

Schedule O

Wildlife Features Guidance

Introduction

This guidance document has been prepared to assist forest practitioners in the identification of Wildlife Features (WF) and to provide information to consider when choosing practices and undertaking forest activities around a given feature, to not disturb while active, damage or render ineffective that feature.

List of Wildlife Features

1. a fisheries sensitive feature
2. a nest of a Bald Eagle
3. a nest of an Osprey
4. a nest of a Great Blue Heron
5. a black bear den
6. a Grizzly Bear ground den
7. a significant mineral lick
8. a significant wallow
9. a bat hibernaculum
10. a bat maternity roost
11. Pileated Woodpecker

Reporting and Tracking Wildlife Features

The location of identified wildlife features and any reserve and/or management zones must be documented on a map and provided to the Tla'amin Stewardship Team as part of the development area referrals package for consideration in the Operational Plan Assessment.

The location of identified wildlife features and any reserve and/or management zones must be documented and submitted as digital spatial data at the end of each calendar year to the Tla'amin Stewardship Team.

Information pertaining to wildlife feature identification and management contained in this document has been sourced from existing legislation, regulations and guidance documents including the British Columbia "Draft" Wildlife Habitat Features Guidance Document, dated December 4, 2012.

This Wildlife Features guidance document does not constitute legal advice.

Guidance for Managing Wildlife Features

A Fisheries Sensitive Feature

Definition - A *fisheries sensitive feature* is seasonally occupied by a salmonid or a red- or blue-listed fish species and may include any of the following:

- a) the littoral zone of a lake;
- b) a freshwater area where the water is less than 10 m deep; or
- c) a flooded depression, pond or swamp that contains perennial or seasonal water that is not a stream, wetland or lake.

Confirm that the feature is a fisheries sensitive feature

Check records for known Fisheries Sensitive Features (FSFs) in your area of operational concern.

Information on FSF may be obtained by:

- Reviewing fisheries studies or surveys that may contain observations and locations in your area of operation. Also review maps and aerial photographs. FSFs may be difficult to identify, even from large-scale maps and aerial photos, especially if they are small or located in forested areas. However, maps and photos can be used to identify low-lying floodplain areas that potentially contain FSFs. The presence of FSFs in these areas could then be field verified during the most appropriate time of year.
- Reconnaissance searches for FSFs are best conducted during the preliminary stage of any operational plan (including road and cutblock layout), so that locations and extent of the FSFs can be identified and mapped to minimize future operational conflicts.
- Some FSFs may only be seasonally wet during periods of peak stream flows and may only be used by fish during these periods. Understanding the life history of fish species that may be present is advantageous.

What to look for

FSFs are generally small and may contain water either perennially or seasonally. These FSFs can be challenging to identify since they may be dry at the time of year that field assessments are usually conducted (i.e., summer). Examples of these types of FSFs are flooded channels, depressions, ponds, flooded woodland areas, sloughs, swamps, fens or other areas that cannot be typically classified as streams, lakes or wetlands. Since many potential FSFs may only be seasonally occupied by a salmonid or red- or blue-listed fish species, the practitioner should consider the following:

- Operational areas may need to be inspected during the winter, spring or other times of the year when peak stream flows occur.

- Professional judgment may be required during field evaluation since FSFs may not be accessible to fish every year.

Many of the small, temporal FSFs may provide important rearing refuge habitat during periods of high-water flows (e.g., spring run-off) when conditions in the mainstream channel are unsuitable for fry.

Information to consider when planning and conducting primary forest activities near a fisheries sensitive feature (FSF).

Information to Consider
• Consider having a qualified fisheries biologist or fisheries technician conduct a site visit if you are uncertain or think there is a FSF within or adjacent to proposed development. • Establish a minimum five-meter machine-free zone adjacent to the FSF to prevent ground compaction, soil erosion and other direct damage to the FSF. • Where practicable retain understory vegetation and non-merchantable trees adjacent to the feature to provide shade and cover for fish, particularly for FSFs that provide summer habitat. • Review operational plans to determine the nature of any upslope activities, water management strategies and erosion control measures in relation to the potential for sediment delivery from upslope or upstream sources. • When locating, designing, constructing, maintaining or deactivating roads, back spar trails, skid trails, etc., do so in a manner that minimizes sedimentation to the FSF. Consider alternative routes or larger machine free zones in areas with moderate or high erosion potential. • Ensure that the FSF is clearly marked on operational maps and is clearly marked and identified in the field. • Ensure that harvesting and silviculture operations staff, including road builders, fallers and machine operators, are aware of an FSF's location, its sensitivity and that it requires special consideration. • When harvesting, avoid felling trees into or across the FSF. • Maintain natural drainage patterns into and out of FSF. • Plan and time operations to minimize impacts on the FSF (e.g., during periods of low water flow, outside of fish spawning and rearing periods, etc.). • Maintain fish passage into and out of the FSF.

A Nest of a Bald Eagle

Definition - A nest of a Bald Eagle (*Haliaeetus leucocephalus*) means a structure used by a Bald Eagle to hold its eggs or offspring and the tree containing the structure.



Bald Eagle at nest. (Photo: Deal Photography)

Species Description

One of British Columbia's largest raptors, adult Bald Eagles are easily identified by a distinctive white head and tail and a powerful yellow bill. Immature birds are mostly dark, with increasing amounts of mottled white on the head and tail as they mature. Immature Bald Eagles may be confused with immature Golden Eagles, but Golden Eagles have more defined white wing patches and a broad white band at the base of the tail, while the tails of juvenile Bald Eagles are mottled with white.

The Bald Eagle is Yellow-listed in British Columbia. It is designated as *Not at Risk* by COSEWIC.

What to look for - Characteristics of preferred habitat

Bald Eagles nest primarily in coniferous forests near a permanent water source, but deciduous and mixed woodlands may also be used. Nests are notably large and generally conspicuous placed in the top third of a large tree. Nests are made of bulky sticks and branches and are at least 1 m across in size. Nests are typically used year after year by the same pair or their offspring.

Generally, the surest way to determine which bird species is using a large stick nest is to observe an adult bird at the nest site. The best opportunity for this is during the breeding season, typically January through August. If a large stick nest is found but it cannot be attributed to a particular bird species (e.g., found during the non-breeding season), then nest characteristics should be assessed to determine whether it is a Bald Eagle nest.

Bald Eagle Nests - What to look for.

