

Colorado State Parks Raptor Monitoring Handbook

Last Edited February 9, 2005



Photo of Golden eagle by Chris Young/The Illinois Raptor Center.

This handbook is for use by Colorado State Parks Staff, Interpreters, and Volunteers.

We ask that any data sheets or maps that you place into this book also be sent to Elizabeth Gillespie, Resource Stewardship Coordinator (at 1313 Sherman St, room 618, Denver, CO 80203) so that they may be filed in the binder kept in Denver, as well as updated in the GIS system.

Acknowledgements

This Handbook was compiled with the help and technical expertise of the following Parks staff, contractors, and technicians: Rob Billerbeck, Heather Brown, Steve Jones, Robert Fenwick, Elizabeth Gillespie, Naomi Yoder, Aimee Caires, and Brian Kurznel. The species descriptions were written by Steve Jones, and most of the content is from his guide that was a precursor to the Handbook. Robert Fenwick designed and piloted the field work from which this manual's protocols are based on.

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Please remit copies of all data sheets and completed field forms to the above address as well.

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How to use this guide

This Handbook is intended to help the State Park in implementing a Raptor Monitoring Program. The guide provides a brief description of the methods to be used, and then provides background information, species descriptions, and copies of blank data sheets and forms to be used in the surveys. As data is gathered, the Handbook will also become a reference for the monitoring program.

State Parks staff should copy useful information from this handbook for volunteers, but keep the master in the Park office. When new data is gathered by volunteers or staff, the volunteer or staff member should keep a copy of the data sheets or give them to the park office, and send a copy to the Denver office for the reference master handbook.

Purpose and Process

Raptor monitoring gives useful tools to a land manager to assist in stewardship and decision-making. Raptors are a *keystone predator* – an animal without which the ecosystem would fail. Raptors are carnivores, and their food base is comprised of fish and mammals, and reptiles. If there is a lack or decline in raptor population, one of the reasons is often lack of prey species. So the top-level carnivores provide insight into populations of small animals within the Park. Also, some raptors have specific breeding and nesting needs that can indicate something about the functioning of the larger system. Bald Eagles and Northern Harriers are two good examples of how we can learn about pieces of the ecosystem puzzle, and whether certain areas of the Park may be experiencing excess disturbance.

Bald Eagles (along with many raptors) are good *indicator species* – species whose population decline indicates poor ecosystem health. Bald Eagles need fish and small mammals for forage, so if the numbers of fish and small mammals are low or start to decline, the birds' population will decline as well due to lack of food.

Another important indicator species is Northern Harrier (formerly called a Marsh Hawk). Harriers build their nests on the ground in marshy areas, so their presence (especially nesting presence) indicates a healthy, robust marsh. A marsh, in turn, is a biological community type that is especially sensitive to pollution and disturbance, and provides water filtration and other essential functions to an ecosystem (an *indicator community*). So the presence of a Harrier nest suggests a healthy surrounding ecosystem. Also, based on the fact that Harriers are ground-nesters, their nest presence indicates of a low level of disturbance in the Park (such as human-related impacts like pets and cars). The presence of Northern Harriers suggests good health of the components of the Park's ecosystem that are dependent on the marshes.

The functioning of the Park ecosystem is dependent on raptors. By monitoring the presence of birds and nests, a clearer picture is drawn of the overall functioning of the system. Suggestions can be made about how to promote healthy system functioning as well. Besides these invaluable benefits, raptors are great charismatic creatures that are relatively easy and a whole lot of fun to monitor! It's a great way to learn about the ecosystem, and get volunteers involved in public land stewardship and management.

The general process works like this:

1. Volunteers contact Park Stewardship staff about a park that they are interested in monitoring (303) 866-3203 x.341.
2. If that park needs a raptor monitor, Stewardship staff facilitates a meeting between the volunteer and the Park staff.
3. The volunteer determines parking and entry issues with the Park manager.
4. The volunteer observes raptors over the winter informally and determines suitable number and location of observation points. Volunteers determine potential nest and roost sites due to structures, behaviors and map those locations on paper or with a GPS.
5. The volunteer meets with Park Stewardship staff to formalize the location of the observation points and assure that they work with existing protocols. Stewardship staff will create a GIS theme of the winter observation points and of all known nest and roost locations.
6. The Parks Stewardship staff prints the official monitoring maps for the park of interest and distributes maps, protocols and survey datasheets to volunteers and Park staff.
7. The volunteer continues informal winter monitoring then transitions to formal nest monitoring as the raptors begin to nest (late February to March). Formal nest monitoring requires using recommended buffers, official survey datasheets and regular correspondence with Stewardship staff. Generally correspondence involves sending a spreadsheet via e-mail every 2 weeks. Nest monitoring continues through August.
8. At the end of the nest monitoring season, the volunteer reports overall nest success and any unsuccessful nests to the Park Stewardship staff. Stewardship staff updates the GIS nest coverage.
9. Volunteers begin formal winter monitoring based on the points that were established the year before.

References to Use With This Guide

Andrews, R. & R. Righter, 1992. "Colorado Birds" Denver Museum of Natural History (Denver, CO) 442 pp.

Kingery, H.E., 1998. "Colorado Breeding Bird Atlas" Colorado Bird Atlas Partnership (Denver, CO), 636 pp. **not easily available; see attached order form below to obtain**

National Geographic Society, 2002. "National Geographic Field Guide To The Birds Of North America, 4th Edition" (Washington, D.C.) 480 pp.

Sibley, D.A., 2000. "The Sibley Guide to Birds" Knopf (New York, NY) 545 pp.

Peterson, Roger Tory, 1998. "A Field Guide to Western Birds: A Completely New Guide to Field Marks of All Species Found in North America West of the 100th Meridian and North of Mexico, Third Edition"

Protocols

A. Monitoring Tips

Raptor nest monitors contribute directly to the preservation of birds of prey in Colorado. By identifying nest sites, monitoring them for disturbance, and observing the behavior of nesting birds, nest monitors provide valuable information to land managers. However, nest monitoring can be tedious and sometimes frustrating. The tips, below, are meant to make the experience more constructive and less stressful both for you and for the nesting raptors you observe.

1. Locate observation points outside the recommended buffer area distances. Use the same observation point each time; do not move around. This will enable the nesting raptors to habituate to your presence.
2. Keep a low profile by sitting or lying down while observing. Birds estimate distances and the degree of threat by assessing the height of human profiles. Avoid making any loud noises.
3. If the birds show signs of distress due to your presence, leave the area immediately.
4. Always carry the following equipment: binoculars and/or a spotting scope, water, rain gear, matches, a first-aid kit, a topographic map, a notebook, a bird field guide, and a whistle or cell phone to call for help in an emergency.
5. Write down everything of interest you observe, and always submit a report form, even if you don't observe any raptors. Sometimes the absence of a nest or of nesting behavior is just as important to know about as the presence of a nest.
6. Become familiar with the species you are assigned to observe by consulting the list of references at the end of each species description in this field manual. All of the recommended

books and articles should be available at any research library; or they can be ordered from any public library through interlibrary loan.

7. Enjoy the experience, and don't worry about missing things. Often the things we are searching for are the last things we see, and the things we see by accident are the most interesting.

B. State Parks Monitoring Protocols

There are two main components to the State Parks Raptor Monitoring Program. One is to identify and document raptor nests. The presence of nesting birds indicates a lot about the healthy functioning of the Park ecosystem, and if nests are documented they can provide an excellent way to chart change over time by returning to the same place over a span of years. This information is critical to be able to evaluate the larger functioning of the system.

The second component is recording the number of birds during non-breeding time, over the winter. By gathering bird counts and species lists, each Park can create a better overall picture of the raptors that use the area for forage and habitat, and add to the greater understanding of the Park's ecosystem.

This protocol also allows for anecdotal observations between points and of species other than raptors, but we treat this data separately from raptor monitoring.

A final component of the monitoring scheme is Nocturnal Owl Monitoring. Those owl species that can be observed during the day (like Burrowing Owl and Great-horned Owl) should be included in the general raptor surveys. Those owls that can only be observed at night should be monitored where resources allow. If the Park has interested volunteers or capability to conduct ongoing surveys at night, then they should. Information is included on how to set up an owl monitoring program, and can be customized depending on Park needs and specifics. However, owl monitoring is not considered a main component of the State Parks Raptor Monitoring Program due to lack of resources.

I. Nest Monitoring

Refer to the nesting schedule of species (see p. 15) and species lists to identify a timeline strategy for identifying raptor nests. Coordinate several surveys based on the times of year that the bird should be nesting. Plan to step up the level of monitoring around the time when the most birds nest at one time (this time will normally be between late February and late August). Identify volunteers for monitoring, and try to assemble a volunteer crew before the season starts. Through the nesting season, plan to have people out monitoring active nests once every two weeks. Every two to four weeks is acceptable (see "Recurrence of observation" in ***Observation Details*** table, p. 16), depending on species and activity. When nests are found at the beginning of the season, document this carefully and plan a monitoring schedule for the rest of the species' nesting season. Time for observations (see ***Observation Details*** table, p. 16) may be less than the maximum if the behavior can be determined in less time. Twenty (20) minutes should be the minimum nest observation time.

It is best to be as consistent as possible with monitoring; try to go out at the same time of day each week, and if possible, in similar weather conditions. Since this is not always possible, document the weather conditions and time of day of the observance on the field forms. The influence of human activity is interesting to the Stewardship staff. If volunteers have the ability to monitor on a weekend and weekday once every two weeks, make this clear to Stewardship

staff so that we may manage the data appropriately. If more than one volunteer is monitoring at a park, please assure that different volunteers are using consistent methods.

Process for Volunteers or Staff

- ♦ Search for nests and return to previous years' nests, if known. Gather nest information from volunteers as they return from field trips, to send others to.
- ♦ Record locations of nests with GPS receivers and print out maps for future reference and field work. Send copies of the data to Resource Stewardship staff in Denver. For detailed information on how to collect GPS data and conform to current Parks standards, contact Rob Billerbeck (see contact information on page 2).
- ♦ Fill out field data sheets entirely. If you have the ability to use Excel on a computer, than please transfer your field data into a spreadsheet since it is much more useful for later analysis (see protocol for completing spreadsheets, Appendix B).
- ♦ If using only paper data sheets, make 2 copies: one for this book and one for Resource Stewardship. Send one copy to Park Stewardship and put one in the Park Raptor Monitoring Handbook. If entering data into a spreadsheet, e-mail to Parks Stewardship.
- ♦ Review the collected data (GPS and written) to evaluate what was recorded and whether more work needs to be done at the site(s) visited. Place data sheets and summary of findings in the Raptor Monitoring Handbook.

II. Winter Monitoring

Winter monitoring will occur when nests are not active, normally from late September to late February. Create one or several routes that people can travel and are likely to see raptors (based on experience and past knowledge). Contact Rob Billerbeck if you need help planning likely routes. Try to get a good range of vegetation and habitat types in the routes. Create monitoring points at logical intervals; either at intersections (if there are enough), or every certain number of miles. Monitoring points along roads or trails are preferred. If you have a lot of miles to cover, you could break up the routes into difficulty of travel or into zones. Sampling points at every ½ or ¼ mile along a route is a good start. We would like to ensure that our monitoring points are not too close together so that our field of view does not overlap. This will minimize double-counting raptors. It is a good idea to only count raptors within a ½ mile of each observation point. The Park Stewardship staff can help delineate these visual boundaries if needed.

