

# **Boulder Reservoir 2015 Birds of Special Concern Monitoring Summary**



Report for Joy Master, Boulder Parks and Recreation Department

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1 September 2015

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## **Introduction**

The marshes and grasslands surrounding Boulder Reservoir support more nests of Boulder County birds of special concern than any other comparably sized area in the county (Hallock and Jones 2010). American Bitterns (Boulder County isolated and restricted) and Northern Harriers (Boulder County rare and declining) have nested in wetlands west of Coot Lake and west of Boulder Reservoir (Hallock and Jones 2010, Jones 2013b). The harrier nests were the only successful ones reported in Boulder County from 2004-13 (Jones 2013a).

Burrowing Owls (Boulder County isolated and restricted) have nested in prairie dog colonies west and north of the reservoir and east of the reservoir dam (Jones and Mahoney 2003, Jones 2013). Ospreys (isolated and restricted) have nested in the Little Dry Creek and Dry Creek wetlands, west of the reservoir, and on the North Rim open space property 1.5 km northwest of the reservoir. The Little Dry Creek site was the first documented Osprey nesting site in Boulder County (Boulder County Nature Association, unpublished data).

Since 2004 Boulder Parks and Recreation Department volunteers have monitored nesting activities of these and other birds of concern within Parks and Recreation properties surrounding the reservoir and Coot Lake. During 2015, 32 volunteers devoted approximately 562 hours (118 hours in training, 444 hours of fieldwork and commuting) to this monitoring effort.

Locating nest sites, tracking nesting success, and monitoring human activities that might disturb active nests all contribute to conservation of species of concern on Boulder Parks and Recreation Department properties. Since Boulder Reservoir is visited by tens of thousands of recreationists each year, nest monitoring can be particularly helpful to land managers wishing to designate and protect sensitive wildlife areas.

## **Methods**

Each volunteer was assigned to one of three areas--Coot Lake wetland, Little Dry Creek wetland, or Dry Creek wetland--and asked to visit the assigned area once monthly, May-July, during early morning or early evening. Volunteers listened and watched for target species for at least 60 minutes from designated observation points and/or while walking on roads or trails near their assigned areas. In addition, each volunteer was assigned a prairie dog colony to monitor for burrowing owls and asked to scan the colony with binoculars for at least 10 minutes from each of two survey points, once monthly, May-July. Volunteers were asked to report any sign of burrowing owl activity (including white excrement on prairie dog burrows) within each colony during each 20-minute observation (Figure 1, Table 5).

## **Results and Discussion**

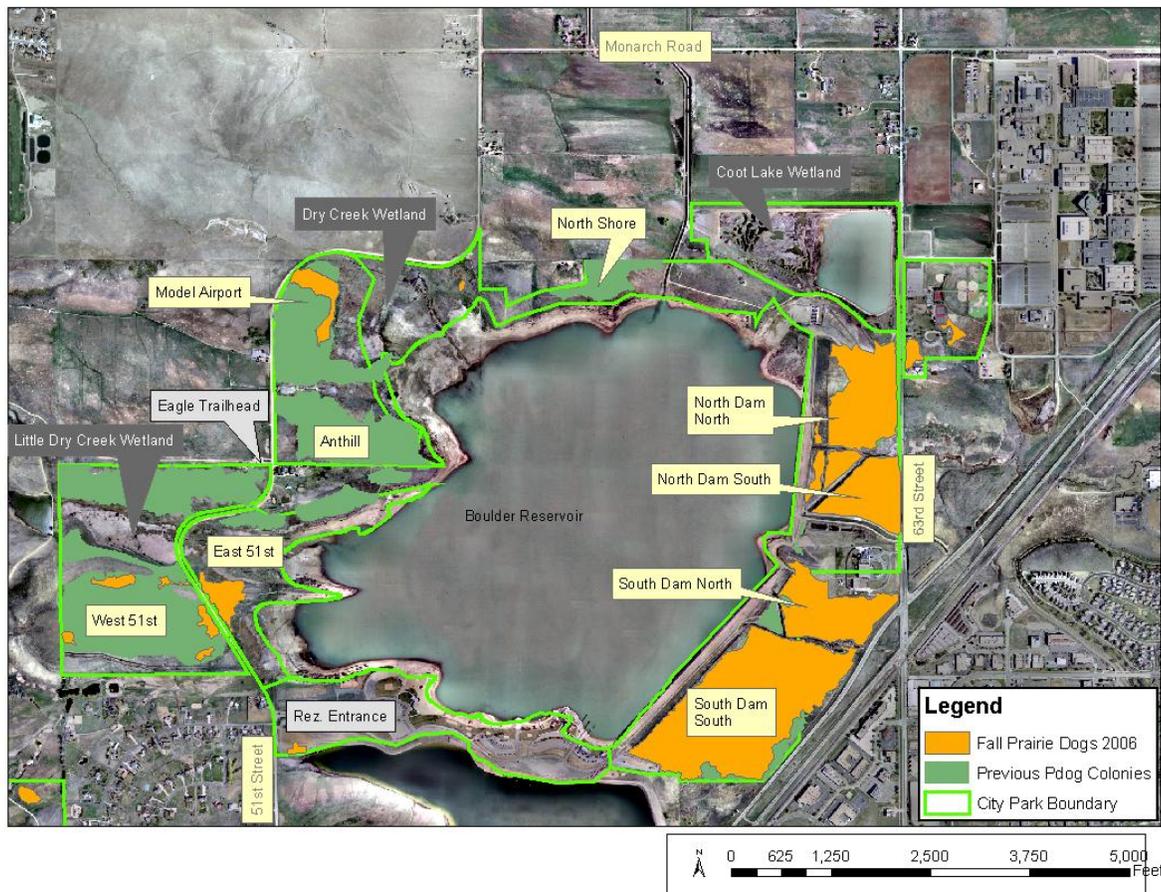
### **American Bittern (Boulder County Isolated and Restricted)**

During 2015 we saw or heard American Bitterns at seven locations: Dry Creek wetland north of the Anthill and west of N. 53rd St.; Little Dry Creek Wetland both east and west of North 51st Street and below the Boulder Valley Ranch pond; and two locations within the Coot Lake wetland (Figure 2).

One to three adults were heard calling at several locations within the Dry Creek marshes on 17 April; 1, 7, and 27 May; and 15 July. We observed no evidence of successful nesting in these marshes during 2015, but did observe recently fledged young within this marsh during 2014. Our protocols, which discourage

volunteers from approaching within 200 m of suspected nests, make it difficult to confirm successful nesting in dense cattail marshes.

