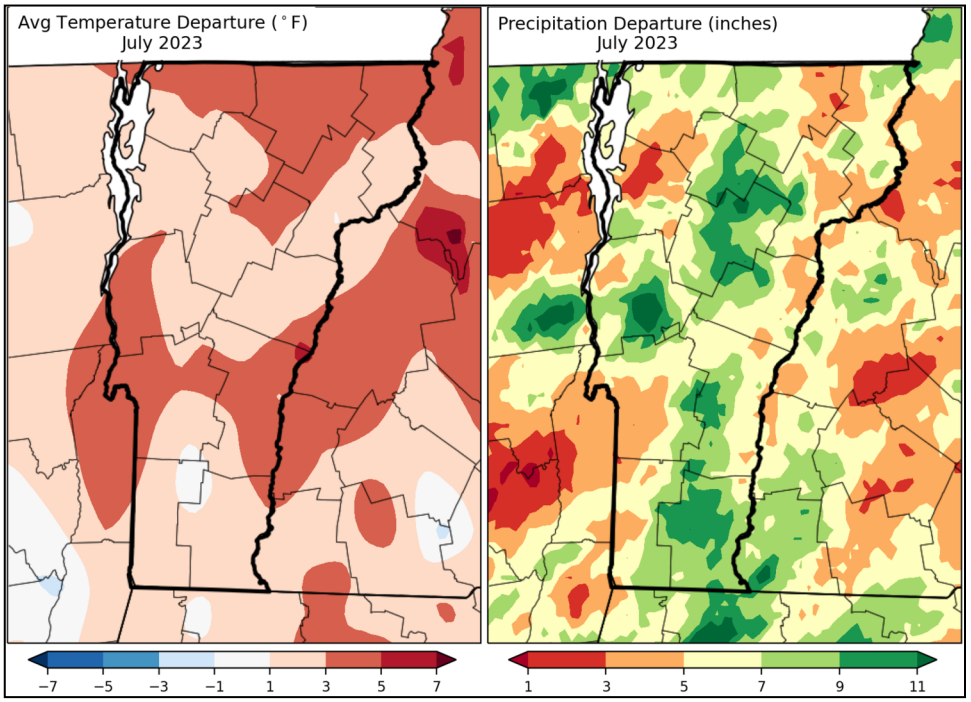
Vermont Forest Health

Insect and Disease Observations — July 2023

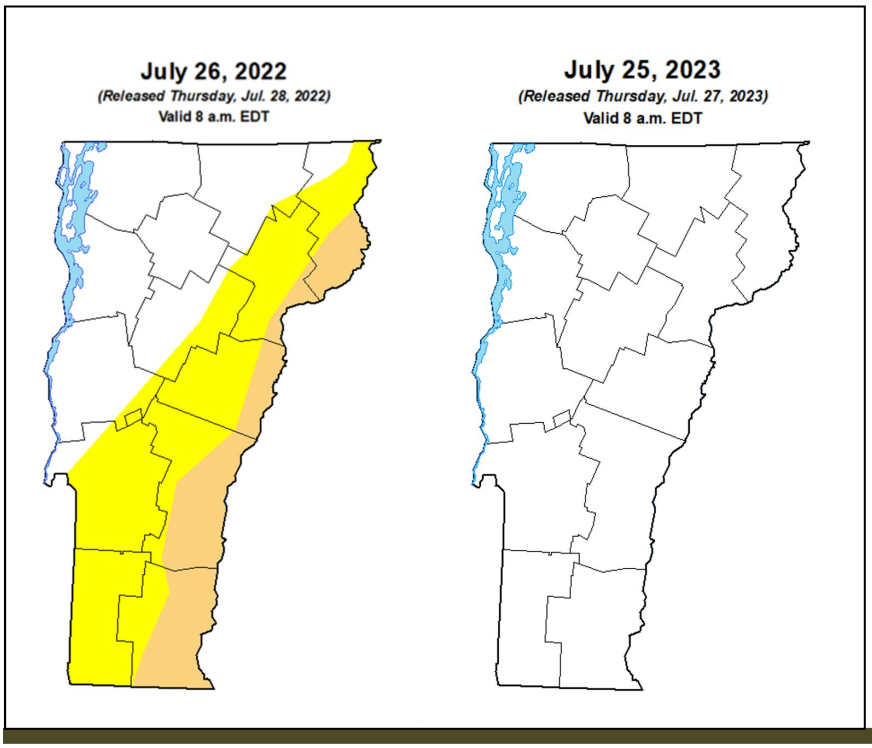
Department of Forests, Parks & Recreation
July 2023 vtforest.com