If there aren't suitable driving or walking routes for winter monitoring, try to visit certain monitoring points in the park (you could use the nest sites from the summer). Name the monitoring points for quick reference and ease of note-taking in the field for example:

SITE CODE:	DATE:	SPECIES:	IMM	M	F	Unknown	BEHAVIOR:	SPECIFIC LOCATION:
BAR003	2/10/05	Red-tailed Hawk				2	Perched	Tree W of road

If the monitoring points and routes do not have GPS locations (check with Park staff before gathering this data), record the data with a GPS receiver and print out maps for future reference and field work. Send copies of the data to Resource Stewardship staff in Denver. For detailed information on how to collect GPS data and conform to current Parks standards, contact Rob Billerbeck (see contact information on page 2). Once you've set your route(s), and it is official with Stewardship and Park staff, then stick to them! These are the routes you should use year after year to conduct monitoring. If you change a route for some reason, make sure there's a strong reason behind it and let the Parks Stewardship team know as soon as possible. Aim for trying to replicate the same observation conditions (place, time of day, time of year, etc.) over time.

Process for Volunteers or Staff

- ◆ Travel the designated route and stop at the predetermined points (either use your odometer or refer to the points on the map). Observations may be made up to 50 ft. from the predetermined point. It may be helpful to move around a bit to avoid obstacles in the viewshed. But, this is a sampling protocol based on point locations, please try not to go beyond 50 ft.!
- ◆ Scan the horizon and sky for *five* minutes (be consistent with this). Record all birds you see; if you see any raptors, watch them and record their behavior every minute. If the raptor's behavior is the same for five minutes, you don't have to record multiple entries. Record on the field form the raptor species and behavior, where you saw it, and what it was doing. Make note of any birds flushed or bird interactions, as well as any abnormal happenings. Record the length of time you observe the animal on the data sheet.
- ◆ If you don't see any raptors right off, keep scanning for the full five minutes and then press on. If you can't identify a bird, record as many details as you can about it and make a note to look it up back at the office. Note on the form that you scanned at the point, even if you didn't see any birds. Record other birds you see, but give precedence to the raptors if there are many species to document. Entries for non-raptors should be made using the 4-letter codes listed in the Appendix. Make notes about other wildlife, only if time permits.
- ◆ If you see raptors outside of the 5 minute observation time or between monitoring points, information should still be entered on the field data sheets. However, these observations should be distinguished from monitoring point observations by starting the site code with an 'X'. For example, observations taken at Barr Lake after the 5 minute observation period at point 002 should have the site code: XBAR002. (A different 3 letter code is given to each park; ask Park staff for the appropriate code).
- ◆ Back at the office, make a copy of the data sheets and download any GPS data you recorded. Review the data, and make notes of any outstanding work to be done, or any interesting or unusual occurrences. Place data sheets and summary of findings in the Raptor Monitoring Handbook.

- ◆ Enter the data from the field data sheets into the spreadsheet and e-mail to Parks Stewardship (see protocol for completing spreadsheets, Appendix B).

III. Owl Monitoring (Nocturnal Species)

Tips for Finding Owls

- ◆ If just recording locations of owl nests (great horned owl most of the time) during daylight hours, use the raptor protocol above.
- ◆ If you want to do night-time surveys with hooting or playbacks, then please coordinate with Stewardship staff because you may actually need a permit from Division of Wildlife.
- ◆ Compile a list of the owls that nest in your region. In the Rocky Mountains, the number of breeding species varies from two in most high-altitude spruce-fir forests to five or six in most foothills mixed coniferous/deciduous forests.
- ◆ Learn the common territorial calls of local owls. Each species uses one or two characteristic vocalizations to advertise its nesting territory to potential mates and potential rivals.
- ◆ Know the likely peak calling period for each species. Unlike owls in the movies, real owls don't hoot incessantly once the sun goes down. Some small owls, including northern pygmy-owls and flammulated owls, call actively for only a few weeks as they establish their nesting territories. These bite-sized raptors can't afford to advertise perch locations to potential predators, including larger owls and hawks.
- ◆ Become familiar with other vocalizations. In addition to their distinctive territorial calls, the majority of owls possess a bewildering repertoire of hisses, squeals, whistles, rasps, and screams. These sounds tend to "overlap" from one species to another, confounding identification efforts. Several excellent tapes and CD's, including the *Peterson Field Guide to Western Bird Songs*, and the Cornell Laboratory's *Voices of New World Owls*, feature an assortment of owl calls.
- ◆ Go hiking at dawn or dusk. Most owls are active, and call most often, during the twilight hours.
- ◆ Look and listen for songbirds "mobbing" owls. Jays and other songbirds often harass owls, hoping to drive them away. Jays make a loud rasping sound when mobbing an owl.
- ◆ Look for owl pellets and excrement at the base of potential nest and roost trees. All owls regurgitate oblong pellets of indigestible bones and fur. Once you've heard an owl calling at night, you can return to the area during daylight hours to search the ground for pellets.
- ◆ Camp out in late winter, early spring, or fall. If you camp out at low to middle elevations during the peak calling period for most owls (roughly January-May), you're likely to hear an owl or two during the night.
- ◆ Use tape playbacks sparingly, if at all. Tapes should be used under the supervision of Park's staff only. Play tapes softly and never for more than a few minutes in one location. Even minor disturbances lessen the owls' chances of survival. Approaching a nest or playing a territorial call stimulates nesting owls to divert precious energy into repelling the perceived intruder.

Data Sheets

C. Winter Observation Forms

Field Data Sheet

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Raptor Winter Monitoring Survey

Observer Name(s): _____ Date: _____ Page: ____ of ____

Transect Name/Route: _____

SURVEY EQUIPMENT: Please circle the appropriate equipment description
Binoculars only: _____ Spotting Scope: _____

HUMAN ACTIVITY: Please indicate the level of human activity during the survey by filling in the number of other Park users during the survey (or check "no activity")
☐ Walkers ☐ Dogs ☐ Motorized Vehicles ☐ Non-motorized Vehicles ☐ No Activity ☐ Other: _____

WEATHER CONDITIONS: (enter Temp, circle others)

Starting Temp. °F	Ending (if different) Temp. °F
Wind: calm moderate windy	Wind: calm moderate windy
Sky: overcast partly cloudy clear	Sky: overcast partly cloudy clear
Clouding: clearing snowing	Clouding: clearing snowing

NOTE: IMM = Non-adult birds, M = Male, F = Female (only fill in if you know). "Location" is where on the landscape the bird is observed (on ground, flying, etc).

SITE CODE	TIME OF OBS	SPECIES (# of each)	NUMBER OF:			LOCATION	BEHAVIOR - List flying, eating (if food item), distributed/observed, interaction with other birds, other
			IMM	M	F		
	Start:						
	Finish:						
COMMENTS							

SITE CODE	TIME OF OBS	SPECIES (# of each)	NUMBER OF:			LOCATION	BEHAVIOR - List flying, eating, distributed/observed, interaction with other birds, other
			IMM	M	F		
	Start:						
	Finish:						
COMMENTS							

Draw AutoShapes

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Excel Spreadsheet

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Raptor Winter Monitoring Survey																		
2	Please note: Blue boxes are locations for your observations and may vary.																		
3	Green boxes contain drop downs menus, so please select one option from each green box and do not change them.																		
4	Provide additional notes in the available comments boxes.																		
5	Additional birds seen at observation points may be listed as well. List these species in the 'If other, specify' column.																		
6	If raptors are seen in between points or after 5 minute observation, please make sure the site code begins with 'X'																		
7	and assign it the number of the closest monitoring point.																		
8	SECTION ONE																		
9	Observer Name(s):				Date:														
10																			
11	Transect Name/Route:																		
12																			
13	Time of observation:				Weather Conditions:														
14	Starting time:				Wind:				Ending time:										
15	Starting Temp:				Sky:				Ending Temp:										
16																			
17	Survey Equipment:																		
18																			
19	Human Activity: Please indicate the level of human activity during the survey by filling in the number of other Park users during the survey (or filling in 'yes' in 'no activity')																		
20	Walkers:				Dogs:				Motorized Vehicles:										
21	No Activity:				Other:				Non-motor Vehicles:										
22																			
23																			
24	SECTION TWO																		
25																			
26	SITE CODE:	DATE:	SPECIES:	If other, specify:	NUMBER OF:				BEHAVIOR:		SPECIFIC LOCATION:		COMMENTS:						
27					IM	M	F	Unknown											
28																			
29																			
30																			
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D. Nest Monitoring Forms

Field Data Sheet

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Raptor Nest Monitoring Survey

Observer Name(s): _____ Date: _____ Page: ____ of ____

Transect Name/Route: _____

SURVEY EQUIPMENT: Please circle the appropriate equipment description
Binoculars-only Spotting Scope

HUMAN ACTIVITY: Please indicate the level of human activity during the survey by filling in the number of other Park users during the survey (or check "no activity")
☐ Walkers ☐ Dogs ☐ Motorized Vehicles ☐ Non-motorized Vehicles ☐ No Activity ☐ Other: _____

WEATHER CONDITIONS: (enter Temp, circle others)

Starting	Temp: <input type="text"/>	Ending (if different)	Temp: <input type="text"/>
Wind:	calm moderate windy	Wind:	calm moderate windy
Sky:	overcast pt. cloudy clear	Sky:	overcast pt. cloudy clear
	raining snowing		raining snowing

NOTE: IMM = Non-Adult Birds, M = Male, F = Female, U = Unknown. If you're out of room, use the comments section.

SITE CODE	TIME OF OBS	SPECIES USING NEST	NUMBER OF:				NEST ACTIVITY AND LOCATION (be specific!)	BEHAVIOR - List flying, eating, disturbed/flushed, interactions, other
			IMM	M	F	U		
	Start:							
	Finish:							
COMMENTS, ADD'L		OBSERVATIONS						

SITE CODE	TIME OF OBS	SPECIES USING NEST	NUMBER OF:				NEST ACTIVITY AND LOCATION (be specific!)	BEHAVIOR - List flying, eating, disturbed/flushed, interactions, other
			IMM	M	F	U		
	Start:							
	Finish:							
COMMENTS, ADD'L		OBSERVATIONS						

Draw AutoShapes

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Excel Spreadsheet

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
1	Raptor Summer Nest Monitoring Survey																			
2	Please note: Blue boxes are locations for your observations and may vary.																			
3	Green boxes contain drop downs menus, so please select one option from each green box and do not change them.																			
4	Provide additional notes in the available comments boxes.																			
5	Additional birds seen during observation period may be listed as well. List these species in the 'if other, specify' column																			
6	SECTION ONE																			
7	Observer Name(s):												Date:							
8	Transect Name/Route:																			
9																				
10	Time of observation:		Weather Conditions:																	
11	Starting time:		Wind:										Ending time:							
12	Starting Temp:		Sky:										Ending Temp:							
13																				
14	Survey Equipment:																			
15																				
16	Human Activity:		Please indicate the level of human activity during the survey by filling in the number of other Park users during the survey (or filling in 'yes' in 'no activity')																	
17	Walkers:		Dogs:										Motorized Vehicles:							
18	No Activity:		Other:										Non-motor Vehicles:							
19																				
20																				
21																				
22	SECTION TWO																			
23	SITE CODE:		DATE:		SPECIES:		If other, specify:		NUMBER OF:				NEST ACTIVITY:		BEHAVIOR:		NEST LOCATION:		COMMENTS:	
24									IMM M F Unknown											
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Appendices

A. Nesting Schedule of Species

When to look for nests and nesting activity; there is no need to pursue nest monitoring if no nests are located within the first months of the nesting season, (unless you are visiting sites previously not visited).

Bird species are listed by common name.

