

## **The Importance of Wildlife trees in the Morrell Nature Sanctuary**

Wildlife trees are standing dead or living trees that serve as important habitat for the conservation of wildlife. The most important wildlife trees are usually large, old, damaged, deformed, diseased or decaying trees or snags which can be readily excavated by various bird species for nests and roosts. Unfortunately, according to wildlife conservation biologist, Christoph Steeger, "there's systematic elimination of those roost trees and habitat trees because of forestry and safety concerns, residential and agricultural development – we have so few snags in our environment and so many species require them." He noted just because a tree may be dead, its use in the ecosystem isn't over; if they don't present a safety hazard, it's important to leave them be. The consequence of not having enough wildlife trees, he warned, is extinction.

### **Tree Species in the Morrell Nature Sanctuary**

In the Coastal Douglas-fir biogeoclimatic zone where the Morrell Nature Sanctuary is located, Douglas-fir is an extremely important wildlife tree. Woodpeckers and nuthatches frequently forage on the corky bark which provides good habitat for insects. Woodpeckers also excavate into the inner wood to create nesting cavities. Many birds and mammals consume the seeds of this species, while dead and dying Douglas-firs supply nesting opportunities for a wide variety of woodpeckers and other cavity users. They are also used for roosting by bats and for denning by pine martens. Witches' broom in Douglas-firs are sites for nesting, roosting and resting for owls.

Other trees in the Morrell Nature Sanctuary include western red-cedar, grand fir, shore pine, arbutus, Garry oak, red alder, black cottonwood, and bigleaf maple. Among the conifers, Douglas-fir appears to be the most sought-after wildlife tree by the greatest number of wildlife species, followed by western red-cedar and shore pine. The most valuable hardwood species are black cottonwood, red alder, and bigleaf maple.

### **Special Attributes of Wildlife Trees**

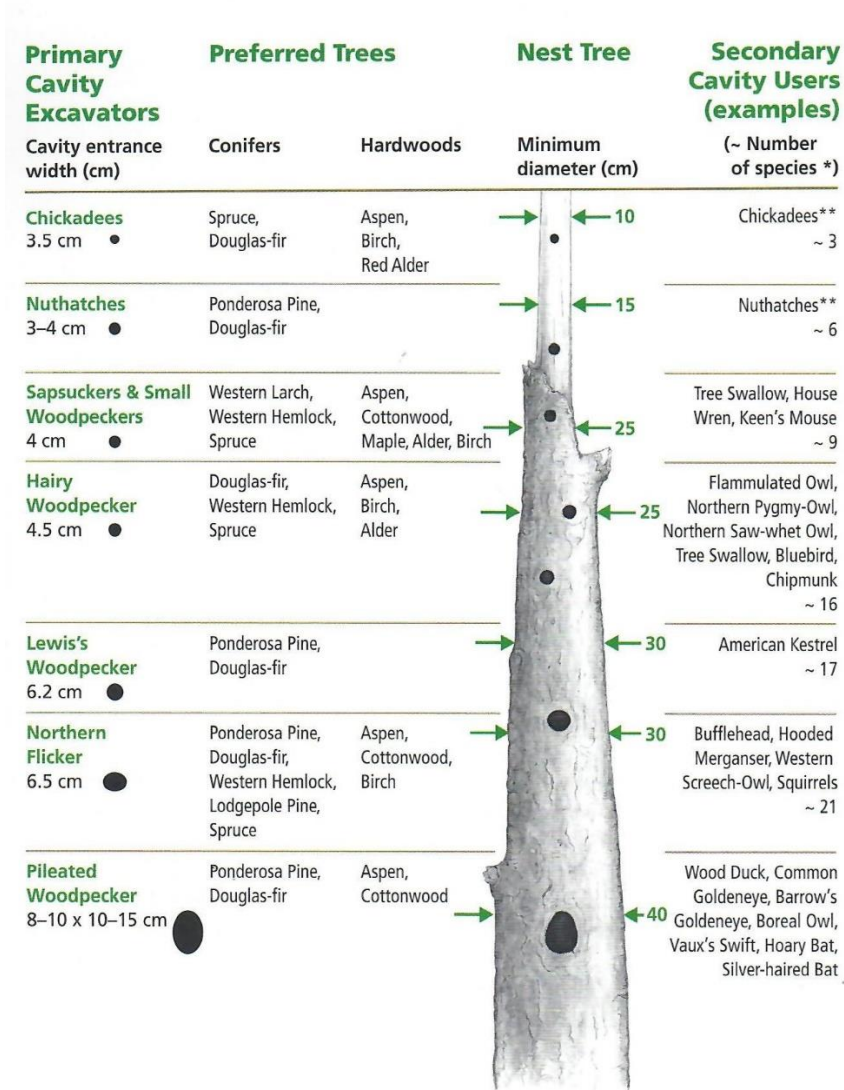
Some of the attributes characteristic of good wildlife trees include size, branch features, witches' broom, bark condition, hollow trunks, and decay class. Large trees have a greater trunk volume, more bark surface area, and usually more branches which offer more habitat in a single tree. The largest trees allow the biggest cavities and offer more security and better lookout posts, providing the most benefits to the widest range of species. As trees age and reach maturity, their branches increase in diameter and strength, sometimes capable of supporting the heavy open nests of bald eagles, ospreys, and great blue herons. A mature tree with dense foliage can provide good cover and shed rain, helping to reduce an animal's energy loss in wet, cold conditions.

