird		FC	CO	FC				
Townsend's Solitaire	CO		UN	UN	RA	UN	FC	UN
Swainson's Thrush						RA		
Hermit Thrush	AB	FC	CO	UN	FC	AB	FC	FC
American Robin	AB	AB	AB	AB	AB	AB	AB	AB
Gray Catbird								RA
European Starling				RA				
Cedar Waxwing				RA			RA	
House Sparrow				UN			RA	
Evening Grosbeak		UN		RA				
House Finch		UN		UN	UN		CO	CO
Cassin's Finch			UN					RA
Red Crossbill	UN		FC	CO		UN	FC	UN
Pine Siskin	AB	FC	CO	AB	CO	CO	AB	AB

	Maxwell Falls Trail	Meyer Ranch	Mount Evans SWA	Mount Falcon	Mount Lindo	Mount Pence	O'Fallon	Pence Park
Lesser Goldfinch		UN		CO	UN		FC	UN
American Goldfinch		RA			RA		RA	
Green-tailed Towhee				FC	AB		CO	UN
Spotted Towhee				AB	AB		UN	UN
Chipping Sparrow	RA	AB	AB	AB	FC	RA	AB	AB
Vesper Sparrow		RA	RA	UN				RA
Lark Sparrow			RA					
Savannah Sparrow		AB						
Song Sparrow	UN	FC	RA	UN	UN		CO	FC
Lincoln's Sparrow	UN		RA					
White-crowned Sparrow			RA					RA
Dark-eyed Junco	AB	AB	AB	AB	AB	AB	AB	AB
Yellow-breasted Chat				UN				
Western Meadowlark				FC				
Bullock's Oriole				FC			RA	
Red-winged Blackbird		AB		CO			RA	
Brown-headed Cowbird	UN	UN	UN	UN	RA	RA	CO	FC
Common Grackle		UN		RA			RA	
Ovenbird					CO			
Virginia's Warbler				UN	AB			
MacGillivray's Warbler	UN		RA	RA	CO		UN	UN
Common Yellowthroat							RA	
Yellow Warbler	RA			CO	UN		FC	RA
Yellow-rumped Warbler	AB	CO	CO	AB	CO	AB	CO	FC
Wilson's Warbler				RA				RA
Western Tanager	RA	FC	UN	AB	AB	RA	CO	CO
Black-headed Grosbeak	UN	UN	UN	CO	CO		FC	CO
Lazuli Bunting				UN	UN		RA	

Appendix 4. Abundance (RA = rare, UN = uncommon, FC = fairly common, CO = common, AB = abundant) of bird species found at sites within the Crystalline Subalpine Forests and Alpine Zone of the Bear Creek Watershed, Colorado (2008–2018), during the core survey period. These sites are primarily in the Arapaho National Forest. See Table 4 for definitions of abundance.

	Beartrack Lakes Trail	Beaver Meadows	Echo Lake/ Beaverdam Creek	Chief/ Squaw Mountains	Cub Creek Trail	Hicks Mountain	Mount Judge
Canada Goose						UN	
Blue-winged Teal		UN					
Mallard		UN	AB				
Green-winged Teal		UN					
Barrow's Goldeneye			UN				
Dusky Grouse	RA	RA	RA	RA		RA	UN
Band-tailed Pigeon	RA			UN			RA
Mourning Dove			RA	RA	UN	UN	
White-throated Swift							RA
Broad-tailed Hummingbird	AB	AB	AB	FC	AB	AB	CO
Wilson's Snipe		RA					
Spotted Sandpiper		RA	RA				
Great Blue Heron		RA					
Turkey Vulture		RA				RA	
Sharp-shinned Hawk	RA					RA	
Copper's Hawk						RA	
Northern Goshawk	RA	RA					
Red-tailed Hawk	RA	UN	RA		RA	RA	
Golden Eagle	RA		RA			UN	
Great Horned Owl				RA	RA		
Northern Saw-whet Owl					RA		
Williamson's Sapsucker	UN	UN	RA			FC	
Red-naped Sapsucker	RA	UN	RA		UN		RA
Downy Woodpecker	UN				FC		RA
Hairy Woodpecker	FC	UN	FC	UN	CO	CO	UN
Am. Three-toed Woodpecker	UN	UN	UN	UN	RA	RA	
Northern Flicker	AB	FC	FC	FC	FC	AB	UN

