

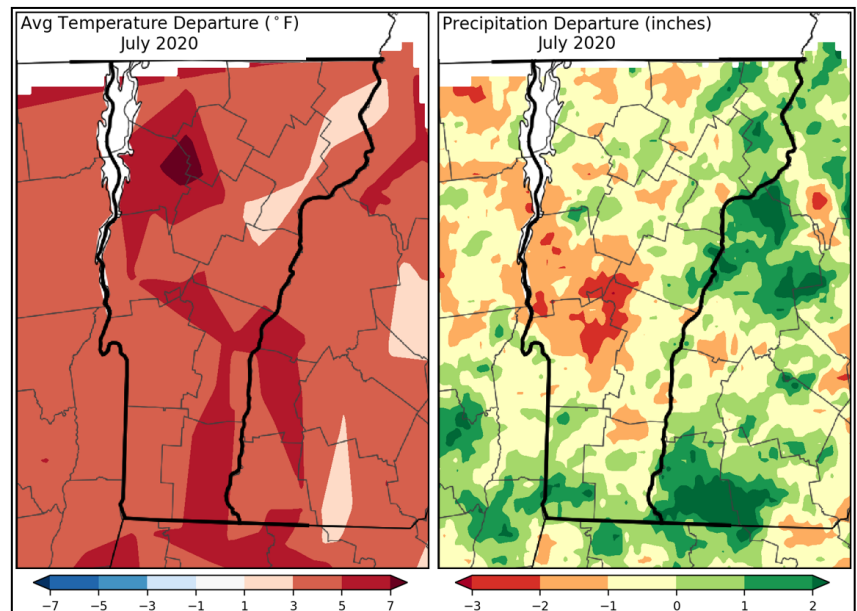
Vermont Forest Health

Insect and Disease Observations — July 2020

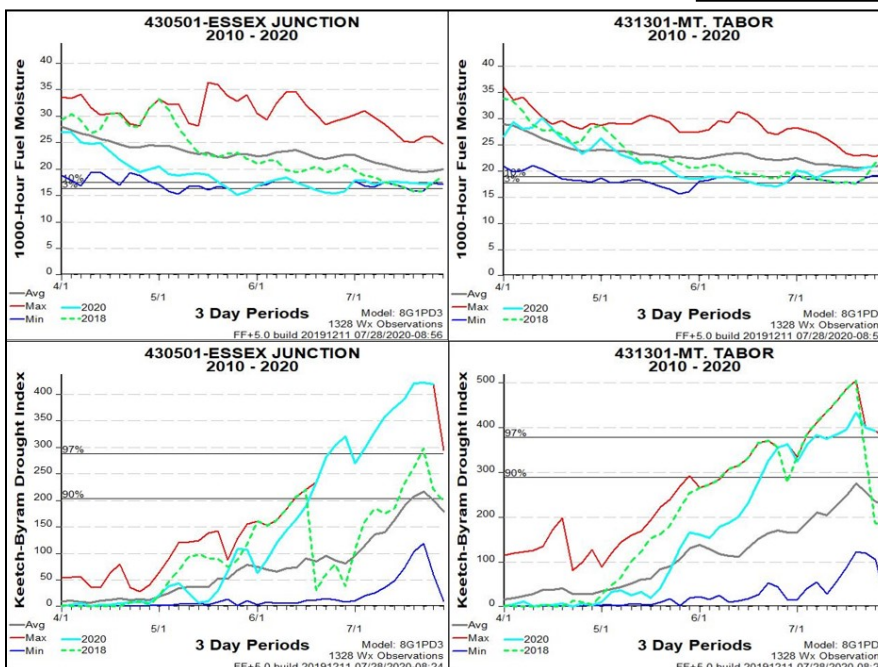
Department of Forests, Parks & Recreation
July 2020
vtforest.com

Weather Recap

July continued to follow the warming trend, with higher temperatures and similar rainfall as the previous year. Statewide temperatures averaged 71°F, which was 2°F warmer than last year. Statewide precipitation averaged 3.93 inches, which was 0.54 inches more than July of last year. In the beginning of the month, the U.S. Drought Monitor listed 39.69% of the state in moderate drought. By the end of the month, this value increased to 41.88%, with the remainder listed as abnormally dry (54.48%) or none (3.64%).



