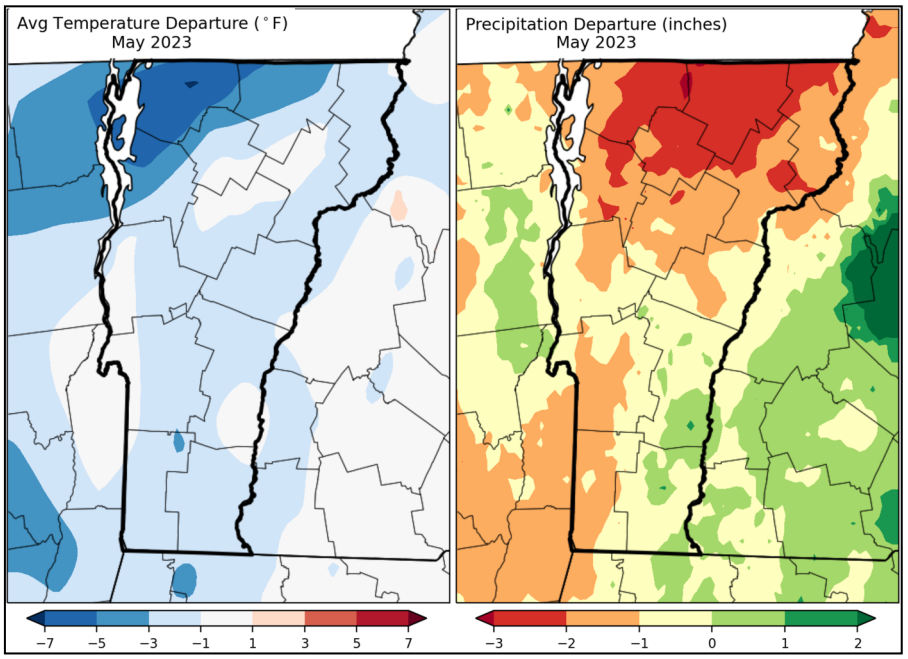
Vermont Forest Health

Insect and Disease Observations — May 2023

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

Weather

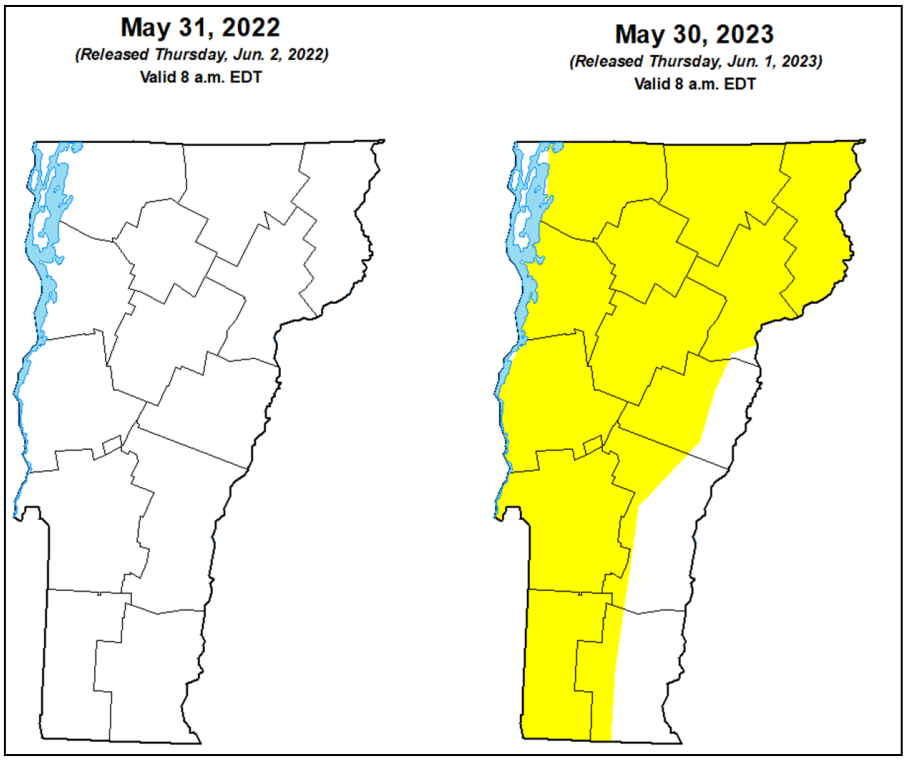
The end of May marks the last full month of spring. On average, this month was cooler and dryer than May of 2022. State-wide temperatures averaged 49.9 °F, which was 7 degrees colder than May of last year. Statewide precipitation averaged 2.42 inches, which was 0.86 inches less than May of last year.