	Beartrack Lakes Trail	Beaver Meadows	Echo Lake/ Beaverdam Creek	Chief/ Squaw Mountains	Cub Creek Trail	Hicks Mountain	Mount Judge
Peregrine Falcon						UN	
Olive-sided Flycatcher	AB	UN				UN	
Western Wood-Pewee	AB	RA	UN		RA	FC	
Hammond's Flycatcher				RA	RA		
Dusky Flycatcher	UN					RA	
Cordilleran Flycatcher	AB	CO	CO		UN	CO	FC
Plumbeous Vireo						UN	
Warbling Vireo	CO	CO	UN		UN	FC	UN
Canada Jay	UN	FC	AB	AB	UN		
Steller's Jay	CO	FC	CO	FC	FC	AB	FC
Clark's Nutcracker	FC	UN	CO	AB		UN	UN
American Crow			FC		FC	AB	UN
Common Raven	FC	FC	CO	FC	FC	CO	FC
Tree Swallow		UN	FC				
Violet-green Swallow	AB		CO		UN	CO	RA
Black-capped Chickadee		RA			RA		RA
Mountain Chickadee	AB	AB	AB	AB	AB	AB	AB
Red-breasted Nuthatch	CO	CO	CO	AB	UN	FC	CO
White-breasted Nuthatch	FC	UN	UN	UN	UN	CO	UN
Pygmy Nuthatch		UN	RA		AB	FC	UN
Brown Creeper	UN	UN	CO	UN	CO	UN	UN
Rock Wren	UN						
Canyon Wren				RA		UN	
House Wren	AB	CO	CO		FC	AB	UN
American Dipper						RA	
Golden-crowned Kinglet	UN	CO	UN	UN	RA		
Ruby-crowned Kinglet	AB	AB	AB	AB	AB	CO	AB
Western Bluebird						UN	
Mountain Bluebird	AB			RA			
Townsend's Solitaire	CO	RA	RA	UN	FC	CO	UN
Hermit Thrush	AB	CO	CO	AB	AB	CO	AB

	Beartrack Lakes Trail	Beaver Meadows	Echo Lake/ Beaverdam Creek	Chief/ Squaw Mountains	Cub Creek Trail	Hicks Mountain	Mount Judge
American Robin	AB	AB	AB	AB	AB	AB	FC
Evening Grosbeak					RA		
Pine Grosbeak	UN	RA	UN	UN			
House Finch			RA			RA	RA
Cassin's Finch	CO			RA		UN	
Red Crossbill	CO	FC	CO	FC	AB	UN	FC
Pine Siskin	AB	FC	AB	AB	AB	AB	AB
Green-tailed Towhee	FC					AB	
Chipping Sparrow	AB	UN	FC	RA	UN	AB	
Vesper Sparrow						RA	
Fox Sparrow		UN					
Song Sparrow	RA	FC	RA			RA	
Lincoln's Sparrow	FC	AB	AB			RA	
White-crowned Sparrow	FC	UN	FC				
Dark-eyed Junco	AB	AB	AB	AB	AB	AB	AB
Red-winged Blackbird			RA			RA	
Brown-headed Cowbird		RA			RA	UN	
MacGillivray's Warbler	UN						
Yellow Warbler			RA		UN		
Yellow-rumped Warbler	AB	AB	AB	AB	AB	AB	AB
Wilson's Warbler		AB	CO			RA	
Western Tanager	UN	RA		RA		AB	UN
Black-headed Grosbeak		RA			UN	CO	

Appendix 4. Crystalline Subalpine Forests and Alpine Zone sites (continued).