Temperature and precipitation departure from normal. Maps and data: [Northeast Regional Climate Center](http://NortheastRegionalClimateCenter.com).



Recent rains have helped with ground fuel moistures and drought. However, soil moistures as measured by the Keech-Byram Drought Index (KBDI) have been at or above 400 KBDI at both Essex and Mt. Tabor weather stations. KBDI values of over 300 are considered dry and increased potential for fire burning in duff and other ground fuels.

1000-Hour fuel moisture and KBDI values for a subset of VT monitored weather stations. Graphs and data: FPR Staff.

PSA: Don't Move Firewood

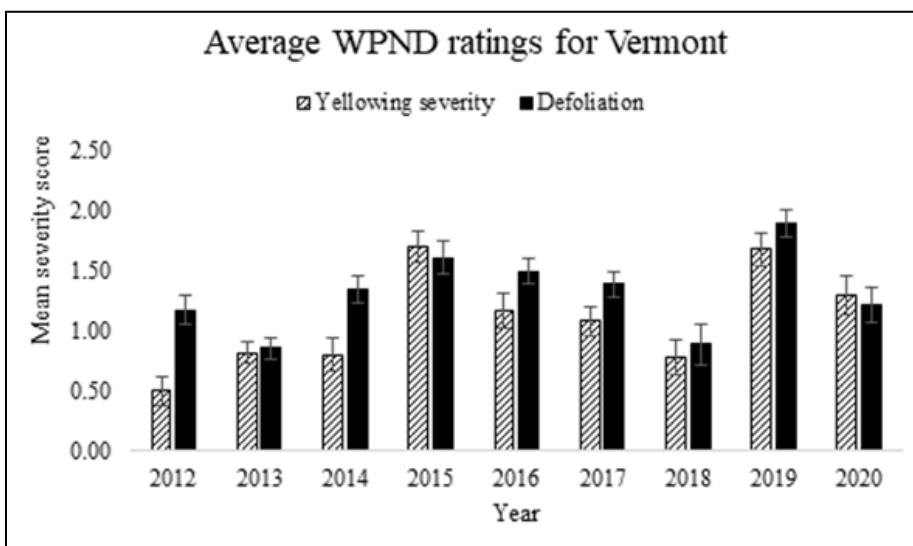
Vermont State Parks welcomed campers for overnight stays beginning on June 26th this year. While many COVID-19 precautions were put into place to ensure the wellbeing of visitors, a new measure was instituted to protect Vermont forests. Starting this year, any firewood brought into state parks that is not already certified heat treated or cannot be burned in one night is being exchanged with firewood from local sources. This measure is being taken to slow the spread of invasive forest pests and pathogens such as the emerald ash borer (EAB, *Agilus planipennis*), Asian long-horned beetle (ALB, *Anoplophora glabripennis*), and oak wilt (*Ceratocystis fagacearum*). Although these examples can be naturally spread or vectored shorter distances, they can hitch rides hundreds of miles by humans transporting contaminated firewood.

Since Vermont State Parks opened for the season, over 100 24x48" bags of firewood have been exchanged and inspected, with one piece of ash wood from an EAB-infested tree being detected. The transportation of this single piece of firewood could cause EAB to rapidly relocate from an infested area to an area free of infestation, resulting in widespread ash mortality within only a few years. For more information about transporting wood and invasive forest pests, please visit dontmovefirewood.org and VTinvasives.org.



EAB galleries from confiscated firewood. Photo credit: FPR Staff.