Figure 1. Location of Monitored Prairie Dog Colonies

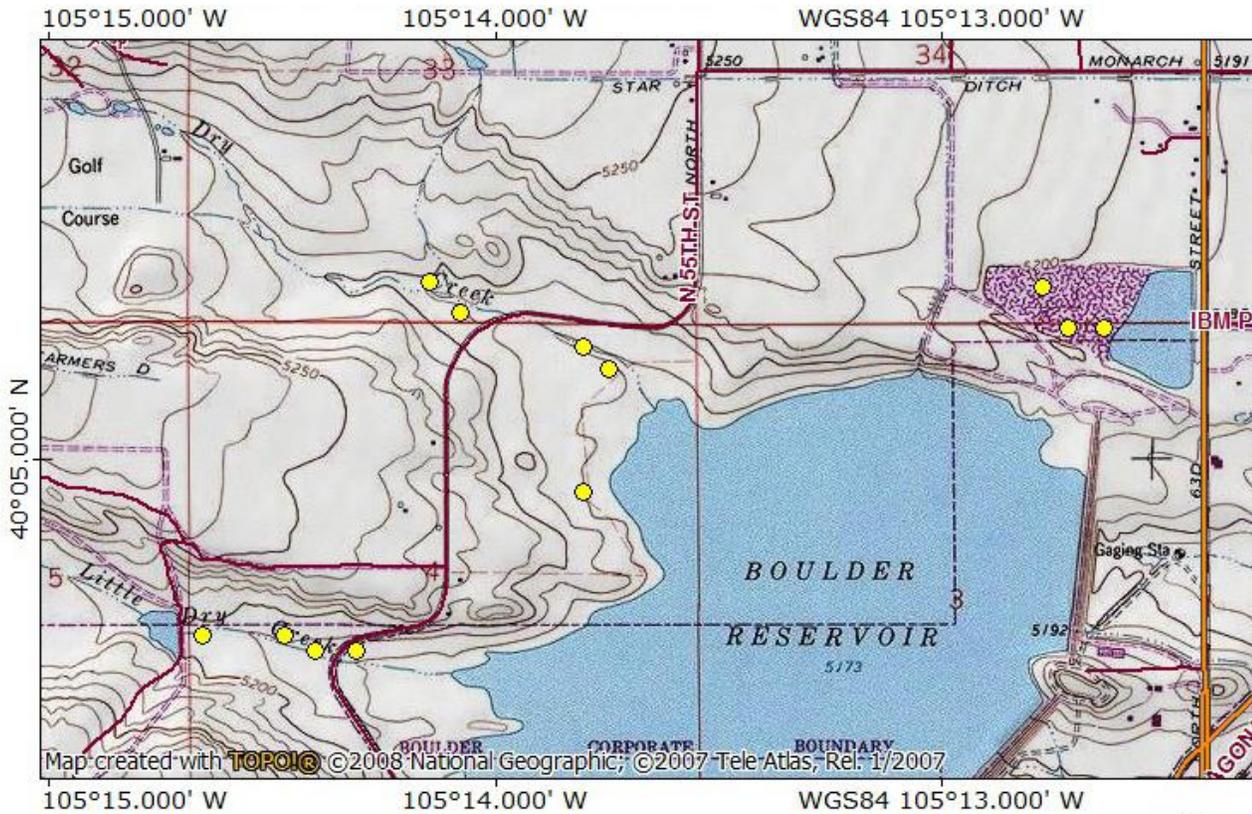


A calling bittern was heard and a second bittern was seen perched in the cattails near the Northern Harrier nest site in the Little Dry Creek wetland 80-100 m west of North 51st Street on 1 May, and a bittern was heard calling at the western end of this marsh, below Boulder Valley Ranch pond, on 7 May. Two American Bitterns were observed flying over these wetlands on 15 May, and a pair of bitterns was perched on the ground, possibly courting, near N. 51st St. on 22 May. A total of six bitterns were observed flying back and forth within this wetland and in the cattail marsh to the west of Boulder Valley Ranch pond on 25 May.

Four American Bitterns were seen within the Little Dry Creek wetland between the road and Boulder Valley Ranch pond on 16 June, and 3 juvenile bitterns were observed flying over the Little Dry Creek and Boulder Valley Ranch pond marshes on 16 July. These observations suggest the presence of three nesting territories within the Little Dry Creek Marsh between the reservoir and Boulder Valley Ranch pond and suggests that at least one nest was successful.

As many as three American Bitterns were heard calling in the wetland west of Coot Lake on 27 June and 31 July, but we observed no evidence of nesting.

Figure 2. American Bittern 2015 approximate calling locations.



American Bitterns lay their eggs on platform nests constructed in dense emergent vegetation, or less frequently, in dense grasslands (Gibbs, Melvin, and Reid 2009). North American nesting success appears highest within large unfragmented marshes (Gibbs, Melvin, and Reid 2009). As a result of fragmentation and loss of wetlands, along with pesticide contamination and human disturbance of marshes, North American breeding populations have declined since 1966 (Kingery 1998, Gibbs, Melvin, and Reid 2009). Sauer, Hines, and Fallon (2012) reported an annual rate of decline of nearly 1.8% from 1966-2011 on North American Breeding Bird Survey routes.

Strategies that increase the size of marshes and protect them from disturbance by humans and pets should benefit nesting bitterns. In Boulder County the species is still limited to only a dozen documented nesting sites, and eight of these are in wetlands adjacent to Boulder Reservoir, privately-owned Six-Mile Reservoir, and Coot Lake. All of the sites are in small (< 5 ha) cattail marshes near reservoirs or within the St. Vrain Creek or Boulder Creek floodplains, and most lie in areas that are fragmented by gravel mining, farming, roads, or trails.

All but one of the known sites (Six-Mile Reservoir) lie on public lands, but their vulnerability to urban-adapted predators and proximity to recreational trails may limit nesting success. Young bitterns are difficult to detect among the cattail foliage, and any attempt to count or band young would require significant disturbance of nesting areas. Therefore, it seems most prudent to continue to monitor sites from afar, limit human encroachment within 200 m of any active nests, and strive to expand the areas and diversity of protected cattail marshes and surrounding wetlands.

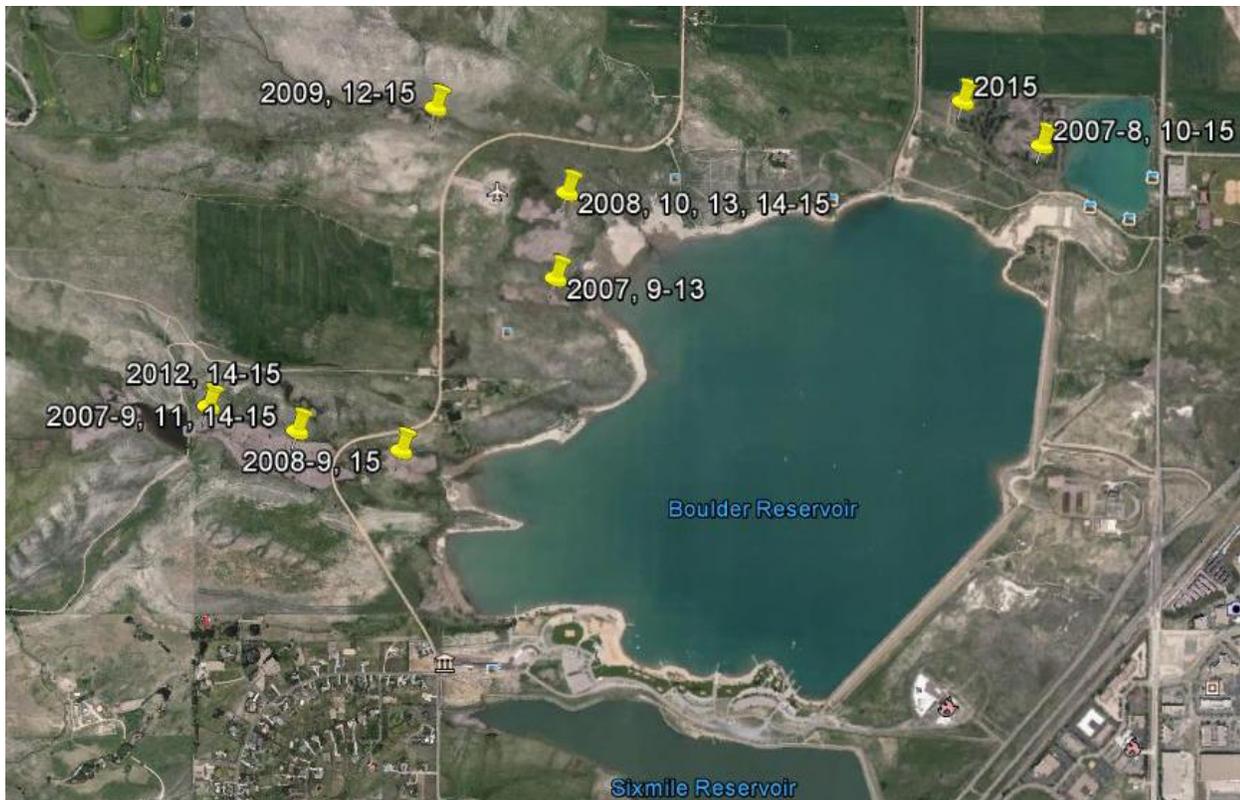
To increase diversity of existing cattail marshes, which have become dense cattail monocultures containing few areas of open water or grassy knolls, staff has considered mechanical thinning of cattails or periodic grazing in the Dry Creek drainage. Experimental use of these tools on selected and carefully mapped areas of the marsh during the fall and very early spring, when most American bitterns are wintering far to the south, might contribute to greater nesting success of American bitterns and greater diversity of nesting songbirds within these marshes.

Table 1. Nesting Season Observations of American Bittern.

Site	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Coot Lake	2 young	active	active	active	active	inactive	active	active	active	pair	inactive	2 terr.
Dry Creek	inactive	inactive	active	1 yg.	active	active	2 yg.	2 terr.	2 terr.	3 terr.	3 terr.	2 terr.
L. Dry Cr.	active	active	active	active	active	active	inactive	active	pair	inactive	2 terr.	3-4 yg.

Active: observed in area; Failed: nesting noted, but no young survived; Inactive: none observed in area; Pair: copulation or territorial behavior; Fledged: young able to fly from nest; Territories: nesting territory established.

Figure 3. American Bittern 2004-15 suspected territories, with years suspected active.



**Northern Harrier (Boulder County Rare and Declining)**

We observed a pair of Northern Harriers flying low over the Little Dry Creek wetlands, carrying nesting material and chasing away other raptors, on 12-19 April. Beginning on 30 April, several food deliveries by the male and food exchanges between the male and female over a location in the marsh 80-100 m west of

North 51st Street suggested that the female had begun incubating in that location. The adult male was observed chasing raptors or coyotes away from the suspected nest location on 10, 14, 15, and 18 May.

