

APPENDIX H: COLORADO DIVISION OF WILDLIFE'S 2002 RECOMMENDED BUFFER ZONES AND SEASONAL RESTRICTIONS FOR COLORADO RAPTORS

RECOMMENDED* BUFFER ZONES AND SEASONAL RESTRICTIONS FOR COLORADO RAPTORS

*These zones and seasonal restrictions are recommended as guidance only and may be subject to change. They do not represent official Division policy.

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Tolerance limits to disturbance vary among as well as within raptor species. As a rule, ferruginous hawks and golden eagles respond to human activities at greater distances than do ospreys and kestrels. Some individuals within a species also habituate and tolerate human activity at a proximity that would cause the majority of the group to abandon their nests. Other individuals become sensitized to repeated encroachment and react at greater distances. The tolerance of a particular pair may change when a mate is replaced with a less tolerant individual and this may cause the pair to react to activities that were previously ignored. Responses will also vary depending upon the reproductive stage. Although the level of stress is the same, the pair may be more secretive during egg laying and incubation and more demonstrative when the chicks hatch.

The term "disturbance" is ambiguous and experts disagree on what actually constitutes a disturbance. Reactions may be as subtle as elevated pulse rate or as obvious as vigorous defense or abandonment. Impacts of disturbance may not be immediately evident. A pair of raptors may respond to human intrusion by defending the nest, but well after the disturbance has passed, the male may remain in the vicinity for protection rather than forage to feed the nestlings. Golden eagles rarely defend their nests, but merely fly a half mile or more away and perch and watch. Chilling and over heating of eggs or chicks and starvation of nestlings can result from human activities that appeared not to have caused an immediate response.

A 'holistic' approach is recommended when protecting raptor habitats. While it is important for land managers to focus on protecting nest sites, equal attention should focus on defining important foraging areas that support the pair's nesting effort. Hunting habitats of many raptor species are extensive and may necessitate interagency cooperation to assure the continued nest occupancy. Unfortunately, basic knowledge of habitat use is lacking and may require documentation through telemetry investigations or intensive observation. Telemetry is expensive and may be disruptive so a more practical approach is to assume that current open space is important and should be protected.

Although there are exceptions, the buffer areas and seasonal restrictions suggested here reflect an informed opinion that if implemented, should assure that the majority of individuals within a species will continue to occupy the area. Measurements are somewhat imprecise (fractions of a mile) and reflect the need to maintain some flexibility to adjust buffer zones depending upon intervening terrain and vegetation screens that obscure the activity. This document is intended to be modified and refined as additional information becomes available, hence the provision of a revision date.

BALD EAGLE

Nest Site:

Year around closure to surface occupancy* (beyond that which historically occurred in the area) within ¼ mile radius of nest. No human encroachment from November 15 through July 31 within ½ mile radius of the nest. This closure is more extensive than the Northern States Bald Eagle Recovery Plan due to the generally open habitat used by Colorado's nesting bald eagles. Aside from four Colorado sites in coniferous forests, all others are in cottonwood riparian zones that don't have the vegetational density, and therefore obscurity offered by the habitats in the lake states. Recent evidence suggests that pairs nesting at lower elevations frequent and maintain their nests throughout the year. If it is necessary to work within the ½ mile buffer, the intrusion should be restricted to August 15 through October 15.

Winter Night Roost:

Activity should be eliminated within 1/4 mile radius of winter roosts between November 15 and March 15. If periodic visits (such as oil well maintenance work) are required within the buffer zone after development, activity should be restricted to the period between 1000 and 1400 hours from November 15 to March 15. Limited restrictions may be necessary out to ½ mile if there is a direct line of sight from the roost to the activities.

Hunting Perch:

Diurnal perches associated with important foraging areas should also be protected from human encroachment. Preferred perches may be at varying distances from human encroachment and buffer areas will vary. However, at least 2 management plans recommend zones that range from 1/8 mile (200 meters) to 1/4 mile (400 meters) depending upon topographic or vegetational screening.

GOLDEN EAGLE

Nest Site:

No surface occupancy* (beyond that which historically occurred in the area) within 1/4 mile radius of the nest site and associated alternate nests. Seasonal restriction to human encroachment within ¼ mile of the nest and any alternate nests from December 15 to July 15.

OSPREY

Nest Site:

No surface occupancy* (beyond that which historically occurred in the area) within 1/4 mile of the nest site. Seasonal restriction to human encroachment within ¼ mile of the nest from April 1 to August 31. Some osprey populations have habituated and are tolerant to human activity in the immediate vicinity of their nests.

FERRUGINOUS HAWK

Nest Site:

No surface occupancy* (beyond that which historically occurred in the area) within ½ mile radius of the nest site, and associated alternate nests. Seasonal restriction to human encroachment within ¼ mile of the nest and any alternate nests from February 1 to July 15. This species is especially prone to nest abandonment during incubation if disturbed.

* Surface occupancy includes human habitation as well as non-human habitation, examples of which would be oil and gas wells, tanks, roads, tracks, trails, etc.