Weather

July is historically the warmest month in Vermont. State-wide temperatures averaged 70.2°F, which was 2.8 degrees warmer than July of last year. Statewide precipitation averaged 9.46 inches, which was 5.7 inches more than last July and only 0.63 inches less than the wettest July on record: 10.09 inches in 1897.



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



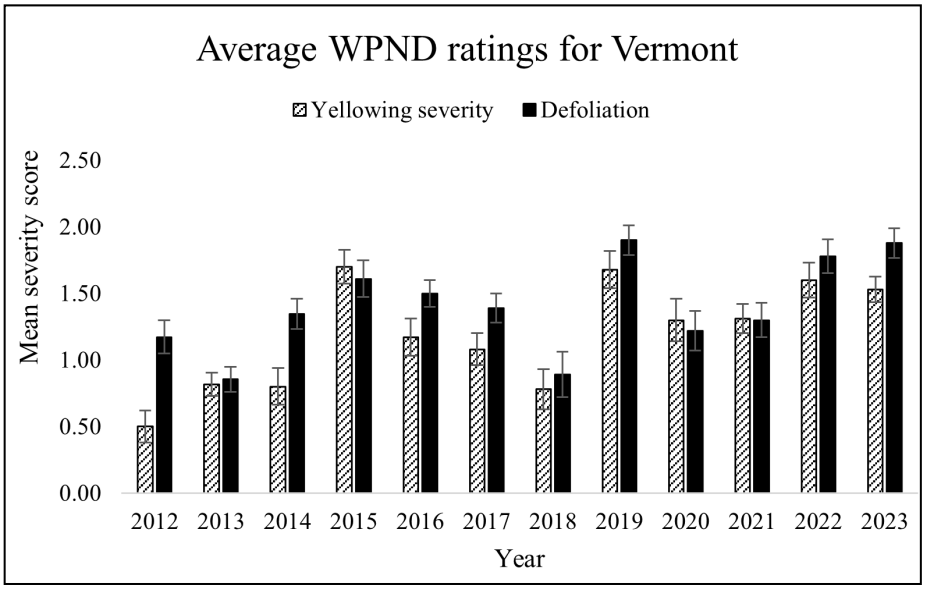
Drought Update

Heavy localized rainfall decreased drought severity across the state. By the end of the month, the U.S. Drought Monitor listed 100% of Vermont as having no drought conditions. Compared to last year on July 26, 2022, 17.45% of the state was listed in moderate drought, 40.01% as abnormally dry and 42.54% as no drought.

Drought Comparison between July 2022 and 2023. Map and data: U.S. Drought Monitor.