White Pine Needle Damage Update

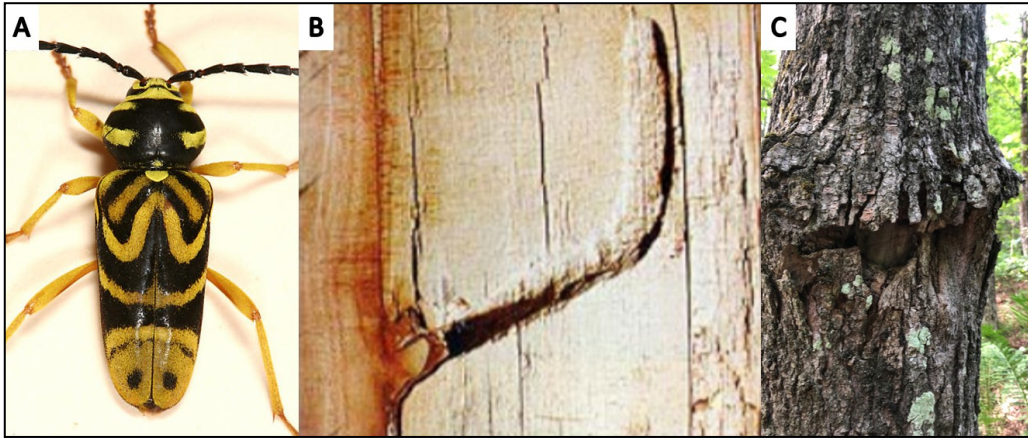


Average WPND yellowing severity and defoliation for Vermont based off our long-term monitoring plots. Graph and data: FPR Staff.

White pine needle damage (WPND) have affected pine foliage in Vermont for the last decade, and this year was no different. While damage was lower than in 2019, significant yellowing and early needle-drop were present throughout the state. The expression of WPND is worse in years following wet springs (e.g., 2020 damage is influenced by 2019 weather). Due to the abnormally dry spring of 2020, we hope to see the severity lessen in 2021. For more information on WPND, please see our annual [Forest Insect and Disease Conditions report](#).

Sugar Maple Borer

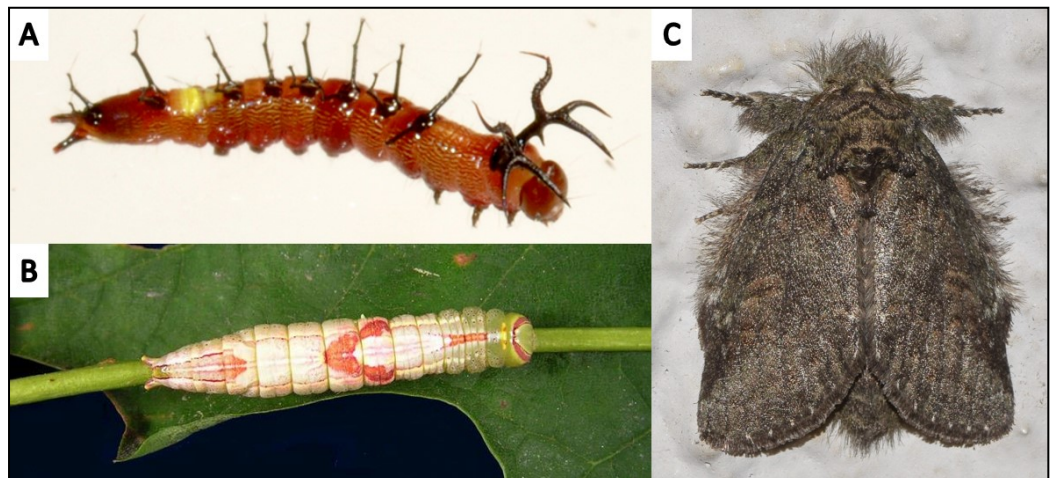
Sugar Maple Borer, *Glycobius speciosus*, is a long-horned wood boring beetle native to Vermont. The adult beetle is the most recognizable life stage and is black and yellow with a “W” design and two mirrored black dots on its elytra (wing covers). Although not a common cause of mortality, larvae do excavate “J-shaped” galleries that can aid in girdling trees and promote stem decay. Galleries and associated damages can significantly reduce lumber value of infested sugar maples. Management guidelines suggest actively managing sugar bushes and promoting individual tree health and vigor to reduce the occurrence of this insect. If possible, removing and destroying infested trees or pruning out infested sections of trees before June will remove the larvae before it pupates into an adult and lays more eggs. For more information and detailed management guidelines, see [How To Identify and Control the Sugar Maple Borer](#).



A: Adult sugar maple borer. Photo credit: Tom Murray, Bug-guide. **B:** Internal view of gallery. Photo credit: USDA Forest Service. **C:** External gallery damage. Photo credit: FPR Staff.

