



NEW INVADERS OF THE NORTHEAST AND NORTHCENTRAL



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The Forest Health Technology Enterprise Team (FHTET) was created in 1995 by the Deputy Chief for State and Private Forestry, USDA, Forest Service, to develop and deliver technologies to protect and improve the health of American forests. FHTET became Forest Health Assessment and Applied Sciences Team (FHAASST) in 2016. This booklet was published by FHAASST as part of the technology transfer series.

<http://www.fs.fed.us/foresthealth/technology/>



Cover photos: a. *Vitex rotundifolia* infestation; b. *V. rotundifolia* flower (a,b. Forest & Kim Starr, Starr Environmental); c. *Clematis vitalba* flower; d. *C. vitalba* infestation (c,d. Robert Vidéki, Doronicum Kft., bugwood.org); e. *Broussonetia papyrifera* (Chuck Barger, University of Georgia, bugwood.org); f. *B. papyrifera* inflorescence (Daderot); g. *Narcissus pseudonarcissus* flower (BerndH); h. *N. pseudonarcissus* infestation (Sapin 88)

How to cite this publication: Rawlins, K.A., R.L. Winston, C.T. Barger, D.J. Moorhead, and R. Carroll. 2018. New Invaders of the Northeast and Northcentral United States. USDA Forest Service, Forest Health Assessment and Applied Sciences Team, Morgantown, West Virginia. FHTET-2017-04.

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NEW INVADERS OF THE NORTHEAST AND NORTHCENTRAL UNITED STATES

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This publication is available online at:

https://www.fs.fed.us/foresthealth/technology/pdfs/FHTET-2017-04_New_Invaders_Northeast.pdf

ACKNOWLEDGMENTS

The authors wish to thank Christopher Evans (UIUC NRES) for his review and helpful comments on this publication. Some of the material in this guide was revised from the sister guides “New Invaders of the Northwest and Southwest”. We acknowledge and express our appreciation for the additional authors of those guides: Rachel Winston, Carol Bell Randall, Wendy DesCamp, Jennifer Andreas, Joseph Milan, and Mark Schwarzländer. We would like to thank all of the photographers who granted permission for the use of photos. The vast majority were obtained via a Creative Commons license and are included herein under the same license; no changes were made to those images. The layout of this guide was designed by Rachel Winston. We also extend our gratitude to Richard Reardon (Forest Service-Forest Health Assessment and Applied Sciences Team) for producing this guide.

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ABOUT THIS FIELD GUIDE

The purpose of this guide is to help landowners and land managers recognize new invasive plants that are not yet widely distributed, so they can be treated rapidly and eradicated rather than becoming large and expensive problems. Invasive plants are a major concern worldwide. They displace native species, decrease forage and agricultural production, alter nutrient and water cycling, and lower the aesthetic value of natural areas. With the increase of world travel, exotic plant introductions are on the rise.

Not all newly introduced species become invasive. Those which do often follow an invasion pattern; they remain at low levels for several years or decades (lag phase) and then enter a phase where they increase dramatically. Attempting to control large invasive plant infestations is a costly endeavor; it is much more cost effective to allocate resources toward invasive plant prevention or the rapid treatment of new introductions. Unfortunately, the process of adding newly introduced species to watch lists or control lists is frequently tedious and lengthy. By the time many invasive species are on the radar, they have become widely established.

This guide focuses on species considered problematic in the 20 states that comprise the northeastern and northcentral United States: Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin. Not all species included herein will be problematic in all portions of this region.

The species in this guide were selected through a multi-step process by:

1. First combining the noxious weed, watch, and new invader lists/alerts of northeastern/northcentral states and regional exotic plant councils
2. Adding species with high ecological impact ratings as assigned by the NatureServe and state and regional exotic plant councils
3. Identifying which of the above species are not yet widespread throughout the northeastern/northcentral United States
4. Eliciting the opinions of numerous state and regional invasive plant experts to narrow the candidate list to those present in this guide