X = Nesting activity, should be observed

C = Courtship; make notes but not essential to record nests

Species	Month												Territory Fidelity	Nest Fidelity
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
American Kestrel			C	C	X	X	X						Y	L
Bald Eagle	c	c	X	X	X	X	X						Y	H
Boreal Owl			c	c	x	x	x						Y	M
Burrowing Owl				c	x	x	x						Y	H
Common Barn Owl			c	x	x	x	x	x	x	x			Y	H
Cooper's Hawk			c	c	x	x	x							
Ferruginous Hawk				x	x	x	x							
Flammulated Owl				c	x	x	x	x						
Golden Eagle	c	x	x	x	x	x	x							
Great Horned Owl	c	x	x	x	x	x	x					c		
Long-eared Owl		c	x	x	x	x	x							
Northern Goshawk				c	x	x	x	x						
Northern Harrier				x	x	x	x	x						
Osprey				x	x	x	x	x	x					
Peregrine Falcon				x	x	x	x							
Prairie Falcon				x	x	x	x							
Pygmy Owl				x	x	x	x	x						
Red-tailed Hawk			c	x	x	x	x							
Saw-whet Owl			c	c	x	x	x							
Screech Owl			c	x	x	x	x							
Sharp-shinned Hawk			c	c	x	x	x							
Short-eared Owl		c	c	x	x	x	x							
Spotted Owl		x	x	x	x	x								
Swainson's Hawk				x	x	x	x	x						

If nests are found, refer to the following table for how often to visit the nest and how long to stay at each nest site.

Observation Details

<u>Species</u>	<u>Nests</u>		
	Keep Distance (m)	Recurrence of Obs	Obs Duration (hours)
American Kestrel	50		
Bald Eagle	800	2 weeks	2-3
Burrowing Owl	200	2 weeks	30 min
Common Barn Owl	200		
Cooper's Hawk	200	2-3 weeks	20 min
Ferruginous Hawk	400	2 weeks	
Golden Eagle	800	2 weeks	2-3
Great Horned Owl	100	2-3 weeks	
Long-eared Owl	200	1-2 weeks	
Northern Goshawk	400	2-3 weeks	20 min
Northern Harrier	400	2 weeks	2-3
Osprey	400	2 weeks	1-2
Peregrine Falcon	800	1 week	2-3
Prairie Falcon	800	1 week	2-3
Red-tailed Hawk	400	2 weeks	
Sharp-shinned Hawk	200	2-3 weeks	20 min
Short-eared Owl	500	1-2 weeks	1-2
Swainson's Hawk	400	2 weeks	

B. Protocols for spreadsheet data entry

Once field data sheets are completely filled out with a copy placed in the Raptor Monitoring Handbook, enter the data into the “Raptor Winter Monitoring Survey” or “Raptor Summer Nest Monitoring Survey” spreadsheet.

- **Section One:** Enter data into all green and blue cells. Green cells have drop-down menus that you should choose from; blue cells require unique data. (time should be entered in standard non-military time with AM or PM; temperature should be in Fahrenheit).
- **Section Two:** Use Park 3-letter codes and monitoring point numbers in the site code column (use an ‘X’ in front of the site code if not at a monitoring point or after the five minute observation time). Use drop-down lists for raptor “Species”, “Nest Activity” or “Behavior” columns; fill in all other information. If a non-raptor is observed, include the 4-letter code (see Appendix F) in the “If other, specify” column.
- Save the spreadsheet as an Excel file (.xls) with a unique file name. Include the 3-letter Park abbreviation at the front of the name and the date at the end of the file name (e.g. “bar_raptor_winter_monitoring_020905”).
- E-mail the newly named spreadsheet to Rob Billerbeck (rob.billerbeck@state.co.us). CC the e-mail to the Park staff contact. If there are multiple monitors at the State Park, than CC the e-mail to the other raptor monitors at this park.

C. Species List by Park

These lists are adapted from State Parks bird lists, Colorado Breeding Bird Atlas data, data provided by the Rocky Mountain Bird Observatory, and personal communications from various observers. The lists are provided to give raptor nest monitors a general idea of which species might be encountered within each park; they should not be interpreted as definitive lists of actual nesting species within each park.

For **Spinney State Park**, see “Eleven Mile and Spinney State Parks”

For **Harvey Gap State Park**, see “Rifle Gap, Rifle Falls, and Harvey Gap State Parks”

Habitat Codes:

A - aspen forest

Cf - coniferous forest

R - riparian woodland

Cl – cliffs

S - shrubland

Cw - coniferous woodland

U - human structures

G - grassland

W - wetland

Nesting Status Codes:

Possible - suitable nesting habitat available within park

Likely - nesting behavior observed within park or in similar habitat within 10 km of park

*Nesting confirmed within park

Arkansas Headwaters Recreation Area

No data yet.

Barr Lake State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R, U	April-July	Likely*
Bald Eagle	R, W	February-July	Likely*
Barn Owl	G, U	March-October	Likely
Broad-winged Hawk			
Burrowing Owl	G	April-July	Likely*
Cooper's Hawk	R	April-July	
Eastern Screech-Owl	R	March-June	Likely*
Ferruginous Hawk	G, Cl	April-July	
Golden Eagle	Cf	February-July	
Great Horned Owl	R, G, U	February-June	Likely*
Long-eared Owl	R	March-July	Likely*
Merlin			
Northern Harrier	W, G	May-August	Likely*
Osprey	R, W	May-July	Possible
Peregrine Falcon	Cl	April-July	
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R	April-July	Likely*
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G, W	April-July	

Swainson's Hawk	G, R	April-July	Likely*
Turkey Vulture	Cl	May-August	

Bonny Reservoir State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R, Cl	April-July	Likely
Bald Eagle	R	March-July	Possible
Barn Owl	Cl, U	March-October	Possible
Broad-winged Hawk			
Burrowing Owl	G	April-July	Likely*
Cooper's Hawk	R	April-July	Possible
Eastern Screech-Owl	R	March-June	Likely*
Ferruginous Hawk	G, Cl	April-July	Possible
Great Horned Owl	R, Cl, U	February-June	Likely*
Golden Eagle	Cf	February-July	
Long-eared Owl	R	March-July	Possible
Merlin			
Northern Goshawk	Cf	April-July	
Northern Harrier	G, W	May-August	Likely
Osprey	R, W	May-July	
Peregrine Falcon	Cl	April-July	
Red-tailed Hawk	R	April-July	Likely
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G, W	April-July	Possible
Swainson's Hawk	G, R	April-July	Likely
Turkey Vulture	Cl	May-August	

Boyd Lake State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R	April-July	Likely
Barn Owl	U, G	March-October	Likely
Broad-winged Hawk			
Burrowing Owl	G	April-July	Likely
Cooper's Hawk	Cf	April-July	
Eastern Screech-Owl	R	March-June	Likely
Ferruginous Hawk	G, Cl	April-July	
Great Horned Owl	R, G, U	February-June	Likely*
Golden Eagle	Cf	February-July	
Long-eared Owl	R	March-July	Possible
Merlin			
Northern Goshawk	Cf	April-July	
Northern Harrier	W, G	May-August	Likely
Osprey	R, W	May-July	Possible
Prairie Falcon	Cl	April-July	
Peregrine Falcon	Cl	April-July	
Red-tailed Hawk	R	April-July	Likely*
Rough-legged Hawk			

Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G, W	April-July	
Swainson's Hawk	G, R	April-July	Likely
Turkey Vulture	Cl	May-August	

Castlewood Canyon State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
Broad-winged Hawk			
Burrowing Owl	G	April-July	
Cooper's Hawk	Cf	April-July	
Great Horned Owl	R, U, Cf	February-June	
Northern Goshawk	Cf	April-July	
Northern Harrier	W,G	May-August	
Prairie Falcon	Cl	April-July	Likely*
Peregrine Falcon	Cl	April-July	
Red-tailed Hawk	R, Cf	April-July	
Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G, W	April-July	
Swainson's Hawk	G,R	April-July	
Turkey Vulture	Cl	May-August	

Chatfield State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R, U, Cl	April-July	Likely*
Bald Eagle	R	March-July	
Barn Owl	R, Cl	March-October	Possible
Broad-winged Hawk			
Burrowing Owl	G	April-July	
Cooper's Hawk	Cf	April-July	
Eastern Screech-Owl	R	March-June	Likely*
Ferruginous Hawk	G,Cl	April-July	
Golden Eagle	Cl, Cf	February-July	Likely*
Great Horned Owl	R, U, Cf	February-June	Likely*
Long-eared Owl	R, Cf	March-July	Likely*
Merlin			
Northern Goshawk	Cf	April-July	
Northern Harrier	W,G	May-August	
Osprey	R, W	May-July	Possible
Peregrine Falcon	Cl	April-July	
Prairie Falcon	Cl	April-July	Possible
Red-tailed Hawk	R, Cf	April-July	Likely*
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G, W	April-July	
Swainson's Hawk	G, R	April-July	Likely*
Turkey Vulture	Cl	May-August	

Cherry Creek State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R, U	April-July	Likely*
Bald Eagle	R	March-July	
Barn Owl	U, G	March-October	Possible
Broad-winged Hawk			
Burrowing Owl	G	April-July	Likely*
Cooper's Hawk	Cf	April-July	Likely*
Eastern Screech-Owl	R	March-June	Likely
Ferruginous Hawk	G, Cl	April-July	
Golden Eagle	Cl, Cf	February-July	
Great Horned Owl	R, U	February-June	Likely*
Long-eared Owl	R	March-July	Possible
Merlin			
Northern Goshawk	Cf	April-July	
Northern Harrier	R, W	May-August	Likely
Osprey	R, W	May-July	Possible
Peregrine Falcon	Cl	April-July	
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R	April-July	Likely*
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G, W	April-July	
Swainson's Hawk	G, R	April-July	Likely*
Turkey Vulture	Cl	May-August	

Cheyenne Mountain State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Likely
Bald Eagle	R	March-July	
Barn Owl	U, G	March-October	
Broad-winged Hawk			
Burrowing Owl	G	April-July	Possible
Cooper's Hawk	Cf	April-July	Likely
Ferruginous Hawk	G, Cl	April-July	
Flammulated Owl	Cf	May-July	Likely
Golden Eagle	Cf	February-July	Likely
Great Horned Owl	Cf, R	February-June	Likely
Long-eared Owl	R, Cf	March-July	Possible
Merlin			
Mexican Spotted Owl			
N. Pygmy-Owl	Cf	April-June	Likely
N. Saw-Whet Owl	Cf	April-July	Possible
Northern Goshawk	Cf	April-July	Possible
Northern Harrier	G, W	May-August	
Peregrine Falcon	Cl	April-July	Likely*
Prairie Falcon	Cl	April-July	Likely

Red-tailed Hawk	R, Cf, Cl	April-July	Likely
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	Possible
Short-eared Owl	G, W	April-July	
Spotted Owl	Cf	March-July	Likely
Swainson's Hawk			
Turkey Vulture	Cl	May-August	Likely
W. Screech-Owl	Cw, R	March-July	Possible

Colorado River State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R, Cl	April-July	Likely
Bald Eagle	R	February-July	Possible
Barn Owl	R, Cl	March-October	Likely*
Cooper's Hawk	Cf	April-July	Likely
Ferruginous Hawk	G, Cl	April-July	
Golden Eagle	Cl	March-July	Possible
Great Horned Owl	R, Cf	February-June	Likely
Long-eared Owl	R, Cf	March-June	Possible
Merlin			
Northern Goshawk	Cf	April-July	
Northern Harrier	G, W	May-August	
N. Pygmy-Owl	Cf	April-June	Possible
N. Saw-whet Owl	Cf	April-June	Possible
Osprey	R	April-July	Likely
Peregrine Falcon	Cl	April-July	Possible
Prairie Falcon	Cl	April-July	Possible
Red-tailed Hawk	R	March-July	Likely
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	Possible
Swainson's Hawk	G,R	April-July	
Turkey Vulture	Cf	April-August	Possible
W. Screech-Owl	R	March-July	Possible

Crawford State Park

No data yet.

