12 INVASIVE PLANTS COMMONLY FOUND IN VERMONT
This guide was compiled by the Vermont Department of Forests, Parks & Recreation's Forest Health Invasive Plant Program.

Collaborators

USDA Forest Service
UVM Extension
VT Agency of Agriculture, Food & Markets
VT Agency of Natural Resources

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What Is An Invasive Species?

Invasive species are non-native plants, animals, and other organisms that are introduced into an ecosystem and cause harm to the things we value.

They are able to thrive in their new environment because they leave behind the predators, competitors, and diseases that were keeping them in check in their native range. Invasive plants have adaptations that allow them to grow quickly, often under adverse conditions. They can spread rapidly due to their reproductive strategies, which allow them to quickly colonize an area (see photo, page 4). They out-compete Vermont’s native plants, thus altering the ecosystem and causing harm to the things we value such as:

The environment
- Reduced biodiversity
- Disruption of the food web
- Negative impacts on wildlife

Human health
- Increased tick populations
- Rashes caused by contact with certain invasive plants

The economy
Invasive plants impede forest regeneration which negatively impacts:
- Forestry and logging industries
- Maple sugaring
- Hunting and tourism
Above: A forest understory infested with a monoculture of invasive Japanese Barberry
Plant Identification Terms

**Leaf Types**

**Simple**: only one leaf between stem and leaf tip

**Compound**: two or more leaflets between stem and leaf tip

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**Leaf Edges**

**Entire/Smooth**: leaf edge has no teeth

**Toothed/Serrrated**: leaf edge has sharp teeth

**Lobed**: leaf edge indents about half way to the midrib

---

**Arrangement**

**Alternate**: leaves are staggered on the stem (1 leaf per node)

**Opposite**: leaves are straight across from each other (2 leaves per node)
Cambium: layer of new growth located just under the bark

Herbaceous: plants that have no persistent woody stem above ground, and may be annuals, biennials or perennials

Lenticels: raised pores on the outer tissues of woody plants that allow gas exchange between the atmosphere and the internal tissues

Node: a joint or point of attachment for leaves and branches

Pith: the most central part of a woody plant’s branch, composed of soft, spongy cells that store and transport nutrients, usually white or pale in color, some are dark or even hollow

Woody: a plant that produces wood as its structural tissue and are usually either trees or shrubs
## Woody Plants

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<thead>
<tr>
<th></th>
<th>Asiatic Bittersweet</th>
<th>Autumn Olive</th>
<th>Burning Bush</th>
<th>Common Buckthorn</th>
<th>Honeysuckle</th>
<th>Japanese Barberry</th>
<th>Multiflora Rose</th>
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## Quick Identification Reference Guide

### Herbaceous Plants

<table>
<thead>
<tr>
<th></th>
<th>Common Reed</th>
<th>Garlic Mustard</th>
<th>Japanese Knotweed</th>
<th>Purple Loosestrife</th>
<th>Wild Parsnip</th>
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*Note: The table indicates the presence or absence of specific characteristics for each herbaceous plant.*
Asiatic Bittersweet  
*Celastrus orbiculatus*

**Arrangement:** alternate  
**Leaf Edge:** toothed  
**Leaf Shape:** simple, elliptical to circular  
**Fruit:** red berries with yellow/orange casing  
**Flowers:** small, greenish-white  

**Woody Vine:** can grow up to 60 ft  
**Bark:** tan/gray furrowed bark on older growth  
**Roots:** reddish orange
Asiatic Bittersweet Look-alikes
American Bittersweet, *Celastrus scandens*

Distinguishing features:
Fruit/Flower: at the end of the branches (terminal) as opposed to the invasive bittersweet which has flowers & fruits all along the vine
Fruits: orange when ripe

Other Vines Found in Vermont

Wild Grape  Virgina Creeper  Poison Ivy
Autumn Olive
*Elaeagnus umbellata*

**Arrangement:** alternate  
**Leaf Edge:** smooth, wavy margins  
**Leaf Shape:** simple, ovate to lanceolate  
**Leaf Texture:** smooth  
**Leaf Color:** silver scales on the underside  
**Fruit:** reddish pink, silver speckled berries  
**Flowers:** small, yellowish tubular

