

Managing for raptors in arboriculture

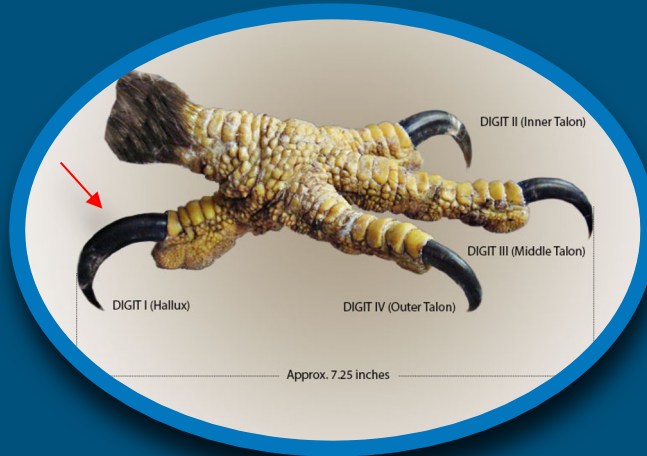


Kristine Kirkby (R.P.Bio.)
Ryan Murphy, RBTech, ISA.

Introduction: What are raptors?

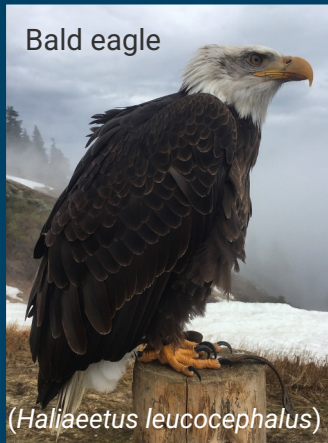
Red-tailed hawk (*Buteo jamaicensis*)

Image by Daniel Brown



Peregrine falcon (*Falco peregrinus*)

Bald eagle



(*Haliaeetus leucocephalus*)



Barn owl (*Tyto alba*)

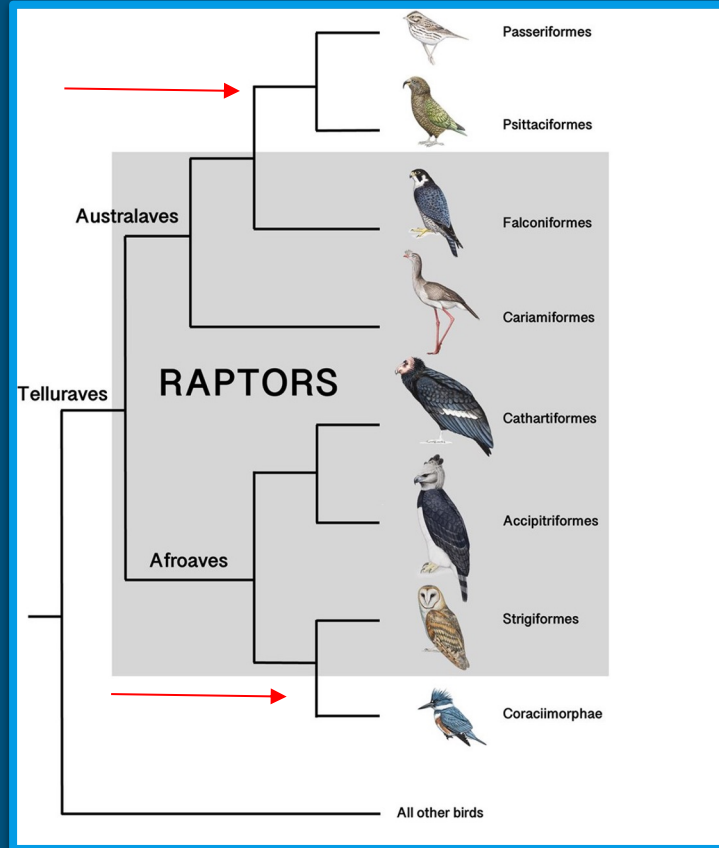
Image: Steven Ward



Osprey (*Pandion haliaetus*)
Image by David Brown

What are raptors?