Eldorado Canyon State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Likely*
Bald Eagle	R	March-July	
Barn Owl	R, Cl	March-October	
Cooper's Hawk	Cf	April-July	Likely
Eastern Screech-Owl	R	March-June	Possible
Flammulated Owl	Cf	May-July	Likely
Golden Eagle	Cf	February-July	Likely*
Great Horned Owl	Cf, R	February-June	Likely*
Long-eared Owl	R, Cf	March-July	Possible

Merlin			
Northern Goshawk	Cf	April-July	Likely
N. Pygmy-Owl	Cf	April-June	Likely*
N. Saw-Whet Owl	Cf	April-July	Likely
Peregrine Falcon	Cl	April-July	Likely*
Prairie Falcon	Cl	April-July	Likely*
Red-tailed Hawk	R, Cf, Cl	April-July	Likely*
Sharp-shinned Hawk	Cf	April-July	Likely
Turkey Vulture	Cl	May-August	Likely

Eleven Mile and Spinney State Parks

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Likely
Bald Eagle	R	March-July	
Barn Owl	R, Cl	March-October	
Boreal Owl	Cf	April-July	
Broad-winged Hawk			
Burrowing Owl	G	April-July	
Cooper's Hawk	Cf	April-July	Possible
Ferruginous Hawk	G, Cl	April-July	
Flammulated Owl	Cf	May-July	
Golden Eagle	Cf	February-July	
Great Horned Owl	Cf, R	February-June	Possible
Long-eared Owl	R, Cf	March-June	
Mexican Spotted Owl			
Northern Goshawk	Cf	April-July	
Northern Harrier	G, W	May-August	Possible
N. Pygmy-Owl	Cf	April-June	Possible
N. Saw-Whet Owl	Cf	April-July	Possible
Osprey	R, W	May-July	
Peregrine Falcon	Cl	April-July	
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R, Cf, Cl	April-July	Possible
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	Possible
Short-eared Owl	G, W	April-July	
Swainson's Hawk	G, S	April-July	Possible
W. Screech Owl	R	March-July	
Turkey Vulture	Cl	May-August	

Golden Gate Canyon State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Likely
Boreal Owl	Cf	April-July	Possible
Cooper's Hawk	Cf	April-July	Likely
Flammulated Owl	Cf	May-July	Likely*
Golden Eagle	Cf	February-July	Possible

Great Horned Owl	Cf, R	February-June	Likely*
Long-eared Owl	R, Cf	March-July	Possible
Northern Goshawk	Cf, A	April-July	Likely
N. Pygmy-Owl	Cf	April-June	Likely
N. Saw-Whet Owl	Cf, A	April-July	Likely
Peregrine Falcon	Cl	April-July	Possible
Red-tailed Hawk	R, Cf, Cl	April-July	Likely
Sharp-shinned Hawk	Cf	April-July	Likely
Turkey Vulture	Cl	May-August	Possible

Highline Lake State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R	April-July	Likely
Barn Owl	Cl, S	March-October	Likely
Burrowing Owl	G, S	April-July	Likely
Ferruginous Hawk	Cl, R	April-July	Possible
Great Horned Owl	R	February-June	Likely
Long-eared Owl	R	March-June	Likely
Northern Harrier	W, S	April-August	Possible
Red-tailed Hawk	R	March-July	Possible
Swainson's Hawk	R, S	April-July	Likely
W. Screech-Owl	R	March-July	Likely

Jackson Lake State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R, Cl	April-July	Likely*
Bald Eagle	R	March-July	Possible
Barn Owl	Cl, U	March-October	Possible
Burrowing Owl	G	April-July	Likely
Cooper's Hawk	Cf	April-July	
Eastern Screech-Owl	R	March-June	Likely
Ferruginous Hawk	G, Cl	April-July	Possible
Golden Eagle	Cf	February-July	
Great Horned Owl	R, Cl, U	February-June	Likely*
Long-eared Owl	R	March-June	
Merlin			
Northern Harrier	G, W	May-August	Likely*
Osprey	R, W	May-July	
Peregrine Falcon	Cl	April-July	
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R	April-July	Likely
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G, W	April-July	Possible
Snowy Owl			
Swainson's Hawk	G, R	April-July	Likely
Turkey Vulture	Cl	May-August	

John Martin State Park
No data yet.

Lathrop State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cf, R	April-July	Likely
Cooper's Hawk	Cf	April-July	Possible
Great Horned Owl	R, U, Cl	February-June	Possible
Northern Harrier	G, W	May-August	Likely
N. Saw-whet Owl	Cf	April-June	Possible
Osprey	R, Cf	April-August	Possible
Red-tailed Hawk	R, U	April-July	Likely
Sharp-shinned Hawk	Cf	April-July	Possible
Swainson's Hawk	G, R	April-July	Possible
W. Screech-Owl	R	March-July	Possible

Lone Mesa State Park

No data yet.

Lory State Park

No data yet.

Mancos State Park

No data yet.

Mueller State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R, U	April-July	
Bald Eagle	R	March-July	
Barn Owl	U, G	March-October	
Cooper's Hawk			
Eastern Screech-Owl	R	March-June	
Ferruginous Hawk	G, Cl	April-July	
Golden Eagle	Cf	February-July	
Great Horned Owl	R, U	February-June	
Long-eared Owl	R	March-July	
Northern Goshawk	Cf	April-July	
Northern Harrier	R, W	May-August	
Peregrine Falcon	Cl	April-July	
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R	April-July	
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G,W	April-July	
Swainson's Hawk	G, R	April-July	
Turkey Vulture	Cl	May-August	
W. Screech Owl	Cw, R	March-July	

Navajo State Park

No data yet.

North Sterling Reservoir State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R, Cl	April-July	Likely*
Bald Eagle	R	March-July	
Barn Owl	Cl, U	March-October	Possible
Burrowing Owl	G	April-July	Possible
Eastern Screech-Owl	R	March-June	Possible
Ferruginous Hawk	G, Cl	April-July	Possible
Golden Eagle	Cf	February-July	
Great Horned Owl	R, Cl, U	February-June	Likely*
Northern Harrier	G, W	May-August	Possible
Osprey	R, W	May-July	
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R	April-July	Likely
Snowy Owl			
Swainson's Hawk	G, R	April-July	Possible
Turkey Vulture	Cl	May-August	

Paonia State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Likely
Bald Eagle	R	March-July	
Barn Owl	Cl, U	March-October	
Boreal Owl	Cf	April-July	
Burrowing Owl	G	April-July	
Cooper's Hawk	Cf	April-July	Possible
Ferruginous Hawk	G, Cl	April-July	
Flammulated Owl	Cf	May-July	
Golden Eagle	Cf	February-July	
Great Horned Owl	Cf, R	February-June	Likely
Long-eared Owl	R, Cf	March-July	Possible
Northern Goshawk	Cf	April-July	
Northern Harrier	R, W	May-August	
N. Pygmy-Owl	Cf	April-June	Possible
N. Saw-Whet Owl	Cf	April-July	Possible
Osprey	R, W	May-July	
Peregrine Falcon	Cl	April-July	
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R, Cf, Cl	April-July	Possible
Sharp-shinned Hawk	Cf	April-July	Possible
Short-eared Owl	G, W	April-July	
Swainson's Hawk	G, R	April-July	

Pueblo Lake State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-June	Likely
Bald Eagle	R	March-July	

Barn Owl	Cl, U	March-October	Possible
Burrowing Owl	G	April-July	Likely
Cooper's Hawk	Cf	April-July	
Ferruginous Hawk	G, Cl	April-July	Likely
Golden Eagle	Cf	February-July	
Great Horned Owl	R, U, Cl	February-June	Likely
Merlin			
Mississippi Kite	R	May-August	Possible
Northern Goshawk	Cf	April-July	
Northern Harrier	R, W	May-August	
Osprey	R	April-July	Likely*
Peregrine Falcon	Cf	April-July	
Prairie Falcon	Cf	April-July	Possible
Red-tailed Hawk	R, U	April-July	Likely
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	
Swainson's Hawk	G, R	April-July	Likely
Turkey Vulture	Cl	May-August	
W. Screech-Owl	R	March-July	Possible

Ridgeway State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cf, R	April-July	Likely*
Bald Eagle	R	March-July	
Cooper's Hawk	Cf	April-July	Possible
Golden Eagle	Cl, Cf	February-July	Possible
Great Horned Owl	Cf, R	February-June	Likely
Long-eared Owl	Cf	March-July	Possible
Northern Goshawk	Cf, A	April-July	Possible
N. Pygmy-Owl	Cf	April-June	Possible
N. Saw-whet Owl	Cf, A	April-June	Possible
Osprey	R	April-July	
Red-tailed Hawk	R, Cf, Cl	April-July	Likely*
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	Possible
Tukey Vulture	Cl	May-August	

Rifle Gap, Rifle Falls, and Harvey Gap State Parks

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Likely
Bald Eagle	R	March-July	
Barn Owl	Cl	March-October	Possible
Cooper's Hawk	Cf	April-July	Possible
Flammulated Owl	Cf	May-July	Possible
Golden Eagle	Cl	February-July	Possible
Great Horned Owl	Cf, R	February-June	Likely
Long-eared Owl	R, Cf	March-July	Possible
Turkey Vulture	Cl	May-August	Possible

Northern Goshawk	Cf, A	April-July	
Northern Harrier	W, S	April-August	Likely*
N. Pygmy-Owl	Cf	April-June	Possible
N. Saw-Whet Owl	Cf	April-July	Possible
Osprey	W, R	April-August	Possible
Peregrine Falcon	Cl	March-July	Possible
Prairie Falcon	Cl	March-July	Possible
Red-tailed Hawk	R, Cf, Cl	April-July	Likely
Sharp-shinned Hawk	Cf	April-July	Possible
W. Screech-Owl	R	March-July	Possible

Roxborough State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Likely*
Burrowing Owl	G	April-July	
Cooper's Hawk	Cf	April-July	Possible
Flammulated Owl	Cf	May-July	Possible
Golden Eagle	Cf	February-July	Likely
Great Horned Owl	Cf, R	February-June	Likely*
Long-eared Owl	R, Cf	March-July	Possible
N. Pygmy-Owl	Cf	April-June	Possible
N. Saw-Whet Owl	Cf	April-July	Possible
Peregrine Falcon	Cl	April-July	Possible
Prairie Falcon	Cl	April-July	Likely
Red-tailed Hawk	R, Cf, Cl	April-July	Likely
Sharp-shinned Hawk	Cf	April-July	Possible
Turkey Vulture	Cl	May-August	Likely

St. Vrain State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R	April-July	Likely*
Barn Owl	R, Cl	March-October	
Broad-winged Hawk			
Burrowing Owl	G	April-July	
Cooper's Hawk	Cf	April-July	
Eastern Screech-Owl	R	March-June	Likely
Ferruginous Hawk	G, Cl	April-July	
Great Horned Owl	R, G, U	February-June	Likely*
Long-eared Owl	R	March-July	
Merlin			
Northern Goshawk	Cf	April-July	
Northern Harrier	W, G	May-August	Likely*
N. Saw-whet Owl	Cf	April-July	
Osprey	R, W	May-July	Possible
Prairie Falcon	Cl	April-July	
Peregrine Falcon	Cl	April-July	
Red-tailed Hawk	R	April-July	Likely
Rough-legged Hawk			

Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G,W	April-July	
Snowy Owl			
Swainson's Hawk	G, R	April-July	Likely
Turkey Vulture	Cl	May-August	

San Luis Lakes State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R	April-July	Possible
Bald Eagle	R	March-July	
Barn Owl	Cl, U	March-October	Possible
Burrowing Owl	G, S	April-July	Possible
Cooper's Hawk	Cf	April-July	
Ferruginous Hawk	S, R	April-July	Likely
Golden Eagle	Cf	February-July	
Great Horned Owl	R	February-June	Possible
Northern Goshawk	Cf, A	April-July	
Northern Harrier	S, W	May-August	Likely
Osprey	R, W	May-July	
Peregrine Falcon	Cl	April-July	
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R	April-July	Possible
Rough-legged Hawk			
Sharp-shinned Hawk	Cf	April-July	
Short-eared Owl	G, W	April-July	Possible
Snowy Owl			
Swainson's Hawk	S, R	April-July	Likely
Turkey Vulture	Cl	May-August	

Stagecoach State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Possible
Bald Eagle	R	March-July	
Cooper's Hawk	Cf	April-July	Possible
Ferruginous Hawk	S, R	April-July	
Golden Eagle	Cl, Cf	February-July	
Great Horned Owl	Cf, R	February-June	Likely
Northern Goshawk	Cf	April-July	Possible
Northern Harrier	W, S	April-August	Possible
N. Saw-Whet Owl	Cf	April-July	Possible
Osprey	R	April-July	Possible
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R, Cf, Cl	April-July	Possible
Rough-legged Hawk			
Swainson's Hawk	R, G	April-July	Possible
Turkey Vulture	Cl	May-August	

State Forest State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Likely
Bald Eagle	R, W	April-July	Possible
Boreal Owl	Cf	April-July	Likely*
Cooper's Hawk	Cf	April-July	Possible
Flammulated Owl	Cf	May-July	Likely
Great Horned Owl	Cf, R	February-June	Possible
Golden Eagle	Cf, Cl	February-July	Likely
Long-eared Owl	R, Cf	March-July	Likely
Northern Goshawk	Cf, A	April-July	Likely*
Northern Harrier	G, W	May-August	Possible
N. Pygmy-Owl	Cf	April-June	Possible
N. Saw-Whet Owl	Cf, A	April-July	Possible
Osprey	R, W	May-August	Likely
Peregrine Falcon	Cl	April-July	Possible
Red-tailed Hawk	R, Cf, Cl	April-July	Likely
Sharp-shinned Hawk	Cf	April-July	Possible
Swainson's Hawk	G, R	May-July	Possible

Staunton State Park

No data yet.