**Woody Shrub/Small Tree:** can grow up to 20 ft  
**Bark:** young twigs are scaled  
**Thorns:** present
Autumn Olive Look-alikes
Russian Olive, Elaeagnus angustifolia

Arrangement: alternate
Leaf Edge: smooth
Leaf Shape: lanceolate
Leaf Texture: smooth
Leaf Color: silver scales on both sides
Fruit: yellow, silver speckled berries
Flowers: silver outside, yellow within

Woody Shrub/Small Tree: can grow up to 35 ft
Bark: young twigs silver scaled, older growth brown
Thorns: present

This look-alike is also INVASIVE
**Burning Bush**  
*Euonymus alatus*

**Arrangement:** opposite  
**Leaf Shape:** simple, oval with a point  
**Leaf Edge:** toothed  
**Leaf Color:** dark green, turning crimson in the fall  
**Fruit:** reddish capsules split to reveal fleshy orange seeds  
**Flowers:** inconspicuous; greenish yellow; 4 petals

**Woody Shrub:** can grow up to 20 ft  
**Stems:** 2-4 corky ridges (wings) grow on younger stems
# Burning Bush Look-alikes

## European Spindle-tree
*Euonymus europaeus*

- **This look-alike is also INVASIVE**

**Distinguishing features:**
- **Fruit:** pink capsules open to reveal orange seeds
- **Stems:** slight ridges on younger stems

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## Shrubs with Brilliant Red Foliage

- **Highbush Blueberry**
- **Arrowwood Viburnum**
- **Fragrant Sumac**
Common Buckthorn
*Rhamnus cathartica*

**Arrangement:** alternate (subopposite)
**Leaf Edge:** toothed
**Leaf Shape:** simple, ovate, with a pointed tip
**Leaf Texture:** smooth; prominent “U” shaped veins curving toward tip
**Leaf Color:** dark, glossy green
**Fruit:** black berries
**Flowers:** yellowish green

**Woody Shrub/Small Tree:** can grow over 15 ft
**Bark:** lenticels, dark gray
**Cambium:** orange/yellow inner tissue
**Thorns:** present
Common Buckthorn Look-alikes

**Glossy False Buckthorn**
*Frangula alnus*

- **Arrangement:** alternate
- **Leaf Edge:** smooth
- **Leaf Texture:** smooth, dark glossy green, prominent parallel veins
- **Fruit:** berries ripen from red to purple
- **Flowers:** small, white, 5-petals
- **Bark:** lenticels, grayish brown

**This look-alike is also INVASIVE**

**Dogwoods**

- **Arrangement:** most species opposite
- **Leaf Edge:** smooth
- **Tear Test:** gently tear a leaf (right); fibrous strands are exposed, allowing half of the leaf to “hang”

**Chokecherry**

- **Arrangement:** alternate
- **This is just one species of cherry that could be mistaken for buckthorn.**
Honeysuckle
*Lonicera maackii, L. morrowii, L. tatarica, Lonicera x bella*

Arrangement: opposite  
Leaf Edge: smooth  
Leaf Shape: simple, egg shaped  
Leaf Texture: soft/downy (except Tartarian)  
Fruit: twinned red or orange berries  
Flowers: twinned, fragrant, white/peach/pink  

Woody Shrub: can grow over 15 ft  
Bark: light brown, shaggy  
Pith: hollow, brown center  

Native species of honeysuckle have a solid pith
**Honeysuckle Look-alikes**

<table>
<thead>
<tr>
<th>Distinguishing features:</th>
<th>Bush Honeysuckle</th>
<th>Distinguishing features:</th>
<th>American Honeysuckle</th>
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<tr>
<td>Leaf Edge: toothed</td>
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<td>Leaf Texture: smooth</td>
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<td>Fruit: capsule</td>
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Native species found in VT have a solid pith and invasive species of honeysuckle have a hollow pith. Check the pith of older growth.

