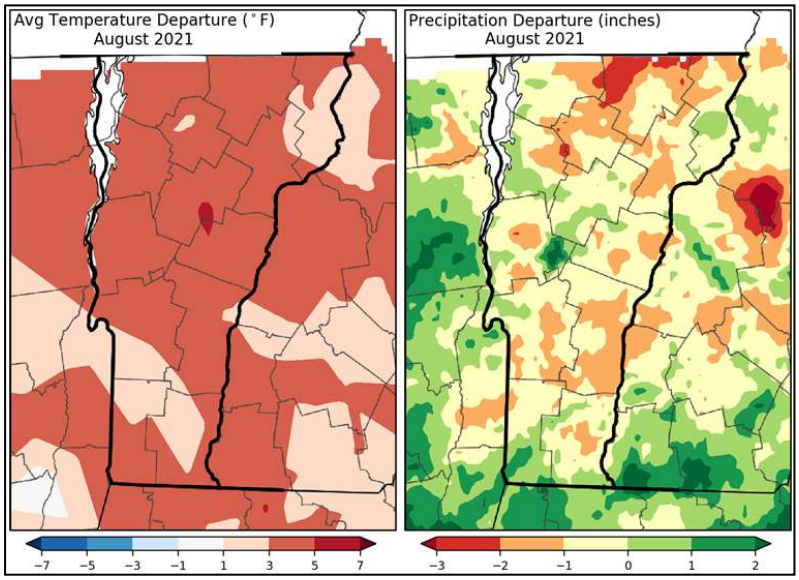
# Vermont Forest Health

# Insect and Disease Observations — August 2021

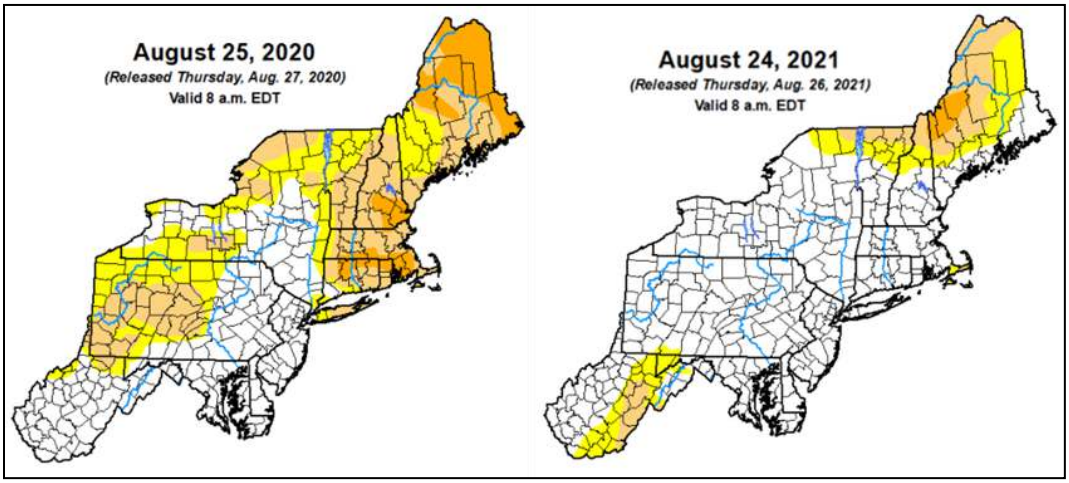
Department of Forests, Parks & Recreation
August 2021 vtforest.com

## Weather Recap

The end of August marks the last full month of summer. On average, this month was warmer and dryer than August of 2020. State-wide temperatures averaged 68.8 °F, which was 3.4 degrees warmer than August of last year. Statewide precipitation averaged 3.62 inches, which was 0.65 inches less than August of last year. Starting August 3rd, the U.S. Drought Monitor listed 22.30% of the state in moderate drought, 26.13% as abnormally dry, and 51.57% as no drought. These drought listings remained steady throughout the month. The Northeast climate region followed a similar drought pattern as Vermont.