On 27 May the male and female circled around the suspected nest location and dropped into the marsh area near the nest several times, suggesting that the eggs may have hatched. On 31 May the female left the nest area for 15 minutes, returned, and then left the nest repeatedly for short flights, returning with grass in her beak. During the first week of June, volunteer monitors observed coyotes repeatedly stalking the nest area. The male harrier of this pair was not seen after 1 June, so the female spent several hours daily strafing coyotes as they approached the suspected nest site. On 7 June the female dived relentlessly for 2.5 hours at a pair of coyotes who seemed to be stalking the nest. The coyotes eventually made it into the nest area, and we did not see the female harrier in the vicinity of the nest after this event.

From these observations it seems likely that young hatched on this nest between 25-30 May, that the male of this harrier pair died around 1 June, and that any young were subsequently killed by coyotes on 7 June.

We began annual monitoring of nesting Northern Harriers within the study area in 2004 (Table 2, Figure 4). Successful nesting occurred in the Coot Lake wetlands in 2004 (4 young fledged); in the Little Dry Creek wetlands in 2004 (4 young fledged), 2009 (4 young fledged), and 2014 (3 young fledged); and in the Dry Creek wetlands in 2010 (3 young fledged). Unsuccessful nesting occurred in the Little Dry Creek wetlands in 2005 and 2007-8 and in the Dry Creek wetlands in 2006, 2008, and 2011. No apparent nesting was observed during 2012 or 2013. The successful 2014 nest, which fledged 3 young, was the fifth successful nest reported within the study area during 11 years of observation. The 2015 nest failure was the eighth one we've observed within the study area since 2004 (Table 2).

The total of only 18 young fledged from at least 13 nesting attempts since 2004 may not be enough to sustain a viable nesting population (Johnsgard 1990).

Table 2. Nesting Season Observations of Northern Harrier.

Site	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Coot Lake	4 fledged	pair	inactive	inactive	inactive	inactive	inactive	inactive	inactive	inactive	inactive	inactive
Dry Creek	inactive	inactive	failed	inactive	failed	inactive	3 fledged	failed	inactive	inactive	inactive	inactive
L. Dry Creek	4 fledged	pair	2 failed	failed	failed	4 fledged	inactive	inactive	inactive	inactive	3 fledged	failed

Active: observed in area; Failed: nesting noted, but no young survived; Inactive: none observed in area; Pair: copulation or territorial behavior; Fledged: young flying from nest; Territories: nesting territory established.

However, a Northern Harrier nest in the cattail marsh west of Boulder Valley Ranch pond, just 800 m west of the Little Dry Creek nest, fledged four young in June 2015. We observed incubation at this site from 7-25 May and four recently fledged young beginning on 15 June. The male and female harrier at this site were observed repeatedly strafing coyotes throughout May and June.

A second successful Northern Harrier nest in Boulder County fledged at least two young in late June (Michelle Durant, Boulder County Parks and Open Space pers. comm.). A pair of territorial Northern Harriers was observed apparently feeding young in a wet meadow south of Hygiene Road and west of St. Vrain Creek

on 29 June (Will Keeley, Boulder Open Space and Mountain Parks, pers. comm.). This site fledged three young in 2014.

Northern Harrier nesting populations have declined throughout many regions of North America. The North American Breeding Bird Survey (Sauer et. al. 2012) reported a 2% annual decline in Northern Harrier observations from 1966-2011 throughout the shortgrass and mixed-grass prairie regions of the Great Plains. Fragmentation of wetland breeding habitats by agriculture, along with declining rodent populations within agricultural areas, have probably contributed to this decline (Smith et. al. 2011).

It's likely that fragmentation of potential nesting habitat by roads, agriculture, and other human activities severely limits Northern Harrier nesting opportunities and nesting success in Boulder County. Nests situated in smaller, fragmented marshes may be more susceptible to predation by carnivores and raptors (Smith et. al. 2011). We've often observed coyotes nosing around Northern Harrier nesting areas west of the reservoir and Red-tailed Hawks harassing nesting harriers (Jones 2014). During May and June 2015, coyotes seemed particularly active around both harrier nests in the Little Dry Creek drainage, and the adult harriers spent a high percentage of each observation period chasing coyotes away. These activities lead to direct failure of the eastern nest, and the Boulder Valley Ranch adults continued to chase coyotes away from their young even after the young had fledged and begun flying on their own.

Figure 4. Northern Harrier 2014-15 approximate nest location.



Figure 5. Northern Harrier 2004-13 approximate nest locations near Boulder Reservoir.



Based on recent observations, Northern Harrier appears to be among the most endangered nesting bird species in Boulder County (see Hallock and Jones 2010). Therefore, every effort should be undertaken to protect and expand potential nesting areas. The Colorado Division of Wildlife gives no nesting buffer recommendations for Northern Harrier, but they do recommend 400 m buffers (no human activity or new occupation) for similar-sized Swainson's Hawks and 800 m nest buffers for Prairie Falcon, Peregrine Falcon, and Northern Goshawk (Colorado Division of Wildlife 2008); so 400 m seems a minimal buffer for Northern Harrier nests, especially considering their nests are located on the ground and particularly vulnerable to disturbance by roaming hikers and dogs.

Encroachment by hikers and their dogs into the closed area along the northwestern shoreline of the reservoir was reported on several occasions by volunteers during the 2013 and 2014 nesting seasons. After additional signage was installed in this area during 2014, and following a very wet spring when reservoir water levels were higher than usual, volunteers observed no incidents of encroachment into this area during the 2015 nesting season.

Efforts to restrict all human traffic passing near the Little Dry Creek and Dry Creek wetlands to the existing road right-of-way would further limit disturbance of nesting harriers. Enforcement of parking prohibitions along N. 51st St. during triathlons and other major reservoir of events is crucial to protecting nesting harriers.

At Coot Lake, dogs should be leashed throughout the Northern Harrier April-August nesting season, or at least until it has been established that no harriers are nesting, on the trail encircling the wetlands west of the lake.

In instances when pairs may choose to nest within 400 m of existing trails or other recreational facilities, seasonal closures of those facilities will contribute to nesting success. Raptors may be more inclined to

abandon nesting sites during the nest-building and early incubation periods than during the chick-rearing period (Colorado Division of Wildlife 2008; Craighead and Craighead 1965). The Northern Harrier nesting chronology, below, based on observations at Boulder Reservoir from 2006-14, can inform decisions about seasonal closures:

- Nest building: 12 April-14 June
- Incubation: 30 April-26 July
- Feeding young on the nest: 25 May-7 July
- Fledged (independently flying) young: 15 June-15 August

### Osprey (Boulder County Isolated and Restricted)

We observed an Osprey pair on the northernmost artificial nesting platform within the Little Dry Creek wetland east of N. 51st St. beginning on 12 April (Figure 5). We observed incubation on this platform from 30 April-27 May, brooding behavior on the nest by one of the adults on 1 June, and two chicks on the nest on 14 June. Both chicks appear to have fledged in early August.

An adult pair was observed perched on the artificial nesting platform in the Dry Creek drainage 50 m west of N. 53rd St. beginning on 12 April, and we observed apparent incubation on this nest from 19 April-10 June. No brooding behavior or young were observed on this nest, and the Osprey pair abandoned the territory by 29 June. This nest also failed in 2011, 2012, 2013, and 2014.

Prior to 2011, this nesting platform supported a productive nest that fledged 20 young from 2004-10. Reasons for the 2011-15 nest failure are undetermined, but the abrupt transition from a productive nest to an unproductive one suggests that perhaps one of the original pair died and was replaced by a less fertile or less experienced adult, or that the resident female became too old to lay fertile eggs. We observed no evidence of direct disturbance of this nest during 2015.

Table 3. Nesting Season Observations of Osprey.

Site	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Dry Creek	2 fledged	2 fledged	2 fledged	4 fledged	4 fledged	3 fledged	3 fledged	failed	failed	failed	failed	failed
L. Dry North	not active	failed	not active	not active	3 fledged	failed	2 fledged	2 fledged				
L. Dry South	not active	not active	not active	not active	3 fledged	3 fledged	2 fledged	2 fledged	goose nest	goose nest	goose nest	goose nest
North Rim	not active	2 fledged	1 fledged	failed	2 fledged	2 fledged	1 fledged	failed	NA	failed	NA	2 fledged

Active: observed in area; Failed: nesting noted, but no young survived; Not active: none observed in area; Pair: copulation or territorial behavior; Fledged: young able to fly from nest. NA: no monitoring information available.

Figure 6. Osprey 2004-15 nest locations.