Commentary: Defining Raptors and Birds of Prey. (2019). McClure et al. *Journal of Raptor Research* 53 (4), 419-430.



Turkey vulture (*Cathartes aura*)



Image: hubert999/ Shutterstock.com

Graphic by Bryce Robinson of Ornithologi.

Why the special considerations?

There are no special legal regulations for raptors as a group; they are protected provincially (*Wildlife Act*), alongside other species not protected by the Migratory Convention Act.

- Apex predator; can be indicator species of ecosystem health
- Sensitive to changes in habitat availability, prey abundance; experience bioaccumulation of pollutants
- Relatively low recruitment in general (not all)
- Less likely to go unnoticed in the workplace; due diligence
- Charismatic species, human connection with natural world
- HPAI and raptors, a developing challenge



Migratory Bird Convention Act (federal)



- Established in 1916, and updated in 1994, to protect migratory birds considered to either be useful or non-harmful to human agenda
- Many groups of birds are excluded from this act, including Corvidae (jays, crows, ravens), Falconidae (falcons, caracaras), Accipitidae (osprey, kites, eagles, harriers, hawks), Cathartidae (vultures), Strigidae & Tytonidae (owls), among others.
- Those not protected are protected under provincial or territorial law, as well as Species at Risk Act, when applicable

Schedule 1 species of Migratory Bird Regulations

Updated in 2022, Schedule 1 species have further protection under the Migratory Bird Regulations, where their nests must not be disturbed or removed for the following waiting periods:

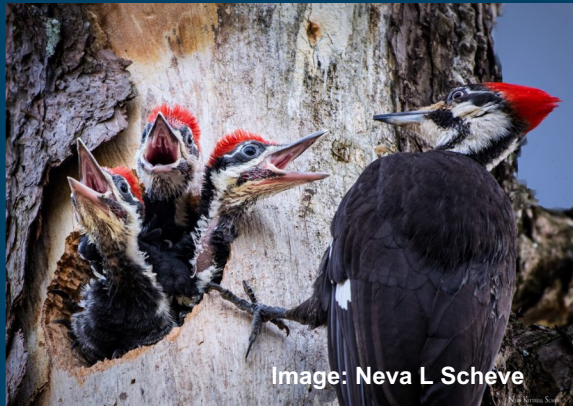


Image: Neva L Scheve

Waiting period (months)		
12	24	36
Pigeon Guillemot	Great Egret	Pileated Woodpecker
Rhinoceros Auklet	Great Blue Heron	
Atlantic Puffin	Cattle Egret	
Tufted Puffin	Green Heron	
Horned Puffin	Snowy Egret	
Manx Shearwater	Black-crowned Night Heron	
Northern Gannet		
Fork-tailed Storm Petrel		
Leach's Storm Petrel		
Cassin's Auklet		
Ancient Murrelet		

BC Wildlife Act (provincial)

Wildlife Act:

Birds, nests and eggs

34. *A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys*

- (a) a bird or its egg,*
- (b) the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl, or*
- (c) the nest of a bird not referred to in paragraph (b) when the nest is occupied by a bird or its egg.*



SARA (federal)

Subsection 61(1) of SARA: *No person shall destroy any part of the critical habitat of a listed endangered or threatened terrestrial species at risk that is on non- federal lands.*

For many SARA listed species, there are species-specific regulations and recovery plans. (E.g. Prothonotary warbler).