Bald Eagle Nest Description
• Nests are large and range in size from 1.0 to 3.5 m in diameter and from 0.5 to 2.5 m in depth. • Nests are made of large sticks and are generally cup-shaped platforms with relatively flat tops. • Typically built in large trees, up against the tree trunk or on a large, forked branch or stem crotch. • Generally built in the upper third of the tree with an unobstructed view of the surrounding area. • Along the coast, usually within 100 m of shore. • On the coast, most nests occur in coniferous trees with large limbs, such as Douglas-fir, sitka spruce, western redcedar and western hemlock; large black cottonwood and red alder are also used. On treeless offshore islands, nests may be on the ground, usually on cliffs or steep slopes. • Evidence of use (i.e., whitewash (feces), remains of prey and raptor feathers) is often seen at the base of nest trees. Fresh greenery can be seen in the nest bowl. • Adult birds can often be seen flying to and from the nest or perched nearby. • Young birds may be too small to be seen from the ground, but they are often heard begging for food from within the nest.

Information to consider when planning and conducting forest activities near a nest of a Bald Eagle.

Information to Consider	
•	The nest is protected throughout the year under Section 34 of the <i>Wildlife Act</i> and until the nest falls out of the tree.
•	In general, Bald Eagles have low to moderate thresholds for new human disturbance, particularly during the breeding season. Unaccustomed levels of noise or human activity near the nest tree can cause some pairs to abandon their nest, or leave eggs or young unattended particularly during the early part of the nesting season (i.e., before June).
•	The sensitivity of raptors to disturbances varies among individuals. The most sensitive periods are just prior to egg laying and the start of incubation, the beginning of hatching until when the chick(s) have feathers to keep them warm and the last few days before the young fledge.
•	Avoid high impact activities (as listed in the table below) in the vicinity of the nest tree between March 1 and August 15, if possible.
•	Consider establishing a forested windfirm buffer (e.g., wildlife tree retention area or other retention patch) around the nest tree. Functions of the patch include providing perching and roosting opportunities near the nest site and security cover.
•	Consider locating any new roads at a distance that will not result in disturbance to the nest site.
•	Consult a qualified professional to confirm if you are uncertain of what species has been recently using an unoccupied large stick nest.
•	Consider substituting lower-impact, alternative activities in areas near a Bald Eagle nest during the breeding season.

Coastal BC Bald Eagle Breeding Chronology

Months	January				February				March				April				May				June				July				August				September			
Weeks	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Eagle Breeding Chronology	Courtship and nest repair																																			
									Egg laying and incubation between mid February and the end of June for 33 to 36 days																											
													Eggs hatch and young remain in nest for 10 to 13 weeks																							
																				Young fledge from late June to late August																

Activity impacts near Bald Eagle nests and suggested lower impact alternatives.

Activity	Suggested Lower Impact Alternatives
High Impact	
Blasting	Delay or reschedule until after breeding season (March 1 to August 15).
Road Construction	Delay or reschedule until after breeding season (March 1 to August 15).
Low Altitude Helicopter Activity (light machines)	Plan and reroute recurring flight paths to at least 500 m from known nest trees during the breeding season (March 1 to August 15); fly at higher altitudes near nest sites during this period (generally > 1000 ft. altitude). Avoid flying over the nest during nest occupancy.
Heavy Lift Helicopter Activity	If a nest is occupied restrict helicopter overflights with heavy lift machines. If the heli-harvesting needs to occur within the breeding window and a nest is occupied, all flight paths from yarding activities should occur outside a 1000m buffer. If there are natural hill-slope breaks, buffers distances can be altered accordingly.
Falling and Yarding	Delay or reschedule until after breeding season (March 1 to August 15).
Medium Impact	
Vehicle Traffic (on existing roads within 200 m of nest trees)	Minimize the number of traffic passes during the breeding season (March 1 to August 15), if possible.
Brushing and Thinning	Delay or reschedule until after breeding season (March 1 to August 15).
Low Impact	
Block Layout, Surveys, Timber Cruising	Minimize loud voices or shouting, try to remain at least 50 m away from active nest sites and minimize time spent in the nest area during the breeding season (March 1 to August 15).
For additional information on managing Bald Eagle nest sites, please refer to Best Management Practices for Raptor Conservation during Urban and Rural Land Development in British Columbia https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/raptor_conservation_guidelines_2013.pdf	

A Nest of an Osprey

1) Definition - A nest of an Osprey (*Pandion haliaetus*) means a structure used by an Osprey to hold its eggs or offspring and the tree containing the structure.



Osprey (Photo: Deal Photography)

Species Description

The Osprey is a large raptor, although smaller than the Bald Eagle. It is dark brown above and generally white below, with a mostly white head and a prominent dark eye stripe. The sexes are similar, although males are usually all white below while females have some dark streaking across the upper breast. In flight, the long, narrow wings are distinctively bent at the wrist, showing a conspicuous dark wrist patch. The common call of the Osprey is a loud, whistled *kyew kyew kyew kyew*.

The Osprey is Yellow-listed in British Columbia. It has no designation by COSEWIC.

What to look for - Characteristics of preferred habitat

Ospreys breed throughout British Columbia, except on the Queen Charlotte Islands, but most nest sites occur in the southern two-thirds of the province. Most nests are located close to permanent water, including lakes, rivers, or marine shores. Nests are large and generally conspicuously placed near the top of a tree, artificial platform, or utility pole. Nests are made of sticks and branches and are at least 1 m across in size. Nests are typically used year after year by the same pair or their offspring.

Generally, the surest way to determine which bird species is using a large stick nest is to observe an adult bird at the nest site. The best opportunity for this is during the breeding season, typically March through August. If a large stick nest is found but it cannot be attributed to a bird species (e.g., found during the non-breeding season), then nest characteristics should be assessed to determine whether it is an Osprey nest.

Osprey Nests -- What to look for.

Osprey Nest Description
• Nests vary in size from 1.5 to 2.5 m in diameter and 0.5 to 1.5 m in depth. • Made of large sticks that are generally > 0.75 cm in diameter (i.e., the width of a pencil). • Typically built at the top of dead trees, snags, live trees and on man-made structures (e.g., utility poles). • Generally close to a permanent source of water, but sometimes up to 4 km away. • Evidence of use (i.e., whitewash (feces), remains of prey and raptor feathers) is often seen at the base of nest trees. • Adult birds can often be seen flying to and from the nest or perched nearby. • Young birds may be too small to be seen from the ground, but they are often heard begging for food from within the nest.