Steamboat/Pearl State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cl, R	April-July	Likely
Bald Eagle	R	April-July	
Cooper's Hawk	Cf	April-July	Possible
Ferruginous Hawk	G, Cl	April-July	
Flammulated Owl	Cf, A	May-July	Possible
Golden Eagle	Cl, Cf	March-July	Possible
Great Horned Owl	Cf, R	February-June	Likely
Long-eared Owl	Cf	March-July	Possible
Northern Goshawk	Cf, A	April-July	Likely
Northern Harrier	W, G	April-August	Possible
N. Pygmy-Owl	Cf	April-July	Possible
N. Saw-Whet Owl	Cf, A	April-July	Possible
Osprey	W, Cf	April-August	Possible
Red-tailed Hawk	R, Cf, Cl	April-July	Possible
Sharp-shinned Hawk	Cf	April-July	Likely
Swainson's Hawk	G,R	April-July	
Turkey Vulture	Cl	May-August	
W. Screech Owl	R	March-July	

Sweitzer State Park

No data yet.

Sylvan Lake State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
Bald Eagle	R	April-July	
Barn Owl	U, G	March-October	
Golden Eagle	Cl, Cf	February-July	
Osprey	R, W	May-July	
Red-tailed Hawk	R	April-July	
Turkey Vulture	Cl	May-August	

Trinidad State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	Cf, R	April-July	Likely*
Bald Eagle	R	March-July	
Burrowing Owl	G,S	April-July	
Cooper's Hawk	Cf	April-July	Possible
Ferruginous Hawk	G,Cl	April-July	
Flammulated Owl	Cf	May-July	Possible
Golden Eagle	Cl, Cf	March-July	
Great Horned Owl	R, U, Cl	February-June	Likely*
Northern Harrier	W,G	April-July	
N. Pygmy-Owl	Cf	April-June	Possible
N. Saw-whet Owl	Cf	April-June	Possible
Osprey	W, Cf	April-August	
Prairie Falcon	Cl	April-July	
Red-tailed Hawk	R, Cf	April-July	Likely
Sharp-shinned Hawk	Cf	April-July	Possible
Swainson's Hawk	G,R	April-July	

Vega State Park

No data yet.

Yampa River State Park

<u>Species</u>	<u>Habitat</u>	<u>Nesting Dates</u>	<u>Nesting Status</u>
American Kestrel	R, U	April-July	
Bald Eagle	R	March-July	
Barn Owl	U, G	March-October	
Cooper's Hawk	Cf	April-July	
Ferruginous Hawk	G, Cl	April-July	
Golden Eagle	Cl, Cf	February-July	
Great Horned Owl	R, U	February-June	
Long-eared Owl	R	March-July	
Northern Goshawk	Cf	April-July	
Northern Harrier	R, W	May-August	
N. Pygmy-Owl	Cf	April-June	
Osprey	R, W	May-July	
Peregrine Falcon	Cl	April-July	

Prairie Falcon	Cl	April-July
Red-tailed Hawk	R	April-July
Sharp-shinned Hawk	Cf	April-July
Short-eared Owl	G, W	April-July
Swainson's Hawk	G, R	April-July
Turkey Vulture	Cl	May-August
W. Burrowing Owl	G	April-July
W. Screech Owl	Cw, R	March-July

D. Breeding Bird Atlas Priority Blocks

The Breeding Bird Atlas priority blocks and the corresponding parks in the Quad's vicinity are listed below. Park staff should be aware of their priority, and consult the Atlas for more information.

***Most or all of park lies within a Colorado Breeding Bird Atlas priority block (southeastern one-sixth of topographic map).**

<u>Quad No.</u>	<u>Quad Name</u>	<u>State Park</u>
3610783/84	Bancos Mesa (NM)	Navajo
3710425	Trinidad West*	Trinidad Lake
3710457/67	Walsenburg S/N	Lathrop
3710566	Medano North	San Luis Lakes
3810467	Cheyenne Mountain	Cheyenne Mountain
3810783	Paonia Reservoir	Paonia
3810436/37	NW Pueblo/Swallows*	Pueblo Lake
3810584/85	Elevenmile/Spinney	Eleven Mile/Spinney Mt.
3810726/27	Dallas/Ridgeway	Ridgeway
3810765	Crawford	Crawford
3810861	Delta	Sweitzer
3910252	Bonny Reservoir South	Bonny Reservoir
3910437	Castle Rock South	Castlewood Canyon
3910467/68	Fitzsimons/Englewood	Cherry Creek
3910487	Brighton	Barr Lake
3910541	Kassler	Roxborough
3910551	Littleton	Chatfield
3910574	Black Hawk	Golden Gate Canyon
3910583	Eldorado Springs	Eldorado Canyon
3910646	Crooked Creek Pass	Sylvan Lake
3910727	Vega Reservoir	Vega
3910756	Silt	Harvey Gap
3910766	Rifle Falls	Rifle Falls
3910767	Horse Mountain*	Rifle Gap
3910814/23	Clifton/Cameo	Colorado River
3910837	Highline Lake	Highline Lake
4010373	North Sterling Reservoir*	North Sterling Reservoir
4010441	Sunken Lake	Jackson Reservoir
4010521	Longmont*	St. Vrain State Park
4010541	Loveland*	Boyd Lake
4010552	Horsetooth Reservoir	Lory
4010568	Rawah Lakes	Colorado State Forest
4010661/71	Johnny Moore Mt/Shipman	Colorado State Forest
4010638	Oak Creek	Stagecoach
4010678	Hahn's Peak	Steamboat

E. Selected Species Descriptions

The reference list follows the species descriptions.

Eagles:

Bald Eagle
Golden Eagle

Hawks and Falcons:

Cooper's Hawk
Ferruginous Hawk
Osprey
Northern Goshawk
Northern Harrier
Peregrine Falcon
Prairie Falcon
Red-tailed Hawk
Sharp-shinned Hawk
Swainson's Hawk

Owls:

Barn Owl
Burrowing Owl
Great Horned Owl
Long-eared Owl
Short-eared Owl
Spotted Owl

Eagles:

Bald Eagle *Haliaeetus leucocephalus*

1. Identification

Perching: Adults always have white heads and white tails. Immatures (less than five years old) have dark heads with very long beaks and mottled white on breast or under wings.

Flying: Long straight wings with exceptionally long "fingers" (outer primaries). Slow, fluid wing beats. Uniformly dark or mottled dark-and-white underwings.

2. Nesting Habitat

Large, mature cottonwoods or pines, usually in riparian areas along rivers or around large lakes or reservoirs. Most nest sites are well removed from human activity areas. Large stick nest is placed near the top of the tree. Inexperienced breeding pairs often build "winter nests" (unused for breeding) on wintering grounds prior to heading north to summer breeding areas.

3. Nesting Dates

Courtship: January to March

Incubation: late February to late May

Dependent nestlings: late April to July

Incubation period is 34-38 days. Young fledge 70-84 days after hatching and remain dependent on adults for several months after fledging.

4. Statewide Distribution and Population

About 50 pairs currently nest in Colorado, up from fewer than 10 pairs in 1960. Highest nesting densities occur along the Yampa River, in the San Juan River basin, and in the South Platte River valley.

5. State and Federal Status

Federal threatened; state threatened.

6. Search and Nest Monitoring Protocol

Beginning in early March, check historic and potential nest sites for activity. Visit nest sites every two weeks for 2-3 hours, supplementing on weekends to monitor nests for disturbance. Observation points should be at least 800 m from active nests and perches/roosts.

7. Recommended Nest Buffer Area

CDOW recommends a year-round closure to surface occupancy (beyond that which historically occurred in the area) within 400 m radius of nest and no human encroachment from 15 November through 31 July within 800 m of the nest.

8. References Bald Eagle

Bent, A. C. 1937; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998; Snow, C. 1973. Bald eagle; Stalmaster, K. 1987

Golden Eagle *Aquila chrysaetos*

1. Identification

Perching: Large, dark raptor with large beak and golden neck feathers. Immatures (less than 5 years old) have a prominent white stripe at base of tail.

Flying: Dark brown underneath. Dark tail unbanded to faintly banded. Long straight wings with long "fingers" (primaries); "lazy" soaring flight. Immatures show white tail stripe and white underwing spots at the wrists.

2. Nesting Habitat

Cliffs or trees, generally in open country. Nesting cliffs are usually sheer and often several hundred feet high. Cliffs often contain several stick nests, 3-10' wide; a single pair will move from one nest to another on the same cliff face from year to year. One nest in a canyon west of Boulder is 10 feet across and 4 feet high, and has been used off and on since 1885. Active nests usually show some greenery (Douglas-fir or pine boughs). Pairs defend nesting territories of several square miles.

3. Nesting Dates

Courtship: January to May

Incubation: late February to June

Dependent nestlings: early April to mid-July

Incubation period is 41-45 days. Young fledge 72-84 days after hatching but remain dependent on parents for several months after fledging.

4. Statewide Distribution and Population

There are probably 200-500 breeding pairs in Colorado. The statewide population appears to have changed little during the past 100 years. For example, there are 8-12 active nesting territories in Boulder County, approximately the same number as in 1885. Golden eagles nest in virtually every part of the state, with highest densities in the northern Front Range foothills and western plateaus. Nesting pairs are widely scattered across the eastern plains.

5. State and Federal Status

Protected. Colorado Natural Heritage Program special concern.

6. Search and Nest Monitoring Protocol

Begin to search for active nests, looking for fresh greenery, in late February. Visit active nest sites for 2-3 hours every 2 weeks (supplementing on weekends to monitor nests for disturbance) until young have fledged. Observation points should be at least 800 m from nests.

7. Recommended Nest Buffer Area

CDOW recommends no surface occupancy (beyond that which historically occurred in the area) within a 400 m radius of the nest site and associated alternate nests, and no human encroachment within 800 m of the nest and any alternate nests from 1 February to 15 July.

8. References Golden Eagle

Bent, A. C. 1937; Craighead, J. J., and F. C. Craighead. 1956; Johnsgard, P. A. 1990; Jollie, M. T. 1945; Kingery, H. E., ed. 1998; Snow, C. 1973. Golden eagle; True, D. 1980

Hawks and Falcons:

Cooper's Hawk *Accipiter cooperii*

1. Identification

Perching: Medium-sized hawk with a small head, rufous- or brown-streaked/checkered breast, and long, banded tail.