	Resthouse Meadows Tr.	Snyder Mountain	Squaw Pass Road	Lincoln Lake	Mount Goliath	Summit Lake
White-tailed Ptarmigan				UN		UN
Dusky Grouse	UN	RA	RA	UN	UN	
Band-tailed Pigeon		RA				
Mourning Dove		UN				
Broad-tailed Hummingbird	CO	AB	UN	CO	FC	UN
Turkey Vulture		UN				
Sharp-shinned Hawk						
Cooper's Hawk						
Northern Goshawk		RA				
Red-tailed Hawk		RA			RA	
Golden Eagle	RA				RA	
Williamson's Sapsucker	RA	FC	RA			
Red-naped Sapsucker						
Downy Woodpecker						
Hairy Woodpecker	FC	UN	UN	UN	UN	
Am. Three-toed Woodpecker	RA	RA	RA	UN	RA	
Northern Flicker	UN	FC	CO	FC	UN	
Peregrine Falcon		RA		UN		
Prairie Falcon						RA
Olive-sided Flycatcher	RA			RA		
Western Wood-Pewee		RA			RA	
Dusky Flycatcher	RA			UN	RA	
Cordilleran Flycatcher	UN	CO	RA		RA	
Warbling Vireo	RA	CO				
Canada Jay	CO		CO		FC	
Steller's Jay	FC	AB	CO	RA	UN	
Clark's Nutcracker	CO	UN	FC	FC	FC	
Black-billed Magpie		AB				
American Crow	UN	AB			RA	
Common Raven	FC	CO	CO	AB	AB	AB
Violet-green Swallow		UN		RA		

	Resthouse Meadows Tr.	Snyder Mountain	Squaw Pass Road	Lincoln Lake	Mount Goliath	Summit Lake
Black-capped Chickadee		FC			RA	
Mountain Chickadee	AB	AB	AB	CO	CO	
Red-breasted Nuthatch	CO	AB	AB	UN	CO	
White-breasted Nuthatch	RA	CO	RA		RA	
Pygmy Nuthatch		CO				
Brown Creeper	CO	UN	UN		RA	
Rock Wren		UN		CO	UN	RA
Canyon Wren						
House Wren		AB		RA	RA	
Golden-crowned Kinglet	UN	RA	UN			
Ruby-crowned Kinglet	AB	AB	AB	CO	AB	
Western Bluebird						
Mountain Bluebird	UN	RA		CO	FC	CO
Townsend's Solitaire	UN	FC	UN	UN	UN	
Hermit Thrush	AB	CO	AB	FC	CO	
American Robin	AB	AB	AB	AB	AB	
American Pipit				AB	FC	AB
Pine Grosbeak	UN		UN	RA	UN	
Brown-capped Rosy-Finch						FC
House Finch						
Cassin's Finch						
Red Crossbill	FC	RA	UN	RA	FC	
Pine Siskin	AB	AB	AB	AB	AB	
Green-tailed Towhee		CO				
Chipping Sparrow		FC			RA	
Vesper Sparrow						
Fox Sparrow	RA			RA	FC	RA
Song Sparrow						
Lincoln's Sparrow	CO			FC	AB	UN
White-crowned Sparrow	UN			AB	AB	AB
Dark-eyed Junco	AB	AB	AB	AB	AB	
Red-winged Blackbird						

	Resthouse Meadows Tr.	Snyder Mountain	Squaw Pass Road	Lincoln Lake	Mount Goliath	Summit Lake
Brown-headed Cowbird		RA				
Yellow-rumped Warbler	AB	AB	AB	CO	AB	
Wilson's Warbler	FC			AB	AB	
Western Tanager		UN				
Black-headed Grosbeak		FC				