**Bald Eagle (Boulder County Isolated and Restricted)**

We observed adult bald eagles perching within the Dry Creek and Little Dry Creek drainages throughout May and June, but we observed no signs of nesting activity. The nearest documented active bald eagle nest is situated along Lefthand Creek approximately 3 km NNW of Boulder Reservoir (Christian Nunes, Boulder Open Space and Mountain Parks, pers.comm.). Bald eagles began constructing a nest on an artificial nest platform within the Dry Creek drainage west of the reservoir during 2011, but we've observed no other nesting activity within the study area.

**Burrowing Owl (Boulder County Isolated and Restricted)**

We observed no Burrowing Owls within the study area during 2015, and Burrowing Owls have not been documented nesting successfully within the study area since 2004 (Table 5).

Table 5. Burrowing Owl 2004-15 observations at Boulder Reservoir.

Site	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
North Dam	3 fledged	1 adult seen	not active	not active	not active	not active	not active	not active	not active	not active	not active	not active
Dry Creek	not active	not active	not active	not active	not active	not active	not active	pair	not active	not active	not active	not active
L. Dry Creek	not active	not active	not active	1 adult seen	not active							
Axelson	NA*	NA	NA	NA	7 fledged	NA	NA	NA	active	NA	not active	not active

NA: no monitoring information available; Active: observed in area; Failed: nesting noted, but no young survived; Not active: none observed in area; Pair: copulation or territorial behavior; Fledged: young able to fly from nest burrow.

A total of 3 pairs were observed nesting in Boulder County during 2015, and those nests produced 7 visible young (Table 6; Christian Nunes, Boulder Open Space and Mountain Parks, pers. comm; Michelle Durant, Boulder County Parks and Open Space, pers. comm.). Low fledge rates throughout Boulder County during the past 20 years (Jones and Mahoney 2003, Boulder County Nature Association unpublished data) suggest that high mortality of young owls, possibly caused by predation, has contributed to declining burrowing owl numbers throughout the county. A total of 49 nesting attempts observed within Boulder County from 2008-15 produced only 133 observed young (Table 6). These nest productivity rates are significantly below those reported for other High Plains burrowing owl populations (Johnsgard 1999) and may be insufficient to maintain viable nesting populations.

Table 6. Burrowing Owl Nesting Success in Boulder County, 2008-15. Nesting attempts/total young observed.

Years	Boulder County Parks and Open Space <sup>1</sup>	Boulder Open Space and Mountain Parks <sup>2</sup>	Boulder Parks and Recreation	Total
2008	NA	7/22	0/0	NA
2009	5/9	6/7	0/0	11/16
2010	5/12	5/10	0/0	10/22
2011	3/15	6/18	0/0	9/33
2012	6/9	3/11	0/0	9/20
2013	1/4	3/13	0/0	4/17
2014	1/5	2/13	0/0	3/18
2015	1/1	2/6	0/0	3/7

Protection and conservation of prairie dog colonies around the reservoir may contribute to future burrowing owl nesting success, especially if prairie dog colonies are relatively large and buffered from disturbance. A variety of studies conducted on the Great Plains and in the Great Basin have determined that burrowing owl nesting success correlates positively with the size of prairie dog colonies and the density of active burrows within colonies (Desmond, Savidge, and Eskridge 2000; Lantz, Smith, and Keinath 2004); and negatively with the degree of fragmentation of grassland habitat and the proximity of human activity to existing nests (Haug 1985, Hughes 1993, Pezolesi 1994, Desmond, Savidge, and Eskridge 2000).

Burrowing Owls nesting in smaller prairie dog colonies appear more vulnerable to predation and have fewer potential nesting burrows to choose from (Desmond, Savidge, and Eskridge 2000; Lance, Smith, and Keinath 2004). In addition, larger numbers of Burrowing Owls nesting in larger prairie dog colonies may gain an advantage over predators through increased vigilance. American Badgers, Coyotes, Red Foxes, Red-tailed Hawks, and Great Horned Owls are considered significant predators of Burrowing Owls (Lance, Smith, and Keinath 2004). Automobiles also kill burrowing owls. Over a five-year period during the 1990s, 26 of 28 injured burrowing owls admitted to the Birds of Prey Rehabilitation Foundation in Broomfield, Colorado, had been struck by cars (Sigrid Ueblacker, pers. comm.).

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<sup>1</sup> Susan Spaulding, Boulder County Parks and Open Space, pers. comm.; Jones, Stephen. 2014. Boulder County Parks and open space burrowing owl nest monitoring summary.

<sup>2</sup> Christian Nunes, Boulder County Parks and Open Space, pers. comm.

No researchers have attempted to set a minimal or optimal size of prairie dog colonies used successfully for nesting by Burrowing Owls, but Lance, Smith, and Keinath (2004) identified the following indicators of suitable nesting habitat:

1. Open, dry, treeless areas on grasslands, shrublands, and desert floors.
2. Gentle slopes, short vegetation, high percentages of bare ground.
3. High densities of burrows.
4. Current activity of burrowing mammals, primarily prairie dogs.
5. Close proximity to other nesting Burrowing Owls
6. Dried manure from cows, horses, or bison.

Lance, Smith, and Keinath (2004) also synthesized a list of priorities for nesting burrowing owl habitat enhancement and conservation:

1. Maintain prairie dog colonies through landowner agreements and habitat management plans.
2. Designate 1/4-mile to 1/2-mile buffer zones around known Burrowing Owl nests where pesticide use, rodent control, and human disturbances are restricted.
3. Protect all known nest burrows, and retain prairie dog burrows as future nest burrows.
4. Maintain areas of short grass and open ground.
5. Do not eliminate prairie dogs and ground squirrels.
6. Avoid fragmenting habitat in known nesting areas. Roads, pipelines, plowing, and industrial developments will fragment burrowing owl nesting habitat and should be avoided in known nesting areas.
7. Delay spring mowing in hayfields until late July, avoid nighttime mowing, and space mowings widely apart throughout the season to allow higher likelihood of successful nesting.
8. Leave dirt berms along edges of cultivated fields.
9. Consider installing artificial nest burrows in areas where burrowing mammals have been exterminated and burrow availability has diminished.
10. Preserve rights-of-way, haylands, and uncultivated fields within 600 m of nests for foraging. Taller grasses may be grazed to attract primary burrowers such as prairie dogs.
11. Provide fresh cattle dung near nesting areas if dung is not available.

### Incidental Observations

Between 20 April and 8 August, we observed a total of 70 bird species within the study area, including 62 potential breeding species (Table 7). Nesting was confirmed for 14 species. Birds observed during 2015 included seven Boulder County or Colorado Natural Heritage Program listed species (Colorado Natural Heritage Program 2014): American White Pelican, American Bittern, Great Egret, White-faced Ibis, Osprey, Bald Eagle, and Northern Harrier.

Table 7. Birds observed and observed breeding behaviors, 15 April- 8 August 2015

*\*Colorado Natural Heritage Program listed species*

Species	Coot Lake	Dry Creek	Little Dry Creek
Canada Goose	Pair	Seen	Fledged young
Cackling Goose	Observed non-breeder		
Mallard	Pair	Pair	Courtship
Blue-winged Teal	Pair		Seen
Cinnamon Teal	Pair		
Northern Shoveler	Seen	Seen	

Species	Coot Lake	Dry Creek	Little Dry Creek
Common Merganser		Seen	
Pied-billed Grebe	Seen		
Western Grebe	Seen	Seen	Seen
D-crested Cormorant	Observed non-breeder	Observed non-breeder	Observed non-breeder
<i>A. White Pelican*</i>		Observed non-breeder	Observed non-breeder
<i>American Bittern*</i>	Territory	Territory	Fledged young
Great Blue Heron		Nest with young	Seen
<i>Great Egret*</i>		Observed non-breeder	Seen
<i>White-faced Ibis*</i>		Seen 7, 30 May	
Turkey Vulture	Observed non-breeder	Observed non-breeder	Observed non-breeder
<i>Osprey*</i>	Seen	Nest with eggs	Nest with young
<i>Bald Eagle*</i>	Observed non-breeder	Observed non-breeder	Pair
<i>Northern Harrier*</i>	Seen	Seen	Nest with young
Red-tailed Hawk	Seen	Nest with young	Seen
Sora	Territory		Territory
Virginia Rail			Territory
American Coot		Seen	
Killdeer	Territory	Territory	Territory
Wilson's Snipe	Territory	Territory	Territory
Ring-billed Gull	Observed non-breeder	Observed non-breeder	Observed non-breeder
Rock Pigeon			Seen
Mourning Dove	Pair	Seen	
Eur. Collared-Dove	Territory	Seen	Territory
Great Horned Owl	Pair	Seen	Fledged young
Common Nighthawk			Territory
White-throated Swift			Observed non-breeder
Broad-tailed Hummingbird		Seen	
Belted Kingfisher	Seen		Seen
Downy Woodpecker	Territory		
Northern Flicker	Seen	Seen	Seen
American Kestrel		Seen	Seen
Say's Phoebe			Seen
Western Kingbird	Feeding fledglings	Territory	Nest with young
Eastern Kingbird	Feeding fledglings	Territory	Seen
Blue Jay	Seen		
Black-billed Magpie	Seen	Seen	Seen
American Crow	Seen		
Common Raven		Seen	Observed non-breeder
Tree Swallow	Seen		Occupied nest
Violet-green Swallow	Seen		
Cliff Swallow	Nest with young	Seen	Seen
Barn Swallow	Seen	Seen	Seen
Bl-capped Chickadee	Seen		
House Wren	Pair		Singing male
American Robin	Pair	Territory	Seen