It was not possible to include all new species of concern, but this manual will hopefully serve as a good starting point. The plants included herein are arranged first by flower color, and then grouped with related species progressing from grasses through forbs, vines, shrubs, and trees. Aquatic plants are given their own section. Non-flowering terrestrial plants are included in the green flower section; non-flowering aquatic plants are included in the aquatic section. Select definitions of plant terms are included in the glossary. For more in-depth explanations of plant

parts and plant life cycles, or for more help with plant identification, please see the suggested references listed at the end of this guide. **Additional references are also provided for guidebooks and websites with identification information on other, more established invasive plants in the region.**

Each plant is represented by multiple photos and descriptions emphasizing key identification traits and ways to distinguish it from look-alike species. Attempts were made to utilize the most current scientific names for all invasive plants. The GRIN (Germplasm Resources Information Network), GBIF (Global Biodiversity Information Facility), databases and ITIS (Integrated Taxonomic Information System) were largely followed in this regard, with input from taxonomists and other sources. Please note the scientific names for many species have changed since previous invasive plant publications.

Plant distribution data is presented in a map for each species. This information was sourced from the Early Detection & Distribution Mapping System (EDDMapS, www.eddmaps.org). Distribution information was also provided by individuals and recent invasive plant alert reports. Counties where the invasive plant has been documented are colored red. Some documented populations of invasive plants have since been eradicated. The locations of these populations are still included in the distribution maps because it is possible some plants, seeds, or propagules survived.



Invasive plant spread is often rapid. Even if an invasive plant is not depicted as occurring in a specific region, it could have spread into that region since the collection of distribution information presented herein. Particular care should be taken searching for species in areas surrounding known infestations, as invasive plant spread into nearby areas is likely.

IF YOU FIND A NEW INVADER

Should you find one of the species listed in this manual in a new region (or a species you believe to be a new invader), notify your local invasive plant authority immediately (e.g. your county weed superintendent or state department of agriculture), and devise a treatment plan to eradicate the infestation as promptly as possible. The infestation should also be mapped and submitted to the EDDMapS database. For more information on how to utilize or contribute to the EDDMapS tools, visit www.eddmaps.org/about/ and apps.bugwood.org/.

INVASIVE PLANT REGULATIONS

Some species in this guide are listed as noxious, prohibited, or restricted within a state(s). Where applicable, this information is included in a special section on the species' description page. Regulations pertaining to these designations are given in the table below. This table is for informational purposes only and should not be interpreted as complete, nor should it be considered legally binding. Coordination with your state plant regulatory agency is recommended to stay up-to-date on revised regulations for any species included in this guide.

STATE	DESIGNATION	DEFINITION
Connecticut (CT)	Prohibited	Species for which importing, moving, selling, buying, cultivating, distributing, or transplanting is prohibited, regardless of any municipal ordinance to the contrary.
Delaware (DE)	Noxious	Species that are not allowed to exceed 24 inches in height or allowed to produce seed.
Illinois (IL)	Aquatic Injurious Plant	Aquatic species that are not allowed to be possessed, bought, sold, distributed, offered for sale, or planted within the state without an IDNR-issued permit.
	Noxious	Any plant which is determined by the Director, the Dean of the College of Agriculture of the University of Illinois and the Director of the Agricultural Experiment Station at the University of Illinois, to be injurious to public health, crops, livestock, land or other property.
	Prohibited Exotic Weed	Species that are not allowed to be bought, sold, distributed, offered for sale, or planted within the state without an IDNR-issued permit.
Indiana (IN)	Noxious	Plants that are under control programs, and/or are prohibited or restricted from sale or distribution in Indiana.
	Prohibited Invasive Aquatic	Species for which it is illegal to (1) sell, offer for sale, gift, barter, exchange, or distribute, (2) transport on or within any: boat, trailer, motor vehicle, bait bucket, fishing gear, creel, tackle, tackle box, or other means.
Iowa (IA)	Noxious	Plants that are under control programs, and/or are prohibited or restricted from sale or distribution.
	Aquatic Invasive Species	Species which it is illegal to possess, introduce, purchase, sell, or transport in Iowa.
Maine (ME)	Noxious	Species that are illegal to import, export, buy sell or intentionally propagate in Maine.