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

Drought Update

Decreased rainfall led to an increase in drought conditions in most parts of the state. On May 30th, the U.S. Drought Monitor listed 81.89% of the state as in moderate drought, and 18.11% as no drought. Compared to this time last year on May 31st, 2022, 100% of the state was listed as no drought.



Drought comparison between May 2022 and 2023. Map and data: U.S. Drought Monitor.

May Freeze Damage

Freeze damage on May 20, 2023. Photo credit: FPR Staff.

Unusually cold temperatures across the state were recorded from May 17-18, with lows reaching the mid to lower 20s in some places. At the same time, many tree species were either just beginning to break bud and/or undergoing leaf expansion, a process that was recorded as being notably earlier than in 2022 (data from April's Insect and Disease Observations). These early leaf stages are particularly vulnerable to sudden drops in temperature, and as a result, many locations experienced foliar necrosis (browning) and premature leaf drop.

Freeze damage at Bridgewater Corners on May 31, 2023. Photo credit: FPR Staff.

Public reports and staff observations recorded damages across the state from Highgate to Halifax, with cold pockets and river valleys seeing the most extensive damage. Most reports of freeze damage in forests stated damage to members of the Fagaceae family, including American beech (*Fagus grandifolia*) and red oak (*Quercus rubra*) regardless of geographic location. In the northeast, reports also included black walnut (*Juglans nigra*) and white ash (*Fraxinus americana*); in the northwest, reports also included black locust (*Robinia pseudoacacia*), staghorn sumac (*Rhus typhina*) and white ash were also reported; in the southwest, reports also included black locust, butternut (*Juglans cinerea*), and staghorn sumac; and in the southeast, reports also included hickory (*Carya* spp.), sugar maple (*Acer saccharum*) and white ash.

Aerial view of freeze damage along the White River in South Royalton on May 31, 2023. Photo credit: FPR Staff.

FPR staff have assessed damage over a small portion of the state through aerial detection surveys and will continue to document the damage in the coming weeks. Since this freeze event happened so early in the growing season, it's likely that otherwise healthy trees will be able to re-leaf, however, these new leaves may be smaller and lighter in color, causing the canopies to look thinner this year. If you would like to contribute to our data and understanding of the extent and impact of this freeze event and have not yet reached out to FPR staff directly, you can submit your observation at VTInvasives: May Freeze Event.

Supplemental Sightings

Painted hickory borers (*Megacyllene caryae*) were reported infesting firewood in Rutland County this month. This insect commonly infests dying or freshly dead hickory (*Carya* spp.) but can be found in association with other hardwoods. Although considered a forest product pest since they may infest freshly cut logs, they serve an important ecosystem role in the breakdown of large wood fibers.

Female (left) and male (right) painted hickory borers. Photo credit: Joe Boggs, OSU Extension.

Field horsetails (*Equisetum arvense*) were observed in lawns in Orange county this month. This native perennial is a relative of ferns that were present in the late Paleozoic forests. This herbaceous plant has two types of stems; a sterile, non-reproductive, photosynthetic stem, and a reproductive, non-photosynthetic stem. These organisms spread by spores and underground rhizomes that can grow up to six feet deep.

Reproductive stem (left) and photosynthetic stem (right). Photo credit: Mary Holland, Naturally Curious.

Orange slime flux *(Cryptococcus macerans* and others) were observed on the surface of beaver-felled yellow birches (*Betula alleghaniensis*) in Rutland county this month. This bright orange flux is primarily composed of yeast fungi, but can also contain bacteria. This slime flux is not harmful to the tree since it only feeds on the extruded sap from preexisting damages.

Orange slime flux. Photo credit: FPR Staff.