Osprey nest. (Photo: Sally Leigh-Spencer)

Information to consider when planning and conducting primary forest activities near a nest of an Osprey.

Information to Consider
• The nest is protected throughout the year under Section 34 of the <i>Wildlife Act</i> and until the nest falls out of the tree. • In general, Ospreys have low to moderate thresholds for new human disturbance, particularly during the breeding season. Unaccustomed levels of noise or human activity near the nest tree can cause some pairs to abandon their nest, particularly during the early part of the nesting season (i.e., before June). • If possible, avoid high impact activities in the vicinity of the nest tree between March 1 and August 15. • Consider establishing a forested windfirm buffer (i.e., wildlife tree retention area or retention patch) around the nest tree. Functions of the patch include providing perching and roosting opportunities near the nest site and security cover. • Consider locating any new roads at a distance that will not result in disturbance to the nest site. • Consult a qualified professional to confirm if you are uncertain of what species has been recently using an unoccupied large stick nest.

Activity impacts near Osprey nests and suggested lower impact alternatives.

Activity	Suggested Lower Impact Alternatives
High Impact	
Blasting	Delay or reschedule until after breeding season (1 March to 15 August).
Road Construction	Delay or reschedule until after breeding season (1 March to 15 August).
Low Altitude Helicopter Activity	Avoid overflights. Plan and reroute recurring flight paths to at least 300 m from known nest trees during the breeding season (March 1 to August 15); fly at higher altitudes near nest sites during this period (generally > 1000 ft. altitude).
Falling and Yarding	Delay or reschedule until after breeding season (1 March to 15 August).
Medium Impact	
Vehicle Traffic (on existing roads within 200 m of nest trees)	Minimize the number of traffic passes during the breeding season (1 March to 15 August).
Brushing and Thinning	Delay or reschedule until after breeding season (1 March to 15 August).
For additional information on managing Osprey nest sites, please refer to Best Management Practices for Raptor Conservation during Urban and Rural Land Development in British Columbia https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/raptor_conservation_guidelines_2013.pdf	

A Nest of a Great Blue Heron

Definition - A nest of a Great Blue Heron (*Ardea fannini*) means a structure used by a Great Blue Heron to hold its eggs or offspring and the tree containing the structure.



Great Blue Heron (Photo: Deal Photography)

Species Description

The Great Blue Heron is a large, long-legged wading bird with a long, yellow bill. The plumage is mostly gray blue, with a white crown and face and a black eyebrow stripe. The front of the neck is white, streaked with black. Breeding adults have shaggy plumes on the head, neck and back. Juvenile herons have a dark crown and lack breeding plumes.

Two subspecies occur in British Columbia: *A. h. fannini* breeds along the coast, while *A. h. herodias* breeds in the interior of the province.

Both subspecies of Great Blue Heron are IWMS species and Blue-listed in British Columbia. *A. h. fannini*, the coastal sub-species is designated as a species of *Special Concern* on Schedule 1 of the Federal Species at Risk and listed under the Migratory Birds Regulation.



Great Blue Heron Nest. (Photo: Deal Photography)

What to look for - Characteristics of preferred habitat

Great Blue Herons nest in relatively contiguous forest, fragmented forest, and solitary trees near foraging areas. The most common tree species used for breeding on the coast are red alder, black cottonwood, big leaf maple, lodgepole pine, Sitka spruce and Douglas-fir.

Generally, the surest way to determine which bird species is using a large stick nest is to observe an adult bird at the nest site. The best opportunity for this is during the breeding season, typically March through August. If a large stick nest is found but it cannot be attributed to a particular bird species (e.g., found during the non-breeding season), then nest characteristics should be assessed to determine whether it is a Great Blue Heron nest.

Great Blue Heron Nests -- What to look for.

Great Blue Heron Nest Description
• Large, stick nest platforms, generally 1 m in diameter and approximately 0.5 m depth. • Flimsy looking, smaller and shallower than raptor nests. • Typically made with thin diameter branches that are loosely arranged. • Herons may nest in loose or tight colonies, building nests in several different trees that may or may not be clustered. • Several pairs of herons may build nests in a single tree; not all of them are necessarily active during a single year.

- Herons may regurgitate indigestible food that can be found at the base of the nest tree. Like its whitewash (feces), the regurgitated food is usually dark gray in colour with a slight sheen or greasy appearance and may smell of fish.
- Adult birds can often be seen flying to and from the nest or perched nearby.
- Young birds can often be heard begging for food from within the nest.

Information to consider when planning and conducting primary forest activities near a nest of a Great Blue Heron.

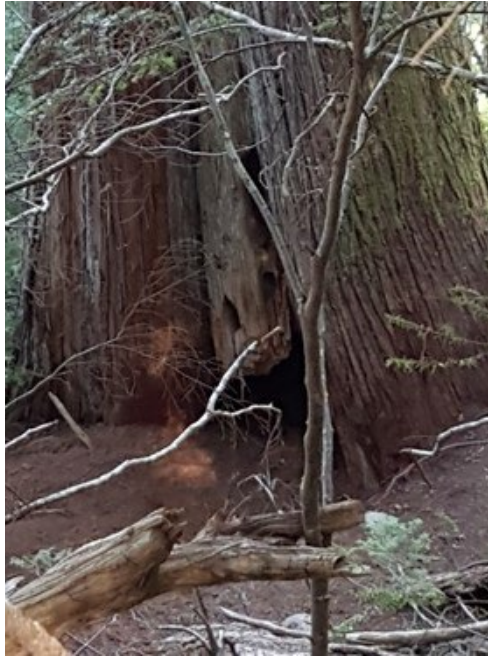
Information to Consider
• The nest(s) is/are protected under Section 34 of the <i>Wildlife Act</i> and until the nest falls out of the tree. • Nest colonies will have multiple nests located in the same tree or in adjacent or nearby trees. • Great Blue Herons have low to moderate thresholds for new human disturbance, particularly during the breeding season. Unaccustomed levels of noise or human activity near the nest tree can cause some pairs to abandon their nest, particularly during the early part of the nesting season (i.e., before June). Considering this, consider taking the following measures: ➤ Avoid disturbance near nests and nest colonies during the breeding season (February 15 to August 31), where possible. Minimize access on existing roads and trails during this period (types and levels of use should not exceed levels that customarily occur). ➤ Consider establishing a forested windfirm buffer (e.g., wildlife tree retention area or other retention patch) around confirmed nest colonies. Ideally, the colony should be roughly centered within this forested patch. However, if location or orientation of the patch in this manner is not possible for operational or other reasons, then locate the patch so that the nest trees are connected to adjacent forested habitat. ➤ Within retention patches established around nest colonies, avoid developing new roads, recreation trails, structures or facilities. • Consult a qualified professional to confirm if you are uncertain of what species has been recently using an unoccupied large stick nest. For additional information on the management of Great Blue Heron habitat consult the IWMS species account https://www.env.gov.bc.ca/wld/frpa/iwms/iwms.html and the COSEWIC status report https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/mp_great_blue_heron_fannini_e_proposed.pdf

Activity impacts near Great Blue Heron nests and suggested lower impact alternatives.