Saddled Prominent

Saddled prominent, *Heterocampa guttivitta*, is a native hardwood defoliator in the northeastern United States. These caterpillars prefer feeding on sugar maple and American beech, but can be observed feeding on other hardwood species. Larvae are most easily recognizable, with early instars having antler-like horns and the late instar having a red saddle-like mark in the middle of its back. Adult moths are brownish grey with white or black splotches on the forewings. Although a native insect, heavy and repeated defoliation can lead to dieback and mortality of infested hosts. For more information, see the [Forest Insect and Disease Conditions In Vermont 2019](#) and [USDA Forest Insect & Disease Leaflet](#).



A: Early instar larvae. Photo credit: Stan Gilliam. **B:** Late instar larvae. Photo credit: Ronald Kelly. **C:** Adult moth. Photo credit: Dave Webb.

Quick Bites



Luna moths, *Actias luna*, a type of native silk moth, have been observed across the state. These moths are lime green with a white body and have long hindwings. The shape and size of these hindwings cause the moth to flutter and twist in flight. This motion is thought to help this nocturnal moth confuse predatory bats that use echolocation to detect prey. To see this fluttering in action, check out this [video](#).

Luna moth. Photo credit: FPR Staff.

A wasp mantidfly, *Climaciella brunnea*, was observed in the Northeast Kingdom. Although physically this insect looks like a mix between a wasp and a praying mantis, this insect is a predatory neuropteran, or net-winged insect. As larvae, wasp mantidflies hitch a ride on adult spiders waiting for females to lay eggs. Once eggs are laid, this insect crawls off the spider and parasitizes its eggs.

Wasp mantidfly. Photo credit: FPR Staff.

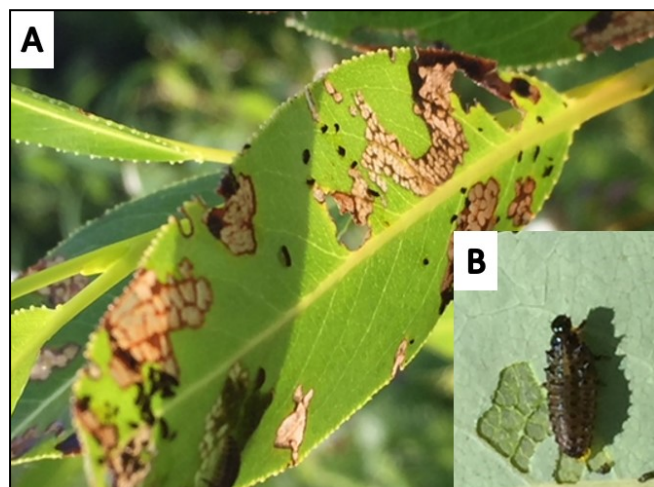


Golden canker, *Cryptodiaporthe corni*, was observed infecting pagoda dogwoods, *Cornus alternifolia*, in southern Vermont. This canker pathogen is host specific, and has not been documented infecting other dogwood trees. If not managed, this canker can cause dieback and mortality of infected hosts.

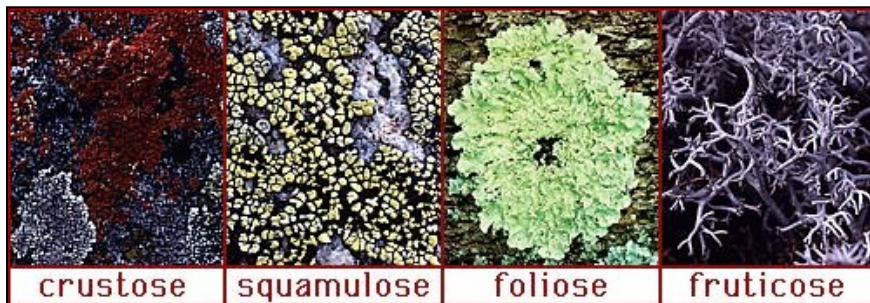
Golden canker. Photo credit: Bruce Watt, University of Maine, Bugwood.

Imported willow leaf beetle, *Plagioderma versicolora*, were observed feeding on autumn willow, *Salix serissima*, in southern Vermont. This insect is originally from Europe and was first observed in the U.S. in 1915. Both larval and adult stages feed on and skeletonize leaves but are not commonly reported as causing severe dieback or decline in infested hosts.

A: Feeding damage. **B:** Imported willow leaf beetle larvae. Photo credit: FPR Staff.