<u>Endangered</u>	<u>Threatened</u>	<u>Special concern</u>
Barn owl (Eastern)	Ferruginous hawk	Peregrine Falcon
Burrowing owl	Barn owl (west)	Flammulated owl
	Western Screech owl	Short-eared owl
	Northern goshawk	



Image: Ryan Sanderson,
Macaulay Library

Permits for removal

- Ministry of Forest, Lands, & Natural Resource Operations (FLNRO) issue permits
- Usually mitigation/compensation strategy is required



Recognizing nests/signs of raptor activity

Pellets & prey
remains



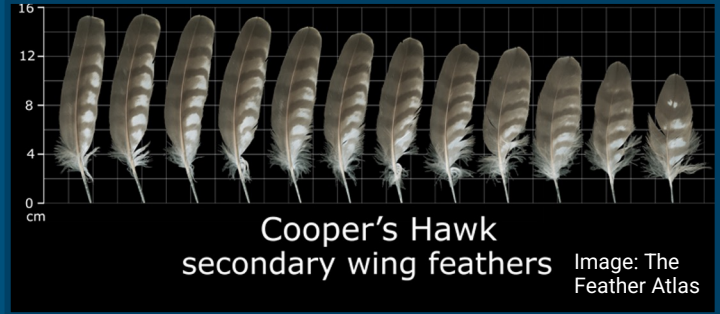
Recognizing nests/signs of raptor activity



Mutes



Feathers



Moulted



Plucked prey

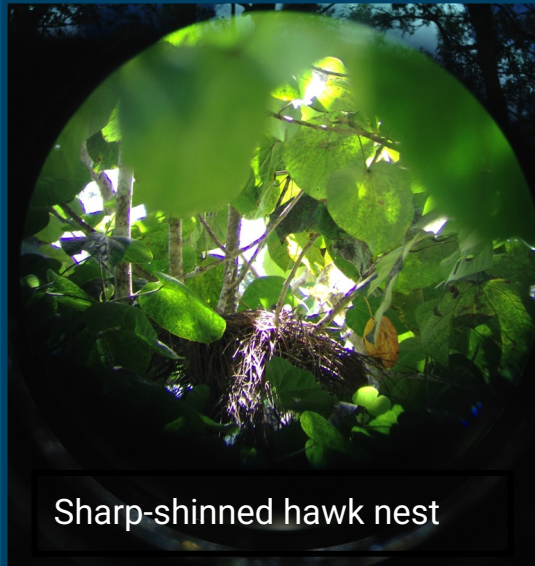
Recognizing nests/signs of raptor activity

Shells



Recognizing nests/signs of raptor activity

Nest structure



Saw-whet owl in cavity nest



Cavity with down on entrance

Behaviour

Vocalizations



Soaring, diving/mobbing



Breeding cycle phases

Courtship,
nest building,
copulation



Egg laying,
incubation

Nestling



Fledgling



Spatial organization

Disturbance at different levels of organization within the territories cause stress, and can vary in impact across phases of breeding cycle