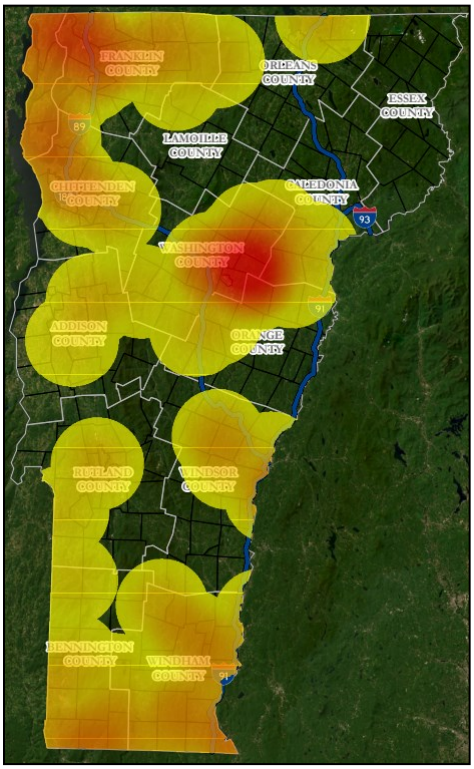
WPND Update

White pine needle damage (WPND) is a fungal complex that infects eastern white pine trees (*Pinus strobus*) throughout Vermont. It is comprised of four different foliar pathogens—*Bifusella linearis*, *Lecanosticta acicola*, *Lophophacidium dooksii*, and *Septorioides strobi*, that have been associated with both needle cast and needle blight on eastern white pines. Individually, these pathogens are not documented as causal agents of large-scale defoliation. However, as a complex, these pathogens can cause increasing damage. Infected trees have been observed with chlorosis (yellowing) and necrosis (browning) of 1-year-old needles; heavy infections cause defoliation and dieback. 2023 defoliation was slightly higher and yellowing was slightly lower than that observed in 2022. The expression of WPND is worse a year after a wet spring (e.g., 2023 damage is influenced by 2022 weather). Due to the wet spring of 2023, we expect to see an increase in severity in 2024.



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

EAB Update



Several new emerald ash borer (EAB, *Agrilus planipennis*) populations were discovered by public reporting and FPR monitoring efforts. The new detections were found in the towns of Calais and Woodstock. These new finds expand the area and severity of infestations to now include or expand further into Plymouth, Vermont. 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 and immediately implement "Slow the Spread" recommendations. For additional resources including managing ash, or Use Value Appraisal guidance, check out the resources available at VTInvasives.

EAB infested areas in Vermont. Map and data: ANR's Natural Resources Atlas.

Supplemental Sightings

Birch leafminer (*Fenusa pusilla*) was reported in Orange County. 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.

Birch leafminer. Photo credit: Whitney Cranshaw, Colorado State University, Bugwood.

Guignardia leaf spot (*Guignardia aesculi*) was reported on an Ohio buckeye (*Aesculus glabra*) in Windsor County. This fungus infects the leaves of buckeyes and horse chestnuts (*Aesculus* spp.), appearing as yellow to reddish-brown spots. Leaf necrosis, leaf distortion, and premature leaf drop may occur. Guignardia leaf spot overwinters on fallen leaves—removing infected leaves after they drop can reduce the severity of future infections.

Guignardia leaf spot. Photo credit: Fabio Stergulc, Università di Udine, Bugwood.

Striated jewel beetle *(Buprestis striata)* was reported in Windsor County as an EAB report. Eggs of this beetle are preferentially oviposited in decaying wood of host plants, including spruce (*Picea* spp.), eastern hemlock (*Tsuga canadensis*), and pines (*Pinus* spp.).

B. striata. Photo credit: Hanna Royals, USDA APHIS PPQ, Bugwood.

Ravenel's stinkhorn (*Phallus ravenelii*) was observed in a deciduous forest in Washington County. As the name suggests, this mushroom emits a strong, rotten-smelling odor. Unlike many Basidiomycota mushrooms, its spores are insect dispersed—the odor of the sticky spore mass on the top of the cap attracts flies and other decomposers. Insects walk and feed on the spore-bearing surface, become covered in spores, and disseminate the spores to other locations.

Ravenel's stinkhorn.
Photo credit: FPR staff.

Bruce spanworm (*Operophtera bruceata*) was reported in Lamoille County. As larvae, Bruce spanworm prefer to feed on sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), and willow (*Salix spp.*), but will also defoliate other hardwood species. Larvae are typically active between May and June, after which they fall to the forest floor and pupate. Adult moths emerge between October and December to mate and lay eggs, which overwinter.