Lichen comes in many different colors, shapes, and sizes, and is found throughout the state growing as an epiphyte on trees, rocks and man-made structures. These organisms are a byproduct of a symbiotic relationship between either algae or cyanobacteria and several fungal species. Although commonly mistaken for a parasite trees, these organisms photosynthesize and can take up their own water.



Different forms of lichen. Photo credit: Ben Waggoner, UCMP Berkley.



Turpentine beetles, *Dendroctonus sp.*, were observed infesting eastern white pine trees in southern Vermont. These beetles prefer weakened and/or previously damaged trees, and can be an indicator of a hazard tree. In large infestations, these beetles can girdle phloem (conducting vessel of primarily photosynthates in trees) and aid in dieback and mortality.

Pitch tubes characteristic of turpentine beetle infestation. Photo credit: FPR Staff.

Strong winds caused dozens of trees to blow over in Springfield this month. Of these trees, many were eastern white pine and Norway maple that had predisposing factors that caused weak spots and decay. Abiotic factors such as grade change, can cause rooting barriers that predispose trees to windthrow.

Red maple that was windthrown due to poor root development. Photo credit: FPR Staff.



Jelly fungus, *Dacrymyces palmatus*, can be spotted across the state on conifer dead wood and snags. This fungus is saprotrophic, and feeds and lives only on decaying material. Following periods of rainfall, this fungus gets plump and squishy and dries to a thin, hard film during periods of drought.

Jelly fungi. Photo credit: Paul Derbyshire, Mushroom Observer.



Moose, *Alces alces*, signs were apparent in the Northeast Kingdom, when forest protection staff noticed large scrapes on a fir tree. Moose will scrape trees with their antlers to dislodge dried velvet as well as to mark their territory. This large damage, destroys cambial tissue and can cause severe dieback and mortality of trees. Damaged trees will produce pitch around the wound in the beginning stages of compartmentalization, which can deplete a tree's stored photosynthates. For more information on moose and their beneficial contributions to our environment, visit [Vermont Fish & Wildlife Department's Moose Population Study](#).

Moose scrape. Photo credit: FPR Staff.

Rosy maple moths, *Dryocampa rubicunda*, also known in its larval stage as green-striped maple worms, are a native silk moth that can be observed on maple trees across the state. As caterpillars, they can be found feeding on the underside of leaves, consuming entire leaf blades. In large populations, heavy feeding can cause defoliation and a decrease in overall tree health and vigor of infested trees.

Rosy maple moth caterpillar. Photo credit: FPR Staff.



Maple trumpet skeletonizers, *Epinotia aceriella*, have been observed in southern Vermont on sugar maples. These insects construct a trumpet-like tube out of silk and frass on the underside of infested leaves. These insects affect trees later in the growing season, rarely causing long-term impacts to tree health.

Maple trumpet skeletonizer shelter from **A**: above **B**: below. Photo credit: FPR Staff.

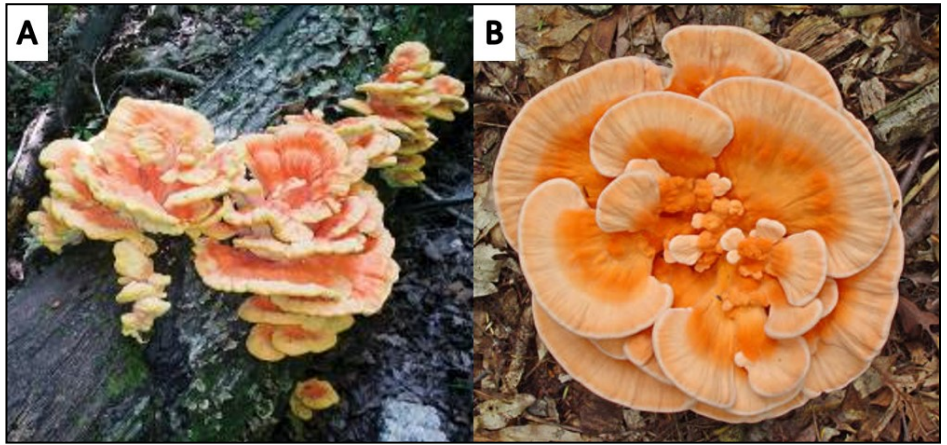
Ghost plant, *Monotropa uniflora*, is a native perennial plant observed in our Vermont forests. This plant is a [myco-heterotroph](#) meaning that it lacks chlorophyll, and parasitizes mycorrhizal fungi that have a symbiotic relationship with trees. Although parasitic, this plant does not contribute to severe dieback or mortality of mycorrhizal mycelium or plant roots.