Activity	Suggested Lower Impact Alternatives
High Impact	
Blasting	Delay or reschedule until after breeding season (February 15 to August 31), unless a variance is provided by a Qualified Professional.
Road Construction	Delay or reschedule until after breeding season (February 15 to August 31), unless a variance is provided by a Qualified Professional.
Low Altitude Helicopter Activity	Plan and reroute flight paths to at least 300 m from known nest trees during the breeding season (February 15 to August 31); fly at higher altitudes near nest sites during this period.
Falling and Yarding	Delay or reschedule until after breeding season (February 15 to August 31), unless a variance is provided by a Qualified Professional.
Medium Impact	
Vehicle Traffic (on existing roads within 200 m of nest trees)	During the breeding season (February 15 to August 31), if possible, minimize the number of traffic passes.
Brushing and Thinning	Delay or reschedule until after breeding season (February 15 to August 31).
Low Impact	
Block Layout, Surveys, Timber Cruising	Minimize loud voices or shouting, try to remain at least 50 m away from active nest sites and minimize time spent in the nest area during the breeding season (February 15 to August 31).

A Black Bear Den

Definition - A black bear (*Ursus americanus*) den means an excavated hole under a large diameter tree, within a cavity of a snag, or live tree, log or stump that is above or below ground and is used by a black bear for winter denning.



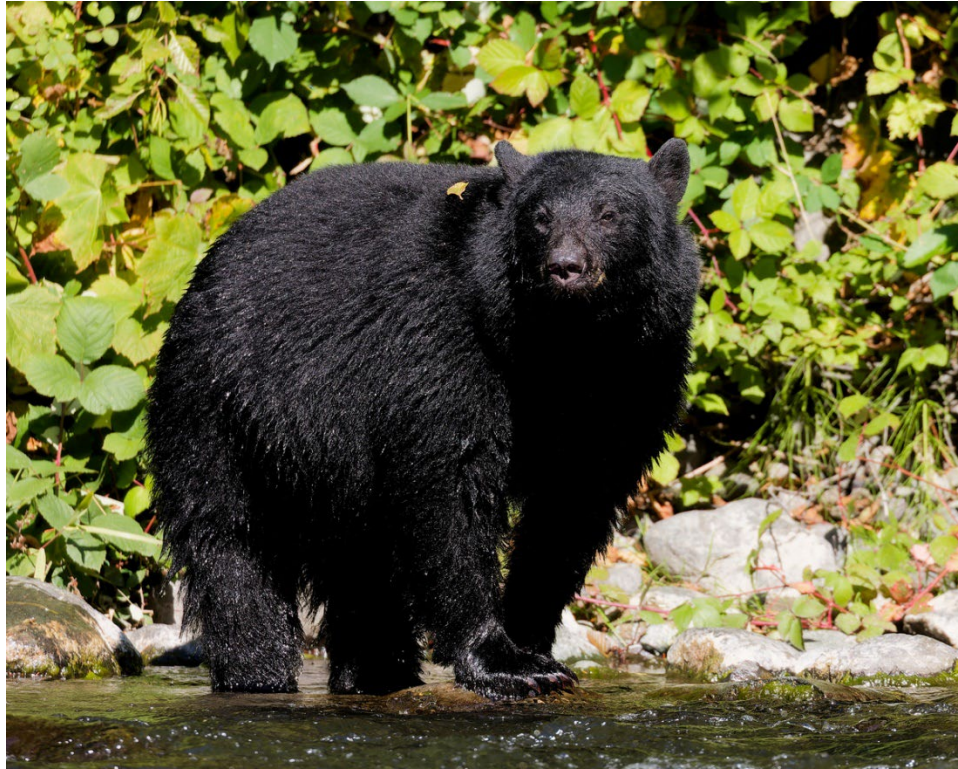
Black bear ground den in a large western red-cedar tree. (Photo: Sally Leigh-Spencer)

2) Species description

The Black Bear is the smallest and most widely distributed of the bear family in North America. Colour can vary from black, cinnamon, brown and blonde.

Black Bears can be distinguished from Grizzly Bears by the grizzlies' distinct shoulder hump, large claws (5-10 cm long), and their facial profile which has a clear depression between the eyes and the nose. Black Bears have a straighter facial profile, lack a shoulder hump, and their tracks do not show the long claw marks that are quite often visible in grizzly tracks. Black Bears are omnivorous. Mating occurs in June and July and cubs are born during hibernation in January-February.

The Black Bear is Yellow listed in British Columbia (Not at Risk).



Black Bear (Photo: Deal Photography)

3) What to look for - Characteristics of preferred habitat

In coastal British Columbia, Black Bears hibernate through cool, very wet winters. Dens play an important role in assisting bears to reduce energy losses during winter hibernation (Lentz et al. 1983) in H. Davis 1996). Selecting a den with a favorable microclimate is especially important for females because they have additional energy costs during this period of gestation, whelping, and nursing of cubs (Lentz et al. 1983). The types of structures that Black Bears can use successfully for denning are dictated primarily by the local weather conditions in the area. Where there is persistent, deep snow cover, dens are well insulated from cold air and provide relatively warm, stable micro-environments.

Black Bear dens are mainly found in cavities of hollow western redcedar or yellow cedar trees that are either alive or in varying stages of decay. These species tend to rot in the inside while retaining a hard outer shell, creating a cavity ideal for denning. Some of the cavities are enlarged by bears and lined with tree branches, grasses, and ferns. Most cavities are at ground level, but some entrances to the cavity are higher up in the tree. Black Bear dens are often found in valley bottom environments on the forest floor, often underneath root mats and fallen logs, or in hollow tree cavities. Although rare on the coast, Black Bears will excavate ground dens in areas that have suitable soil substrates.

Black Bear Ground Dens - What to look for.