STATE	DESIGNATION	DEFINITION
Maryland (MD)	Noxious	Plants that are under control programs, and/or are prohibited or restricted from sale or distribution.
	Invasive (Tier 1)	Plants that may not be propagated, imported, transferred, sold, purchased, transported, or introduced.
	Invasive (Tier 2)	Plants that a person may not sell or offer for sale at a retail outlet unless the retail outlet posts in a conspicuous manner in proximity to such plant displays, a sign identifying the plants as Tier 2 plants.
Massachusetts (MA)	Prohibited	Species that are prohibited from sale, trade, purchase, distribution and related activities.
Michigan (MI)	Noxious (Prohibited)	Species whose seeds are prohibited as contaminants in seed offered for sale.
	Noxious (Restricted)	Species for which the contaminant limit is one seed per 2000 of agricultural seed offered for sale.
	Prohibited	Species that cannot be sold or grown in the state. and whose fragments, seeds or a hybrid or genetically engineered variant thereof are specifically prohibited.
	Restricted	Species for which any plants, fragments, seeds or a hybrid or genetically engineered variant thereof are restricted.
Minnesota (MN)	Noxious (Control)	Prohibited noxious weeds listed to be controlled are plants established throughout Minnesota or regions of the state which must be controlled, (efforts must be made to prevent the spread, maturation and dispersal of any propagating parts, thereby reducing established populations and preventing reproduction and spread), and their transportation, propagation, or sale is prohibited.
	Noxious (Eradicate)	Prohibited noxious weeds listed to be eradicated are not currently known to be present in Minnesota or are not widely established. These species must be eradicated, and their transportation, propagation, or sale is prohibited.
	Prohibited Seed	Species whose seeds are prohibited as contaminants in seed intended for planting.
	Restricted Seed	Species for which the contaminant limit is 25 per pound of seed intended for planting.
	Specially Regulated Plant	Plants that may be native species or have demonstrated economic value, but also have the potential to cause harm in non-controlled environments.

INVASIVE PLANT REGULATIONS (CONTINUED)

STATE	DESIGNATION	DEFINITION
Missouri (MO)	Noxious	Plants that are under control programs, and/or are prohibited or restricted from sale or distribution.
New Hampshire (NH)	Prohibited Aquatic	Exotic aquatic weeds for the which the sale, distribution, importation, purchase, propagation, transportation, or introduction into the state is prohibited.
	Prohibited Terrestrial	Terrestrial species for the which no person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant.
New Jersey (NJ)	Noxious Seed	Seed which contains in excess of a pre-determined limitation (%) of noxious weed seeds is prohibited from sale or must have the noxious weed species and amounts clearly labelled (limitations based on species).
New York (NY)	Prohibited	Plants that are prohibited from sale, purchase, possession, propagation, introduction and transport in New York State.
	Regulated	Plants that cannot be knowingly introduced into a free-living state, or introduced by a means that one should have known would lead to such an introduction, although such species shall be legal to possess, sell, buy, propagate and transport.
Ohio (OH)	Noxious	Plants that are under control programs, and/or are prohibited or restricted from sale or distribution.
Pennsylvania (PA)	Noxious	Plants that are under control programs, and/or are prohibited or restricted from sale or distribution.
Rhode Island (RI)	Noxious	Plants that are prohibited from movement into or within Rhode Island.
	Noxious Seed	Species for which the sale of agricultural, vegetable or lawn seed containing any seeds is prohibited.
Vermont (VT)	Noxious A	Noxious weeds that are not native to the State, not currently known to occur in the State on the date of listing, and pose a serious threat to the State. They are prohibited or restricted from sale, possession, cultivation, or distribution.
	Noxious B	Noxious weeds that are not native to the state, are of limited distribution statewide, and pose a serious threat to the State, or any other designated noxious weed being managed to reduce its occurrence and impact in the State. They are prohibited or restricted from sale, possession, cultivation, or distribution.

STATE	DESIGNATION	DEFINITION
West Virginia (WV)	Noxious	Species for which it is illegal to move, transport, deliver, ship or offer for shipment into or within West Virginia.
Wisconsin (WI)	Noxious	Plants that are under control programs, and/or are prohibited or restricted from sale or distribution.
	Prohibited	Invasive species that are not currently found in Wisconsin, with the exception of small pioneer stands, but which, if introduced into the state, are likely to survive and spread, potentially causing significant environmental or economic harm or harm to human health. The transport, possession, transfer and introduction of these species is not allowed.
	Restricted	Invasive species that are already established in the state and cause or have the potential to cause significant environmental or economic harm or harm to human health, and for which the transport, transfer and introduction are prohibited, but possession is allowed.