Ghost plant. Photo credit: FPR Staff.

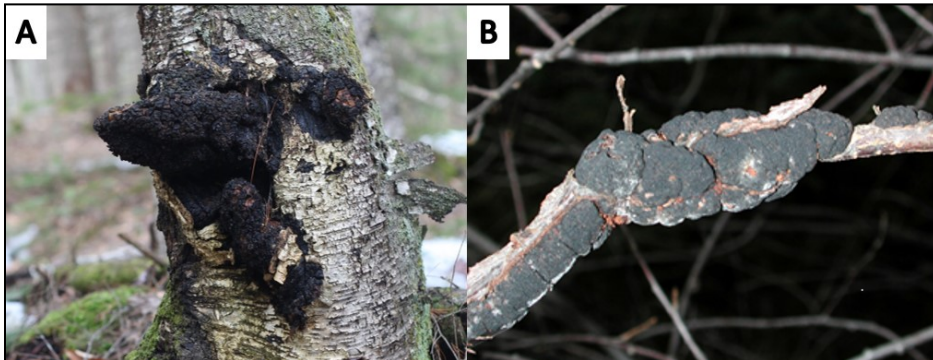


Foraging for Fungi

Chicken of the woods, *Laetiporus* spp., a genus that contains several edible species of fungi, has started to be observed in central Vermont this month. *Laetiporus sulphureus*, the most easily identifiable, is an edible polypore found growing out of decaying hardwoods trees such as beech, oak, and chestnut. This fungus is bright orange and yellow and has wavy-edged brackets. The underside of the cap has a pale yellow to white pore surface and gives off a white spore print. This fungus has another edible look-alike, *Laetiporus cincinnatus*. This fungus is pale orange and has a yellow pore surface that gives off a white spore print. Unlike *L. sulphureus*, this is a root rot and is found growing out of the roots or bottom of a tree in a rosette. Although these mushrooms are a highly sought-after replacement for chicken, in some individuals this fungus can cause mild allergic reactions such as swollen lips, nausea, vomiting dizziness, and disorientation.



A: *L. sulphureus*. Photo credit: Maxine Stone, Missouri Department of Conservation. **B:** *L. cincinnatus*. Photo credit: David Work, Messiah College.



A: Chaga. Photo credit: Sarah Galvin. **B:** Black knot. Photo credit: R. Kelly.

Chaga, *Inonotus obliquus*, is a parasitic fungus that is often found on living birch and other hardwood trees. While the tree is alive, this fungal conk is sterile and does not produce a fruiting body. This fungus is an irregularly shaped conk and is rough textured and when cut open, this fungus is amber to rusty yellow brown in color. Although not a fungus you would cook and eat, some cultures have used extracts of this fungus as al-

ternative medicine. A non-edible look-a-like is black knot, *Apiosporina morbosa*, which affects stone fruit trees such as cherry and pear. This fungus also has irregular black galls, but these galls form around branches instead of growing out of infected trees. This fungus is not malleable and cannot be easily sliced open.

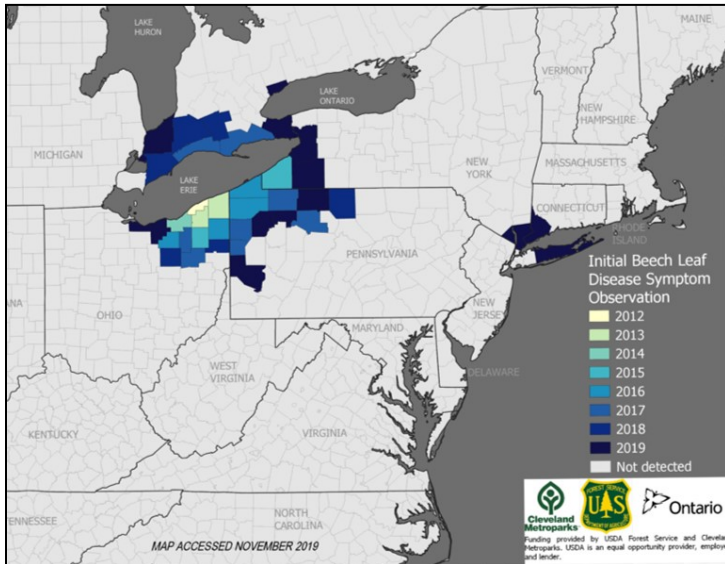
As with all wild mushrooms, there are risks to eating and misidentifying them which can be both dangerous and fatal. Always ensure you have the correct identification before consuming any wild edible. ***The State of Vermont accepts no liability or responsibility for the consumption and/or misidentification of these mushrooms.***