Beech blight aphids (*Grylloprociphilus imbricator*) were observed on American beech (*Fagus grandifolia*) leaves in Rutland County. These native aphids hatch from eggs in April and tend to congregate in large masses by early fall. In large colonies, these aphids will raise their abdomen and sway when threatened. This defense dance has inspired another common name, the "boogie-woogie aphid." Although not typically a pest of concern, feeding causes honeydew excretions that can be colonized by sooty mold. Sooty mold can block photosynthesis if covering foliage, leading to dieback.

Beech blight aphids. Photo credit: FPR Staff.

Winter storm damage has caused dieback and loss of flowers to Rhododendrons in Orange county. Foliage that stayed above the snowline all winter experienced strong winds and low temperatures, which contributed to noticeable dieback this spring. Foliage below the snowline was observed as green with flower buds beginning to swell by mid-May.

Rhododendron with winter storm damage. Photo credit: FPR Staff.

Hickory gall midges (*Phylloxera caryaeglobuli*) were observed on shagbark hickory (*Carya ovata*) in Windsor County. These leaf galls provide vital nutrients and protection for larvae that are developing within them. Although infested leaves have abnormal growth and potentially less photosynthetic capabilities, this insect does not contribute to large-scale dieback or decline.

Hickory gall midge galls. Photo credit: FPR Staff.

Emerald ash borer (EAB, *Agrilus planipennis*) was detected for the first time in the towns of Berkshire, Enosburg, Fayston, Marlboro, Sheldon, Westminster and Whitingham this month. These new towns did not expand the infestation severity into neighboring towns, but increased infestation severity of already affected towns. For additional resources including managing ash, Use Value Appraisal guidance, and to report a sighting, check out the resources available at VTInvasives.

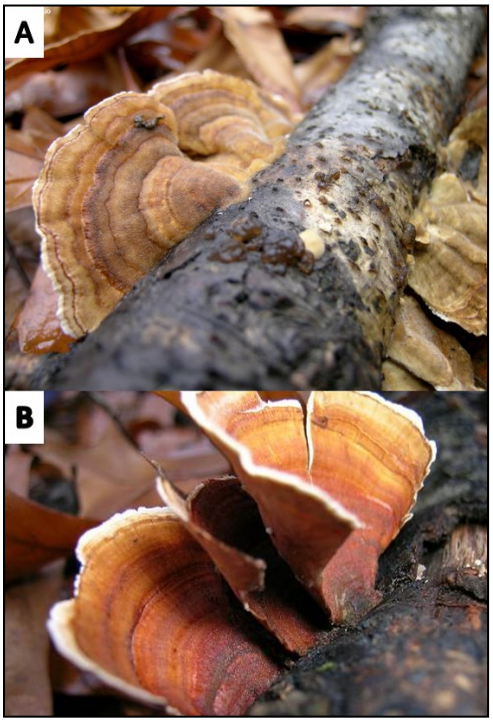
EAB gallery. Photo credit: FPR Staff.

Oat crown rust caused by the fungal pathogen *Puccinia coronata* was observed causing aceia (fruiting body) lesions on common buckthorn (*Rhamnus cathartica*) leaves this month. This rust pathogen requires two obligate (living) hosts, buckthorn (*Rhamnus* spp.) and oat (*Avena* spp.), to complete its lifecycle. This pathogen causes minimal damage to buckthorn hosts but can cause mortality and large-scale crop loss in oats.

Aceia on common buckthorn leaves. Photo credit: FPR Staff.

Foraging For Fungi

Turkey tails (*Trametes versicolor*), are a commonly foraged polypore that is found throughout the state. This fungus is a saprotroph and is commonly found on dead hardwoods. Its cap varies in color but is typically in the red-brown to brown range with concentric zones of color. This mushroom has a thin and flexible cap that has fine hair on the surface and feels velvety when rubbed. The underside of its cap has pores that give off a whiteish spore print. This mushroom has many look-alikes, including the non-edible false turkey tails (*Stereum ostrea*). This mushroom is also a saprotroph that has concentric zones of colors and is sometimes velvety. Its fruiting body is funnel-shaped, brown to red-orange in color and is 1-7cm wide. Unlike true turkey tails, this is a crust fungus, and has no pore surface.



A: True turkey tails. **B:** False turkey tails. Photo credit: Michael Kuo, Mushroom Expert.