COMMON BUGLOSS

Anchusa officinalis L.

SYNONYMS: alkanet, bee bread, *Anchusa angustifolia* L.

ORIGIN: Europe

GROWTH TRAITS: Upright, herbaceous growing 1-3' (30-90 cm) from a deep taproot. It is a basal rosette in its first year. Plants that behave as biennials bolt several flowering stems their second year before dying by their second winter. Plants growing as perennials bolt one flowering stem the second year and several stems thereafter. Stems and leaves are fleshy and hairy. Leaves are narrowly lance-shaped and decrease in size further up the stem. Basal leaves are stalked while stem leaves are alternate and clasp the stem. Flowers are produced from late spring to early fall in fiddleneck clusters at the ends of stems and branches. With maturity, fiddlenecks unfurl and straighten. Each flower is bluish-purple with a white center and has 5 petals fused at their bases to form a trumpet shape. Each flower produces a 4-chambered nutlet, and each nutlet produces one seed.



Common bugloss a. plant; b. small infestation (a. © Gerald D. Carr 2017; b. John M. Randall, The Nature Conservancy, bugwood.org)



Common bugloss c. leaves and stem; d. flowers; e. fruit bases with 4 nutlets each (c. Andreas Rockstein; d. © Marco Munari, iNaturalist.org; e. © Gerald D. Carr 2017)

REPRODUCTION: Spreads by seed. Seeds may remain viable in the soil for many years.

HABITAT: Does best in full sun in moist but well-drained conditions. It can be found in disturbed environments such as roadsides, pastures, and cultivated fields.

LOOK-ALIKES: Several native and exotic species in the Boraginaceae family resemble common bugloss with their bluish fiddleneck flowers, alternate and hairy leaves, nutlet fruits, and erect growth form. The combination of small, deep blue, uncurved, tubular flowers with white centers, fleshy stems and leaves, and narrow leaves larger at their base help differentiate common bugloss.



Look-alike: blueweed (Pleple2000)

The exotic blueweed (*Echium vulgare*) and Patterson's curse (*E. plantagineum*) are very similar, but their flowers are less tubular, and their upper petal lobes overhang the lower lobes. The exotic small bugloss (*Anchusa arvensis*) differs from common bugloss by growing smaller, having smaller blue flowers, and having warty foliage.

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Common bugloss frequently invades pastures and can cause hay bales to mold.



BEACH VITEX

Vitex rotundifolia L. f.

SYNONYMS: roundleaf chastetree

ORIGIN: Asia, Australia, the Pacific Islands (including Hawaii)

GROWTH TRAITS: Prostrate, deciduous shrub or sprawling vine growing up to 2' (0.6 m) tall from a deep, minimally-branched taproot. The sprawling stems root at the nodes and may spread as much as 33-60' (10-20 m) away. Stems are green, square, and fleshy when young. Mature stems are brown, woody, and brittle, breaking off easily in high tide and colonizing new areas after rooting from stem nodes. Leaves are oval, 1-2" (2.5-5 cm) long, opposite, strongly aromatic, and have smooth margins. The upper leaf surface is pale green and lightly hairy while the lower surface is silvery-gray and has dense, matted hairs. Flowers are 0.3" (8 mm) long, 2-lipped with bluish-purple petals fused at their base, and occur in small clusters at the ends of branches. The fruit is round, 0.25" (6 mm) in diameter, green when young, and dark purplish-black when mature. At temperate locations, flowers appear spring to summer, fruits mature



Beach vitex a. plant; b. infestation (a,b. Forest & Kim Starr, Starr Environmental)



Beach vitex c. leaves; d. flowers; e. fruits (c-e. Forest & Kim Starr, Starr Environmental)

in early autumn, and the plant drops its leaves in winter. In warm climates, the plant retains its leaves and flowers year-round.

REPRODUCTION: Spreads by seed and vegetatively by rooting at stem nodes. Seeds remain viable in the soil for up to four years.