Pests in the Spotlight: Beech Leaf Disease

Beech leaf disease (BLD) affects both American and European beech trees, and causes leaf deformation, dieback, and potential mortality of infested hosts. The causal agent of BLD is an introduced nematode from Japan, *Litylenchus crenatae mccannii*. This pest was first documented in Ohio in 2012 and has currently not been observed in Vermont. This pest can affect all ages and sizes of beech, being most deadly to saplings and understory beech.

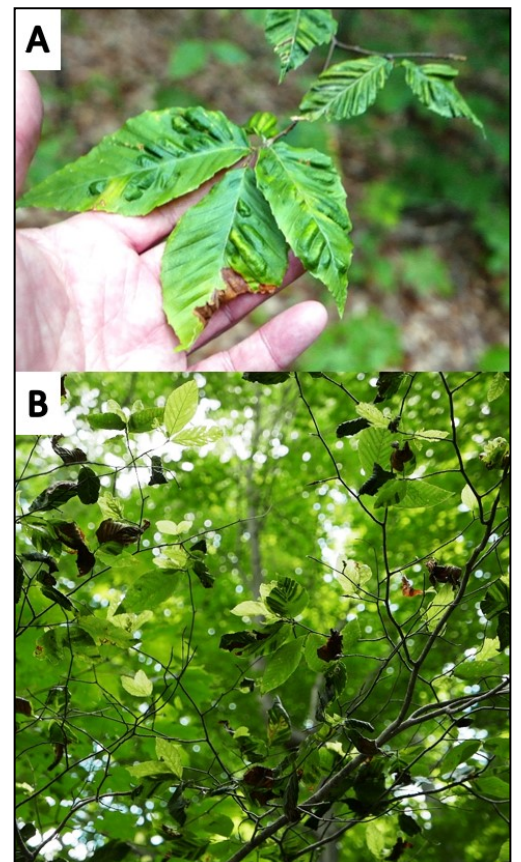


Scanning electron microscope of *Litylenchus crenatae mccannii*. Photo credit: Electron and Confocal Microscopy Unit USDA; colorization by Joe Mowery, D4260-1.



This pest has currently been reported in 6 states, and Ontario Canada. The most recent reports (2020) are in Massachusetts and Rhode Island (not yet documented on this map).

In early stages of infection, beech leaves begin to develop a thick striping pattern between leaf veins, which can sometimes coincide with chlorosis (yellowing). In severe infections, the striping area has been observed as slightly raised and thicker than normal tissue, which will lead to leaf deformation. Heavily symptomatic leaves may drop mid-growing season, however less symptomatic leaves typically do not drop. Overtime, dieback will occur which starts at the lower branches on a canopy and progresses upwards. In younger trees, disease progression can be rapid which leads to high mortality of saplings and understory beech. Studies have shown that symptoms do not progress throughout the growing season, which provides support for nematodes overwintering inside of buds and affecting leaves before budbreak in the spring. Due to this, symptoms can include aborted buds which present as crispy empty buds on an affected branch. For more information or to report a sighting, visit [VTinvasives](https://www.vtinvasives.org).



A: Symptomatic leaves. **B:** Leaf drop and dieback. Photo credit: Jim Chatfield, Ohio State University.

Species Spotlight: Purple Loosestrife

If you have ever spent an August afternoon along a lake with a reedy shoreline, you may have noticed some brilliant, beautiful purple flowers. In some places in Vermont, these colorful purple spikes are even visible in late July.