Image: Murielle Bennett

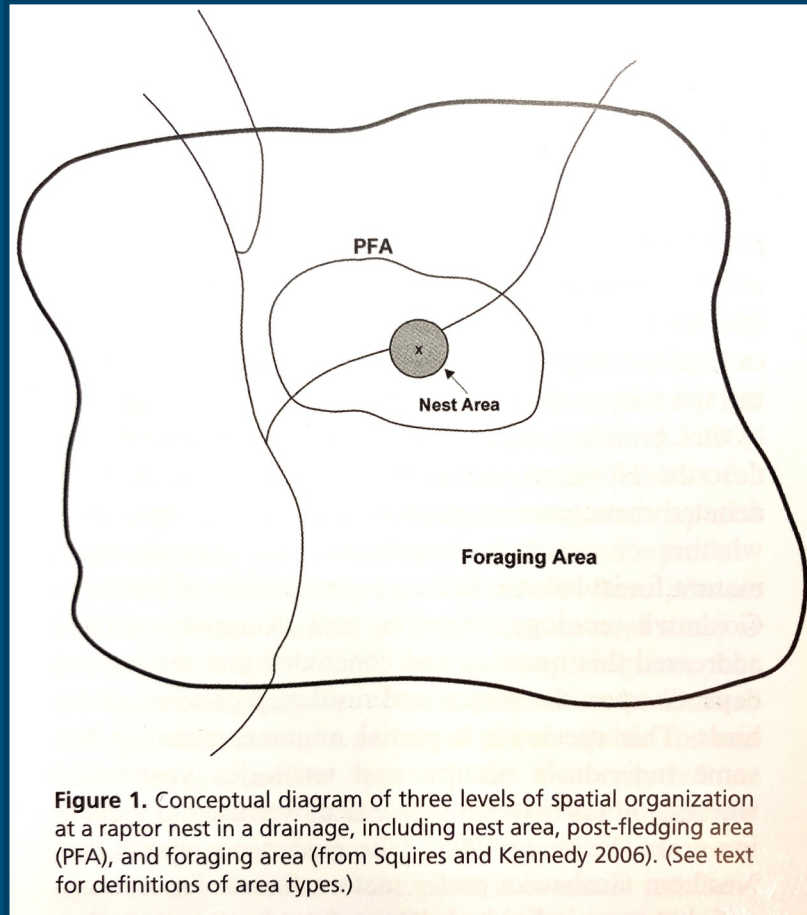


Figure 1. Conceptual diagram of three levels of spatial organization at a raptor nest in a drainage, including nest area, post-fledging area (PFA), and foraging area (from Squires and Kennedy 2006). (See text for definitions of area types.)

Guidelines for Raptor Conservation

during Urban and Rural Land Development in British Columbia (2013)

A companion document to *Develop with Care 2012*



https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/raptor_conservation_guidelines_2013.pdf

Table 6: Recommended minimum buffers for nesting raptors

Ability to co-exist*	Undeveloped	Rural	Urban	Breeding season 'quiet' buffer (additional)
"High" and "moderate-high"	200 m	100 m	1.5 tree lengths or 50 m from cliff	100 m
"Moderate"	500 m	200 m	1.5 tree lengths or 50 m from cliff	100 m
"Low-moderate" and "low"	500m	As advised by Professional Biologist**	As advised by Professional Biologist**	As advised by Professional Biologist**

'Undeveloped' applies to large tracts of previously undeveloped forest or grasslands that are being developed into lots of 5 ha or less. In undeveloped areas, most birds have likely had less contact with humans and will be less tolerant of human presence. 'Rural' applies to lots sizes of 1–5 ha that are being further subdivided or developed. 'Urban' applies to lots that are 1 ha or less and are being further subdivided, developed, or modified in some way. In urban areas, buffer widths are smaller because some birds will have developed greater tolerance to human activity, and the high demand for land and/or previous developments may preclude larger buffers.

'Breeding season quiet buffer' is an additional buffer distance that should be used where land contouring, construction, or any unusual or sudden loud activities (e.g., tree felling, chain saws, concrete cutters, large trucks, whistles, fireworks, or banging devices) is to take place during the active breeding season. During their breeding season, especially during early courtship and egg-laying periods, birds are very sensitive to noise disturbances and may desert their nests and young. This distance is ADDED to the prescribed buffer. For more information about breeding seasons, see the species accounts in Section 10.

Where a Species at Risk has a [Recovery Plan](#), that report's recommended buffers and timing take precedence to this table. Always check for the latest information when dealing with species at risk.

*"Ability to Co-exist" refers to the species' tolerance to activity near the nest site. This may differ from the tolerance rating shown in Table 3 (page 26) which also includes disturbances near feeding and winter habitats. Species listed below are those known to nest in proximity to rural or urban habitats in B.C. Should nests of other species be found where they may conflict with potential development activities, the advice of a Professional Biologist should be sought before proceeding with activities that may disturb the nest site.