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<th>Shrubs with Opposite Leaves</th>
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<td>Common Snowberry</td>
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<tr>
<td>Fruit: white berries</td>
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</tbody>
</table>

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<th>Shrubs with Opposite Leaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Border Privet</td>
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<tr>
<td>Dogwoods</td>
</tr>
</tbody>
</table>
Japanese Barberry
*Berberis thunbergii*

**Arrangement:** alternate (leaves are clustered along branches)

**Leaf Edge:** smooth

**Leaf Shape:** simple, small, oval

**Fruit:** bright red berries, persist into winter

**Flowers:** pale yellow, drooping below branches

*A cultivar with red leaves is commonly used in landscape plantings*

**Woody Shrub:**
multiple arching branches, can form a dense understory

**Cambium & Roots:**
bright yellow

**Thorns:** single spine at each cluster of leaves
Japanese Barberry Look-alikes

**Common Barberry** *Berberis vulgaris*

**Distinguishing features:**
- **Leaf Edge:** toothed
- **Flowers:** pale yellow clusters droop below branches
- **Woody Shrub:** can grow up to 13 ft
- **Thorns:** 3-pronged spine at each cluster of leaves

This look-alike is also **INVASIVE**

**Other Thorny Shrubs**

- **Roses**
- **Raspberry/Blackberry**
Rosa multiflora

**Multiflora Rose**

**Arrangement:** alternate
**Leaves:** pinnately compound, 7-9 leaflets
**Leaf Edge:** toothed leaflets
**Fruit:** small, red rose hips
**Flowers:** clusters of numerous, white flowers with 5 petals
**Fringed Stipules:** (appendage at base of leaf stalk) distinguishes it from other rose species

**Woody Shrub:** multiple canes, can grow up to 15 ft
**Thorns:** stout, curved
Multiflora Rose Look-alikes

Distinguishing features:
**Flowers:** pink to pale pink flowers; grow singly or in small clusters of flowers
**Stipules:** entire
**Growth:** smaller, shorter, less extensive shrubs
**Common Reed**  
*Phragmites australis*

- **Arrangement:** alternate
- **Leaf Shape:** simple, long, flat, pointed leaves
- **Leaf Texture:** smooth
- **Fruit:** seeds are light brown
- **Flowers:** dense, feather-like inflorescence; gray or purple in color

**Perennial Grass:** stems can grow over 10 ft tall

- **Stems:** thick, round, hollow
- **Ligule** (outgrowth at junction of leaf and leafstalk): 0.1-0.4 mm with dense, thick hairs

*Dead leaves adhere to brown dead stems through winter*
# Common Reed Look-alikes

<table>
<thead>
<tr>
<th>Ornamental Grasses</th>
<th>American Reed</th>
</tr>
</thead>
</table>

**Distinguishing features:**

**Stem Color:** green to maroon, bright maroon on lower portions of culm where sheath is removed

**Leaf Sheaths:** pull off easily from dead stems
Garlic Mustard
*Alliaria petiolata*

**Arrangement:** alternate
**Leaf Edge:** coarsely toothed
**Leaf Shape:** simple, heart/triangular, vary in size
**Fruit:** long, slender seed pods
**Flowers:** small, white 4 petals

**Herbaceous Biennial:** 1st year- basal rosette; 2nd year-produces flowers on 1-4 ft stalks
**Roots:** “S” shaped taproot
**Stems:** young plants have purple stems
**Scent:** crushed plants smell like garlic
Garlic Mustard Look-alikes

**Distinguishing features:**
- **Stem:** square
- **Scent:** minty odor when crushed
- **Growth Form:** runners
- **Flowers:** purple

**Distinguishing features:**
- **Leaves:** heart-shaped base
- **Leaf Edge:** finely toothed
- **Flowers:** blue, violet, yellow or white

**Species with White Flowers in Early Spring**

- Toothwort
- Early Saxifrage
- Sweet Cicely

**Other species in the mustard family can have similar seed pods**
Japanese Knotweed
*Fallopia japonica*

**Arrangement:** alternate  
**Leaf Edge:** smooth  
**Leaf Shape:** simple, broad, spade shaped; flat at base  
**Fruit:** small, triangular seeds  
**Flowers:** form spikes made up of many small white flowers

**Herbaceous Perennial:** can grow over 10 ft  
**Stems:** hollow between nodes, bamboo-like; green with pinkish red accents  
**Young Shoots:** reddish  
*Rusty red standing dead in winter*
# Japanese Knotweed Look-alikes