These showy blooms belong to this month's focal plant: purple loosestrife, *Lythrum salicaria*. Originating from Asia, Europe, and Africa, purple loosestrife is thought to have been introduced to North America on the east coast in the early 1800s, as an ornamental species. Today it can be found in almost every state in the U.S., and almost every province in Canada. In

Vermont, purple loosestrife is documented in every county. This plant can tolerate a variety of soil conditions but prefers open, moist soils to establish. You can find it in wetlands and wetland margins, along the shores of rivers and lakes, and wet disturbed areas like ditches and fields.



Purple loosestrife in full flower in Williston, VT on July 22, 2019. Photo credit: FPR Staff.



Flowers of purple loosestrife are purple and are clustered along with a tall spike. Photo credit: Norman E. Rees, USDA Agricultural Research Service.

Purple loosestrife is an herbaceous perennial plant, and mature plants can host multiple erect stems in clumps several feet wide. The leaves are long and narrow and are arranged oppositely or whorled, around a square stem. The roots are thick and hard and can grow laterally. One mature plant can produce 1-3 MILLION seeds. A new plant can sprout, grow, flower, and produce viable seeds in the first growing season. In some areas, sterile cultivars are sold, but research has shown that even these plants can produce viable seed.

The seed production, lateral root spread, and competitive nature of purple loosestrife allow it to quickly overtake an area. This spread often results in what is called a monotypic stand, where one species persists. Monotypic stands not only have direct impacts on native vegetation by outcompeting them for space and nutrients, but they also displace the wildlife that would otherwise use the diverse wetland or water's edge habitat. When purple loosestrife grows densely over large areas, soil can get trapped

in its dense roots and stems, effectively raising the water table, or closing off waterways. In Vermont, this species is listed on [Vermont's Noxious Weed Quarantine](#), which makes it illegal to buy, sell, or transport.

Shoot emergence and seed germination can occur in late April, but the easiest time to spot this plant is when it flowers from early through late summer (mid-June - September). Some actions you can take in your yard include pulling young plants by hand or with a tool (like a garden fork) but take caution to remove all parts of the plant above and below ground. For older plants, hand pulling may require repeated removal, for multiple years. Cutting flower heads is also useful to slow the spread of the plant when removal is not an option, and removal along shoreland of species listed by the state as noxious or nuisance is [permitted](#).

There is a similar, native species— [Chamerion angustifolium](#) (narrow-leaved fireweed), which also has bright purple flowers, but the flowers only have 4 petals, and the leaves are arranged alternately.

To learn more about purple loosestrife, check out [www.VTinvasives.org](#) and these additional resources:

- [UConn Go Botany](#)
- [NYISI \(New York Invasive Species Information\)](#)
- [National Park Service](#)
- [DCNR Pennsylvania](#)
- [New Hampshire DES](#)



Narrow-leaved fireweed. Photo credit: Missouri Botanical Garden.

July Invasive Plant Phenology

Volunteers are keeping track of invasive plant phenology in order to time management treatments most effectively. Below are observations made from July 13th-17th, 2020.

- Addison County**—Full Flower: Wild Parsnip; Fruit Forming: Wild Parsnip; Fruit Ripening: Wild Parsnip; Fully Seeded: Garlic Mustard; Vegetative Growth: Knotweed (>6').
- Caledonia County**—Vegetative Growth: Knotweed (>6').
- Chittenden County**—Full Flower: Wild Parsnip; Fruit Forming: Goutweed, Common Buckthorn, Wild Parsnip; Fruit Ripening: Honeysuckle, Wild Parsnip; Fully Seeded: Garlic Mustard.
- Essex County**— Fruit Forming: Honeysuckle; Vegetative Growth: Knotweed (>6').
- Orleans County**— Flowering: Japanese Barberry; Vegetative Growth: Knotweed (>6').

If you are interested in volunteering, please contact: elizabeth.spinney@vermont.gov.



For more information, contact the Forest Biology Laboratory at 802-565-1585 or:	Windsor & Windham Counties.....	Springfield (802) 289-0613
	Bennington & Rutland Counties.....	Rutland (802) 786-0060
	Addison, Chittenden, Franklin & Grand Isle Counties.....	Essex Junction (802) 879-6565
	Lamoille, Orange & Washington Counties.....	Barre (802) 476-0170
	Caledonia, Orleans & Essex Counties.....	St. Johnsbury (802) 751-0110