Temperature and precipitation departure from normal. Maps and data: Northeast Regional Climate Center.

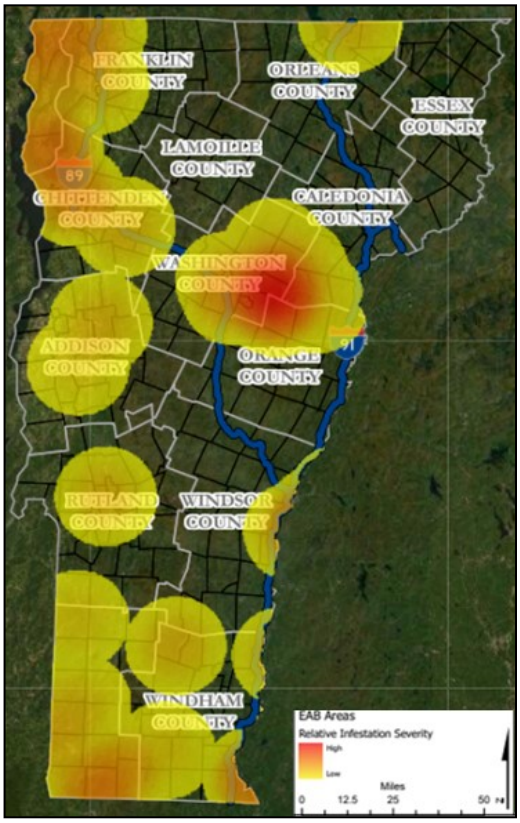



Drought comparison between August 2020 and 2021. Map and data: U.S. Drought Monitor.

On August 24th, 1.54% of the region was listed in severe drought, 9.05% of the region in moderate drought, 12.05% as abnormally dry, and 77.36% as no drought. Comparted to this time last year on August 25th, 2020, 9.71% of the region was listed in severe drought, 27.46% of the state in moderate drought, 23.01% as abnormally dry, and 39.82% as no drought.

## Invasive Update

Several new emerald ash borer (EAB, *Agrilus planipennis)* detections were found by dedicated volunteers from Vermont's Forest Pest First Detectors program through observations and mid-season inspections of purple prism traps. The new detections were found in the towns of Berlin, Highgate, Middlebury, Rupert, St. Albans, Swanton, and Wilmington. These detections extend the "Slow-the-Spread" recommendations to Roxbury, Brookfield, Franklin, Fairfax, Fairfield, Fletcher, Bridport, Goshen, Leicester, Salisbury, Shoreham, Whiting, Danby, Pawlet, Wells, Halifax, Marlboro, and Newfane. If you are a forest landowner, homeowner, forester, logging contractor, municipality, and/or utility professional in an infested area, you should evaluate the options available to protect ash trees and immediately implement Vermont's "Slow the Spread" recommendations. For additional resources including managing ash in your woodlot or around your home, or Use Value Appraisal guidance, check out the resources available at VTInvasives.




EAB Infested Area in Vermont. Map and data: ANR's Natural Resources Atlas.


BWA infested tree. Photo credit: Jerald E. Dewey, USDA Forest Service, Bugwood.

There has been an increase in balsam woolly adelgid (*Adelges piceae*, BWA) reports this month. BWA is an invasive insect that feeds on true firs. This insect uses its piercing and sucking mouthparts to consume phloem tissue in infested hosts. This feeding on branch twigs and nodes injects digestive enzymes into the host which causes abnormal growth also known as "gouting". This gouting stunts the growth of twigs and branches which can lead to dieback and decline. Heavily infested trees can have large populations of BWA build up on the main bole, where heavy feeding will lead to dieback causing the tree to have a "fiddle-shaped" appearance. Although an invasive insect, BWA has a scattered and sporadic presence throughout the state due to their low mobility and reliance on wind dispersal. In forested stands, management for BWA is impractical and inefficient because these insects protect themselves from broadband aerial sprays by using a white, woolly wax-like covering. In isolated or small-scale infestations such as urban lawns and Christmas tree plantations, management can include the use of horticultural oil and/or insecticide applications.