<table>
<thead>
<tr>
<th>Horsetail species</th>
<th>Bamboo species</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="Horsetail" /></td>
<td><img src="image2.jpg" alt="Bamboo" /></td>
</tr>
</tbody>
</table>

**Distinguishing features:**

**Leaves:** bush like growth, resembling a horsetail

**Height:** resembles knotweed shoots in the early spring, but do not grow very tall

**Distinguishing features:**

**Leaf Shape:** long and slender

**Stems:** harder than Japanese knotweed
**Purple Loosestrife**  
*Lythrum salicaria*

**Arrangement:** opposite/whorled leaves  
**Leaf Edge:** smooth  
**Leaf Shape:** simple, lanceolate  
**Fruit:** capsules containing many reddish-brown seeds  
**Flowers:** magenta 5-7 petaled flowers form spikes  

**Herbaceous Perennial:** multiple stems, can grow up to 5 ft  
**Stems:** square on younger stalks, many angles on mature plants  

*Often found in wet areas*
<table>
<thead>
<tr>
<th>Distinguishing features:</th>
<th>Fireweed</th>
<th>Blue Vervain</th>
<th>Distinguishing features:</th>
</tr>
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<tbody>
<tr>
<td>Arrangement: alternate</td>
<td></td>
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<td>Flowers: bluish purple with 5 fused petals</td>
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<td>Stem: round</td>
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<tr>
<td>Flowers: pink, 4 petals</td>
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<thead>
<tr>
<th>Distinguishing features:</th>
<th>Winged Loosestrife</th>
<th>Swamp-Loosestrife</th>
<th>Distinguishing features:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrangement: upper opposite, lower alternate</td>
<td></td>
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<td>Flowers: pink/purple whorled in a dense cluster around stem; 8-10 white-tipped pink stamens</td>
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<tr>
<td>Stem: winged</td>
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<tr>
<td>Flowers: solitary 6 petals, pink-purple</td>
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</table>
Wild Parsnip
*Pastinaca sativa*

**Arrangement:** alternate  
**Leaves:** coarsely toothed  
**Leaf Shape:** compound, 5-11 leaflets  
**Fruit:** flat, brown seeds  
**Flowers:** small yellow flowers form a flat top (umbel)

**CAUTION:** Exposure to sap causes extreme skin irritation!

**Herbaceous Biennial/Perennial:**  
1st year- basal rosette; flowering plant can grow 5 over ft  
**Stems:** hollow, except at nodes; ridges  
**Root:** taproot, smells like parsnip
## Wild Parsnip Look-alikes

<table>
<thead>
<tr>
<th>Distinguishing features:</th>
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<th>Distinguishing features:</th>
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<tbody>
<tr>
<td><strong>Size:</strong> grows up to 2 ½ feet tall</td>
<td><strong>Flowers:</strong> white umbel</td>
<td><strong>Flowers:</strong> white umbel</td>
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<tr>
<td><strong>Leaves:</strong> 3-5 leaflets</td>
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- **Golden Alexander**
- **Cow Parsnip**
- **Queen Anne's Lace**

- **Giant Hogweed**
  - **This look-alike is also INVASIVE**

**INVASIVE**
Prioritizing invasive plant work is important to ensure that time and resources are spent efficiently in the face of seemingly overwhelming invasive infestations. Focus time and resources on high priority areas where management actions can make the most difference with emphasis on resources and values protected rather than individual invasive plants controlled. There are populations of invasive plants that will not meet these criteria and, given limited time and budget, may not be managed.

**High Priority Invasive Plants:**
- Aggressive plants (could have the most impact on an ecosystem)
- Uncommon plants (few to no populations in the state)
- Plants that are new to an area
- Plants that pose a threat to human health

**Note:** Chart on the following page to be used for each invasive plant encountered in an area. Use the chart for each plant found and consider the combined results.

**Above:** Volunteer uses a Weed Wrench
Is this area a high priority for protection?  
Do you place value on the area?
Valuable resources (example: sugarbush, woodlot), little/no existing invasives, 
used frequently for recreation, important wildlife habitat, intact forest

YES
Is this a small population?

NO
Is this a small population?

YES
Is this a high priority invasive plant?