Species	Coot Lake	Dry Creek	Little Dry Creek
European Starling	Seen	Seen	Seen
Cedar Waxwing	Feeding fledglings		
Common Yellowthroat	Pair	Singing male	Territory
Yellow Warbler	Pair	Singing male	Territory
Y-rumped Warbler	Observed non-breeder		Observed non-breeder
Green-tailed Towhee	Seen		
Vesper Sparrow			Singing male
Song Sparrow	Pair	Territory	Singing male
Blue Grosbeak		Singing male	
R-winged Blackbird	Fledged young	Territory	Territory
Western Meadowlark	Fledged young	Territory	Territory
Y.-headed Blackbird		Territory	Pair
Brewer's Blackbird			Seen
Common Grackle	Pair	Pair	Seen
Br-headed Cowbird			Seen
Bullock's Oriole	Fledged young	Singing male	Seen
House Finch	Seen		Seen
American Goldfinch	Seen		

### **Disturbances of Nesting Bird Habitat**

We asked volunteers to report any observed disturbances of nesting bird habitat as well as violations of area closures and dog voice-and-sight regulations. Since we did not develop protocols for defining "disturbance" or "dog-off-leash," it's more useful to report these observations anecdotally than to attempt to quantify them. Listed below are specific 2015 observations for specific areas:

#### Coot Lake

7 May: Wildlife camera shows a man and woman fishing within the closure area (staff).

28 June: Dogs swimming after female duck in northeast corner of Boulder Reservoir, duck in much distress (Lester).

#### Dry Creek

13 May: BAS flyer there later than allowed, which is a closure violation.

28 May: Osprey changed course and dodged plane while flying over aeromodeling runway (Gregory).

1 June: Downed model aircraft retrieved from cattails east of runway (Aeromodel downed aircraft log).

9 June: Downed model aircraft retrieved from wildlife closure area (Aeromodel downed aircraft log).

16 June: Downed model aircraft retrieved from area east of runway (Aeromodel downed aircraft log).

17 June: Downed model aircraft retrieved from cattails 100 yards east of runway (Aeromodel downed aircraft log).

19 June: Downed model aircraft retrieved 200 yards from clubhouse (Aeromodel downed aircraft log).

26 June: Downed model aircraft retrieved 200 yards southeast of runway (Aeromodel downed aircraft log)

24 July: Downed model aircraft retrieved 50 yards east of runway (Aeromodel downed aircraft log).

1 August: Downed model aircraft retrieved 100-150 yards east of runway (Aeromodel Downed Aircraft Log).

19 August : Downed aircraft removed from closure area (Wold).

### Little Dry Creek

13 June: Up to 100 vehicles parked illegally along N. 51st St. within 200 m of the Little Dry Creek Northern Harrier nest site during triathlons competition. None of the vehicles appear to have been ticketed or towed.

16 July: Crew found a man in the closure digging holes in the Windsurfer's Point section of the closure area (staff).

## **Management**

Marshes and prairie dog colonies surrounding Boulder Reservoir support historic nesting populations of for Boulder County bird species of special concern (Boulder County Parks and Open Space 2015): American Bitterns (Boulder County isolated and restricted), Northern Harrier (Boulder County imperiled), Osprey (Boulder County isolated and restricted), and Burrowing Owl (Boulder County imperiled). Because of their importance to these nesting bird species, these marshes and some of the adjacent grasslands have been designated as "critical wildlife habitat" in the Boulder County Comprehensive Plan (Boulder County Parks and Open Space 2015 ). However, these areas of marsh and prairie habitat are bisected or bordered by heavily used roads and trails. The proximity of these remaining natural habitats to disturbed areas and human activities poses challenges to nesting birds. Urban-adapted predators, including American Raccoon, Coyote, Red-tailed Hawk, and Great Horned Owl, can easily find and prey on nests that are situated in small or easily accessed cattail marshes and grassland patches. Human activities such as hiking, jogging, bicycle riding, or dog-walking, when conducted off-trail or off-road, can flush birds off their nests or discourage them from nesting. To alleviate these risks to nesting birds, management of relatively natural areas around the reservoir should maximize the size of unfragmented habitat patches and minimize the amount of human encroachment into these patches.

As a general rule, humans and their pets should be restricted from encroaching into marshes or prairie dog colonies on the west and north sides of the reservoir, where American Bitterns, Ospreys, Northern Harriers, and Burrowing Owls nest; and into the marsh and prairie dog colonies west and south of Coot Lake, where American Bitterns, Northern Harriers, and Burrowing Owls have nested. Specific management recommendations, were included in my 2012 report and, by management zone in my 2013 comprehensive breeding and migratory bird survey report (Jones 2013a). Many of these recommendations have already been implemented:

### **Little Dry Creek and Dry Creek Marshes**

1. Restrict all human recreational activity to the N. 51st St. right-of-way and Eagle Trail. Maintain fences on both sides of the road and Eagle Trail.
2. Eliminate the practice of allowing cars to park illegally on N. 51st St. during the Northern Harrier and American Bittern nesting seasons (March-August).
3. Maintain buoy lines across both inlets, March-August, to limit encroachment of boats into Osprey and American Bittern nesting and foraging habitat.

4. Post the shoreline areas west and south of the North Shore parking area and north of the reservoir entrance as closed to hikers and dogs, 1 April-10 September. Increase enforcement of this closure.

5. Restrict activity at the model airplane facility, as necessary, to protect nesting raptors and bitterns. Staff should do this on a case-by-case basis, using active monitoring of nesting pairs to assess their vulnerability to disturbance.

### **Coot Lake Area**

1. Restrict all recreational activity to existing trails. Monitor the wetland area for disturbance by humans or dogs.

2. Require that dogs to be leashed on the trail immediately bordering the wetland west of Coot Lake April-June or until American Bitterns or Northern Harriers have completed nesting.

3. Continue to protect all prairie dog colonies in the area from disturbance by recreational users and dogs.

### **Nest Buffers**

Colorado State Parks and Wildlife has developed guidelines for recommended buffers and seasonal restrictions around active raptor nests. These guidelines represent minimum standards for protecting nesting raptors from disturbance. While some nesting species, including Osprey, may habituate to human activities, others are easily disturbed (Colorado Division of Wildlife 2008). Disturbances can be subtle and difficult to measure, ranging from adults becoming slightly more vigilant and thus reducing foraging time to adults actually abandoning their nests (Colorado Division of Wildlife 2008). For species such as Northern Harrier and Burrowing Owl, which have experienced low nesting productivity in Boulder County and appear to be on the brink of extirpation from the county, protection of nests from human disturbance is critical:

*Osprey recommended buffer: No surface occupancy (beyond that which historically occurred in the area) within 400 m of active nests. Seasonal restriction to all human encroachment within 400 m of active nests from 1 April-31 August (or until all young have fledged from nest). A possible exception to this limitation would be state-mandated spraying of "A" listed weed species, with prior approval from the Colorado Division of Wildlife, during the time after all eggs have hatched.*

*Northern Harrier recommended buffer: No surface occupancy (beyond that which historically occurred in the area) within 400 m of active nests. Seasonal restriction to all human encroachment within 400 m of active nests from 1 April-31 July (or until all young have fledged from nest). A possible exception to this limitation would be state-mandated spraying of "A" listed weed species, with prior approval from the Colorado Division of Wildlife, during the time after all eggs have hatched.*

*Burrowing Owl recommended buffer: No human encroachment within 50 m of nest sites, 15 March-31 October. There should be no human encroachment into any prairie dog colonies where burrowing owls are present between 15 March and 31 October, until all nest burrows have been located. An exception to this encroachment restriction would be prairie dog colonies where burrows need to be sampled for suspected plague.*

American Bittern nests are susceptible to disturbance by humans and free-roaming dogs. Various scientists have suggested buffers of 50-200 m for nesting herons (Beans and Niles 2003). Since bitterns typically breed in cattail marshes where their ground nests are shielded from view, their nests may require less buffering from human activities than is necessary for the more visible nests of colonial-nesting herons. However,

American Bitterns nesting near Boulder Reservoir may be particularly vulnerable to disturbance due to the proximity of their nests to trails and roads

I recommend a minimum buffer area (no human encroachment) of 200 m around suspected American Bittern nests. In addition, dog-on-leash and dog-on-trail restrictions should be strictly enforced near marshes where bitterns are believed to nest. This is especially important at the wetlands west of Coot Lake, where bitterns are seen almost every spring but appear to have experienced little or no nesting success (see Table 1).