## Other Observations

Fall webworm (*Hyphantria cunea*), a native hardwood defoliator, has started to be reported in central parts of the state. Unlike eastern tent caterpillars, the nests of these caterpillars are formed in late summer/early fall near the tips of branches. These caterpillars feed late in the growing season, after most of the photosynthates have been produced by the tree, and therefore the defoliation has a minimal impact on overall health and vigor.

Fall webworm nest. Photo credit: Linda Haugen, USDA Forest Service, Bugwood.

Jelly babies (*Leotia lubrica*) were observed growing out of rotting wood early this month. These tiny mushrooms grow in clumps and are 2-8 cm tall with a 1-4 cm wide cap. They are brownish-yellow to yellow-olive and sticky and slimy when fresh. The stem will bruise a dark green color when damaged, and are either hollow or filled with a gelatinous (or jelly-like) material.


Jelly babies. Photo credit: Michael Kuo, Mushroomexpert.

Birch leafminer (*Fenusa pusilla*) is being observed on birch species in Northern Vermont. As larvae, this insect feeds inside of the leaf, causing irregular blotchy mines that range from green to brown in color. Although larvae appear translucent, holding up an infested leaf to light will help show hollow leaf pockets filled with frass.

Leaf miner damage. Photo credit: Minnesota Department of Natural Resources, Bugwood.

Lilac-staining milkcap mushrooms (*Lactarius uvidus)* were observed following heavy rainfall. This mushroom has a common mycorrhizal association with quaking aspen, big-tooth aspen, and birch species, although it can sometimes be found in conifer stands. When damaged, this mushroom secretes white milk that stains the damaged gills and flesh a lilac color.

Lilac staining milk caps. Photo credit: Dianna Smith, Mushroomexpert.

Elm leaf beetle (*Xanthogaleruca luteola*) damage was reported skeletonizing American elm leaves this month. As larvae, these beetles skeletonize infested leaves, by feeding on the undersides of the leaf surface but not on the leaf veins. As adults, these beetles chew circular holes in the leaves, leaving "shot-hole" like damage. This damage can cause premature leaf drop and can be a significant pest of ornamental trees.

Adult elm leaf beetle. Photo credit: Clemson University, USDA Cooperative Extension Slide Series.

Yellow garden spiders (*Argiope aurantia*) were observed in a backyard garden in central Vermont. This spider is in the family of orb-weavers (Araneidae) and therefore has three claws per foot instead of the usual two claws per foot. This additional claw is used to help handle thread when building a web. This species produces venom to paralyze prey, however, its venom is not poisonous to humans.

Yellow garden spider. Photo credit: FPR Staff.

Bark lice (Psocoptera) were reported on poplar trees early this month. This order of insects represents a diverse group of soft-bodied insects that are scavengers. These insects feed on lichen, fungi, and other organic matter and do not cause damage to infested trees. These insects are often present individually or at low levels but are not usually noticed until they gather in large masses on the bole and branches of trees.

Herd of bark lice. Photo credit: Linda Williams, Wisconsin DNR.

Leaf galls caused by *Aceria cinereae* mites were observed on butternut leaves. These mites use their piercing-sucking mouthparts to feed on leaf tissue, and their digestive enzymes cause the leaves to deform. These galls typically form between leaf veins, and although unsightly, these mites cause minimal damage to overall tree health and vigor.

Galls caused by *Aceria cinereae* mites. Photo credit: Tom Murray, Bugguide.

Swamp milkweed beetles (*Labidomera clivicollis*) were observed feeding on milkweed plants in Northern Vermont. These native beetles cut small slits on leaf veins, and feed on the milky fluid that is excreted. This sap secreted by the plant contains cardiac glycosides, which are fatal for many animals. These insects tolerate this toxin and by feeding, concentrates it in their body which helps protect them from predators.