Black bear Ground Den Description
• Bear dens require two important features, a secure, dry chamber, and entrance to the chamber that is just large enough to fit a bear. • Black Bear den tree entrances are usually ≥ 25 cm in diameter. • Den chambers are usually ≥ 60 cm in diameter. • Dens are usually, but not always, lined with shrub branches, tree boughs, duff, or grass. • Hair is often visible at the den entrance and in bedding material. • Bite or claw marks at entrance and/or inside tree den cavities. For help in identifying Black Bear dens in British Columbia, refer to the publication <i>Coastal Bear Den Identification Manual v2</i>, Artemis Wildlife Consultants. https://artemiswildlife.com/AWC_Bear_Den_ID_manual_v2.pdf

Information to consider when planning and conducting primary forest activities near Black bear dens.

Information to Consider
• If possible, maintain a minimum of 200 meter no work zone around the den when active. • If an active, recently used or potential den is discovered during cutblock layout the den should be retained and a minimum width 20-meter treed buffer established around the den. If possible, the buffer should retain additional “escape” trees. • If an active or recently used den tree is discovered during primary forest activities protect the den and if possible, establish a treed retention area around the den. • Consider developing access management plans to minimize potential disturbance to den areas. • If more than one confirmed den site is found in a relatively small area (1-2 ha), it’s probable that bears are regularly (and repeatedly) using this area for winter denning. • Consider having a qualified professional biologist confirm what species has been recently using an unoccupied ground den.

A Grizzly Bear Ground Den

Definition - A Grizzly Bear (*Ursus arctos*) ground den means an excavated hole that descends below ground and is used by a grizzly bear for winter denning.



Grizzly Bear ground den in alpine. (Photo: Stefan Himmer)

2) Species description

Grizzly Bears are large carnivores that average 160-225 kg in weight and stand approximately 1 m at the shoulder height. They vary in colour from blonde to black, but most are a medium to dark brown. Grizzlies have long guard hair that often have lighter tips, giving some bears their “grizzled” appearance. They can be distinguished from black bears by the grizzlies’ distinct shoulder hump, large claws (5-10 cm long), and their facial profile which has a clear depression between the eyes and the nose. Black Bears have a straighter facial profile, lack a shoulder hump, and their tracks do not show the long claw marks that are quite often visible in grizzly tracks.



Grizzly Bear. (Photo: Jared Hobbs)

The Grizzly Bear is an IWMS species and is Blue listed in British Columbia. It is designated as a species of *Special Concern* by COSEWIC.

3) What to look for - Characteristics of preferred habitat

Grizzly Bear ground dens are typically located on moderate to steep (approximately 40-90%) mountain slopes, in alpine, subalpine or montane environments. Ground dens are usually located on cooler north or east-facing aspects where insulating snow accumulations are greater. In flat topography, ground dens may be located on high spots or small knolls, as the sides of these features provide easier digging conditions. In some locations, where conditions are optimum (i.e., slope, soil texture, aspect, snow cover, security), more than one den site can be found in a relatively small area (1-2 ha). These areas can be used year after year as hibernation sites by grizzly bears.

In contrast, Black Bear dens are found from valley bottom environments up to approximately 1,100 meters elevation, often underneath root mats and fallen logs, or in hollow tree cavities. On occasion, black bears will excavate ground dens in areas that have suitable soil substrates. In general, grizzly bear ground dens usually have larger entrances and larger inside chambers than the dens of black bear, wolves or coyotes.

Grizzly Bear Ground Dens -- What to look for.

Grizzly Bear Ground Den Description
• Grizzly Bear ground den entrances are usually about 75 cm in diameter. • Den chambers may be 150-225 cm in diameter with a height of 125 cm. • Dens are usually lined with shrub branches, tree boughs, duff, or grass. However, some dens may be unlined. • Hair is often visible at the den entrance and in bedding material. • Because of their long front claws and powerful shoulder muscles adapted for digging, many grizzly dens are excavated. In these cases, large piles of soil, rocks or wood (called a "porch") are found downslope of the den entrance. • Fresh material with little or no vegetation growing on a debris pile may indicate a freshly dug den. • Unexcavated grizzly dens are often located under root wads of large trees and occasionally in sheltered, dry caves or rock cavities. • Den sites are often most visible in spring during snow melt when soil from the den gets tracked onto the surrounding snow, thereby enhancing melting immediately around the den (i.e., the den area becomes more visible in contrast to the adjacent snow). • Tracks in the snow or trails on the ground may lead to or from den sites.

Information to consider when planning and conducting primary forest activities near Grizzly Bear ground dens.

Information to Consider
• Because Grizzly Bear dens are often located in alpine and subalpine habitats, there may be few trees immediately around the den. If the den appears to be recently used (i.e., excavated soil or rocks below the entrance and little or no vegetation growing on the debris pile), consider establishing a windfirm buffer zone around the den (approximately 1 ha in size is suggested). Bears may reuse suitable den sites or excavate new dens in the same vicinity. • Resource activities (e.g., helicopter landing pads, and road construction) should be restricted to outside the buffer zone described above. • If a recently used grizzly den is discovered in a forested area, where possible establish a wildlife tree patch (wildlife tree retention area) or other retention area around the den. • If necessary, consider developing access management plans to minimize potential disturbance to den areas. • If more than one confirmed den site is found in a relatively small area (1-2 ha), then it is possible that bears are regularly (and repeatedly) using this area for winter denning. • Consider having a qualified professional biologist confirm what species has been recently using an unoccupied ground den. Consult the IWMS species account http://www.env.gov.bc.ca/wld/frpa/iwms/documents/Mammals/m_grizzlybear.pdf for detailed information on Grizzly Bear habitat characteristics.

A Significant Mineral Lick

Definition - A significant mineral lick means an area used on a habitual basis by ungulates to obtain dietary macroelements including sodium, calcium and phosphorous, and trace elements such as manganese, copper or selenium, that:

- a) is regionally rare on the landscape; and
- b) is used regularly and annually by one or more species (i.e., demonstrates clear evidence of heavy use).

This definition is not applicable where the mineral lick has been created by a primary forest activity (e.g., road construction).



Mountain goats at a dry mineral lick. (Photo: Deal Photography)

Importance of mineral licks

A mineral lick is a natural mineral deposit where animals in nutrient-poor ecosystems can obtain essential mineral nutrients. Mineral licks are frequented by ungulates throughout the year, but particularly during periods when bone, antler, horn, and muscle growth peak (i.e., spring and summer). It is believed that ungulates require these minerals for nutrition, but also to aid in digestion by countering the effects of unpalatable plant compounds. Mineral licks are relatively uncommon across the landscape and some ungulates will travel extensive distances (e.g., over 15 km) to visit them.