Flying: Short, rounded wings and long, banded tail (compared to Buteos). Tail is rounded off at the end (compared to more square tail of sharp-shinned), and head projects far beyond wrists when gliding.

2. Nesting Habitat

Primarily coniferous forests in the mountains between 1500 and 3200 m. They typically nest in dense conifers such as Douglas fir, but they also nest in dense stands of juniper and scrub oak, and occasionally in aspen groves and riparian woodlands.

3. Nesting Dates

Courtship: March to May

Incubation: early May to early July

Dependent nestlings: late May to late July

Incubation period for 2-6 eggs is about 30 days. An average of 2-3 young fledge 27-30 days after hatching.

4. Statewide Distribution and Population

Scattered throughout the mountains and western plateaus, possibly also plains. Highest nesting densities may occur in western valleys and Front Range foothills. They are probably more common than some studies indicate, but they are secretive around the nest, which is often placed in dense foliage, where it is difficult to see.

5. Federal and State Status

Not listed.

6. Search and Nest Monitoring Protocol

Beginning in early May, search areas where individuals have been sighted. Look for butcher blocks (stumps where prey has been taken apart) and pellets in areas of dense conifer growth. Once a nest has been located, visit every 2-3 weeks for no more than 20 minutes per visit. Do not approach within 200 m of active nests.

7. Recommended Nest Buffer Area

No foot traffic or recreational activity within 400 m of active nests.

8. References Cooper's Hawk

Bent, A. C. 1937; Call, M. 1978; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998; Reynolds, R. T., and H. M. Wright. 1982

Ferruginous Hawk

Buteo regalis

1. Identification

Perching: Large hawk with white breast and white or dirty orange, unbanded tail. White feathers on chin and neck, long yellow beak extending back below eye, mottled rusty, white, and brown feathers on back.

Flying: White breast and white underwings in light morph bird. Almost all birds have white or dirty orange, unbanded tails. Upper wings show prominent white "windows" at base of primaries. Rusty leggings form a prominent "V" against whitish underparts of light morph adults. Tends to fly in a straight line from perch to perch. Wings are long, broad, and pointed.

2. Nesting Habitat

Prairies and shrublands, eastern plains and northwestern plateaus. They build a stick nest in a tree, on a cliff face, or on the ground. In the Pawnee National Grassland, one nest was placed in a 30-foot high cottonwood near a paved highway, while another was located 4 feet off the ground on a small chalk cliff. They prey on rabbits and large rodents, including prairie dogs and ground squirrels.

3. Nesting Dates

Courtship: April to June

Incubation: mid-April to mid-July

Dependent nestlings: mid-May to late July

Incubation period is 30-34 days. Usually 2-4 young fledge 38-50 days after hatching.

4. Statewide Distribution and Population

Highest nesting densities occur on the southeastern and northeastern plains, with small numbers nesting from the Grand Valley northward to Wyoming. Only a few thousand pairs nest in the world, primarily on the high plains and in the Great Basin. Urban development and conversion of grassland to farmland threaten populations in many areas.

5. Federal and State Status

State special concern.

6. Search and Nest Monitoring Protocol

Beginning in mid-April drive a set route, stopping every 500 m to scan all potential nest trees, cliffs, and ground sites (usually hilltops or rocky areas) with binoculars. Repeat every two weeks throughout the nesting season. Monitor active nests at two-week intervals from a fixed observation point located at least 400 m from the nest.

7. Recommended Nest Buffer Area

No foot traffic or recreational activity within 400 m of active nests or perches.

8. References Ferruginous Hawk

Bent, A. C. 1937; Houston, C. S., and M. J. Bechard. 1984; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998; Olendorff, R. R. 1972

Osprey *Pandion haliaetus*

1. Identification

Perching: Large raptor with dark brown back, white breast, white head with prominent dark eye stripe, long beak.

Flying: Mostly white underneath with dark wing tips and dark patches at the wrists. Narrow wings with distinctive crook at the wrists give this raptor a gull-like appearance in flight. Wings are slightly arched when soaring.

2. Nesting Habitat

Near lakes on the plains or beside rivers, lakes, or beaver ponds in the mountains. They build a large stick nest in a tall tree, in a broken-topped snag, on a power pole, or on an artificial nest platform. In the mountains they frequently nest in flooded groves of trees on islands. They take readily to artificial nest platforms. Young breeding pairs have a high rate of nest failure.

3. Nesting Dates

Courtship: March to May

Incubation: early May to mid-July

Dependent nestlings: early June to late July

Incubation period is 34-40 days. Young fledge 50-60 days after hatching. Fledged young remain dependent on parents for about three months.

4. Statewide Distribution and Population

Osprey nest primarily in mountain parks and western valleys, but recently a few pairs have begun to breed on artificial platforms around prairie reservoirs, especially in Boulder and Larimer counties. The statewide population has increased from about 10 pairs in 1965 to around 100 pairs in 2000. DDT and other pesticide use in Mexico continue to affect North American nesting osprey populations.

5. State and Federal Status

Not listed. Formerly federal sensitive.

6. Search and Nest Monitoring Protocol

Beginning in mid-April, visit potential nest sites (lakes, reservoirs, and mountain marshes) every two weeks for 1-2 hours. Continue monitoring until young have fledged. Observation points should be located at least 400 m from active nests and perches.

7. Recommended Nest Buffer Area

CDOW recommends no surface occupancy (beyond that which historically occurred in the area) within 400 m of the nest site and no human encroachment within 400 m of the nest site between 1 April and 31 August.

8. References Osprey

Bent, A. C. 1937; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998; Peck, G. K., and R.D. James. 1983; Swenson, J. E. 1981

Northern Goshawk *Accipiter gentilis*

1. Identification

Perching: Much larger than other accipiters. Adults have dark crowns, white "eyebrow" behind red eye, blue-gray backs, and white underparts with dense gray barring.

Flying: Wings are proportionately longer and tail proportionally shorter than Cooper's and sharp-shinned. But goshawks do show densely barred breast and long, banded tail typical of accipiters.

2. Nesting Habitat

Open conifer stands with large trees (often old-growth ponderosa pine), dense stands of spruce or fir, or mature aspen stands, usually between 2000 and 3200 m. No one is sure what constitutes optimal goshawk nesting habitat. In the Boulder Mountain Park they nest in 80-foot high ponderosa pines in remote north-facing canyons. In Rocky Mountain National Park pairs often nest in aspen groves near meadows. Adults are vocal and sometimes aggressive around the nest.

3. Nesting Dates

Courtship: April to May

Incubation: early May to mid-July

Dependent nestlings: early June to early August

Incubation of 2-5 eggs requires around 30-35 days, and young fledge 35-42 days after hatching.

4. Statewide Distribution and Population

They nest throughout the mountains and western plateaus, with highest nesting densities apparently occurring in the north-central mountains. They may be threatened in some areas by forest fragmentation, as they seem more sensitive than other accipiters to human disturbance.

5. Federal and State Status

Not listed. U.S. Forest Service and Colorado Natural Heritage Program species of concern.

6. Search and Nest Monitoring Protocol

Drive a set route beginning in mid-May, stopping every 500 m to look and listen for 10 minutes. After locating a territory, search suitable trees for nests. Visit nest sites every 2-3 weeks, observing for no more than 20 minutes at a time from a distance of at least 400 m.

7. Recommended Nest Buffer Area

No human encroachment within 400 m of active nests whenever possible.

8. References Northern Goshawk

Bent, A. C. 1937; Braun, C. E., J. H. Enderson, M. R. Fuller, Y. B. Linhart, and C. D. Marti. 1996; Call, M. 1978; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998; Reynolds, R. T., and H. M. Wright. 1982

Northern Harrier (Marsh Hawk)

Circus cyaneus

1. Identification

Perching: Slender silhouette, long, banded tail, small head with owl-like facial disk. Males gray above and white below; females brown above with heavy brown streaking on breast. Juveniles chocolate brown underneath. Perches on the ground or on low fence post in wetland or grassland.

Flying: Long slender wings held in slight dihedral; tilts from side to side while gliding low over the ground. Prominent white rump patch (when viewed from above) on both sexes.

2. Nesting Habitat

Wetlands, grasslands, and shrublands, usually below 3000 m. Nest is a platform of grass, reeds, and cattails placed on the ground and concealed by thick vegetation. One male may nest with two or more females. When not nesting, harriers roost communally on the ground. It's easy to stumble over one of these nests, so avoid walking through areas of dense grass or cattails.

3. Nesting Dates

Courtship: late April to late June

Incubation: early May to early July

Dependent nestlings: early June to mid-July

Clutch sizes range from 3-7 eggs. Incubation period is 29-31 days. Individual young hatch over a period of 1-10 days. Young fledge 30-40 days after hatching.

4. Statewide Distribution and Population

Nests throughout eastern plains, western valleys, and mountain parks. Populations are declining in areas where habitat has been fragmented by farming and urban expansion. Audubon Blue List; Boulder County "rare and declining."

5. State and Federal Status

Not listed.

6. Search and Nest Monitoring Protocol

Beginning mid-April, observe potential nesting habitat for 2-3 hours every two weeks (early morning or early evening optimal) from one or more fixed observation points. Note behavior of males and females. Both engage in prominent courtship flights, and males perform "food drops" over active nests. *Do not search for nests or approach within 400 m of suspected nest sites.* If nest site is active, continue observations until mid-August or until all young have fledged.

7. Recommended Nest Buffer Area

No surface occupancy, foot traffic, or recreational activity within 400 m of suspected nest sites. Permanent trails should be located at least 400 m from recent nest or roost sites.

8. References Northern Harrier

Bent, A. C. 1937; Craighead, J. J., and F. C. Craighead. 1956; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998; Rice, W. R. 1982

Peregrine Falcon

Falco peregrinus

1. Identification

Perching: Medium-sized raptor with short beak, cream to brown-colored breast and abdomen with light to heavy streaking, dark back. Head has distinctive black "helmet" and wide, dark mustache mark.

Flying: Narrow, pointed wings, rapid wing beats; no dark axillaries ("armpits") on underwings, which usually exhibit a checkered pattern of black on white.

2. Nesting Habitat

Ledges of high cliffs, usually remote areas in foothills and mountains, sometimes near wetlands. They advertise their nesting territory with a sky dance and high circling display. They vocalize frequently, making a loud screaming sound audible 1-2 km away. Nesting cliffs usually show extensive patches of whitewash. Their nest sites are not distinguishable from those of prairie falcons.

3. Nesting Dates

Courtship: late March to late May

Incubation: late April to late June

Dependent nestlings: early May to late July

Incubation of 3-4 eggs requires around 30 days. Young fledge 35-42 days after hatching.

4. Statewide Distribution and Population

Nests in western two-thirds of state, mostly in foothills and mountain valleys. Current state population is probably between 80 and 120 nesting pairs, up from a low of 4 nesting pairs in 1977. Highest concentrations nest in Western Slope river valleys and canyons.

5. State and Federal Status

State special concern.

6. Search and Nest Monitoring Protocol

Prior to searching, check with CDOW and Rocky Mountain Bird Observatory to ascertain whether there are any recent nesting reports from the target area. Beginning early April, search potential nesting habitat (cliffs) for whitewash, then observe potential nesting and perching sites for 2-3 hours every week from a fixed observation point *located at least 800 m away*. Once nesting is confirmed, monitor nests on weekends to enforce climbing and recreational closures. Continue monitoring until late July or until all young have fledged.

7. Recommended Nest Buffer Areas

CDOW recommends no surface occupancy (beyond that which historically occurred in the area) or other human activity or encroachment within 800 m of the nest cliffs from 15 March to 31 July.