Bruce spanworm. Photo credit: Ronald Kelley, FPR, Bugwood.

Eastern spruce gall adelgid (*Adelges abietis*) was observed in Washington County. Adelgids overwinter as nymphs at the base of spruce buds—Norway spruce (*Picea abies*) and white spruce (*P. glauca*) are preferred. In spring, overwintered nymphs mature then lay their eggs on the needles. Galls appear at the base of new growth, forming in response to feeding of the newly hatched generation. In late summer, the galls break open and release winged adults, who disperse, lay eggs, and produce the new overwintering generation.

Old eastern spruce gall adelgid. Photo credit: FPR staff.

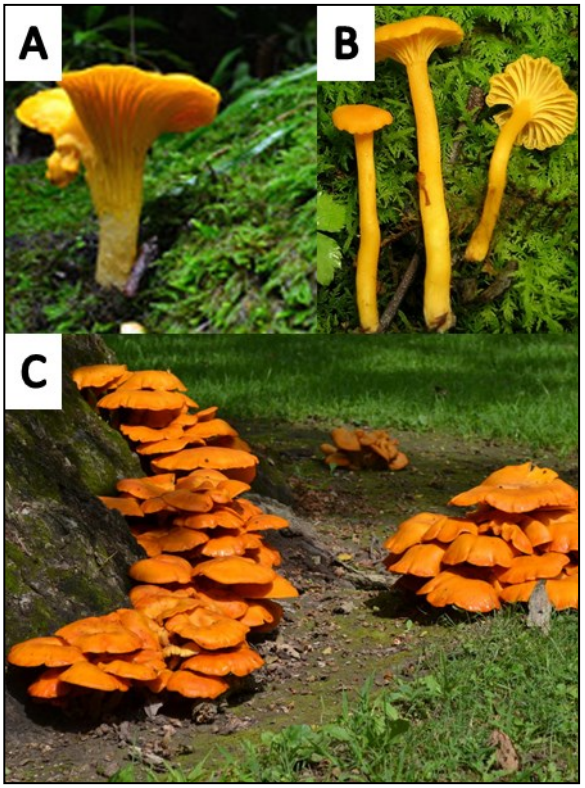
Maple trumpet skeletonizer (*Catastega aceriella*) was reported in Caledonia County. Red and sugar maple (*Acer rubrum* and *A. saccharum*) are primary hosts. This insect constructs a trumpet-like tube out of silk and frass on the underside of infested leaves, feeding between July and October. It has minimal impact on overall tree health and vigor.

Maple trumpet skeletonizer. Photo credit: USDA FS Northeastern Area, Bugwood.

Ghost pipe (*Monotropa uniflora*) is a native perennial plant observed in our Vermont forests. This plant is a mycoheterotroph meaning that it lacks chlorophyll and parasitizes mycorrhizal fungi in the genera *Russula* and *Lactarius* 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 pipes. Photo Credit: FPR Staff.

Foraging For Fungi



A-B: Chanterelle mushrooms. And information credit: Michael Kuo, mushroomexpert. **C:** Jack o' lantern mushrooms. Photo and information credit: Michael Kuo, mushroomexpert.