Witches' broom are dense clumps of swollen stems and branches, typically caused by dwarf mistletoe, a parasitic flowering plant that absorbs nutrients, water and carbohydrates from its host tree. Although broom are deformations of the tree, they provide habitat for some wildlife, such as elevated platforms for safe resting, nesting and denning, as well as vantage points for predators to detect prey. Furrowed bark in older trees provides habitat for insects which are an important food source for many wildlife species. After a tree dies, the bark loosens and pulls away from the trunk, and the protected space under the sloughing bark becomes valuable habitat for bats and small birds.

Hollow trunks provide large cavities that offer safety and shelter to many species. They are used as colonial roost sites by bats and hibernation dens by black bears, as nest and roosting sites by large owls, and as temporary rest sites or maternal dens by mammals such as martens. Decay fungi convert healthy trees into potential wildlife trees by supporting large insect populations for foraging birds and by making cavity excavation much easier. Strong cavity excavators such as woodpeckers prefer to nest in trees that have live sapwood, but with heartwood that has been softened by rot. The weakened inner wood of these trees offers less resistance when the birds are excavating their nest cavities at the centre of the trunk, whereas the firm sapwood provides strong walls and secure entranceways. Weak excavators such as nuthatches and chickadees can excavate only in trees in advanced stages of decay.

## Primary Cavity Excavators and Secondary Cavity Users

Primary cavity excavators are birds that create their own nest holes in trees. This guild consists of the woodpeckers, sapsuckers, flickers, nuthatches, chickadees. At the Morrell Nature Sanctuary, primary cavity excavators include the pileated woodpecker, hairy woodpecker, downy woodpecker, northern flicker, red-breasted sapsucker, chestnut-backed chickadee, and red-breasted nuthatch. Secondary cavity users are animals that use either the abandoned nest holes of primary cavity excavators or natural chambers formed by trunk breakage, branch loss and other damage and decay. Among the members of this guild are some species of ducks, owls, bats, squirrels, martens, and black bears. At the Morrell sanctuary these species include the barred owl, big brown bat, California myotis, little brown myotis, hoary bat, silver-haired bat, red squirrel, and pine marten. Another group of wildlife tree users is the open nester guild, which consists of birds such as eagles, ospreys, and herons that construct massive, open nests on strong tree limbs or treetops. These birds are represented by bald eagles and great blue herons at the Morrell Nature Sanctuary. A summary of primary and secondary cavity species webs is reproduced in the figure below from *Wildlife & Trees in British Columbia* (Figure 14).










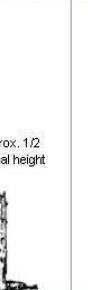

\* Although secondary cavity users may fit, some species do not occur in the range of the primary excavators.

\*\* Chickadees and nuthatches can be either primary or secondary.

Woodpeckers, especially the strong excavators, are considered keystone species because they provide essential habitat for the group of birds and mammals known as secondary cavity users, which become tenants after the woodpeckers vacate their nest holes. Although chickadees and nuthatches can excavate their own nest and roost holes if the right type of wildlife tree is available, they often use existing cavities so are not regarded as keystone species. Large cavities have the most potential to provide habitat for the most secondary cavity users so the largest woodpecker in British Columbia, the pileated, is a very important keystone species. The northern flicker, although much smaller than the pileated woodpecker, is even more important as a keystone species in this province because it is much more abundant and widely distributed. The sapsuckers have been called “double keystone” species because they (1) provide nesting and roosting habitat for small secondary users such as chickadees, wrens, and swallows, and (2) they make available a food source for a variety of species. The food comes from “sap wells” which are small holes that sapsuckers drill in live trees. Both the sugar-rich sap that collects in the wells and the insects that are attracted to it are consumed by sapsuckers and other species. Sapsucker wells are a vital source of nutrition for rufous hummingbirds in early Spring before flowering plants can provide sufficient nectar.