What to look for - Mineral licks

Three types of mineral licks are generally recognized:

- (i) wet or mucky mineral licks found in seepage areas;
- (ii) dry earth exposures such as clay or lacustrine deposits, often found above river cutbanks; and
- (iii) rock face mineral licks.

Some mineral licks with exposed mineral crystallization are easily recognizable due to their white or colourful mineral deposits. Other mineral licks are nondescript and are easily overlooked and only appear as bare soil areas or muddy seepages. Most mineral licks will have visible, well used wildlife trails typically radiate out in multiple directions from the mineral lick. Bare soil areas associated with most mineral licks are usually covered in animal tracks that can help identify which wildlife species are using the mineral lick.

A Significant Mineral Lick -- What to look for.

Description of a Significant Mineral Lick
- Well-established trails or braided trail systems through forested and non-forested areas, usually lead to regularly used mineral lick sites. Although these trails will be used most frequently in the spring and early summer, Mountain Goats also visit mineral lick sites during the fall (October-November). - Both dry and wet mineral licks can occur. Seepage areas and hot springs may provide potential mineral licks. In contrast, clay and/or silty lacustrine cutbanks or rock face areas can provide high concentrations of minerals. - Heavy use of the lick is evidenced by areas of trampling (wet lick) or significant excavation (dry lick). - Other evidence of use at each mineral lick site includes teeth marks, pellets, tracks and hair.

Information to consider when planning and conducting primary forest activities near a significant mineral lick.

Information to Consider
• Avoid physical destruction of the mineral lick site (i.e., harvesting or road building through a mineral lick). • Where possible, maintain the integrity of trails between mineral lick sites and seasonal ranges (winter/spring). • Avoid locating new roads near known mineral lick sites and trails. It is important not to isolate the mineral lick from nearby escape cover. If roads are required near mineral licks, implement measures to minimize disturbance to mineral lick access trails by minimizing the number of road crossings. • For existing roads near known mineral licks, where possible, minimize road use and disturbance during critical use periods (May-November; date depending on geographic location and ungulate species). • Where roads can be deactivated, do so as soon as possible, and consider ATV restrictions. • Arrange flight plans for helicopter or fixed wing activity to avoid known mineral licks, especially during critical use periods (May-November). • Consider having a qualified professional assess the use and significance of the site for local ungulate populations. For mineral licks that are known to have Mountain Goat use, please refer to the Management Plan for Mountain Goat for British Columbia http://www.env.gov.bc.ca/wld/documents/recovery/management_plans/MtGoat_MP_Final_28May2010.pdf for further management options.

A Significant Wallow

Definition - A significant wallow means a shallow depression or pit in the ground created by ungulates (applicable to Elk and Mountain Goat) or Grizzly Bear through regular (not occasional) digging, trampling or rolling, or an existing wet depression regularly used by ungulates or grizzly bears to wallow. A significant wallow is:

- a) regionally rare on the landscape;
- b) typically used regularly and repeatedly (at least annually) by one or more species; and
- c) used by multiple individuals within a local population.



Wallow in high elevation fen. (Photo: Eliot Terry)

Importance of wallows

Ungulates roll in wallows to cover themselves in mud or dust to provide relief from biting insects. In addition, wallowing may serve a social function during the breeding season where male ungulates (e.g., elk) will urinate in the wallow and roll in it to attract females. Wallowing may also be important as a grooming behavior associated with molting, social behavior for group cohesion, or simply play behavior. Bears will also roll in wallows to help cool themselves in summer and as a method of marking their presence to other bears.

What to look for - Wallows

Wallows are typically shallow depressions in the soil that can either be wet or dry. They are generally situated in openings or clearings, usually adjacent to nearby security cover. Many wallows lack plant cover in their centers due to the disturbed conditions from frequent wildlife use that inhibits plant growth. The bare soils of wallows are usually covered in animal tracks that can provide an indication of what wildlife species are using the wallow. Well used wildlife trails typically radiate out in multiple directions from the wallow.



Grizzly Bear in wallow. (Photo: Steve Stuller)

A Significant Wallow - What to look for.

Species	Description of a Significant Wallow
Ungulates and Grizzly Bears	• Shallow wet/mucky depressions ranging in size from 2-3 m to many meters wide and typically less than 20 cm deep. • Disturbed vegetation (herbs and low shrubs) because of pawing, digging or rolling, often in a non-forested area for ungulates (e.g., wet meadow). These sites may have a strong odor of urine. Also look for tracks, shed hairs or droppings nearby.
Grizzly Bears	• Grizzly Bear wallows are almost always found where there is seepage or the water table is close to the surface (e.g., near skunk cabbage seeps); others are found in muddy patches. Typical locations are in or beside shrubby fringes of estuaries and wetlands, in open forests where an underground spring comes to the surface, or in small pockets of imperfect drainage.

	• Grizzly Bear wallows contain shed hairs and provide excellent conditions for tracks. The edges of bear wallows may be worn smooth from bears laying and rubbing against them. Tree branches, roots and duff along the edges usually have an abundance of snagged hairs. The fine bear hairs contrast with the coarse hair of ungulates. • Grizzly Bear wallows are often found in proximity to mark trees. Well-worn bear trails or mark trails may also lead to or skirt around the wallow. CAUTION: If you suspect you have located a Grizzly Bear wallow, use caution and “bear awareness” while investigating the feature.
--	---

Information to consider when planning and conducting primary forest activities near a significant wallow.

Information to Consider
• Avoid destruction of the wallow site. • Avoid road construction and human disturbances near known wallow areas during the autumn rut for ungulates (September-November). • Incorporate wallows into forested retention areas such as a wildlife tree patch (wildlife tree retention area) or Riparian Management Area (RMA). Aim to maintain the wallow with connectivity to the forested matrix. • Consider having a qualified professional assess the use and significance of the site for local ungulate and bear populations.

A Bat Hibernaculum

Definition - A *bat hibernaculum* means a feature used by bats to hibernate during the winter.