NO
Is this a high priority invasive plant?

YES
Is this a high priority invasive plant?

NO
Is this a high priority invasive plant?

YES
High priority

NO
Medium priority

YES
Medium priority

NO
Medium-low priority

YES
Medium-low priority

NO
Lowest priority
Setting reasonable goals and expectations is important. In most cases the goal is to control the spread of the infestation, not eradicate the invasive population entirely. For instance, the quicker an infestation is identified, the easier and more cost-effective it will be to manage it. Once an infestation is identified, use the prioritization flow chart (p35) to determine the intensity/severity of the situation.

To slow the spread, there are two main forms of management to consider:
- **Mechanical**: hand pulling, digging, burning, mowing, cutting, smothering, grinding and any other techniques that physically remove the plant
- **Chemical**: using both organic and conventional herbicides

Which method(s) to utilize will vary situationally, depending on a variety of factors including target plants, size of infestation, site specifications, time of year, prioritization, resources available, etc. In some situations, the most effective treatment plan is a combination of mechanical and chemical treatments.

Regardless of the management techniques used, monitoring and follow up treatments are extremely important to long term success.

For more information on specific control methods visit VTinvasives.org.
**Phenology Information**

**Phenology**: the study of the timing of biological events in a plant such as leaf out, flowering, and seed production.

When considering treatment options, understanding the plant's phenology is very important as different treatment options are most effective at different times in the plant's life cycle. For example, to effectively control some herbaceous plants using the treatment method of mowing, the treatment would need to take place before the plants produce seeds. If the plants are mowed too late, after they have gone to seed, mowing will only exasperate the problem by spreading the seeds.

### Asiatic Bittersweet

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<td>Fruiting</td>
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### Autumn Olive

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**Berries persist through winter**
### Phenology Information

<table>
<thead>
<tr>
<th>Month</th>
<th>Burning Bush</th>
<th>Common Buckthorn</th>
<th>Honeysuckle</th>
<th>Japanese Barberry</th>
<th>Multiflora Rose</th>
<th>Common Reed</th>
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- **Burning Bush**: Blooms in March and September.
- **Common Buckthorn**: Blooms in May and September.
- **Honeysuckle**: Blooms in May and June.
- **Japanese Barberry**: Blooms in May and October.
- **Multiflora Rose**: Blooms in May and September.
- **Common Reed**: Blooms in June and July.
**Phenology Information**

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<td><strong>Garlic Mustard</strong></td>
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<td><strong>Japanese Knotweed</strong></td>
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<td><strong>Purple Loosestrife</strong></td>
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<td><strong>Wild Parsnip</strong></td>
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- **Leafed out**
- **Flowering**
- **Fruiting**
- **Berries persist through winter**
Seed Bank Information

**Seed Bank**: the accumulation of viable seeds in the leaf litter or on the soil surface which serves as a source for the production of subsequent generations of plants.

**Seed Viability**: a seed which is able to germinate given the right conditions of moisture, temperature, light etc is called "viable".

It is important to note that even once the seed producing plants are removed, there are still subsequent generations of seeds in the soil. The area needs to be monitored for several years and follow up treatments are necessary until the seed bank is depleted.

### Average Seed Bank

*These are averages and should be used as a guideline only.*

| Common Buckthorn: 2-6 years | Burning Bush: low seed viability after the 1st year | Honeysuckle: 3-5 years |
| Wild Parsnip: 5 years | Japanese Barberry: low seed viability after the 1st year | Japanese Knotweed: length of viability debated |
| Multiflora Rose: 10-20 years | Garlic Mustard: 5-10 years (most germinate in 1-2 years) | Autumn Olive: 3 years |
| Purple Loosestrife: 3 years | Asiatic Bittersweet: low seed viability after the 1st year | Common Reed: length of viability debated |
Understanding how invasive plants spread can be critical for preventing new infestations and slowing the spread of existing infestations. Management strategies should take these potential modes of spread into consideration to prevent unintentional spread.