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## **Acknowledgments**

Parks and Recreation Department Volunteer Services Coordinator Mary Malley and Conservation Ecologist Joy Master recruited and organized volunteers for this study and provided exemplary guidance and encouragement throughout the field season. Richard Holmes provided the cover photo of the nesting Ospreys. Susan Spaulding, of Boulder County Parks and Open Space, and Christian Nunes and Will Keeley, of Boulder Open Space and Mountain Parks, provided nesting data for Northern Harriers and Burrowing Owls on their respective properties.

Fieldwork was carried out primarily by volunteers who devoted at least one morning or evening per month to monitoring potential nesting sites. We thank George Alexander, Sharon Anderson, Linda Andes-Georges, Stu and Yvonne Bader, Ginger Beske, Barbara Brandt, John Dietrich, Carol Dozier, Haylen Gregory, Greg Holden, Kumiko Iwata, Shirley Jin, Chuck Klomp, Viki Lawrence, Melissa Lester, Elizabeth Litkowski, Nancy Ries Morrison, Kitty Noonan, Linda Palmer, Michael Patterson, Carly Pierce, Jeanine Pow, George Rosborough, Gary Rouborn, Gretchen and Peter Ridgeway, Mary Sandmann, Darin Toohey, and Robin Youngelman.

## Appendix: 2015 Monitoring Summary and Volunteer Roster

### Coot Lake

- 22 April, 0425-0540. Osprey heard (Andes-Georges).  
30 April, 0434-0600. Adult bald eagle flew over lake (Mike Patterson).  
30 April, 1800-1915. No target species observed (Rosborough).  
12 May, 0515-0800. One female northern harrier flying over lake from west to north (Ridgeways).  
13 May, 1715-1850. No target species observed (Iwata).  
14 May. No target species observed (Rosborough).  
15 May, 0525-0637. No target species observed (Bader).  
26 May, 1815-1930. No target species observed (Roxborough).  
29 May, 0515-0815. No target species observed (Ridgeways).  
1 June, 1815-1920. No target species observed (Andes-Georges).  
4 June, 0515-0845. No target species observed (Ridgeways).  
7 June, 1830-1945. No target species observed (Roxborough).  
8 June, 0600-0715. Two ospreys hunting over water (Iwata).  
14 June, 1850-2005. No target species observed (Alexander).  
16 June, NA (1.5 hours). No target species observed (Andes-Georges).  
17 June, 0515-0815. One osprey soaring over (Ridgeways).  
17 June, 1620-1700. No target species observed (Iwata).  
24 June, 1805-1825. One osprey fishing (Roxborough).  
27 June, 0444-0525. Three Bitterns heard calling and one osprey fishing (N 40.0 5.155; W 105.12.626; N 40.0 5.179; W 105.12.756; N 40.0 5.334; 105.12.792 (Badgers)).  
28 June, 1050-1240. No target species observed (Lester).  
13 July, 1740-1915. No target species observed (Iwata).  
16 July, 1800-1930. No target species observed (Rosborough).  
16 July, 0445-0745. No target species observed (Ridgeways).  
29 July, 1820-1930. No target species observed (Rosborough).  
31 July. One northern harrier seen and one American Bittern heard, calling loudly from south side of wetland (Badgers).  
3 August, 0500-0800. No target species observed (Ridgeways).

### Birds Observed (\*Colorado Natural Heritage Program listed species)

- Canada Goose (pair)  
Cackling Goose  
Mallard (pair)  
Blue-winged Teal  
Cinnamon Teal  
Northern Shoveler  
Western Grebe  
Pied-billed Grebe  
**\*American White Pelican**  
Double-crested Cormorant  
Great Blue Heron  
**\*American Bittern**  
Turkey Vulture  
**\*Osprey**  
**\*Northern Harrier**  
**\*Bald Eagle**

Red-tailed Hawk  
Killdeer  
Sora (territory)  
Wilson's Snipe  
Ring-billed Gull  
Eurasian Collared-Dove  
Mourning Dove (pair)  
Great Horned Owl (pair)  
Belted Kingfisher  
Downy Woodpecker (territory)  
Northern Flicker  
Eastern Kingbird (feeding fledglings)  
Western Kingbird (feeding fledglings)  
Blue Jay  
Black-billed Magpie  
American Crow  
Tree Swallow  
Violet-green Swallow  
Cliff Swallow  
Barn Swallow  
Black-capped Chickadee  
House Wren (pair)  
American Robin (pair)  
European Starling  
Cedar Waxwing (feeding fledglings)  
Yellow Warbler (pair)  
Yellow-rumped Warbler  
Pine Warbler (12 May, Ridgeways, no photo)  
Common Yellowthroat (pair)  
Green-tailed Towhee  
Song Sparrow (pair)  
Blue Grosbeak  
Red-winged Blackbird (fledged young)  
Western Meadowlark (fledged young)  
Brown-headed Cowbird  
Brewer's Blackbird (pair)  
Common Grackle (pair)  
Bullock's Oriole (fledged young)  
House Finch  
American Goldfinch

### **Dry Creek**

12-17 April. One bittern observed on 14th flying west from reservoir along Dry Creek and on 16th along Dry Creek. Both adult ospreys present but not yet nest building (Rabourn).

19 April, 0506-0625. Osprey apparently incubating, second adult on top of adjacent pole. Has agonistic encounter with a third osprey (Palmer).

1 May, 0445-0718. Bittern calling from west side of the road directly across from model airplane field. Osprey apparently incubating and turning eggs (Litkowski, Youngelman).

7 May, 0545-0730. Osprey nest active. Adult bald eagle flying over west shore of reservoir (Dozier).

7 May, 1715-1915. Osprey apparently incubating, second osprey on adjacent power pole before leaving to hunt and then returning to nest platform. American bittern calling from marsh just east of model airplane runway (Klomp).

13 May, 1845-2015. Adult osprey on nest in incubation posture for entire time. Second adult perched on nearby pole for all but 5-10 min. of observation (Litkowski, Youngelman).

14 May, 0520-0730. Both ospreys present at nesting platform. Possibly injured great horned owl observed on road (Morrison).

15 May, 0430-0630; 1100-1240. Both ospreys present, probably incubating (Gregory, Rabourn).

24 May, 0415-0650. Osprey pair on nest, 2 bald eagles, 1 American bittern calling. Osprey incubating during most of observation (Litkowski, Youngelman).

27 May, 0515-0635. Ospreys incubating, both adults present, fish delivery to nest, adult bald eagle on pole (Palmer).

27 May, 1725-1927. Both ospreys present, incubating. One bittern calling from marsh east of runway. One adult and one immature bald eagle hunting, 3 coyotes hunting in field north of Osprey nest platform (Klomp).

28 May, 0845-1052. Both adult ospreys present, one incubating throughout. One adult bald eagle seen (Gregory).

4 June, 0450-0600. Ospreys incubating with one on nest and one on telephone pole nearer to road. Male left perch and circled when observer walked by.

10 June, 0545-0700. Ospreys still incubating (Lawrence).

17 June, 0430-0630. Both adult ospreys sat on nest adjacent to one another for most of observation time, then one flew to adjacent power pole, then returned to the nest (Litkowski and Youngelman).

18 June, 1735-1925. One osprey on nest standing up, looking into nest; second osprey arrived at power pole near nest one hour into observation and stayed there for duration of observation (Klomp).

18 June, 0450-0615. Both adult ospreys present, one on nest standing up and either rearranging nesting material or possibly feeding chicks (Palmer).

26 June, 0445-0600. One apparent osprey chick observed on nest, but no adult on nest--adult was perched on nearby pole and showed agitated behavior when observer walked by (Palmer).

June 29 and 30. Female osprey has left the nest finally, after diligently incubating since May 5. Male mostly gone from area (Rabourn).

2 July, 0440-0555. No target species present. Osprey nest appears to have failed. Questions her own observation of a young on the nest the previous week (Palmer).