Swamp milkweed beetle. Photo credit: Tom Murray, BugGuide.

A large swarm of ash bark beetles (*Hylesinus aculeatus*) was observed in recently cut firewood in southern Vermont. These native beetles favor recently cut and broken ash trees for breeding sites, although they may also be found on stressed living trees. These beetles create egg tunnels that are perpendicular to the branch or trunk. After hatching, larvae feed away from the egg sites, girdling the tree more in the process. If this beetle is present in low populations, infested branches can be pruned out, and cultural practices could be implemented to reduce tree stress. Since this insect prefers weakened trees, management is not usually necessary.


Ash bark beetle galleries. Photo credit: James Solomon, USDA Forest Service,

Cleft-headed loopers (*Biston betularia*) were observed feeding on pin oaks in Rutland county. This green to brown caterpillar mimics twigs by laying flat against a twig or branch when it is not feeding, although its unique shaped head, lends it to having a cat-like appearance.

Cleft-headed looper. Photo credit: FPR Staff.

Symptoms of fungal leaf spot of mountain laurel (causal agents including *Cercospora*, *Phyllosticta*, *Septoria*) were observed on ornamental mountain laurel in central and northern Vermont this month. Leaf spots are necrotic areas of tissue that are tan-brown in color with distinct margins. This symptom is more commonly found on the current year's foliage and can lead to premature leaf drop in infected hosts.

Leaf spots. Photo credit: Sharon Douglas, CT Agricultural Experiment Station.

# Foraging for Fungi

Shaggy mane mushrooms (*Coprinus comatus*) are in season in most parts of the state. This native edible fungus is saprotrophic and can commonly be found in mulch beds and urban lawns. This fungus has an oval to rounded cap that matures into a bell shape that measures 3-15 cm wide. The cap is whitish with large, brownish-white shaggy scales. The underside of the cap has free gills, which vary in color while maturing, starting white, then turning pink, and eventually turning black and deliquescing. The stem is 5-20 cm long and 1-2 cm thick, white and is smooth. This stem is hollow and is easily broken. This mushroom has a look-alike, the inky cap mushroom (*Coprinopsis atramentaria).* These mushrooms look similar to the shaggy mane when immature, and also have hollow stems, and deliquescing gills. The inky cap mushrooms have gray to gray-brown caps that have fine scales near the center. This mushroom contains the mycotoxin coprine, which makes it poisonous when ingested within three days of (before and after) consuming alcohol.


**A:** Shaggy mane mushrooms. Photo credit: Tim Zurowski, mushroomexpert. **B:** Inky cap mushrooms. Photo credit: Eileen Seto, mushroomexpert.


Variety of variegated russula mushrooms: Michael Kuo, mushroomexpert.