<table>
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<tr>
<th>Reproductive Strategy</th>
<th>Potential Methods of Spread</th>
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<tbody>
<tr>
<td>Roots (Rhizomes)</td>
<td>Ditching, road grading, transporting contaminated fill, flooding, improper disposal</td>
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<tr>
<td>Stem and/or root</td>
<td>Mowing, ditching, road grading, transporting contaminated fill, flooding, improper disposal</td>
</tr>
<tr>
<td>Seeds</td>
<td>Mowing, transporting contaminated fill, equipment, birds and animals, wind, improper disposal</td>
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</table>

Invasive plants can be spread unknowingly and accidentally through improper disposal. Proper disposal is extremely important for successful invasive plant management. For the most updated disposal guidelines please visit VTinvasives.org.

Learn
• Get to know the invasive plants found in Vermont
• Familiarize yourself with state quarantines and regulations

Get Involved
• Create and implement a management plan for your property
• Volunteer with local invasive efforts
• Add your invasive sightings to the “Mapping for Healthy Forests: Vermont” project on iNaturalist

Make a Difference
• Garden with native plants
• Help spread the word, not the invasive!

More information on all these topics and more can be found at: VTinvasives.org
Above: Volunteers from Orvis work together to remove invasive plants from a Vermont State Park.
### Citations

Photos are listed by page number/position - (T)op, (M)iddle, (B)ottom, (L)eft, (R)ight.

| 10/BL, 20/BR | David Cappaert | 12/BR, 26/BR | Joseph M. DiTomaso, U. CA - Davis |
| 10/BM, 27/TR, 28/TL 31/TR | John Cardina, The Ohio State University | 12/TM, 14/L | Jan Samanek, Phytosanitary Administration |
| 10/BR, 13/TR, 18/BR, 29/BL, 32/BL, | Richard Gardner | 13/BL, 24/TL, 24/BL | John Ruter, University of Georgia |
| 11/BR | James R. Allison, Georgia Dept. of Natural Resources | 14/L, 18/BL | Robert Vidéki, Doronicum Kft. |
| 11/TM, 11/TR, 26/TR | Karan A. Rawlins, U. of Georgia | 14/BR | Bruce Marlin |
| 12/BR, 26/BR | Patrick Breen, Oregon State University | 14/TR | David J. Stang |
| 12/TM, 14/L | Jan Samanek, Phytosanitary Administration | 14/TR | Kent McFarland |
| 13/BL, 24/TL, 24/BL | John Ruter, University of Georgia | 16/TR, 16/BR | Paul Wray, Iowa State University |

Most photos are courtesy of Bugwood.org
| Photos are listed by page number/position - (T)op, (M)iddle, (B)ottom, (L)eft, (R)ight. |
|---|---|
| **16/TR, 18/TL, 18/BL, 18/TR, 18/BR, 21/TM, 21/BR, 24/TM, 24/TR, 25/TM, 26/BL, 30/TR, 30/BR** | **Rob Routledge, Sault College** |
| **27/BR** | **Tom Heutte, USDA Forest Service** |
| **27/TM** | **Britt Slatyter, USFWS** |
| **28/BR** | **Whitney Cranshaw, Colorado State University** |
| **28/TL** | **Mary Ellen Harte** |
| **28/TR** | **Caryn Rickel, Institute of Invasive Bamboo Research** |
| **28/TR** | **Whitney Cranshaw, Colorado State University** |
| **29/TM** | **Steve Dewey, Utah State University** |
| **30/BL** | **Rebekah D. Wallace, U.of Georgia** |
| **30/TR** | **Bonsak Hammeraas, NIBIO - The Norwegian Institute of Bioeconomy Research** |
| **32/BL** | **USDA APHIS PPQ - Oxford, North Carolina** |
| **32/TL** | **Peter Dziuk, Minnesota Dept. of Agriculture** |
| **32/TR** | **Alex Katovich** |
| **19/BR** | **Barry Rice, sarracenia.com** |
| **21/BL, 22/TR** | **James H. Miller, USDA Forest Service** |
| **21/TR** | **James W. Amrine Jr., West Virginia University** |
| **22/BL** | **Michael Becker** |
| **22/M** | **Steven Katovich, USDA Forest Service** |
| **22/TM, 23/TR, 23/BR, 31/TM** | **Ohio State Weed Lab, The Ohio State University** |
| **27/BL** | **Jenn Grieser, New York City Department of Environmental Protection** |