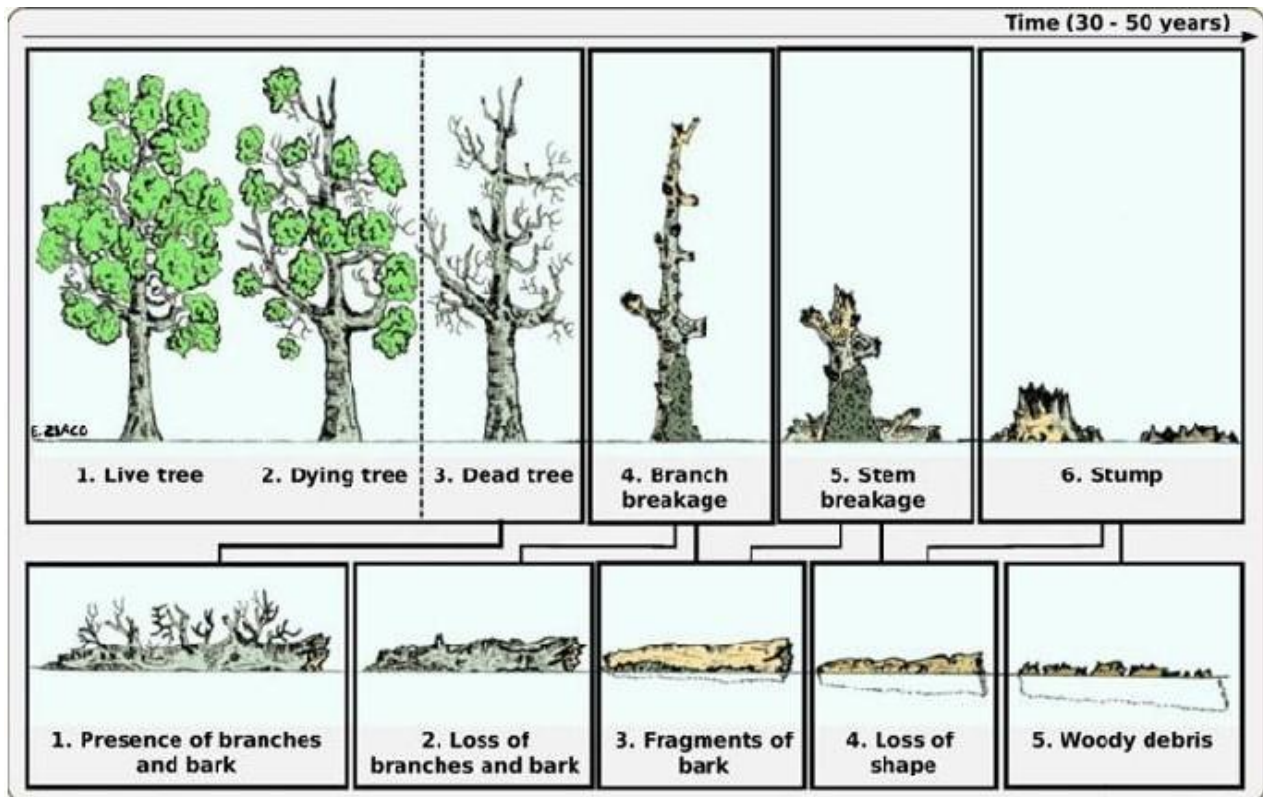
### Classifying Wildlife Trees

A wildlife tree is defined by the British Columbia Wildlife Tree Committee as any standing dead or live tree with special characteristics that provide valuable present or future habitat for the conservation or enhancement of wildlife. Wildlife trees must be greater than 10 cm diameter breast height (dbh), as this is generally accepted as the minimum size of tree used for cavities, and greater than 1.3 m in height. Stumps smaller than 1.3 m in height are considered coarse woody debris. The classification of wildlife trees ranges from Class 1 (live and healthy) to Class 9 (decaying debris).