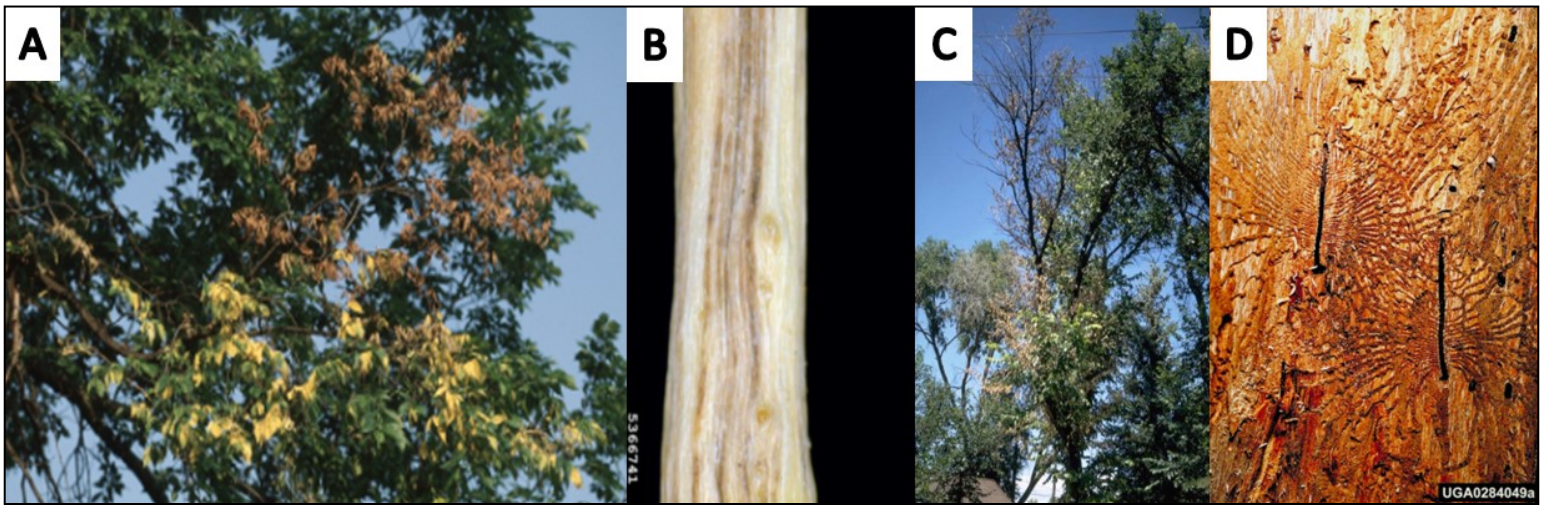
Variegated russula (*Russula variata*) is another edible that can be found this month. This mycorrhizal mushroom has strong associations with oak however can also be found in mixed hardwood and (less commonly) conifer stands. Its cap is 5-15 cm wide and broadly convex to flat when mature. The cap varies in color from olive greenish to green, purple to purple-pink, or a mottled combination of shades of green and pink. Under the cap, the gills are attached and runs partway down the stem. These gills are forked, white to white-brown with a white spore print. The stem is 3-10 cm long and 1-3 cm thick and is white to white-brown. Although brittle, this mushroom does not bruise when handled. Mushrooms in the genus *Russula* are often hard to distinguish from another due to their vast variability in morphological features within the same species. Due to this, this genus of mushrooms should not be sought for consumption by amateur foragers. 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 any mushrooms mentioned in this publication.***

## Pests in the Spotlight:
## Dutch Elm Disease


Symptomatic elm. Photo credit: Ward Upham, Kansas State University, Bugwood.

Dutch elm disease is a vascular wilt disease caused by the invasive fungal pathogens, *Ophiostoma novo-ulmi* and *Ophiostoma ulmi*, which causes rapid decline and mortality in infected hosts. This pathogen is thought to originate from Asia, however, the exact origin is still unknown. This pathogen was first documented in the United States in the early 1930s and is widespread across the United States, including Vermont. Dutch elm disease can infect all species of native elm (*Ulmus americana, Ulmus rubra,* and *Ulmus thomasii*), however, non-native elm species are often resistant, and are commonly used in hybrid breeding programs. **Although these hybrids are often less susceptible to this pathogen, they are not immune and can still be infected and killed by this pathogen.**

Early symptoms of this pathogen include wilted and discolored leaves in the outer crown of the tree that prematurely drop. Advanced symptoms have yellowing, wilting, and dieback of entire branches that start at the branch tip and progress down to the main stem. Removing the bark of infected branches will show symptoms of xylem streaking in the sapwood. Depending on the susceptibility of the tree, mortality can occur in a single growing season, or over several years. This disease can spread locally through root graphs and fungal spores, and larger distances by the European (*Scolytus multistriatus*) (most common) and North American (*Hylurgopinus rufipes*) elm bark beetles. Humans can expedite the spread by moving infected firewood, or transporting insect vectors. For more information on Dutch elm disease, or to report a sighting, please visit VTinvasives.