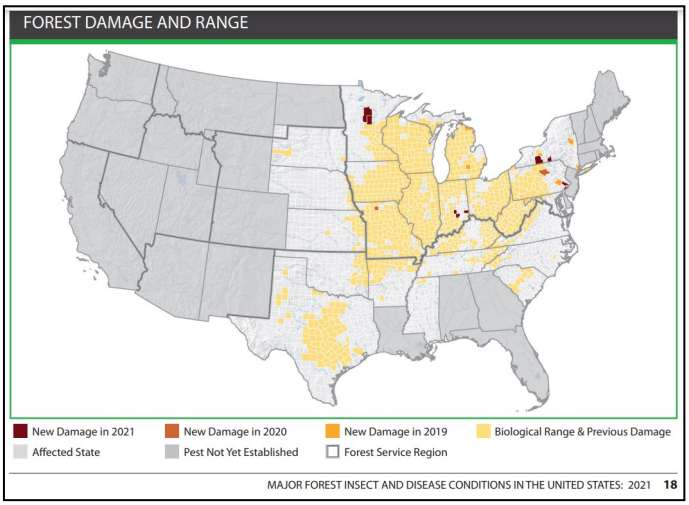
Chanterelle mushrooms (*Cantharellus* spp.) are in season in most parts of the state. This edible native fungus is pale-yellow to deep-orange in color and has a funnel shape. The cap is 3-10 cm wide with a wavy, irregular margin. The underside of the cap has false gills, which partially run down the stem of the mushroom and cannot be picked off and separated from the cap. Its stem is the same color or slightly paler than the cap and is 2- 4 inches tall. These mushrooms grow individually, directly out of the soil. They are ectomycorrhizal, meaning that they have a symbiotic relationship with trees. These mushrooms have a poisonous look alike, Jack o' lantern mushrooms (*Omphalotus illudens*). These mushrooms are saprotrophic, and often found growing in clumps out of decaying stumps and roots. This toxic mushroom has an orange cap that is 3-20 cm wide and flat to narrowly vase-shaped. The cap will turn green with KOH. Under the cap, orange gills run down the stem, which can be picked off and separated from the cap, and gives off a white to pale yellow spore print.

Loose cluster of black trumpets. Photo and information credit: Michael Kuo, mushroomexpert.

Black trumpets (*Craterellus fallax*) are another sought-after edible that start to show up in late July. This mushroom doesn't have a clearly defined cap and stem but is deeply vase-shaped and thin-fleshed. It is between 1-5 cm wide and 3-9 cm tall. The upper (inner) surface is grey-black to black and is finely scaled. The under (outer) surface is smooth to lightly wrinkled, changing color from black to yellow-orange as it matures. This mushroom has a pale pink-orange spore print. This mushroom is mycorrhizal and is often found growing individually or in loose clusters in beech and oak-dominated forest types. This is reported as a choice edible, although its dark color makes it hard to find. Due to its unique color and shape, this mushroom has no reasonable look-a-likes.