8 July, 1722-1901. Both adult ospreys present, no nesting activity observed (Litkowski, Youngelman).

15 July, 0852-0955. One adult osprey present, one American bittern heard calling (Litkowski, Youngelman).

23 July, 0610-0725. Both osprey adults present, no nesting activity (Gregory).

26 July, 0427-0700. Both osprey adults present, no nesting; one northern harrier observed (Litkowski, Youngelman).

29 July, 1846-1950. Both adult ospreys perching on nest and on nearby pole. One bald eagle seen (Litkowski, Youngelman).

31 July, 0655-0835. Three ospreys on and around nesting platform. Female northern harrier flies low near reservoir then soaring near Osprey platform (Gregory).

Birds (\*Colorado Natural Heritage Program listed species)

Canada Goose

Mallard (pair)

Northern Shoveler

Common Merganser

**\*American White Pelican**

Double-Crested Cormorant

**\*Great Egret**

Great Blue Heron (multiple nests with young)

**\*White-faced Ibis (30, 7 May)**

Turkey Vulture

**\*Osprey (nest with eggs)**

Red-tailed Hawk (nest with 3 young)

Killdeer (territory)

Wilson's Snipe

Ring-billed Gull

American Coot

Eurasian Collared-Dove

Great Horned Owl

Hummingbird species

Northern Flicker

American Kestrel

Eastern Kingbird (territory)

Western Kingbird (territory)

Black-billed Magpie

Common Raven

Cliff Swallow

Barn Swallow

European Starling

Yellow Warbler (singing male)

Common Yellowthroat (singing male)

Blue Grosbeak (singing male)

Red-winged Blackbird (territory)  
Western Meadowlark (territory)  
Yellow-headed Blackbird (territory)  
Common Grackle (pair)  
Bullock's Oriole (singing male)

### **Little Dry Creek**

12-17 April, 0415-0730 (12 hours total). Two pairs of harriers in Little Dry Creek drainage, one pair in same location as last year 100 m west of road, second pair in cattails west of Boulder Valley Ranch pond. Both adult ospreys present and nest building (Rabourn).

19 April, p.m., 2.5 hours. Adult male harrier perched in small trees on the edge of marsh. Female apparently incubating in same location as last year. Both adult ospreys present on nesting territory (Rabourn).

30 April, 0445-0715. Northern harrier male periodically harassing American bittern that was on the ground about 30-40 m east of nest site. Female left nest for up to 20 min. and flew with mail for a short time. Osprey incubating (Dietrich).

1 May, 0450-0710. One American bittern calling in cattails just west of 51st. Male harrier apparent prey delivery to nest. Second bittern visible 10-20 m east of nest site. Also food exchange was female while she remained in trees on south side of wetland for about 10 min. before returning to nest. Female Osprey apparently incubating (Noonan).

1 May, 0515-0715. Both osprey adults present. American bitterns heard very close to 51st and also in marsh below Eagle Trail (Pow).

3 May, 0530-0830. Three aerial food exchanges between male and female Little Dry Creek harriers; female bringing grass and straw to nest site. Total of 4 harriers and 6 ospreys observed (Rabourn).

7 May, 0355-0710. Food exchange off nest between male and female harrier. Female off nest for total of about 5 min., suggesting continued incubation. Second male harrier seen west of the Boulder Valley pond. One bittern calling at western end of wetland, another in center of wetland. Immature bald eagle perched near Boulder Valley pond (Noonan).

9 May, 0535-0620. Osprey apparently incubating; male on adjacent power pole. Male harrier circled and dive-bombed willow on south edge of the marsh, eventually flushing red-tailed hawk, which flew away (Morrison plus Jones training group).

10-17 May (14 hours). Adult bald eagle lands on fencepost and northern harrier male divebombs it repeatedly. After 30 min. eagle leaves area.. Both male and female harriers observed attacking flock of ravens that had moved to within a few feet of the nest site (Rabourn).

14 May, 0505-0715. Male harrier observed chasing red-tailed hawk. Osprey incubating on platform nest. Second male harrier seen near perched on post and fighting off blackbirds near western nest (Anderson).

14 May, 0910-1045. Harrier pair observed in possible food exchange west of pond. Immature bald eagle soaring over trailhead area (Klomp).

14 May, 1630-1750. Both harriers seen flying over wetland (Pow and Jin).

14 May, 1730-1900. Osprey perched on power pole near nest (Brandt).

15 May, 0430-0620. Osprey on nest moving sticks around. Male seen on abandoned telephone pole nearby. Both harrier pairs present and active, no food exchanges observed. Western harrier pair diving repeatedly at something very near apparent nest site. Female harrier off nest for at least 18 min. (Dietrich).

15 May, 0455-0745. Male harrier perched on fencepost just west of 51st and north of wetland. Harrier pair west of Boulder Valley Ranch pond observed divebombing something near their nest area. Food exchange between eastern male and female harriers. Apparent food exchange over nest between western pair. Both adult ospreys present and apparently incubating. Two American bitterns flying west over the wetlands (Noonan).

18 May, 0430-0630. Male harriers seen guarding both nests. Bittern flies up from marsh east of anthill and heads toward Little Dry Creek. Second bittern flies up from Dry Creek near model airport and west across road (Rabourn).

22 May, 1740-1930. Male bittern in green grass not far from road, calling. Second bittern was very close, in the grass (courtship). Single female harrier flying over cattails on north side of road (Sandmann, Beske, Holden).

23 May, 0430-0630. Three bitterns fly out of cattail marsh just west of 51st St. Adult bald eagle flying low over model airport. Osprey still on Dry Creek nest incubating. Both male and female harrier seen around both nests (Rabourn).

23 May, 0455-0710. Osprey on nest, second osprey on nearby pole. Female harrier left nest closest to 51st St., flew south so the trees at the edge of the wetland, turned back and returned to the nest. Later male harrier observed flying south low across the trail toward the wetland with small rodent in talons. Across the trail toward the wetland. About 10 min. later female came off nest, then male appeared from surrounding trees. She returned to the nest within a minute. Male flew off (Kitty Noonan).

25 May, 0900-1200. Saw a total of six bitterns flying back and forth along Little Dry Creek and at Boulder Valley Ranch. Three food exchanges between Little Dry Creek harriers and one food exchange between Boulder Valley Ranch pair. Also two bald eagles (Rabourn).

27 May, 0600-0740. Both ospreys on nest, apparently incubating. Male and female harrier exchanged food, performed food drops, and dropped into marsh multiple times in the nest area and on the marsh perimeter (Brandt, Carly Pierce).

28 May. Both harriers visible flying low over Dry Creek near road (Gregory).

31 May, 0455-0710. Female harrier behavior suggests young on nest, as she left the nest for 15 min., then returned and then left the nest for 1 min. each during three times over the next 15 min. After 20 min. more she again flew off the nest, hunting over the wetland. After returning for a bit she again flew several times, landed, and returned with grasses in her beak (Kitty Noonan).

1 June, 0420-0715. Osprey on nest incubating or possibly brooding young. Two American bitterns flying over the cattails west of the road. Another bittern flew in and landed in the cattails west of the harrier nest. One harrier flies in and lands near nest location (John Dietrich).

1-7 June. Male harrier not seen throughout this time (22 hours of observation). Female hunting and retrieving grass and weeds to repair nest (rising water?). Boulder Valley Ranch female also leaving nest frequently and retrieving grass and other nest materials. Bitterns courting and flying together in groups of 3-4. Two chicks on Little Dry Creek Osprey nest.

7 June, 1130-1500. Female harrier flew in from the north and began to dive attack four different spots in the marsh near the location of the harrier nest, diving relentlessly for 2.5 hours. When she finally stopped to rest on a small bush for a minute, two coyotes trotted out of the cattails near where she had been diving and she attacked them while still dive attacking two other locations near the nest site. She did not return to the nest area after this observation.

9 June, 0440-0715. Female harrier from eastern nest flew north over wetland hunting in the field north of Eagle Trail. She had not returned to the nest 95 min. later. No sign of the male. Two adult bitterns in the grass at the edge of the north side of the wetland a bit west of the center point. They were close together. One caught a small snake (Noonan).

8-14 June. No harriers observed at or near Little Dry Creek nest site. Harrier still present at Boulder Valley Ranch site. Two chicks on Little Dry Creek osprey nest. Several bitterns seen and heard in wetland (Rabourn).

10 June, 0520-0705. One bittern calling in central part of Little Dry Creek marsh. Both osprey adults present, one apparently brooding young on nest (Dozier).

12 June, 0415-0715. No activity observed at harrier nest. Two adult ospreys on and near nest. Bittern perched and singing on small rise between two harrier nests.

15 June, 0415-0715. Male and female harriers repeatedly attack coyotes in Boulder Valley Ranch marsh. One apparent harrier fledgling lands near nest site (Rabourn, Morrison, Noonan).

