



Haliburton
Highlands
Land Trust

*Protecting the land we love
for future generation*

The Important Role of Dead Trees

A resource for HHLT Partners in Conservation

At the time a tree dies, it has only partially fulfilled its potential ecological function.

It is important to keep the above statement in mind when approaching the management of your forested property. The perception of dead trees as mere 'waste' or 'debris' is misguided and needs to be examined. As the tree dies and transforms from a living state to decomposition, it cultivates an environment that supports a myriad of life. Unnoticed by most, the process of tree decomposition significantly increases biodiversity. A rich tapestry of life springs from death.

Windstorms, lightning, floods, natural aging, fungal and insect infections can all kill trees. When trees die, they can fall, break, lean or remain standing. At every stage of their death, the tree provides an ecological function. For this resource document, the focus will mostly be on down woody debris and snags. Down woody debris is a term used to describe fallen dead trees and branches resting on the forest floor. Snags are dead, standing trees.

Part 1: Why Dead Trees Matter



Downed tree trunks are reservoirs for moisture and foster the growth of mycorrhizal fungi which play a vital role in an underground nutrient sharing network. Fungi starts the process of breaking down wood into the nutrients that are usable by insects and molluscs.

Downed logs are vital components of the forest ecosystem. Rick Whitteker 2023



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Dead wood is anything but dead. The following are common inhabitants of rotting logs:

- fungi
- spiders
- beetles
- snails
- ants
- worms
- centipedes
- sow bugs
- slugs

Rotting log critters provide food for animals such as:

- salamanders
- snakes
- birds
- mice
- shrews
- skunks
- bears

For some forest wildlife, the tree only becomes valuable after it is dead. In fact, studies have shown there is more life in a dead tree than a living one. About 5% of a living tree has living cells which include the leaves, the cambium layer just under the bark and sapwood cells. There can be up to 40% more living cells in a dead tree, largely made up of fungi, insects and bacteria.

As the log softens from fungal and insect action, the wood becomes more accessible to small mammals, such as voles and shrews who use rotting logs as nesting sites and protection from predators. Squirrels and chipmunks use logs as part of their travel pathways for safe escape, elevated feeding platforms and food caches.

Moisture retaining logs are a natural choice for wet-skinned amphibians like salamanders and frogs. Hollow logs provide bees and wasps for nesting sites, and these logs also provide sufficient insulation value for wildlife to survive the extremes of heat and cold.

Dead wood is an important carbon reservoir in a forest ecosystem. During decomposition, carbon is slowly released into the atmosphere. Some carbon is also stored in soil, with all these rotting log inhabitants playing a role in the breakdown of wood fibre into the soil nutrients that can be used by all forest plants.



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Large woody debris also plays a key role in creating diverse ecological niches within forest streams and wetlands. Fallen logs, for example, can provide cover for fish and amphibians, as well as creating pools and gravel deposits which are used for spawning. Debris dams gather leaf litter, providing food for fish and invertebrates. Logs also provide safe basking sites for turtles.

Part 2: Nursing Logs



Nursing Log. Ralph Beare. 2023

Logs, stumps and root balls also act as “nurseries” for plants, a nutrient-rich landing pad for seeds to quickly take root. Slowly decomposing, stumps and logs progress through their own natural succession, with fungi and mosses establishing themselves early, followed by ferns. A thin veneer of soil will eventually form providing the right conditions for sapling growth. Yellow birch and hemlock trees often use these

nursing logs as ideal starters for their small seeds to take hold. After the log or stump rots out, the roots are left elevated like a tree on stilts. Root balls attract the tiny Winter Wren as the gaps between the upturned roots, rocks and soil make for good nesting cavities in the tangled forest understory.



Root balls provide escape routes, nesting and denning sites for wildlife. Rick Whitteker. 2023



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Part 3: Snags



Snags play a significant role in forest ecology. Paul Heaven. 2021

Dead standing trees called snags also provide an important ecological function as multifunctional forest high rises. Often taken down for safety reasons but, if possible, snags should be left standing. Snags often have or will develop cavities which provide food, shelter and safety for many birds and mammals. By letting cavity trees remain standing in your forest, you are providing valuable habitat for wildlife.

Part 4: Tree Cavities

Whether bored out by woodpeckers or developed naturally through decay or branch mortality, tree cavities provide an important ecological function in the forest ecology. More than 50 bird and mammal species rely on tree cavities for:



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- Nesting sites
- Places to raise the young
- Roosting
- Feeding
- Food storage
- Predator escape
- Hibernation
- Clear view perches for birds of prey



Tree cavities provide diverse functions for wildlife. Paul Heaven. 2013

The list of cavity users is extensive and includes the saw-whet owl, barred owl, and kestrel, as well as several species of waterfowl including the common goldeneye and wood duck. Many songbirds, including eastern bluebird, great-crested flycatcher, brown creeper and white breasted nuthatch are cavity nesters.

Various mammals also rely on existing cavities. They include deer mice, bats, weasels including martens and fishers, porcupines, squirrels, raccoons, and even black bears.



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Escape cavities at the base of trees create safe shelters in times of need. Paul Heaven. 2022

Not all cavities will be suitable for nesting, feeding or perching due to their size and location on the tree. Escape cavities provide wildlife temporary shelter from the elements and predation.