8. References Peregrine Falcon

Bent, A. C. 1937; Craig, G. R. 1991-94; Glinski, R. L., and S. Ambrose. 1990; Houle, Marcy Cottrell. 1991; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998

Prairie Falcon *Falco mexicanus*

1. Identification

Perching: Medium-sized raptor with short beak, pale brown back, white breast streaked with brown, and prominent brown "teardrop" below eye. Sexes similar in plumage.

Flying: Pointed wings, rapid wing beats, long banded tail, distinctive dark axillaries ("armpits") and dark bar on wing lining (front part of underwing).

2. Nesting Habitat

Cliffs in open country such as grasslands, deserts, and shrublands, usually below 3000 m. They lay their eggs directly onto the rock of a ledge, pothole, or crevice, or occasionally in a used hawk or eagle nest. Nest sites are prominently marked by excrement ("whitewash"), and screaming of adults is audible from 1-2 km. In the Flatirons near Boulder they typically nest in south-facing potholes; in the Pawnee Buttes, they nest on cliff ledges. Adults compete with peregrine falcons for nest sites, although these two species can nest successfully in close proximity.

3. Nesting Dates

Courtship: mid-April to early June

Incubation: late April to mid-July

Dependent nestlings: late May to late July

Clutch sizes range from 2-6 eggs. Incubation period is about 30 days; young fledge about 40 days after hatching.

4. Statewide Distribution and Population

Only about 5000 pairs nest in all of North America. About 300-500 pairs probably nest throughout Colorado, with highest nesting densities in southeastern Colorado, Front Range foothills, Comanche National Grassland, and Pawnee National Grassland. Nesting populations have declined near urban areas. Nest depredations by falconers have also reduced populations in some areas.

5. State and Federal Status

Not listed. Colorado Natural Heritage Program watchlisted.

6. Search and Nest Monitoring Protocol

Beginning early April, search potential nesting habitat (cliffs) for whitewash, then observe potential nesting and perching sites for 2-3 hours every week from a fixed observation point *located at least 800 m away*. Once nesting is confirmed, monitor nests on weekends to enforce climbing and recreational closures. Continue monitoring until late July or until all young have fledged.

7. Recommended Nest Buffer Areas

CDOW recommends no surface occupancy (beyond that which historically occurred in the area) within 800 m of the nest site and no human encroachment or disturbance within 800 m of the nest site from 15 March through 15 July.

8. References

Prairie Falcon
Bent, A. C. 1937; Craighead, J. J., and F. C. Craighead. 1956; Enderson, J. H. 1964; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998

Red-tailed Hawk
Buteo jamaicensis

1. Identification

Perching: Extremely variable. Most light morph adult birds have red tails, white breasts with broken belly bands, and dark, square heads. Juveniles have gray, narrowly banded tails. In the adults and juveniles, folded wings usually make an indistinct "V" against brown or black back. Upright, "blocky" appearance when perched.

Flying: Dark patagial marks on the leading edge of wings, on either side of the head, are only certain identification mark (but some red-tails don't have them). Look also for red or narrowly banded tail and broken belly band. Some birds may be almost entirely white underneath, others almost entirely black.

2. Nesting Habitat

All Colorado ecosystems from the plains to the high mountains, including urban areas. They prefer open country and mosaics of wetlands, grasslands, and woods. They occasionally nest on cliffs but usually place a bulky stick nest in a tall tree or, occasionally, on a utility pole. They will use the same nest for several years in a row. Their nests are later used by great horned owls, which sometimes prey on red-tailed hawk young.

3. Nesting Dates

Courtship: March to May

Incubation: late March to late June

Dependent nestlings: late April to late July

Incubation period is 28-32 days, and the young fledge 44-46 days after hatching.

4. Statewide Distribution and Population

Common throughout Colorado. Populations are increasing near urban areas where this habitat generalist outcompetes other hawks. Highest nesting densities occur in western valleys and along Front Range urban corridor.

5. State and Federal Status

Not listed.

6. Search and Nest Monitoring Protocol

Beginning in mid-April drive a set route, stopping every 500 m to scan all potential nest trees with binoculars. Repeat every two weeks throughout the nesting season. Monitor active nests at two week intervals from a fixed observation point located at least 400 m from the nest.

7. Recommended Nest Buffer Area

No foot traffic or recreational activity within 200 m of active nests.

8. References Red-tailed Hawk

Bent, A. C. 1937; Houston, C. S., and M. J. Bechard. 1983; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998; Olendorff, R. R. 1972

Sharp-shinned Hawk

Accipiter striatus

1. Identification

Perching: Small hawk with a small head, streaked breast (brown or red-streaked), and long, banded tail.

Flying: Short, rounded wings and long, banded tail (compared to Buteos). Tail is squared off at the end (compared to more rounded tail of Cooper's).

2. Nesting Habitat

Primarily coniferous forests in the mountains between 1500 and 3200 m. They typically nest in dense conifers such as Douglas-fir, but they also nest in dense stands of juniper and scrub oak, and occasionally in aspen groves.

3. Nesting Dates

Courtship: March to May

Incubation: early May to early July

Dependent nestlings: early June to late July

Incubation period for 2-6 eggs is about 30 days. An average of 2-3 young fledge 21-27 days after hatching.

4. Statewide Distribution and Population

Scattered throughout the mountains and western plateaus. They are probably more common than sighting records indicate, but they are secretive around the nest, and nests are usually placed in dense foliage where they are difficult to see. Nesting populations are probably fairly stable. Howard Weinberg (unpublished study) found 8 nest sites within 6 km of Boulder, all in dense stands of Douglas-fir on north-facing slopes in the foothills.

5. Federal and State Status

Not listed.

6. Search and Nest Monitoring Protocol

Beginning in early May, search areas where individuals have been sighted. Look for butcher blocks (stumps where prey have been taken apart) and pellets in areas of dense conifer growth. Once a nest has been located, visit every 2-3 weeks for no more than 20 minutes per visit. Do not approach within 200 m of active nests.

7. Recommended Nest Buffer Area

No foot traffic or recreational activity within 400 m of active nests.

8. References Sharp-shinned Hawk

Bent, A. C. 1937; Call, M. 1978; Johnsgard, P. A. 1990; Joy, S. M., R. T. Reynolds, R. L. Knight, and R. W. Hofmann. 1989; Kingery, H. E., ed. 1998; Platt, J. 1973

Swainson's Hawk
Buteo swainsonii

1. Identification

Perching: White or mottled abdomen, chocolate-colored bib, white chin, narrowly banded tail, and white spot ("flashlight") above beak. Back is uniformly dark.

Flying: Our only hawk with dark flight feathers (trailing part of wings) and light wing linings (front part of wings). Wings are narrow and pointed, held in a slight dihedral when soaring. Tail has several dark, narrow bands.

2. Nesting Habitat

Open country, usually grassland, on plains and in mountain valleys and parks. Large stick nest is usually placed in an isolated tree or shrub. They nest in small trees in the medians of I-76 and I-70. One nest in the Pawnee National Grassland was only seven feet off the ground in a small cottonwood. These hawks are often seen circling behind farm machinery as they search for grasshoppers and other insects. They form kettles of several hundred birds in the fall, when they migrate to Argentina.

3. Nesting Dates

Courtship: early April to late June

Incubation: early April to late July

Dependent nestlings: early May to early August

Incubation period is 33-36 days. The young fledge 38-46 days after hatching. Young remain with the adults until the whole family migrates south in September.

4. Statewide Distribution and Population

Nests virtually statewide below approximately 3000 m. Highest densities are on the northeastern plains, where these grassland specialists outnumber red-tailed hawks. Numbers appear to be declining in many areas, and insecticides have poisoned many thousands of birds on wintering grounds in Argentina.

5. State and Federal Status

Not listed.

6. Search and Nest Monitoring Protocol

Beginning in mid-April drive a set route, stopping every 500 m to scan all potential nest trees with binoculars. Repeat every two weeks throughout the nesting season. Monitor active nests at two-week intervals from a fixed observation point located at least 400 m from the nest.

7. Recommended Buffer Area

No foot traffic or recreational activity within 400 m of active nests or perches. These hawks will abandon nests if they are disturbed.

8. References Swainson's Hawk

Bent, A. C. 1937; Fitzner, R. E. 1978; Johnsgard, P. A. 1990; Kingery, H. E., ed. 1998; Olendorff, R. R. 1972

Owls:

Barn Owl

Tyto alba

1. Identification

Visual: Medium-sized owl with a white or cinnamon breast, pale golden wings and back, heart-shaped face, and dark eyes. The heart-shaped face and long, spindly legs separate this owl from all other North American owls.

Vocal: Territorial calls include a hiss-scream (like a steam locomotive venting steam) and a ghostly rattle.

2. Nesting Habitat

Cliffs, ravines, unoccupied human structures--plains and western valleys, mostly below 2000 m. They typically lay their eggs on an internal building ledge, in a cave or pothole, or in a rodent or mammal burrow in a ravine.

3. Nesting Dates

Courtship: March to July

Incubation: late March to early August

Dependent nestlings: April to October

They may raise two clutches or re-nest if the first clutch fails. Incubation of 2-11 eggs requires a variable amount of time, since the eggs are laid at 2-3 day intervals. The young fledge 56-62 days after hatching.

4. Statewide Distribution and Population

This cosmopolitan owl nests at low elevations throughout the state. Little is known about population trends in Colorado.

5. Federal and State Status

Not listed.

6. Search and Nest Monitoring Protocol

Beginning in April, search cliffs and abandoned buildings for nests; or drive a set route after sundown, stopping every 400 m to listen for calls. Do not approach within 200 m of active nests.

7. Recommended Nest Buffer Areas

Avoid human encroachment within 200 m of active nests.

8. References Common Barn-Owl

Craighead, J. J., and F. C. Craighead, Jr. 1956; Johnsgard, P. A. 1988; Kingery, H. E. 1998
Marti, C. D. 1992; Vroos, K. 1988

Burrowing Owl

Athene cunicularia

1. Identification

Perching: About 10" tall with long spindly legs. Perches on prairie dog mounds, fence posts, and on the ground. Brown to buff colored.

Flying: Flies low to the ground, usually in a straight line. Sometimes hovers into the wind. Wide, rounded wings distinguish it from meadowlarks and other songbirds.

2. Nesting Habitat

Rodent colonies in grasslands, shrublands, and deserts, mostly below 2000 m. Highest nesting densities occur in prairie dog colonies on the eastern plains. Burrowing owls avoid areas where mid- to tall grass obscures their view of terrestrial predators. Occupied nest burrows usually have whitewash on the burrow mound, and bits of bone and fir of prey items are often scattered around the burrow entrance.

3. Nesting Dates

Courtship: mid-April to mid-May

Incubation: early May to mid-July

Dependent nestlings: mid-May to early August

Incubation of 6-11 eggs requires 27-30 days. Young appear above ground after about two weeks and fledge (moving to separate burrows) about 40-45 days after hatching. Number of young appearing above ground averages 3-5.

4. Statewide Distribution and Population

Nests throughout eastern plains, in some western valleys (primarily the Grand Valley area), and in scattered mountain parks. Declining in many areas, including eastern plains, Front Range urban corridor, and some western valleys. This decline has been attributed to loss of nesting habitat (primarily prairie dog colonies on the high plains), fragmentation of nesting habitat leading to increased predation by urban-edge predators, automobile collisions, and poisoning of insect prey in Mexico.

5. State and Federal Status

State threatened.

6. Search and Nest Monitoring Protocol

For rodent colonies of 50 acres or less: Beginning in mid-May, observe each colony for a minimum of 30 minutes from a stationary observation point, scanning the colony every 5 minutes with binoculars or a spotting scope. Repeat at two-week intervals until 1 August or until all young have dispersed from the nest burrow.

For rodent colonies larger than 50 acres: Same as above, but locate multiple observation points as necessary to provide a clear view of all areas of the colony.

7. Recommended Nest Buffer Areas

No foot traffic or recreational activity within 200 m of active nest burrows, 1 April-15 August.