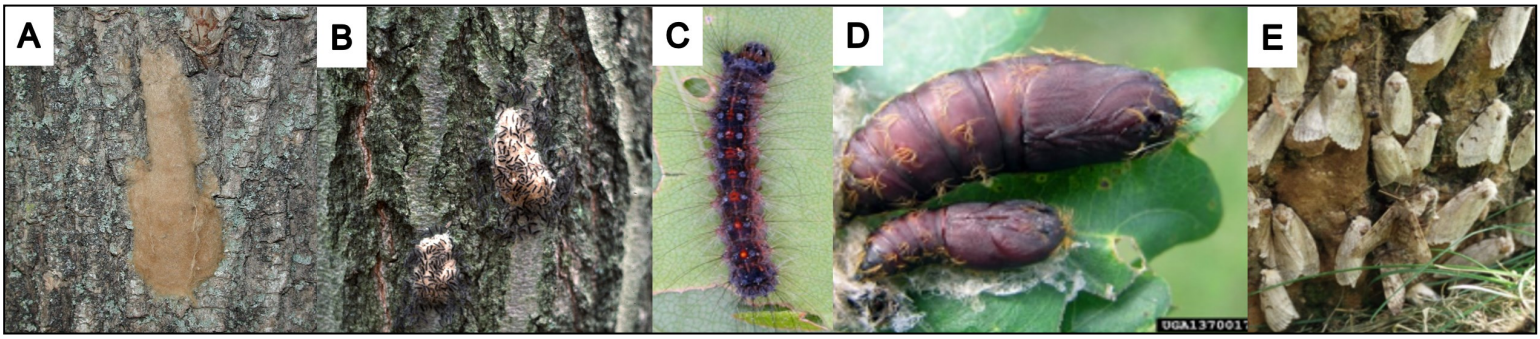
The hemlock varnish shelf, (*Ganoderma tsugae*) is a foraged polypore that peaks in late May. This fungi is both parasitic and saprotrophic of hemlock (*Tsuga* spp.) trees. Its cap is kidney-shaped with a red, varnished surface and is 4-16cm wide. When immature, this mushroom has whiteish-yellow stripes towards the margin of the cap. The underside of its cap has a whiteish to reddish-brown pore surface that bruises when damaged and turns black with KOH. It gives off a brown spore print. Its stem is 3-14cm long and 3cm thick. A similar species, *Ganoderma sessile*, is another forgeable look-a-like found in our eastern forests. This mushroom is mostly saprotrophic, but can sometimes be parasitic, and grows out of dead and damaged hardwood trees. Its cap is irregularly kidney-shaped with a red-brown lacquered surface and is 8-16cm wide and 4-8cm wide. The cap turns black with KOH. As the mushroom matures, there are concentric growth rings in the flesh of the cap. This mushroom usually has an absent stem, but when present, is lacquered brownish-red, and is 5cm long and 2 cm thick. The underside of its cap has a whiteish to pale-brown pore surface that bruises when damaged and gives off a reddish-brown spore print. 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.***

A: Hemlock varnish shelf. Photo credit: Melissa Kuo, MushroomExpert. **B:** *Ganoderma sessile* Photo Credit: Michael Kuo, MushroomExpert.

Pests in the Spotlight: Spongy Moth

The spongy moth (*Lymantria dispar dispar*) is an invasive hardwood defoliator that has been observed in Vermont since the late 1800s. In Vermont, the most commonly defoliated trees are oaks, but the caterpillars will feed on over 300 species of trees and shrubs including sugar maple. The 2023 growing season marks year three of a predicted three to five year outbreak of spongy moth defoliation in Vermont. In 2022, 42,797 acres of defoliation were mapped during FPR's statewide aerial surveys, a slight decrease from the 50,945 acres mapped in 2021. Although spongy moth is documented in all VT counties, most defoliation occurred in oak and maple forests in the Champlain Valley, extending east to the foothills of the Green Mountains.

Spongy moth caterpillars emerge from egg masses in late April-June, feeding in groups on expanding leaves. Young caterpillars spread by "ballooning" from long threads, which break in the wind and carry caterpillars to a new location. As they grow, they molt 5-6 times, increasing in size and appetite. Feeding is complete by early July, then spongy moth caterpillars pupate, where skins are shed and a new purplish-brown shell forms around the larva. After 1-2 weeks, an adult moth emerges from the pupal shell. Moths mate and lay eggs on bark fissures and crevices in August. These egg masses are yellowish-tan in color and outbreaks can number in the hundreds on individual trees.