Townsend's big-eared bat hibernaculum located in a cave. (Photo: Anna Roberts)

Importance of a bat hibernaculum

A bat hibernaculum is a site where bats hibernate over the winter. Hibernacula are most often caves, cliff crevices, or abandoned mines characterized by cool, constant temperatures and provide protection from the elements and predators. The cool, moist microclimate in hibernacula allows the bats to go into a torpid state for most of the winter, infrequently awakening. Human disturbance can disrupt the hibernating bats, depleting necessary energy resources to survive the winter. Continued disturbance during hibernation can be fatal to bats.

Typically, several species of bat will use a hibernaculum since these features are relatively scarce across the landscape. Hibernacula are generally used year after year. Blocking or damaging the entrances to hibernacula can render them unusable.

What to look for -- bat hibernaculum

Bat hibernacula can be large and conspicuous such as a cave or mine opening or a large fissure in a rock face. Alternatively, they can be small and easily overlooked like a ground sink hole, a collapsed mine shaft or tunnel, or a narrow rock crevice. If the entrance is sufficiently large, the suspected hibernaculum can be cautiously inspected by shining a flashlight into the chamber and looking for any evidence of use. Hibernating bats typically cluster together in groups to maintain body heat, hanging from the ceilings or

walls; others may hibernate individually. Bat droppings (guano) are often present at the base of the entrance and the smell of ammonia from the bats' urine may be noticeable at recently active hibernacula. Bat droppings are like mouse or rat droppings but are generally not as smoothly formed and have a shiny speckled appearance from the remains of insect wings. At dusk, bats may be seen emerging from or flying around the entrance as they leave to forage.

Bat hibernaculum - what to look for.

Description of a Bat Hibernaculum
• Most of the known bat hibernacula in British Columbia are in caves, cliff crevices, or horizontal mine tunnels. • Karst (limestone) landscapes with their many caves, are especially significant areas for bat hibernacula. • The temperature and humidity range used for hibernation varies with the species, but in general, bats select areas with high humidity and cool (1°-8° C) temperatures that vary little throughout winter. • Other features of hibernacula are that they are dark and secluded, with little disturbance from human activity.

Information to consider when managing habitat adjacent to a bat hibernaculum.

Information to consider
• Consider incorporating the hibernaculum into a windfirm wildlife tree retention area or other retention patch. • Avoid harvesting or salvaging trees within the retention area. • Avoid road building or blasting near the retention area, especially during October to May. • Minimize adjacent disturbance during critical times, generally October to May. • If the bat hibernaculum is located within a karst landscape, then refer to best management practices within the Karst Management Handbook for British Columbia. http://www.for.gov.bc.ca/hfp/publications/00189/Karst-Mgmt-Handbook-web.pdf. • If necessary, consider having a qualified professional confirm the identity of the bat species using the hibernaculum. • Consider installing a "bat-friendly" gate or other means of limiting human disturbance/access to known hibernacula (especially during the October-May hibernation period). For help with identifying bat species of British Columbia, please refer to the publication <i>An Identification Manual to the Small Mammals of British Columbia</i> http://www.env.gov.bc.ca/wld/documents/techpub/id_keys_s.pdf. Refer to the IWMS strategy for additional guidance concerning the management of any IWMS species if they are confirmed to be associated with the bat hibernaculum http://www.env.gov.bc.ca/wld/frpa/iwms/accounts.html. Additional information for each species can be found on the Species at Risk public registry at http://www.registrelep-sararegistry.gc.ca/species/default_e.cfm.

A Bat Maternity Roost

Definition - A *bat maternity roost* means a feature that “houses” an aggregation of bats and their young.



Western redcedar bat maternity roost. (Photo: Province of British Columbia)

Importance of a bat maternity roost

A bat maternity roost is where female bats give birth and rear their young during the summer. Some maternity roosts are used by single female, while others may be used by large concentrations of females. Maternity roosts are typically warm sites (often located on southerly aspects), the heat of which aids in thermoregulating the young while they are developing. Roost sites are generally confined areas that help to inhibit predator entry.



Inside a western redcedar bat maternity roost (looking upwards). (Photo: Suzanne Beauchesne)

Several species of bat may use a maternity roost since there are relatively few of these features across the landscape (especially roosts which have the potential for continued multi-year use, such as those located in hollow trees and rock crevices). Maternity roosts may be used year after year. Continual disturbance while the females are tending their young in the maternity roost may cause abandonment.

What to look for – Bat maternity roost

Bat maternity roosts can be natural sites like hollow trees, ‘stub trees’, hollow branches or sloughing bark, as well as rock crevices on warm aspects.

Features that are suspected of being maternity roosts can be cautiously inspected by shining a flashlight into the entrance and looking for any evidence of use. Bat droppings (guano) are often present at the base of the entrance and the smell of ammonia from the bats’ urine may be noticeable at recently used roosts. Bat droppings are similar to mouse or rat droppings but are generally not as smoothly formed and have a shiny speckled appearance from the remains of insect exoskeletons and wings. At dusk, bats may be seen emerging from or flying around the entrance as they leave to forage.

Bat maternity roosts - what to look for.

Description of Bat Maternity Roosts
• Maternity roosts are usually located in natural sites such as trees and rock crevices, and occasionally in man-made structures such as the attics of buildings. In British Columbia, most caves and mine tunnels are too cool for use as maternity roosts. • Temperature requirements vary with the bat species, but in general, female bats select sites with warm temperatures (often located on sunny southerly aspects and on the south side of a tree), or that facilitate increased temperature from aggregating together, that promote rapid growth of the young. • Bats using tree roosts prefer to roost in older forests, where they select wildlife trees with a moderate decay stage (tree classes 2-6), large diameter and height, and with much of their bark remaining. The maternity roost may be located under bark or within hollow stem cavities. • Rock crevices used for maternity sites are usually in warm, inaccessible sites on south-facing aspects.

Information to consider when managing habitat adjacent to bat maternity roosts.