**A:** Symptomatic branch. Photo credit: Joseph Obrien, USDA Forest Service, Bugwood. **B:** Xylem streaking. Photo credit: William Jacobi, Colorado State University, Bugwood. **C:** Severe dieback. Photo credit: William M. Brown Jr., Bugwood. **D:** European elm bark beetle galleries. John A. Williams, USDA Forest Service, Bugwood.

# Invasive Maples in Vermont


Amur maple sapling. Photo credit: L. Mehrhoff, UCONN, Bugwood.

For some, "maple" is almost synonymous with "Vermont". Vermont has almost a dozen species of shrubs and trees that are part of the genus *Acer* that for the most part, looks the part of a maple (see **box elder maple** *Acer negundo* for a cool morphological divergence). All *Acer* species belong to the soapberry family (Sapindaceae), which absorbed members of the maple family (Aceraceae) as a result of the advancements of DNA testing in taxonomy. Within this interesting group of plants, there are two species of special concern in Vermont, invasive **Amur maple** (*Acer ginnala*) and invasive **Norway maple** (*Acer platanoides*).

Norway maple evolved in Northeastern Europe and Eastern Asia up to the Urals and south to Ukraine. It was introduced to the United States in 1756 by botanist John Bartram. Its shade tolerance and hardiness made it a favorable ornamental tree for farms and cities alike (globally), and in North America, it was widely planted, and can now be found in most of the U.S. and Canada. Amur maple evolved in northern China and Japan and was introduced into North America in 1860. Beginning in the 1950s, Amur maple was reported as "locally established". Its cold hardiness has led to it being widely used as an ornamental tree in colder North American regions. This species is now documented in the Northeast, North Central US, and the Canadian provinces of Ontario, Manitoba, New Brunswick, and Saskatchewan.

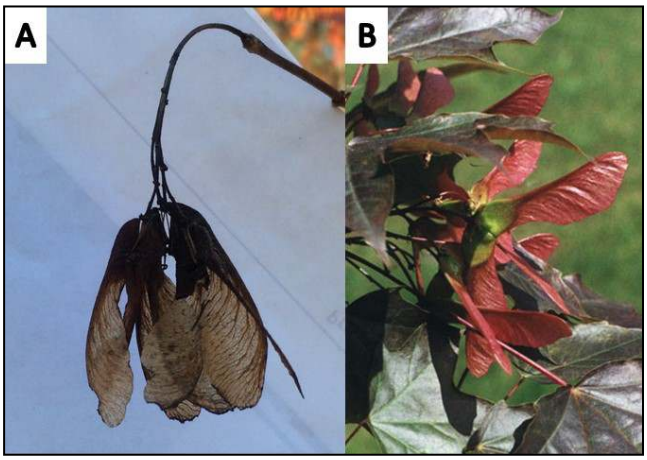
While some struggle to differentiate these invasive maples from maples that evolved in North America, there are a few ways to distinguish the invasive Amur and Norway maple from their respective local look-alikes red (*Acer rubrum*) and sugar maple (*Acer saccharum*):

- Leaves
  - Amur maple (invasive) leaves are simple, oppositely arranged, doubly toothed margin, and have 3 lobes, prominent central lobe – leaves are longer than wide
  - Red maple leaves are simple, oppositely arranged, doubly toothed margin, and have 3 lobes, less prominent central lobe
  - Norway maple (invasive) leaves are simple, oppositely arranged, have smooth margin, and have 5-7 lobes
  - Sugar maple leaves are simple, oppositely arranged, smooth margin, and have 3-5 lobes

*Acer ginnala* leaf, showing three distinct lobes, the center one quite prominent. Photo credit: FPR Staff.