LIVE		DEAD					DEAD FALLEN	
Decay class								
1	2	3	4	5	6	7	8	9
								
<b>Description</b>								
<b>Live/healthy;</b> no decay; tree has valuable habitat characteristics such as large, clustered or gnarled branches, or horizontal, thickly moss-covered branches.*	<b>Live/unhealthy;</b> internal decay or growth deformities (including insect damage, broken tops); dying tree.*	<b>Dead;</b> needles or twigs may be present; roots sound.	<b>Dead;</b> no needles/twigs; 50% of branches lost; loose bark; top usually broken; roots stable.	<b>Dead;</b> most branches/bark absent; some internal decay; roots of larger trees stable.	<b>Dead;</b> no branches or bark; sapwood/heartwood sloughing from upper bole; decay more advanced; lateral roots of larger trees softening; smaller ones unstable.	<b>Dead;</b> extensive internal decay; outer shell may be hard; lateral roots completely decomposed; hollow or nearly hollow shells.	<b>Debris;</b> downed trees or stumps.	
<b>Uses and users</b>								
Nesting (e.g., Bald Eagle, Great Blue Heron colonies, Marbled Murrelet); feeding, roosting, perching.	Nesting/roosting — strong PCEs <sup>2</sup> (woodpeckers); SCUs <sup>3</sup> ; large-limb and platform nests (Ospreys); insect feeders.	Nesting/roosting—strong PCEs; SCUs; bats.	Nesting/roosting —PCEs; SCUs; insect feeders.	Nesting/roosting—weak PCEs (nuthatches, chickadees); SCUs; bats; insect feeders.	Weaker PCEs; SCUs; insect feeders; salamanders; small mammals; hunting perches.	Insect feeders; salamanders; small mammals; hunting perches; occasionally used by weak cavity excavators such as chickadees.	Insect feeders; salamanders; small mammals; drumming logs for grouse; flicker foraging; nutrient source.	
<sup>1</sup> Large 'witches' brooms provide nesting/denning habitat for some species (e.g., fisher, squirrels). <sup>2</sup> PCE = primary cavity excavator <sup>3</sup> SCU = secondary cavity user * This classification system does not recognize root disease trees specifically. Such trees become unstable at or before death.								

Each category of wildlife tree offers different habitats for a number of species so a mixture of wildlife tree classes and different tree species across the landscape is the best means of providing the broadest habitat for the largest number of wildlife species. Live, healthy trees (Class 1) offer nesting, roosting, and perching for eagles, osprey, raptors, and scavengers, among others. Live, but unhealthy trees (Class 2) provide nesting and roosting habitat for primary cavity nesters (strong woodpeckers) and secondary cavity users (small owls, nuthatches). The number of cavities increases with the age and diameter of the tree, and wetter sites typically receive less use.

Nesting availability is often a limiting factor for woodpeckers; they will nest in trees with a dbh greater than 30 cm and a minimum height of 15 m. These primary cavity excavators depend on trees with varying degrees of heartwood decay surrounded by firm sapwood to provide protection from the elements. They also require dead standing trees and coarse woody debris for feeding. Frequently, birds may nest in the live, unhealthy trees found in classes 1 to 3, but feed on standing dead debris, stumps and woody debris from classes 3 through 9. Class 3 and 4 trees are also used by other species, such as the bald eagle, for roosting and perching. Class 5 snags tend to be frequented by weaker cavity nesters, bats, and salamanders, while bats will often use old abandoned cavities. Class 6 trees are used by insect feeders, salamanders, and small mammals. Class 7 and 8 trees provide a source of prey for insectivores and are used by a variety of small mammals and salamanders. Other wildlife tree users include red squirrels, large owls occupying open nests and using the trees for perching and hunting, and smaller owls which may use old cavities for nests. Black bears will use larger Douglas-fir trees as den sites, and will forage around these sites. Hardwood trees typically do not live as long as conifers and usually follow an aging process as illustrated below. As noted earlier, valuable hardwood wildlife trees include black cottonwood, red alder, and bigleaf maple.





*Cavities excavated by pileated woodpeckers*



*Pileated woodpecker*



*Holes drilled in Maple tree by red-breasted sapsucker*



*Red-breasted sapsucker*

**Examples of cavities made by Woodpeckers and Sapsuckers on the  
Rocky Knoll and Tranquility trails at the Morrell Nature Sanctuary  
(Bird photos by Bob Harvey; Tree cavity photos by Lance Nordstrom)**

**References:**

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