8. References Burrowing Owl

Johnsgard, P. A. 1988; Kingery, H. E. 1998; Pezsolesi, L. S. 1994; Plumpton, D. L., and R. S. Lutz. 1993; Vroos, K. 1988; Walker, L. W. 1974

Great Horned Owl

Bubo virginianus

1. Identification

Visual: Very large owl with prominent "ear tufts" and oblong facial disk. Coloring varies from almost white to dark brown. Bulky shape, white throat, and wide spacing between ear tufts separate this species from smaller long-eared owl.

Vocal: Territorial call is a series of 4-8 deep, resonant hoots: *who-who*; *who-who-who*. They also give single hoots, along with squawks and squeals around the nest. Young hiss when begging for food and also give a kazoo-like contact call in early summer.

2. Nesting Habitat

All Colorado ecosystems from the plains and western valleys to treeline. They usually lay their eggs in a hawk, crow, or magpie nest; but they also use stumps, large tree cavities, cliff ledges, and building ledges. Extremely adaptable, they thrive in human-disturbed habitats, driving away or preying upon other owls, including barn owls, long-eared owls, and burrowing owls.

3. Nesting Dates

Courtship: December through March

Incubation: late January through May

Dependent nestlings: March through July

Incubation of 2-4 eggs requires about 32-35 days. The young fledge about 45 days after hatching but remain dependent on their parents for several months. Parents chase young away when adults begin courtship again in late fall.

4. Statewide Distribution and Population

Nests statewide. Populations are increasing in urban and suburban areas. Highest nesting densities occur on the eastern plains, particularly along the Front Range urban corridor, where they have displaced the formerly common and now rare long-eared owl.

5. Federal and State Status

Not listed.

6. Search and Nest Monitoring Protocol

Beginning in February on the plains, March in the mountains, drive a set route, stopping every 500 m to scan all visible trees for nests. Nests are usually fairly large and flat-topped. Incubating adults are visible from several hundred meters away. Average population density is one nesting pair for every 3-5 square km (1-2 square miles). Visit nest sites briefly every 2-3 weeks. Do not approach within 100 m of active nests.

7. Recommended Nest Buffer Area

None required, but nest observers should stay at least 100 m from active nests.

8. References Great Horned Owl

Craighead, J. J., and F. C. Craighead, Jr. 1956; Johnsgard, P. A. 1988; Kingery, H. E. 1998; Vroos, K. 1988

Long-eared Owl

Asio otus

1. Identification

Visual: Slender owl with long, close-set "ear tufts." Their wings are more than two and a half times longer than their bodies. Squarish, rusty facial disk, streaked breast and abdomen.

Vocal: Extremely difficult, since almost all of their calls overlap with those of the more common great horned owl. Territorial call is a single hoot, given at 2-5 second intervals. They also give a variety of barks, wails, screams, and kazoo-like squeals around the nest. Courting pairs sing a captivating duet, with the male's deep *hoos* accompanied by the female's higher-pitched, descending *whoow*.

2. Nesting Habitat

Variable, but often in dense thickets of coniferous or deciduous growth with nearby open areas for hunting small rodents. A nest in the Boulder Mountain Park was located in a crow's nest in a dense stand of ponderosa pine and Douglas-fir adjacent to a mountain meadow. A nest in Rocky Mountain National Park was located in spruce-fir forest at nearly 11,000 feet. These medium-sized owls breed from the plains to the subalpine forest. Once common along foothills streams of northeastern Colorado, they have been displaced by more cosmopolitan (adaptive to human disturbance) great horned owls.

3. Nesting Dates

Courtship: February to April

Incubation: late March to early June

Dependent nestlings: early April to early July

Incubation of 3-7 eggs requires 25-35 days, with the eggs hatching over a period of a week or more. The young fledge 30-40 days after hatching.

4. Statewide Distribution and Population

They nest statewide from the eastern plains and western valleys to near treeline. Populations have declined near urban areas.

5. Federal and State Status

Not listed. Colorado Natural Heritage Program special concern.

6. Search and Nest Monitoring Protocol

Beginning in March, drive or walk a set route at 1-2 week intervals, stopping every 400-800 m to listen for territorial calls. Once a territory has been located, search the ground for pellets, and search the trees for stick nests. Avoid approaching within 200 m of active nests.

7. Recommended Nest Buffer Area

Avoid human encroachment within 200 m of active nests.

8. References Long-eared Owl

Johnsgard, P. A. 1988; Kingery, H. E. 1998; Marks, J. S., D. L. Evans, and D.W. Holt. 1994; Vroos, K. 1988; Walker, L. W. 1974

Short-eared Owl

Asio flammeus

1. Identification

Visual: Medium-sized, tawny colored owl with bold black streaks on breast, round facial disk, and tiny, barely visible "ear tufts." Courses low over the ground, like a northern harrier, skimming over wetlands and grasslands, often during the day. Long, tapered wings have a distinctive black comma underneath at the wrists.

Vocal: Territorial calls include a raspy, high bark and a series of low-pitched *boo* notes reminiscent of a distant steam engine.

2. Nesting habitat

Open country, particularly wetlands and grasslands. They nest on the ground amid concealing vegetation. They roost communally on the ground in similar habitat. However, in winter they occasionally flock to tree roosts.

3. Nesting Dates

Courtship: probably February to April

Incubation: probably April to June

Dependent nestlings: probably May to July

Incubation of as many as 13 eggs (5-7 average) requires about 24-29 days. The young walk away from the nest 14-18 days after hatching, but they require a week or two more to achieve stable flight.

4. Colorado Distribution and Population

Known to nest only in a dozen or so scattered locations on the eastern plains and in mountain parks and valleys, including the South Platte River basin, Alamosa and Monte Vista National Wildlife Refuges in the San Luis Valley, and Arapahoe National Wildlife Refuge in North Park. They occasionally winter in wetlands in the Front Range urban corridor, but nesting has not been confirmed in these areas. Loss of habitat due to agriculture and urbanization may have caused a decline in statewide nesting populations.

5. Federal and State Status

Not listed. Colorado Natural Heritage Program imperiled.

6. Nest Search and Monitoring Protocol

Beginning in April, observe potential nesting habitat for 1-2 hours from a fixed observation point around dawn or dusk. Repeat observations every 1-2 weeks. *Do not search for nests.* If you keep a low profile and stay at least 500 m away from nest sites, males will eventually bring prey to incubating females. Male performs hovering courtship flight, sometimes clapping his wings or vocalizing while hanging in the wind.

7. Recommended Nest Buffer Area

No foot traffic or recreational activity within 400 m of suspected nest sites. Permanent trails should be located at least 400 m from recent nest or roost sites.

8. References Short-eared Owl

Johnsgard, P. A. 1988; Kingery, H. E. 1998; Holt, D.W., and S. M. Leasure. 1993; Vroos, K. 1988; Walker, L. W. 1974

Spotted Owl
Strix occidentalis

1. Identification

Visual: Large owl with rounded head, dark eyes, and white spotting on head, back, and underparts. Strictly nocturnal.

Vocal: Territorial call is three or four low-pitched, cadenced hoots, lasting nearly 2 seconds: *who*; *who-who*; *who*. This call sounds a little like the *who-cooks-for-you* of barred owls. Contact call is a hollow, upslurred whistle.

2. Nesting Habitat

Deep, rocky canyons containing old-growth coniferous forest or scattered conifers. These reclusive owls may require the shade of these canyons to help them regulate body heat. They lay their eggs in crevices of cliffs and in stumps or on limbs of tall conifers. They may use nests of other raptors, clumps of mistletoe or debris, or lay their eggs directly onto a stump or rock ledge.

3. Nesting Dates

Courtship: probably February through April

Incubation: probably March through June

Dependent nestlings: probably June through August

Incubation of 2-4 eggs requires 28-32 days. The young fledge about 32-36 days after hatching.

4. Statewide Distribution and Population

Charles Johnson (1997) found 12 occupied territories in deep canyons south and west of Colorado Springs. Smaller populations inhabit slickrock canyons of Mesa Verde National Park in southwestern Colorado and remote river canyons in Dinosaur National Monument.

5. Federal and State Status

Federal threatened and state threatened (Mexican spotted owl--our subspecies).

6. Search and Nest Monitoring Protocol

Walk through appropriate habitat shortly after sunset or before sunrise, February-June. Listen for territorial calls. If you find an active territory, immediately notify State Parks or Colorado Division of Wildlife personnel.

7. Recommended Nest Buffer Area

To be determined on a case-by-case basis by Colorado Division of Wildlife personnel.

8. References Spotted Owl

Ganey, J. L., and R. P. Balda. 1994; Johnsgard, P. A. 1988; Johnson, C. L. 1997; Kingery, H. E. 1998; Vroos, K. 1988; Walker, L. W. 1974

Additional Species

Turkey Vulture: Statewide in caves of remote cliffs, May-August. They will not enter their nesting cave if humans are nearby. Most nests have been discovered by accident by rock climbers.

Mississippi Kite: Southeastern Colorado only, nesting colonially in cottonwood groves and urban parks, May-August. Largest colonies are in Pueblo and Lamar, but these acrobatic kites also nest in several canyons in Comanche National Grassland. They are conspicuous as they soar and dive over nesting areas.

American Kestrel: Statewide in tree cavities or on cliffs, April-July. Highest nesting densities probably occur in and around urban areas, where these small falcons hunt insects and small rodents. They are very vocal (high screams) around the nest.

Eastern Screech-Owl: Tree cavities, cottonwood-willow creekbottoms, and urban parks north of Palmer Divide and east of Continental Divide, March-June. Fairly common along South Platte River and tributaries. Listen for two territorial calls (a soft, horse-like whinny; and a rapid series of "hoo" notes, like a bouncing ping-pong ball), December-March, and again June-July. They respond to tape playbacks of their territorial calls.

Western Screech-Owl: Tree cavities and sometimes cliff cavities, cottonwood-willow creekbottoms and pinon-juniper woodlands, west of Continental Divide and south of Palmer Divide, March-June. Listen for their territorial call (a rapid series of soft hoots), January-June. Call is distinct from those of eastern screech-owl, but these two species are difficult to distinguish visually.

Northern Pygmy-Owl: Tree cavity (ponderosa pine, pinon pine, lodgepole pine, or aspen), foothills, western plateaus, and mountains, March-July. They vocalize (a series of high, hollow, breathy whistles--1-2 per second) from early March to late April. They make a creeper-like twitter around the nest. They are active in the daytime, when they perch on dead branches and are sometimes mobbed by flocks of songbirds.

Flammulated Owl: Tree cavity, usually in ponderosa pine, pinon pine, or aspen, 2000-2800 m, May-July. They begin vocalizing (short, resonant hoots) shortly after arriving from the south in early May. These fist-sized owls hunt moths and other insects in remote foothills canyons. Once you have located a territory by listening for the hooting males, search tree cavities at dusk or listen for the loud hissing sound that fledglings make when begging for food.

Northern Saw-Whet Owl: Tree cavity (often ponderosa pine, lodgepole pine, or aspen), foothills, plateaus, and mountains, April-July. They vocalize (a series of high, hollow, persistent whistles) March-May and respond readily to take playbacks. Since they are entirely nocturnal and cryptically colored, most nests are discovered by accident.

Boreal Owl: Tree cavity (spruce or fir), subalpine life zone (usually above 3000 m), May-August. Their eerie territorial call (a rapid series of "hoo" notes very similar to the sound made by a winnowing snipe) are heard in the high country February-April. Ski or snowshoe into potential habitat before dawn or after sunrise. Sometimes they respond to tape playbacks. Adults

make a variety of high-pitched wails and laser-like screams around the nest. They hunt voles and other small rodents in meadows and open forests.

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F. Non-raptor 4-letter codes

See the The Institute for Bird Populations website for 4-letter codes to use in the field data sheets and spreadsheets.

<http://www.birdpop.org/AlphaCodes.htm>