- Species with "high" tolerance: Osprey, Red-tailed Hawk, Great Horned Owl, and Barred Owl
- Species with "moderate-high" tolerance: Bald Eagle, Cooper's Hawk, Swainson's Hawk, American Kestrel, Merlin, Barn Owl, and Northern Saw-whet Owl
- Species with "moderate" tolerance: Turkey Vulture, Sharp-shinned Hawk, Peregrine Falcon, Northern Harrier, Flammulated Owl, Western Screech-Owl, Short-eared Owl, Long-eared Owl, and Northern Pygmy Owl
- Species with "low-moderate" tolerance: Burrowing Owl, Red-legged Hawk, and Prairie Falcon
- Species with "low" tolerance: Golden Eagle, Northern Goshawk, and Spotted Owl

**Where professional advice is recommended, ensure that the individual has expertise with that species to determine an appropriate buffer.



Where a Species at Risk has a Recovery Plan, that report's recommended buffers and timing take precedence to this table. Always check for the latest information when dealing with species at risk.

Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (2013)

Species – breeding occurs or probably occurs within the Region but does not necessarily occur everywhere within the Region.	Breeding Occurrence by Region(s) (see map page 10)								Breeding Chronology*	
	West Coast	South Coast	Thompson/ Okanagan	Kootenay/ Boundary	Cariboo	Omineca	Northeast	Skeena	Eggs Present	Young present at nest
Turkey Vulture									April 10-June 21	May 10-Aug 31
Osprey									April 21-July 5	May 25-Sept 5
Bald Eagle									Feb 5- June 25	April 1-Aug 31
Golden Eagle									April 1- June 10	May 1-Aug 31
Northern Harrier									Apr 15-June 30	May 10-Aug 7
Sharp-shinned Hawk									May 30- June 5	July 1- Aug 15
Cooper's Hawk									May 1-July 21	June 5-Aug 31
Northern Goshawk									April 7-June 10	May 20- Aug 21
Swainson's Hawk		??				??			May 2-June 30	June 5-Aug 15
Red-tailed Hawk									Feb 26-June 30	April 10-Aug 10
Ferruginous Hawk									May 1-31	July 1-31
American Kestrel									April 5 – July 20	May 5- Aug 27
Merlin									April 17 – July 4	May 20 – Aug 12
Peregrine Falcon									Mar 30 – June 30	May 2- July 20
Gyrfalcon									April 1 – May 30	May 2 – July 18
Prairie Falcon									Mar 30 – April 30	May 21-Aug 4

? Historic breeding record, no recent records

?? Possible breeding record or breeding recorded immediately adjacent to region boundary

* For land development, follow the guidelines in *Develop with Care*. Where the *Develop with Care* guidelines do not apply, avoid disturbance activities near the nest at least one month prior to 'eggs present date' and until after young have left the nest area.

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	West Coast	South Coast	Thompson/ Okanagan	Kootenay/ Boundary	Cariboo	Omineca	Northeast	Skeena	Eggs Present	Young present at nest
Barn Owl									Year round	Year round
Flammulated Owl		??							April 25-July 25	May 15 – Aug 17
Western Screech-Owl									March 17-June 1	April 20-Aug 25
Great Horned Owl									Feb 10 – May 18	March 20 – Sept 6
Northern Hawk Owl									April 21-May 31	May 27 – Aug 8
Northern Pygmy-Owl									April 15 – June 15	June 9 – Aug 27
Burrowing Owl		?		??					Mar 25 – May 20	May 2 – Sept 30
Spotted Owl									Mar 18 – June 26	April 25 – July 27
Barred Owl									Mar 21 – April 7	April 20 – Aug 14
Great Gray Owl									Mar 27 – May 15	April 30 – Aug 12
Long-eared Owl									March 11- June 12	April 11-Aug 1
Short-eared Owl	??							??	March 28 – July 10	April 12 – Sept 15
Boreal Owl				??					April 1 – May 1	May 1 – July 15
Northern Saw-whet Owl									March 1 – May 31	April 4 – Aug 14

? Historic breeding record, no recent records

?? Possible breeding record or breeding recorded immediately adjacent to region boundary

* For land development, follow the guidelines in *Develop with Care*. Where the *Develop with Care* guidelines do not apply, avoid disturbance activities near the nest at least one month prior to 'eggs present date' and until after young have left the nest area.