Information to consider
• Consider establishing a wildlife tree retention area (WTRA) or other forested retention patch centered around confirmed maternity roosts. • When establishing 'Wildlife Tree Retention Areas' or other treed retention patches as part of stand-level biodiversity retention requirements try to include trees that have features which make them amenable as potential bat maternity roosts (i.e., trees with loose sloughing bark, hollow cavities, stem cracks and broken tops). Those trees which have the potential for continued multi-year use, such as hollow trees and trees with stem cracks or thick, loosening bark, are particularly valuable. • Avoid blasting, removal of rock or talus, or construction of new roads near WTRA or retention patch surrounding the roost unless there is no other practicable option. • Avoid salvaging trees within the WTRA or retention patch. • Within harvest areas retain some large diameter (generally > 50 cm dbh) defective trees (i.e., trees with hollows, stem cracks, broken tops, or loose bark) and veteran trees, especially those which extend above the main canopy. • Western redcedar, Douglas-fir, western hemlock, and spruce are preferred as potential roost trees. • Anchor WTRAs around cliffs or rock outcroppings which have openings or crevices (especially those which have sunny aspects). The most suitable cliff or rock outcrop sites will usually be at lower elevations. • Minimize disturbance adjacent to known roost sites during critical times, generally May to September (i.e., when young are born and reared). • If necessary, consider having a qualified professional confirm the identity of the bat species using the maternity roost. • Because many roost trees are either dead or decayed, they are often targeted by firewood cutters. Consider placing a "Wildlife Tree Sign" on roost trees in locations near public roads to educate the public and others about their high ecological value.

For help with identifying bat species of British Columbia, please refer to the publication *An Identification Manual to the Small Mammals of British Columbia*
http://www.env.gov.bc.ca/wld/documents/techpub/id_keys_s.pdf.

Refer to the IWMS strategy for additional guidance concerning the management of any IWMS species if they are confirmed to be associated with the bat hibernaculum
<http://www.env.gov.bc.ca/wld/frpa/iwms/accounts.html>. Additional information for each species can be found on the Species at Risk public registry at http://www.registrelep-sararegistry.gc.ca/species/default_e.cfm.

A Nest tree of a Pileated Woodpecker

1) Definition - A nest tree of a Pileated Woodpecker (*Dryocopus pileatus*) means a structure used by a Pileated Woodpecker to hold its eggs or offspring and the tree containing the structure.

Species Description

The Pileated Woodpecker is a large (40-49 cm long; 250-350 g body mass), mostly black woodpecker native to North America and is widely distributed in southern British Columbia. The species occurs in mature, coastal and interior Douglas-fir and western hemlock forests, including adjacent logged and second growth areas, to open deciduous and mixed forests. Pileated Woodpeckers are insectivores that forage in a variety of habitats but is usually considered a bird of mature forests where large trees provide nesting and roosting sites and foraging habitat.

The Pileated Woodpecker is Yellow-listed in British Columbia and a species requiring special management under the Migratory Birds Regulation.

What to look for - Characteristics of preferred habitat

Pileated Woodpeckers nest in mature mixed or coniferous forests or in younger forests with numerous large, dead trees. Query tools are available (e.g., [Bird Canada Calendar Query Tool](#)) to help determine when pileated woodpecker nesting occurs in a region.

Pileated Woodpecker Nests - What to look for.

Pileated Woodpecker Nest Description
• Pileated Woodpeckers typically use large (> 40 cm diameter breast height), solid trees, with heart rot for nesting. • Nesting trees normally contain only one entrance hole. It is rare to find a tree with more than one nest cavity, but when several nest cavities are encountered, entrance holes are typically over 1 m apart. • Nearby trees may also contain dummy cavities, as woodpeckers in some locations excavated an average of 1.2 nest cavities per pair each year. • Nest cavities have an internal diameter of about 20 cm and are up to 75 cm deep. • Entrances can be circular or slightly oval (tear drop shaped), with a vertical diameter around 12 cm and a horizontal diameter around 9 cm. • Entrances have smooth edges and surfaces. Nesting cavities may appear dark from the outside, because they lead to a hollow chamber.



Pileated Woodpecker nesting cavities (Photo: Government of Canada)

Pileated Woodpecker Roost Cavities – What to look for.

Pileated Woodpecker Roost Cavity Description
• Pileated Woodpeckers use their nest cavities for roosting, especially during the breeding season, or they can excavate new holes for roosting. • Pileated woodpeckers sleep or roost in cavities at night. They can be seen leaving roosts after sunrise and returning to roosts about 1 h before sunset until shortly after sunset. • Compared with nesting trees, trees that are only used for roosting are often hollow and may have numerous entrance holes (2 to 10+). This gives pileated woodpeckers several exits for evading predators. • Nest cavities may become cavities that are only used for roosting as a tree ages, and more holes may be added to these trees over time. • Entrance holes to roost cavities are excavated in all seasons. • Roost cavities average about 28 cm in internal diameter and 4.3 m in length. Roost cavity entrance holes may be less than 1 m apart. • Entrance holes are usually oval and about 7.5 to 10 cm wide by 10 to 12.5 cm high.



Pileated woodpecker roosting cavities (Photo: Government of Canada)

Pileated Woodpecker Feeding Cavities – What to look for.

Pileated Woodpecker Feeding Cavity Description
• Pileated Woodpeckers mostly forage from large diameter (at least 25 cm dbh, preferably > 40 cm dbh), decaying trees and woody debris. • They will also feed on living trees with decayed heart. • Feeding cavities differ from nest and roost cavities in three key ways: (1) they are more irregular in shape (instead of symmetrical), (2) they have rough edges and surfaces, and (3) they only extend 5 to 20 cm into a tree and then stop (they do not lead to large chambers suitable for roosting or nesting). • Because feeding cavities do not lead to large chambers, they typically appear lighter in colour than nest or roost cavities.



Pileated woodpecker feeding cavities (Photo: Government of Canada)

Information to consider when planning and conducting primary forest activities near a nest, roost or feeding cavity of a Pileated Woodpecker.

Information to Consider
• Pileated Woodpecker nests are protected under the Migratory Bird Regulation for 36 months after reported unoccupied. • You can commit an offence and be charged even if you accidentally contravene the regulations. Therefore, due diligence is required of all stakeholders to ensure nests are not destroyed (purposefully or unknowingly). • If you are unsure about a nest, then seek the advice of a Qualified Professional. • Stakeholders may only damage, disturb, or remove a nest if Environment and Climate Change Canada has received a notification through the electronic Abandoned Nest Registry regarding the potentially abandoned nest, and the nest remains unoccupied by any migratory bird for the period of 36 months. • To determine occupancy, nest need to be observed by an appropriate Qualified Professional during a period when they could reasonably be expected to be occupied by breeding birds. • If a protected nest site has become a hazard, then there is a provision for the proponent to apply for a permit from Environment and Climate Change Canada to destroy the nest. For further information about the Migratory Bird regulation (protection, abandoned nest registry, permits, set-backs), visit: https://www.canada.ca/en/environment-climate-change/services/migratory-bird-permits/faq-migratory-birds-regulations-2022.html