16-23 June. Four American bitterns seen or heard in marsh. Both adult Boulder Valley Ranch harriers ferrying food to the marsh and attacking every coyote they see (Rabourn).

16 June, 0523-0720. Adult osprey observed on nest, apparently feeding young (Sandmann).

22 June, 1810-1950. One osprey chick visible on nest and both adults present bringing in food. Both adult Boulder Valley Ranch harriers seen flying over and dropping into marsh (Brandt)

23 June, 0530-0730. One osprey on nesting platform and another perched on nearby power pole. A total of five harriers (one male and four females or young) observed in the marsh west of Boulder Valley Ranch pond. Both male and female harrier observed strafing coyote in this area for 15 min. Fledglings flying for short distances (Pow).

24 June, 0510-0710. One adult and at least one chick in the osprey nest. No harriers observed in wetland closest to 51st. Coyote observed entering wetland above Boulder Valley Ranch pond where second harrier pair is nesting, and both the male and female harrier began divebombing it. This continued for about 30 min. Then two apparent fledglings flew out of the marsh and landed at the southern end of the wetland (Noonan).

25 June, 0415-0746. Three harrier fledglings observed west of Boulder Valley Ranch pond and around pond. They are flying fairly strongly. Still two chicks on osprey nest (Rabourn, Noonan).

26 June, 0515-0650. One adult and apparently two chicks on osprey nest. Second adult flew in and perched nearby then delivered food to nest. No bitterns heard. Two harrier young flying over marsh.

28 June, 0420-0700. Adult osprey and two chicks on nest, second adult on pole nearby. Adult harriers (two males) harassing coyote at south end of Boulder Valley Ranch pond. Adult female and two fledglings also flying in area. One bittern observed flying (Dietrich).

28 June, 0445-0730. Three fledgling harriers observed around ranch pond (Morrison).

29-30 June. Female Osprey has left the nest finally, after diligently incubating since May 5. Male mostly gone from area (Rabourn).

2-4 July. Saw seven harriers perching and flying over Boulder Valley Ranch pond and adjacent marsh. Four appear to be juveniles, one male, and two adult females. One fledgling catching prey on its own. Aerial food exchange between adult female and fledgling (Rabourn).

5 July, 0430-0730. Seven harriers in Russian-olives or on the ground and on fence posts near pond. Coyotes have been stalking them every morning for the last four days with no success. One American bittern seen/heard (Rabourn).

5 July, 0530-0735. Five harriers in area around the pond at Boulder Valley Ranch. Several harriers try to displace red-tailed hawk from perch (Noonan).

6-12 July, 0430-0630 (15 hours). Total of 6 female and juvenile harriers observed flying over Dry Creek marsh and perching. No males observed. Young harriers escorting bitterns flying out of Boulder Valley Ranch marsh (Rabourn).

12-26 July, 0430-0800 (18 hours). No northern harriers observed after 18 July. 10 ospreys observed (presumably includes two adults and two young on the North Rim nest). One bald eagle, 3 juvenile bitterns flying from Little Dry Creek and Boulder Valley Ranch marshes. North Rim ospreys: 2 fledged. Little Dry Creek ospreys: 2 fledged. Dry Creek ospreys: failed.

13 July, 0550-0720. Three harriers (adult female or juveniles) observed flying over Eagle Trail. Two juvenile ospreys visible on nest, one stretching its wings (Dozier).

13 July, 0810-1130. Both adult ospreys present, one juvenile harrier flyover (Morrison).

15 July, 0515-0715. Five harriers perched on bush by Boulder Valley Ranch pond. Adult ospreys feeding two chicks on nest.

16 July, 0520-0715. One juvenile harrier perched in Russian-olive next to pond then flying away; saw three bitterns flying out of the wetland, toward the subdivision south of the wetland (Noonan).

27 July, 0510-0630. One osprey on pole north of nest and one chick visible on nest (Noonan).

31 July, 1731-1925. Both adult ospreys and two young on nest (Sandmann, Ginger Beske, Greg Holden).

#### Birds (Colorado Natural Heritage Program listed species)

Canada Goose (fledged young)

Mallard (courtship)

Blue-winged Teal (pair)  
Western Grebe  
Double-crested Cormorant  
**\*American White Pelican**  
**\*Great Egret**  
Great Blue Heron  
Turkey Vulture  
**\*Osprey (nest fledged two young)**  
**\*Bald Eagle (two adults)**  
**\*Northern Harrier (nest with young failed)**  
Red-tailed Hawk  
Killdeer (territory)  
Wilson's Snipe (territory)  
Virginia Rail  
Sora  
Eurasian Collared-Dove (territory)  
Great Horned Owl  
White-throated Swift (observed non-breeder)  
Belted Kingfisher  
Common Nighthawk  
Northern Flicker  
American Kestrel  
Say's Phoebe  
Eastern Kingbird  
Western Kingbird (occupied nest)  
Black-billed Magpie  
Common Raven  
Tree Swallow (occupied nest)  
Cliff Swallow  
Barn Swallow  
House Wren  
American Robin  
European Starling  
Yellow Warbler (territory)  
Common Yellowthroat (territory)  
Vesper Sparrow (singing male)  
Song Sparrow  
Red-winged Blackbird (territory)  
Western Meadowlark (territory)  
Brewer's Blackbird  
Common Grackle

White-tailed Deer (2)

### **Prairie Dog Colonies**

Note: While some volunteers reported numbers of prairie dogs observed, they were not specifically asked to do so or trained in accounting procedures. More accurate prairie dog numbers for each of these colonies are available in the Boulder Parks and Recreation Department's annual staff counts carried out annually in June, July, and August.

Aeromodel. 7 May, active (Dozier, Klomp); 24 May, active 13 prairie dogs observed (Litkowski and Youngelman); 27 May, active some whitewash (Palmer); 27 May, active (Klomp); 4 June, only one pup observed, whitewash on entrances (Palmer); 18 June, active with whitewash visible (Palmer, Klomp) 26 June, just one prairie dog seen (Palmer).

Little Dry Creek/Eagle Trail. 1 May, active (Noonan); 7 May, active (Noonan); 14 May, Active (Pow and Jin); 15 May, active with at least 41 prairie dogs visible (Brandt, Gregory, Noonan); 22 May, active, only 2 prairie dogs visible (Sandmann); 28 May, active with pups (Gregory); 1 June, active, no pups visible (Dietrich, Noonan); 9 June, active with some whitewash on burrows (Noonan); 22 June, active with whitewash on burrow entrances (Brandt); 28 June, active (Dietrich); 5 July, active with whitewash (Noonan); 23 July, active (Gregory).

North Dam North. 12 May, active (Ridgeways); 15 May (Bader); 29 May and 4 June, some whitewash (Ridgeways); 8 June, active, some whitewash (Iwata); 17 June, active with pups (Iwata); 17 June, active with whitewash (Ridgeways); 27 June, active with some whitewash (Baders)

North Dam South. 30 April, active (Patterson); 12 May, active (Ridgeways); 29 May and 4 June, some whitewash on burrow entrances (Ridgeways). 17 June, active with whitewash (Ridgeways).

North Shore. 1 May, active more than 70 prairie dogs present (Litkowski, Youngelman); 8 July, no prairie dogs visible, grass growing 2 feet high (Litkowski, Youngelman).

South Dam North. 15 May move left, active (Dietrich); 14 June, active (Alexander); 28 June, no prairie dog seen, burrows with orange flags (Lester);

South Dam South. 30 April, active (Rosborough); 14 May, active with at least 55 prairie dogs visible (Rosborough 15 May, active (Dietrich); 26 May, active (Roxborough); 7 June, active (Roxborough); 25 June, active with red tailed hawk present (Roxborough);

W. 51st St. 1 May, active (Pow); 10 June, active with numerous pups out (Lawrence); 22 June, active (Noonan); 24 June, active (Dozier);

Windsurfer. 14 May, active with at least 30 prairie dogs observed (Anderson); 12 June, no prairie dogs observed (Anderson);

### **Other Disturbances**

28 May, Dry Creek. Bailing wire on Osprey nest (Gregory).

Observers reporting: George Alexander, Sharon Anderson, Linda Andes-Georges, Stu and Yvonne Bader, Ginger Beske, Barbara Brandt, John Dietrich, Carol Dozier, Haylen Gregory, Greg Holden, Kumiko Iwata, Shirley Jin, Chuck Klomp, Viki Lawrence, Melissa Lester, Liz Litkowski, Nancy Ries Morrison, Kitty Noonan, Linda Palmer, Michael Patterson, Carly Pierce, Jeanine Pow, George Rosborough, Gary Raybourn, Gretchen and Peter Ridgeway, Mary Sandmann, Darin Toohey, Robin Youngelman.