Species	At-risk*	Ability to co-exist**	Remarks
Turkey Vulture	No	Mod	Forages in urban and rural settings; requires remote nesting and roosting sites
Osprey	No	High	Readily nests on human-made structures; tolerant of human activity
Bald Eagle	No	Mod - High	Requires large nest trees near coast or large body of water; tolerant of human activity
Golden Eagle	No	Low	Usually found in remote mountainous areas
Northern Harrier	No	Mod	Forages in old-fields and marshes in urban and rural areas; ground nests susceptible to disturbance and predation from domestic pets and humans
Sharp-shinned Hawk	No	Mod	Requires secure forest cover for nesting; tolerant of human activity
Cooper's Hawk	No	Mod - High	Can nest in close proximity to human developments; prefers an area of interlocking tree canopy for rearing young; Greater Victoria contains one of the highest nesting densities of this species in North America
Northern Goshawk - <i>laingi</i>	Yes	Low	Requires large tracts of forest for nesting and foraging; may use rural areas, especially during winter. <i>A. g. laingi</i> breeds on Haida Gwaii and Vancouver Island and mainland coast. <i>A. g. atricapillus</i> breeds in the interior and may winter along the coast
Northern Goshawk - <i>atricapillus</i>	No	Low	
Broad-winged Hawk	Yes	Low-Mod	Inconspicuous and secretive; occasionally seen during migration in B.C.
Swainson's Hawk	Yes	Mod - High	Can nest and forage in close proximity to human developments and farmland; requires undisturbed grasslands with adequate food supply
Red-tailed Hawk	No	High	Very tolerant of human activity; nests and forages in urban and rural settings
Ferruginous Hawk	No status	Low - Mod	Historic, uncommon breeder in Southern Interior; prefers undisturbed grasslands and desert-shrub; little is known about its habitat requirements in B.C.
Rough-legged Hawk	Yes	Mod	Tolerant of human activity; commonly winters on farmland in Lower Mainland and Southern Interior; does not breed in B.C.
American Kestrel	No	Mod -High	Forages and nests in urban and rural settings; tolerant of human activity
Merlin	No	Mod -High	Forages and nests in close proximity to human developments, provided songbird prey is available. Requires secure tree cover for nesting

* At-risk: Colours in the "at-risk" column correspond to Red-, Blue-, or Yellow-listing of raptors.

** Ability to Co-exist: This assessment is based on the species' tolerance of human activities near the nest site, foraging habitat and wintering habitat. The column colours reflect the level of tolerance, with green colours signifying greater compatibility and red colours signifying low tolerance of human disturbance. Note that this rating affects the recommended nesting buffer distances (see Table 6, which bases tolerance only on proximity to nesting sites).