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.***

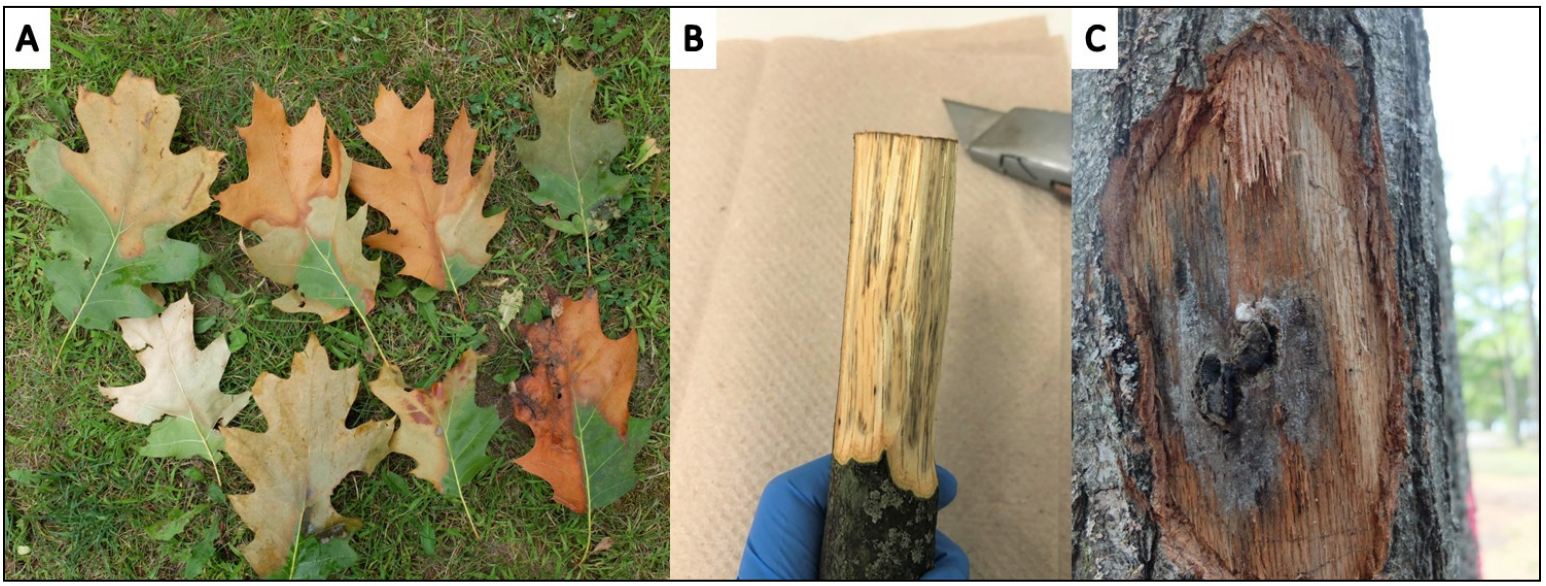
Pests in the Spotlight: Oak Wilt



U.S. Counties with confirmed oak wilt infections. Map and data: USDA Forest Service, Major Forest Insect and Disease Conditions in the United States.

Oak wilt (*Bretziella fagacearum*) is a vascular disease of oak trees, which causes rapid decline and mortality in infected hosts. Due to the fast progression of this disease, it is thought to be introduced to the United States, however, its exact origin is unknown. This pathogen was first documented in Wisconsin in 1944 and has been reported in 24 states. It has not been observed in Vermont—Glenville, NY is the closest infection center to Vermont.

Oak wilt can infect all species of true oaks (*Quercus* spp.)—members of the red oak family are most susceptible to mortality after infection. This pathogen spreads large distances through a variety of bark and sap-feeding beetles as well as locally through root graphs. Humans can expedite the spread by moving infected firewood or by transporting insect vectors. Generally, early symptoms of this pathogen include wilted and discolored leaf margins. This can lead to leaf drop during the growing season which gives infected trees a "fall-like" appearance. In white oak family members, cutting into the infected tree will show symptoms of xylem streaking. In red oak family members, sporulating mycelial mats with pressure pads will develop under the bark of infected trees, which can lead to bark splitting—the aforementioned symptoms are uncommon for most white oak family members. Over time, dieback and mortality will progress. Red oak family members having rapid onset and mortality which can happen over a single growing season, while white oak family members have a slower decline. For more information on oak wilt, or to report a sighting, please visit VTinvasives.



A: Symptomatic leaves. Photo credit: Monique Sakalidis, Michigan State University. **B:** Xylem streaking. Photo credit: Laura Miles, Michigan State University. **C:** Mycelial mat and pressure pad. Photo credit: Monique Sakalidis, Michigan State University.