RED-TAILED HAWK

Nest Site:

No surface occupancy* (beyond that which historically occurred in the area) within 1/3 mile radius of the nest site, and associated alternate nests. Some members of this species have adapted to urbanization and may tolerate human habitation to within 200 yards of their nest. Development that encroaches on rural sites is likely to cause abandonment. Seasonal restriction to human encroachment should be in effect from February 15 to July 15.

SWAINSON'S HAWK

Nest Site:

No surface occupancy* (beyond that which historically occurred in the area) within 1/4 mile radius of the nest site, and associated alternate nests. Some members of this species have adapted to urbanization and may tolerate human habitation to within 100 yards of their nest. Seasonal restriction to human encroachment within 1/4 mile of the nest from April 1 to July 15.

PEREGRINE FALCON

Nest Site:

No surface occupancy* (beyond that which historically occurred in the area) within 1/2 mile of the nest site. Seasonal restriction to human encroachment within 1/2 mile of the nest cliff(s) from March 15 to July 31. A 1 mile buffer with a closure from February 1 to August 31 was originally stipulated in the approved Recovery Plan, but recent field evidence suggests that the zone can be reduced to 1/2 mile. Due to propensity to relocate nest sites, sometimes up to 1/2 mile along cliff faces, it is more appropriate to designate 'Nesting Areas' that encompass the cliff system and a 1/2 mile buffer around the cliff complex.

PRAIRIE FALCON

Nest Site:

No surface occupancy* (beyond that which historically occurred in the area) within 1/2 mile radius of the nest site.

GOSHAWK

Reynolds et al. (1993) proposed 30 acres for the nest, a post fledge family area of 420 acres, and a foraging area of 5400 acres in size that encompasses habitat for squirrels, rabbits, jays, woodpeckers and grouse. For purposes here, it seems that a buffer of 1/2 mile around the nest should protect the integrity of the nesting and post fledging effort. Occupancy of the nesting and brood rearing area takes place from early March through late September.

BURROWING OWL

Nest Site:

No human encroachment or disturbance within 75 yards of the nest site from April 1 through August 15. This period is necessary to avoid disturbing nesting owls. However, owls may be present at burrows up to a month before egg laying and several months after young have fledged. Therefore it is recommended that efforts to eradicate prairie dogs or destroy abandoned towns not occur between March 1 and October 31 when owls may be present. Although owls may

* Surface occupancy includes human habitation as well as non-human habitation, examples of which would be oil and gas wells, tanks, roads, tracks, trails, etc.

occur throughout a prairie dog colony, they have a propensity to frequent the colony margins and buffer zones should be applied to the colony perimeter. Measures that protect and enhance prairie dog colonies will benefit this species.

Buffers Documented in the Literature

Species	Period		Optimal Distance	Authority
	Incubation	Brood		
Ferruginous Hawk	380-488yd. 200-500m 0.5mi	619-781yd 200-500m 0.5mi	781yd. (.45mi)	Holmes Woffinden in Suter & Jones Howard in Suter and Jones
Red-tailed Hawk	448-553yd	428-604yd	604yd (.34mi)	Holmes
Swainson's Hawk	171-203yd	309-382yd	382yd. (.22mi)	Holmes
Prairie Falcon	500-1000m 546-1093yd 0.5mi 0.6mi		1000m 1093yd (.62mi.)	Holthuijzen et al. Howard in Suter and Jones ERDA
Bald Eagle	1.0mi			Olendorff and Zeedyk
Golden Eagle	1.0mi 0.25-0.5mi 0.6mi 1.0mi			Howard in Suter and Jones Fuller in Suter and Jones ERDA

Perch Buffers

The following buffers for perches were recommended by T. Holmes (1994) to prevent flushing of 90% of raptors wintering in rangeland and agricultural habitats.

SPECIES	BUFFER AREA (Radius)
American Kestrel	75m
Merlin	125m
Prairie Falcon	160m
Rough-legged Hawk	210m
Ferruginous Hawk	140m
Golden Eagle	300m

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Recommended Seasonal (Disturbance) Restrictions around Raptor Nest Sites

Species	Buffer	January	February	March	April	May	June	July	August	September	October	November	December
Bald Eagle	Nest	_____										_____	
	Winter Roost ¹	_____										_____	
Golden Eagle	¼ mile	_____										_____	
Osprey	¼ mile	_____										_____	
Ferruginous Hawk	¼ mile	_____										_____	
Red-tailed Hawk	½ mile	_____										_____	
Swainson's Hawk	¼ mile	_____										_____	
Peregrine Falcon	½ mile	_____										_____	
Burrowing Owl	Nest	_____										_____	
	Colony Eradication	_____										_____	

¹ If activity is necessary in buffer, it should occur between 1000-1600 hours; if direct line of site to roost occurs, a buffer zone of ½ mile should be considered.

Recommended Surface Occupancy Buffers around Raptor Nests

Species	Buffer Distance
Bald Eagle	¼ mile
Golden Eagle	¼ mile
Osprey	¼ mile
Ferruginous Hawk	½ mile
Red-tailed Hawk	½ mile
Swainson's Hawk	¼ mile
Peregrine Falcon	½ mile
Prairie Falcon	½ mile
Northern Goshawk	½ mile

Based on: Craig, Gerald R. 2002 (19 December). Recommended buffer zones and seasonal restrictions for Colorado raptors. Colorado Division of Wildlife, Fort Collins.