- Other Foliage Characteristics
    - Amur maple (invasive) leaves out early in the spring, and have distinctive fire red foliage in the fall
    - Red maple is one of the first trees to turn color in the fall, turning yellow-orange to orange-red
    - Norway maple (invasive) leaves persist after most plants have dropped their leaves, and have a pale to orange-yellow color in the fall, produce a milky white sap that exudes from leaf petioles
    - Sugar maple has distinctive bright orange and red foliage in the fall

- Samaras
    - Amur maple (invasive) have paired samaras that droop nearly parallel to each other and persist on the tree into the fall
    - Red maple has paired samaras that droop in a "U" shape
    - Norway maple (invasive) have paired samaras that spread widely from each other
    - Sugar maple has paired samaras that droop in a "U" shape




The paired samaras of Amur maple are nearly parallel, whereas Norway maple paired samaras spread widely from each other. Photo credit: (A) FPR staff, (B) Bill Cook, Michigan State University, Bugwood.

- Height
    - Amur maple (invasive) is a small tree, about 20' in height
    - Red maple is a medium to large-sized tree, averaging 40-60' in height
    - Norway maple (invasive) is a medium to large-sized tree, averaging 40-60' in height
    - Sugar maple is a large tree, averaging 60-75' in height

- Buds
    - Amur maple (invasive) terminal buds are small and rounded, and sometimes occurring in pairs
    - Red maple terminal buds are pointed and reddish in color
    - Norway maple (invasive) terminal buds are rounded, large, and blunt, 2-3 pairs of scale
    - Sugar maple terminal buds are long, pointed, with many scales

The paired terminal buds of Amur maple. Photo credit: Oregon State University.

Another notable characteristic of Norway maple is their propensity to develop "tar spots" each summer and fall. These distinct large round spots start green and turn black and more conspicuous (and easier to identify) by late summer, and result from several different fungi that cause tar leaf spot diseases. The most damaging to Norway maple are *Rhytisma acerinum*. These spots can appear on other maples as well but vary in their appearance. The Statewide Invasive Plant Monitoring Program has recorded tar spots on Norway Maple as early as July this year in Chittenden County.

Amur maple and Norway maple can establish dense canopies, reducing understory cover diversity, and can be found in forests, forest edges, meadows, fields, and human-impacted areas. This documented behavior and the continued spread of these trees in Vermont are reasons they are listed as Class B Noxious Weeds in Vermont.

## Invasive Plant Phenology

In the second full week of every month, volunteers around the state record and report invasive plant phenology, creating both a timely resource for best manage contact Pauline.Swislocki@vermont.gov. Observers are still needed in Bennington, Essex, Franklin, Rutland, Washington, Windham, and Windsor counties. For more information about the phenology of invasive plants in Vermont, check out Bud Buds, a podcast from the Invasive Plant Program.

**Caledonia County –** leaf out: Asiatic bittersweet; flowering: Japanese knotweed, phragmites; fruit ripening: common barberry, common buckthorn, glossy buckthorn; fruit dried up/ falling: common barberry, common buckthorn, glossy buckthorn, shrub honeysuckles

**Chittenden County –** leaf out: Asiatic Bittersweet, common buckthorn, goutweed, phragmites, shrub honeysuckle; flowering: purple loosestrife, spotted knapweed; full flower: Japanese knotweed, phragmites, purple loosestrife, spotted knapweed; fruit forming: common buckthorn, purple loosestrife; fruit ripening: common buckthorn, common barberry, multiflora rose, shrub honeysuckle; fully seeded: cypress spurge; garlic mustard; goutweed; shrub honeysuckle

**Grand Isle County –** leaf out: Asiatic bittersweet, common buckthorn, Japanese barberry; flower buds: Japanese knotweed; flowering: wild parsnip; fully seeded: garlic mustard; axillary/terminal buds: garlic mustard

**Lamoille County –** flowering: purple loosestrife

**Orange County –** leaf out: Asiatic bittersweet, common buckthorn, shrub honeysuckles; fruit ripening: shrub honeysuckles


FORESTS, PARKS & RECREATION VERMONT AGENCY OF NATURAL RESOURCES

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*2021-06*