Species	At-risk*	Ability to co-exist**	Remarks
Peregrine Falcon - <i>anatum</i>	Yes	Mod	Some birds can nest in close proximity to human developments including tall buildings and bridges; cliff nesting birds may be susceptible to human disturbance; prefers to hunt over large wetlands, estuaries and along undisturbed coastlines
Peregrine Falcon - <i>pealei</i>	Yes	Mod	<i>F. p. pealei</i> breeds on and around Haida Gwaii and Vancouver Island; <i>F. p. anatum</i> breeds in the interior and the Lower Mainland. The Gulf Islands is a hybrid zone of the two subspecies
Gyr Falcon	Yes	Low - Mod	Some birds winter in open fields and marshes fairly close to human developments; nest in remote mountainous regions of northwestern B.C.
Prairie Falcon	Yes	Mod	May forage close to human developments, but requires remote cliffs for nesting
Barn Owl	Yes	Mod - High	Fairly adaptable; will nest and roost in old farm buildings (currently being lost to development) and artificial nest structures; requires old-fields and abundant supply of voles for foraging
Flammulated Owl	Yes	Mod	Requires relatively large dead or dying trees for nesting; mainly dependent on woodpeckers to create cavities; susceptible to forest clearing and danger tree removal activities
Western Screech-Owl - <i>macfarlanei</i>	Yes	Mod	Populations, particularly interior populations of <i>O. k. macfarlanei</i> in the Okanagan Valley, are very susceptible to land use changes and loss of woodlands and shrubby areas in valley bottoms; requires relatively large dead or dying trees for nesting; mainly dependent on woodpeckers to create cavities; susceptible to forest clearing activities; expansion of Barred Owls into human-altered landscapes appears to have negative consequences for B.C. populations
Western Screech-Owl - <i>kennicottii</i>	Yes	Mod	
Great Horned Owl	No	High	Very tolerant of human activity; nests and forages in urban and rural settings
Snowy Owl	Yes	Mod	Some birds winter in open fields and marshes relatively close to human developments. Snowy Owls do not breed in B.C.
Northern Hawk Owl	No	Mod	Requires large dead or dying trees for nesting; dependent on woodpeckers to create cavities; susceptible to forest clearing activities
Northern Pygmy-Owl	No	Mod	Requires large dead or dying trees for nesting; mainly dependent on woodpeckers to create cavities; susceptible to forest clearing activities. Only the subspecies <i>G. g. swarthi</i> on Vancouver Island is At Risk/Blue-listed. Throughout the rest of their range in B.C. pygmy-owls are not at risk.
Northern Pygmy-Owl <i>swarthi</i>	Yes	Mod	
Burrowing Owl	Yes	Low	Can nest close to human developments but nesting burrows are susceptible to predation and disturbance; requires undisturbed grassland for foraging
Spotted Owl	Yes	Low	Requires large tracts of old-growth forest for foraging and nesting

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Cooper's Hawk	No	Mod - High	Can nest in close proximity to human developments; prefers an area of interlocking tree canopy for rearing young; Greater Victoria contains one of the highest nesting densities of this species in North America

Ability to co-exist*	Undeveloped	Rural	Urban	Breeding season 'quiet' buffer (additional)
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"Low-moderate" and "low"	500m	As advised by Professional Biologist**	As advised by Professional Biologist**	As advised by Professional Biologist**



Table 4. Important features of raptor habitat and the values they confer.

CRITICAL HABITAT/FEATURE TO RETAIN	KEY VALUES FOR RAPTORS
Large, wind firm trees (living and dead) and veteran recruit trees, particularly within 500 m of large water bodies	Nesting and roosting
Dead and dying trees suitable for use by woodpeckers, who in turn create nest cavities for small owls	Nesting and roosting
Stands of coniferous or deciduous forest cover, preferably with an inter-locking canopy	Nesting, perching (hunting/resting); rearing of young, roosting
Woodlots, shelterbelts, shrubby areas, hedgerows, and natural forest openings	Nesting, perching (hunting/resting), prey habitat
Riparian and valley bottom areas with trees and dense thickets	Nesting, perching (hunting/resting), prey habitat
Undisturbed grasslands and scrubland	Nesting, hunting, prey habitat
Agricultural "old-fields" and pastures	Nesting, hunting, prey habitat
Natural forested and open (e.g., riparian) habitats adjacent to fish bearing water bodies, including ocean shorelines, estuaries, lakes, reservoirs, and rivers	Nesting, perching (hunting/resting), prey habitat
Cliffs, steep terrain and rocky areas	Nesting, perching, hunting
Marshes, swamps, wet meadows and other wetlands	Nesting, hunting, prey habitat
Barns and buildings with permanent openings in agricultural areas	Nesting and roosting