Early Detection Species: Pale Swallowwort

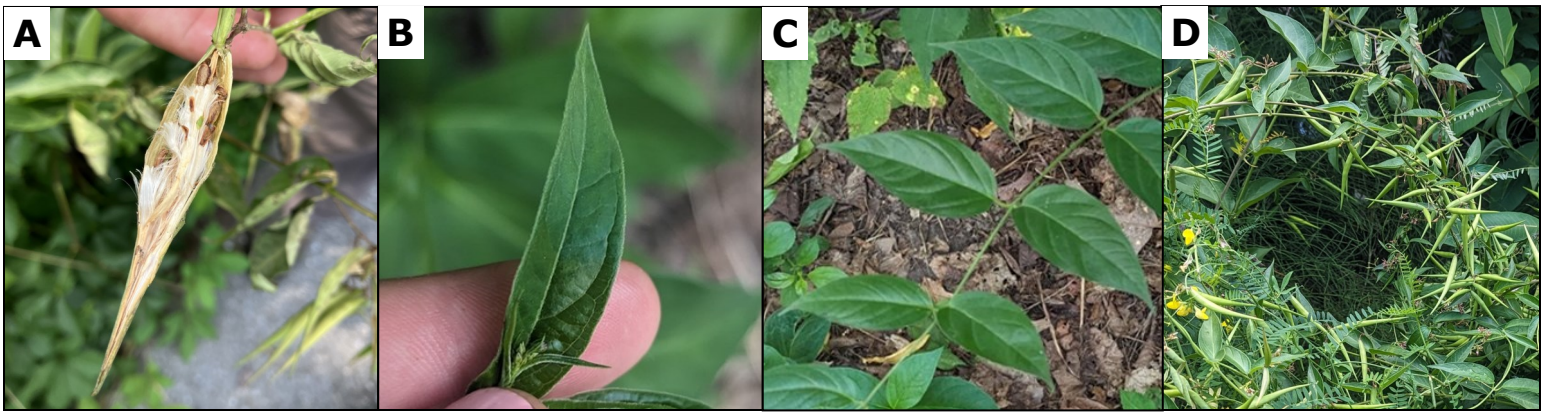
In July, pale swallowwort (*Vincetoxicum rossicum*) was confirmed in Burlington and Georgia, Vermont (Chittenden and Franklin County, respectively). Pale swallowwort is a perennial climbing vine. Native to Europe, pale swallowwort was likely introduced to North America in the 1800s as an ornamental with its relative, black swallowwort *(V. nigrum).* Black swallowwort has been reported in the counties of Addison, Bennington, Chittenden, Grand Isle, Orange, Rutland, Washington, Windham, and Windsor.

Swallowworts are related to milkweeds (*Asclepias spp.*), often growing in the same habitats and attracting similar species. For the ecosystem, the similarities end there. While native milkweeds are vital for multiple taxa found in the region, swallowworts reduce biodiversity on several levels. Swallowworts secrete chemicals from their roots that inhibit mycorrhizal fungal and plant growth and may negatively impact soil microbial communities. Vegetation and roots are toxic to certain organisms, including monarchs *(Danaus plexippus).* Studies have found arthropod biodiversity and abundance to be lower on pale swallowwort than on native vegetation. Additionally, swallowworts form thick patches that can shade out remaining native vegetation and restrict the movements of animals and people across a landscape.

To identify pale and black swallowwort, look for twining vines up to seven feet in length with opposite, long, oval leaves that come to a pointed tip. Flowers are small (less than three fourths of an inch) and star-like—pale swallowwort has pink to maroon flowers with hairless petals; black swallowwort has deep purple flowers with hairy inner petals. When not in flower, black and pale swallowwort can be difficult to differentiate—pale swallowwort tends to have smaller, slightly lighter leaves. Both species form chili pepper-shaped seed pods that are one and a half to three inches in length. Mature seeds are usually wind-dispersed, but can also be transported by water or hitch-hike on animals, people, or machinery. One square meter of swallowwort can produce up to 2000 seeds per year.

Many invasive plants are characteristically hard to eradicate, and swallowworts are no different. These plants resprout easily even after being cut, can regrow from root fragments, and may be resistant to herbicides. Repeatedly cutting or digging out plants in small infestations may prove effective, but the best treatment option is preventing plants from going to seed, thereby keeping infestations isolated. Cut off flowers or pods before they mature, deposit plant material into a sturdy plastic bag, and dispose in trash headed for the landfill. Timing is important – cut too early and the plants can reflower, cut too late and the seeds can ripen and disperse. Ongoing site monitoring is vital as seeds can remain viable for up to five years.