Life stages of spongy moth. **A:** Intact egg masses found in fall/winter. Photo: FPR Staff. **B:** Hatched egg mass found in spring. Photo: FPR Staff. **C:** Late instar caterpillar. Photo: FPR Staff. **D:** Pupal cases. Photo: USDA Forest Service. **E:** Adult moths laying eggs. Photo: FPR Staff.

The most effective control we see in Vermont is the fungal pathogen *Entomophaga maimaiga* and the viral pathogen LdMNPV (*Lymantria dispar multicapsid nuclear polyhedrosis virus)*. The fungal pathogen *E. maimaiga* is most prevalent in the environment when we have wet and humid springs, something we have been experiencing this year. This moisture allows more populations of this fungus to become established, which increases the likelihood of spongy moth caterpillars becoming infected and killed. LdMNPV virus is less dependent on weather and often is more successful when spongy moth populations reach outbreak levels. Spongy moth outbreaks may also collapse if eggs hatch early and a frost occurs. Most infested trees will recover, but defoliation stress can incite tree decline if other stresses are present. In addition to drought, consecutive years of defoliation, severe winters, and other disturbances magnify the impact and lead to tree mortality. For more information or to report a sighting, visit VTinvasives.

Seasonal Spotlight: Species to Spot in Late Spring and Early Summer

Grass is growing, robins are nesting, and flowers are blooming. Like these well-known signs of spring in New England, we can also find patterns in the seasonal changes of invasive plants. Highlighted below are common invasive plants that tend to stand out in **May**, **June**, and **July**. Learning easy ways to spot these plants is a great first step to managing for them on your land or in your community.

These invasive plants are commonly spotted in ***May***:

Honeysuckle

- In Vermont in May, look for invasive honeysuckles to have leaves, flower buds, and for those flowers to start opening. Some parts of the state may even see fruit forming by the end of the month.

Invasive honeysuckle with open flowers in May. Photo credit: FPR Staff.

Garlic mustard

- In Vermont in May, look for invasive garlic mustard to have leaves, flower buds, and open flowers. Some parts of the state may even see fruit forming by the end of the month.

Invasive garlic mustard with open flowers in May. Photo credit: FPR Staff.

These invasive plants are commonly spotted in ***June:***

Wild chervil

- In Vermont in June, look for wild chervil to have leaves, flower buds, and open flowers.

Invasive wild chervil with open flowers. Photo credit: Leslie J. Mehrhoff, University of Connecticut, Bugwood.

Dame's rocket

- In Vermont in June, look for dame's rocket to have leaves, flower buds, and open flowers.

Invasive dame's rocket with open flowers. Photo credit: Leslie J. Mehrhoff, University of Connecticut, Bugwood.

These invasive plants are commonly spotted in ***July:***

A field of invasive wild parsnip blooming. Photo credit: FPR Staff.

Wild parsnip

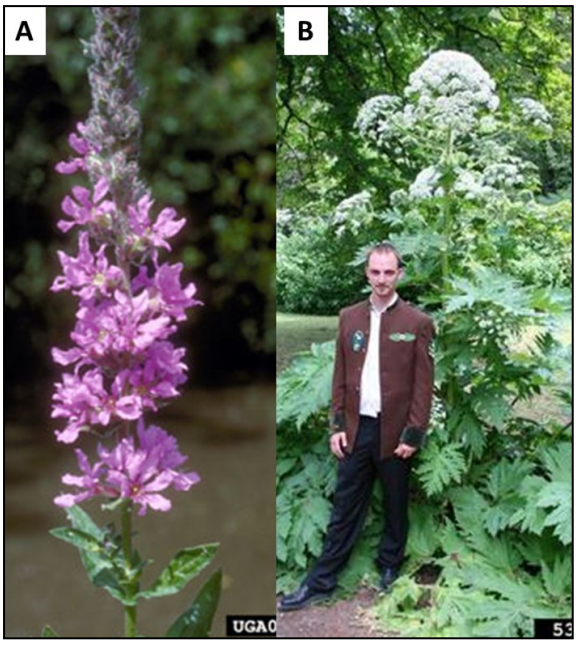
- In Vermont in July, look for wild parsnip to have leaves, flower buds, open flowers, and fruit starting to form.