City of Nanaimo - Tree protection bylaw

REFERENCE NUMBER	TREE SPECIES	LOCATION	WILDLIFE
BAEA-105-304	Douglas fir	6466 Lewis Road	Bald eagle
BAEA-105-078	Douglas fir	3947 Gulf View	Bald eagle
BAEA-105-108	Douglas fir	3600 Place Road	Bald eagle
BAEA-105-307	Douglas fir	ROW Bonnie Drive	Bald eagle
BAEA-105-033	Douglas fir	150 Dogwood Road	Bald eagle
BAEA-105-313	Douglas fir	2243 Arbot Road	Bald eagle
BAEA-105-308 BAEA-105-309	Douglas fir	3945 Biggs Road	Bald eagle
BAEA-105-061	Douglas fir	N Jack Point (cent	
BAEA-105-341	Douglas fir	N Jack Point (wate	
BAEA-105-062	Douglas fir	S Jack Point	
BAEA-105-063	Douglas fir	Biggs Point- Jack	
BAEA-105-031	Douglas fir	1141 Frew Road –	
BAEA-105-339	Douglas fir	1560 Island Hwy S	
BAEA-105-059	Douglas fir	Jackson Road	
BAEA-105-102	Douglas fir	Leask Road	
BAEA-105-057	Douglas fir	Dodd Narrows (So	
BAEA-105-106	Douglas fir	960 Phoenix Road	
BAEA-105-064	Douglas fir	732 Maughan Roa	
BAEA-105-080	Douglas fir	1390 Fielding Roa	
BAEA-105-330	Douglas fir	48 Cutlass Lookou	
New location	Atlas cedar	104 Esplanade	
BAEA-105-326 BAEA-105-327	Douglas fir	86 Captain Morga	
BAEA-105-070 BAEA-105-071 BAEA-105-072 BAEA-105-073 BAEA-105-323 BAEA-105-324	Douglas fir	Newcastle Island	Bald eagle
GBHE-105-031		5414 Lost Lake Road	Great blue heron
GBHE-105-009		3669 Rock City Road	Great blue heron
GBHE-105-021		2140 Departure Bay Road	Great blue heron
GBHE-105-007		11 Capt. Kidds Terrace	Great blue heron
GBHE-105-037		140 Tenth Street	Great blue heron
GBHE-105-025		1105 Old Victoria Road	Great blue heron

List not comprehensive

4.2 If the Bald Eagle Nest Tree or Great Blue Heron Nest Tree is to be cut down or removed for a reason other than being a Hazard Tree, the Owner of the real property from which the Bald Eagle Nest Tree or Great Blue Heron Nest Tree is to be cut down, trimmed, root planed, topped, modified or removed, or their duly agent authorized in writing, shall first submit to the City a habitat compensation plan prepared by a Qualified Environmental Professional, prior to the cutting or removal, that:

- a) describes the measures required to be implemented to ensure how no net loss of Bald Eagle Nest Tree Habitat or Great Blue Heron Nest Tree habitat will be achieved occur; and
- b) includes a time frame for implementation implementing and completion of completing the measures with, including the actions required and the monitoring schedule and communications plan.

City of Campbell River Environmental Protection Bylaw

Removing nests/nest trees

- Consult with a QEP
- Removals outside of breeding period
- Permits
 - Provincial, Municipal
- Compensation
 - Relocating nest structure
- Wildlife tree retention
 - Nesting and/or prey species habitat
- Documentation



Pruning Considerations

- Leave the nest structure alone
- Avoid the temptation to 'improve' flyways
- Below the nest can matter as much as above
- Try to retain perches, if identifiable.
 - Plucking perches may not be in the nest tree.
- Do not worry about your 'scent'.
- Assess circumstances if identified during works
 - Behaviour
 - Timing
 - Weather





Opportunities with raptors for arborists





Resources

- MARS Wildlife Rescue Center (Mountaineer Avian Rescue Society) - Comox Valley
- The Raptor Rescue Society - Duncan
- BCSPCA Wild Animal Rehabilitation Center - Metchosin
- North Island Wildlife Center - Errington
- Wildlife Natural Care Center - Saltspring Island





Thank You