To learn more, please visit the VTInvasives pages on black swallowwort and pale swallowwort. You can also learn more on the New York Invasives page on black and pale swallowworts. To report a pale or black swallowwort sighting, please visit vtinvasives.org.



A: Ripe pale swallowwort pod. **B:** Pale swallowwort leaf and flower bud. **C:** Leafing pattern. **D:** Pale swallowwort patch with pods. Photo credits (all): FPR staff.

Invasive Plant Phenology

In the second full week of each month, volunteers around the state observe and report invasive plant phenophases. Their observations are compiled here, to create a resource for best management options and a historic record of plant behavior. If you would like to be involved in this effort, please contact pauline.swislocki@vermont.gov or check our volunteer page for other opportunities to get involved. For more information about the phenology of invasive plants in Vermont, check out Bud Buds, a podcast from the Invasive Plant Program.

Purple loosestrife. Photo credit: Linda Wilson, University of Idaho, Bugwood.org

Addison – common buckthorn: leaves, fruit/ unripe fruit; common reed: leaves; multiflora rose: leaves; shrub honeysuckle: leaves, ripe fruit; wild parsnip: leaves, flowers/ flower buds, open flowers.

Caledonia – common barberry: leaves, fruit/ unripe fruit; common buckthorn: leaves, fruit/ unripe fruit; common reed: leaves; garlic mustard: leaves, flowers/ flower buds; glossy buckthorn: leaves, fruit/ unripe fruit; goutweed: leaves, flowers/ flower buds; Japanese barberry: leaves, fruit/ unripe fruit; knotweed: leaves, flowers/ flower buds; round leaf bittersweet: leaves; shrub honeysuckle: leaves, fruit/ unripe fruit, ripe fruit; wild chervil: leaves, fruit/ unripe fruit, ripe fruit; wild parsnip: leaves, flowers/ flower buds.

Chittenden – common barberry: leaves, fruit/ unripe fruit; common buckthorn: leaves, flowers/ flower buds, open flowers, fruit/ unripe fruit; common reed: leaves; garlic mustard: initial growth, leaves, fruit/ unripe fruit, ripe fruit, recent fruit or seed drop; glossy buckthorn: leaves, flowers/ flower buds, open flowers, fruit/ unripe fruit; goutweed: leaves, fruit/ unripe fruit, ripe fruit, recent fruit or seed drop; Japanese barberry: leaves, fruit/ unripe fruit; knotweed: leaves; multiflora rose: leaves, flowers/ flower buds, open flowers, fruit/ unripe fruit; purple loosestrife: leaves, flowers/ flower buds, open flowers; round leaf bittersweet: leaves; shrub honeysuckle: leaves, flowers/ flower buds, open flowers, fruit/ unripe fruit, ripe fruit; swallowworts: leaves, flowers/ flower buds, open flowers, fruit/ unripe fruit; wild parsnip: leaves, flowers/ flower buds, open flowers, fruit/ unripe fruit.

Franklin – burning bush: leaves, fruit/ unripe fruit; common buckthorn: leaves, fruit/ unripe fruit; goutweed: leaves, flowers/flower buds, open flowers; Japanese barberry: leaves; knotweed: leaves; purple loosestrife: leaves, flowers/flower buds, open flowers, fruit/ unripe fruit; shrub honeysuckle: leaves, fruit/ unripe fruit, ripe fruit.

FORESTS, PARKS & RECREATION VERMONT
AGENCY OF NATURAL RESOURCES

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

Forest health programs in the Vermont Department of Forests, Parks, and Recreation are supported, in part, by the US Forest Service, State and Private Forestry, and conducted in partnership with the Vermont Agency of Agriculture, Food, and Markets, USDA-APHIS, the University of Vermont, cooperating landowners, resource managers, and citizen volunteers. In accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discrimination on the basis of race, color, national origin, sex, age, or disability.

2023-05