Purple loosestrife

- In Vermont in July, look for purple loosestrife to have leaves, flower buds, and open flowers.

Giant hogweed

- In Vermont in July look for giant hogweed to have leaves, flower buds, and open flowers.
- **SPECIAL NOTE**: While giant hogweed blooms this time of year, this plant is very ***uncommon and rare*** in Vermont; there are many plants that are often mistaken for giant hogweed. This resource can help determine which plant you're looking at.



A: Invasive purple loosestrife with open flowers. Photo credit: Eric Coombs, Oregon Department of Agriculture, Bugwood. **B:** Invasive giant hogweed with open flowers. Photo credit: Robert Vidéki, Doronicum Kft. Bugwood.

To learn more about these invasive plants, check out VTinvasives.org and these additional resources:

- PlantSnap, GoBotany, and iNaturalist, which are plant ID tools we find helpful
- Resources on management/control, with tips on how to manage invasive plants on your own or hire a contractor
- Guides for how to organize successful invasive plant removal workdays and for working with volunteers
- Distribution maps: EDDMapS and iNaturalist

Invasive Plant Phenology

In the second full week of each month, volunteers around the state observe and report invasive plant phenophases. These observations are compiled here, creating both a timely resource for best management options and a historic record of plant behavior.

This project aspires to include observations from every county, cand more observers are welcome in multiple places. 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.

Addison – common barberry: leaves, flowers/flower buds; common buckthorn: leaves; dame's rocket: leaves, flowers/flower buds; garlic mustard: leaves, flowers/flower buds, open flowers; goutweed: leaves; knotweed: leaves, evidence of prior infestation; multiflora rose: leaves; shrub honeysuckles: leaves, flowers/flower buds, evidence of prior infestation; wild chervil: leaves, flowers/flower buds, open flowers; wild parsnip: leaves.

Caledonia – common barberry: leaves; common buckthorn: leaves; glossy buckthorn: leaves; goutweed: leaves; Japanese barberry: leaves; Knotweed: initial growth; leaves; round leaf bittersweet: leaves; shrub honeysuckles: leaves, flowers/flower buds; wild chervil: leaves.

Chittenden – black swallowwort: leaves, flowers/flower buds; burning bush: leaves, flowers/flower buds; Callery pear: leaves, flowers/flower buds, open flowers; common barberry: leaves, flowers/flower buds, evidence of prior infestation; common buckthorn: leaves, flowers/flower buds, evidence of prior infestation; common reed: initial growth, evidence of prior infestation; cypress spurge: leaves, flowers/flower buds, open flowers; dame's rocket: leaves, flowers/flower buds, open flowers; garlic mustard: initial growth, leaves, flowers/flower buds, open flowers, fruit/unripe fruit; glossy buckthorn: leaves, evidence of prior infestation; goutweed: initial growth, leaves; greater celandine: leaves, flowers/flower buds, open flowers; Japanese barberry: leaves, flowers/flower buds, evidence of prior infestation; knotweed: initial growth, leaves, flowers/flower buds, evidence of prior infestation; multiflora rose: leaves, flowers/flower buds, evidence of prior infestation; Norway maple: leaves; round leaf bittersweet: leaves, flowers/flower buds, evidence of prior infestation; shrub honeysuckles: leaves, flowers/flower buds, open flowers, evidence of prior infestation; vinca minor: leaves, flowers/flower buds, open flowers; wild chervil: leaves, flowers/flower buds, open flowers; wild parsnip: initial growth, leaves.

Franklin – goutweed: initial growth, leaves; burning bush: leaves, flowers/flower buds, open flowers; common buckthorn: leaves, flowers/flower buds, open flowers; Japanese barberry: leaves, flowers/flower buds, open flowers.

Orange – common buckthorn: leaves; shrub honeysuckles: leaves.

Washington – garlic mustard: initial growth, leaves; flowers/flower buds, open flowers; goutweed: initial growth, leaves; knotweed: initial growth, leaves; wild chervil: initial growth, leaves; burning bush: leaves; shrub honeysuckle: leaves, flowers/flower buds, open flowers; multiflora rose: leaves.

FORESTS, PARKS & RECREATION VERMONT AGENCY OF NATURAL RESOURCES

For more information, contact the Forest Biology Laboratory at 802-505-8259 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

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