HABITAT: Does best in sandy soils in full sun. Highly tolerant of drought and salt.

LOOK-ALIKES: Several dune species resemble beach vitex, including the native Brazilian bayhops (*Ipomoea pes-caprae* ssp. *brasiliensis*) and gulf croton (*Croton punctatus*). The combination of opposite leaves with smooth margins, 2-lipped bluish-purple flowers, and low sprawling growth form help differentiate beach vitex from potential look-alikes. Brazilian bayhops has alternate leaves funnel-shaped flowers while gulf croton has alternate leaves and non-showy, green flowers.



Look-alike: gulf croton (Rebekah D. Wallace, University of Georgia)

NOXIOUS WEED LISTINGS: NY (Prohibited)

NOTES: This species was intentionally introduced into the continental United States in the 1980s as a beach stabilization plant, although it is much less effective than native dune grasses that have more fibrous root systems.



BUTTERFLY BUSH

Buddleja davidii Franch.

SYNONYMS: orange eye butterflybush, summer lilac, Texas lilac

ORIGIN: China

GROWTH TRAITS: Deciduous shrub typically growing 6-12' (1.8-3.7 m) tall and often equally wide from a deep root system. Stems are dense, outward-arching, 4-angled, often hairy when young, and have scraggly, grayish-brown, peeling bark at maturity. There are several varieties and cultivars available which vary in their leaf size, leaf color, and flower color. Leaves are opposite, lance-shaped, 2-8" (5-20 cm) long, and have very finely toothed margins. They vary from dark green to light silver-green and are hairless above with dense hairs on the undersides. Leaves are shed in autumn and replaced by new ones that remain over winter. Flowers appear in long, dense, spikes at branch tips from summer to early fall. The tiny, tubular flowers have 4 petals that vary from white to deep purple and often have orange centers. The fruits are inconspicuous, dry brown



Butterfly bush a. shrub; b. hillside infestation (a. Ptelea; b. Leslie Mehrhoff, University of Connecticut, bugwood.org)



Butterfly bush c. leaves; d. flowers; e. fruits (c. © naturewatchwidow, iNaturalist.org; d. Ptelea; e. Robert Vidéki, Doronicum Kft., bugwood.org)

capsules that split open when ripe to release numerous dust-like seeds. Plants typically live up to 20 years.

REPRODUCTION: Spreads by seed, which may remain viable for five years. Cut stems and root fragments can also sprout roots and grow into new plants.

HABITAT: Tolerates a variety of conditions, but grows best in full sun to partial shade in moist, well-drained, fertile soils. It capitalizes on disturbance and readily invades forest margins, streamsides, fields and moist rock faces.



Look-alike: Lindley's butterfly bush (*Pancreat*)

LOOK-ALIKES: The combination of opposite, lance-shaped leaves and long, purple, spike inflorescences help differentiate butterfly bush from unrelated look-alikes. Within the genus, most species in the USA grow in southern or western states. In the East, the exotic fountain butterfly bush (*B. alternifolia*) has long, weeping inflorescences. The exotic Lindley's butterfly bush (*B. lindleyana*) typically only grows to 5' (1.5 m) tall and has more ovate leaves and more tubular flowers.

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: This species is still popular in the ornamental trade where it is planted to attract bees, butterflies, and hummingbirds. It frequently escapes cultivation.



AMUR SILVERGRASS

Miscanthus sacchariflorus (Maxim.) Hack.

SYNONYMS: silver banner grass, *Miscanthus sacchariflorus* (Maxim.) Franch.

ORIGIN: Asia

GROWTH TRAITS: Perennial clump-forming grass typically growing 5-8.2' (1.5-2.5 m) tall from a rhizomatous root system. Leaves are 1-3' long (0.3-0.9 m) and 1" wide (2.5 cm). They are often recurved and have rough margins and a prominent whitish midvein. The ligules and stem nodes are membranous and fringed with hairs. The inflorescence resembles a corn tassel and is pyramid- to fan-shaped, up to 1' long (30 cm), and occurs at stem tips in late summer/early fall. Florets do not have awns. Mature seeds are covered in silky hairs, giving the mature inflorescence a fluffy, silver appearance.

REPRODUCTION: Spreads by seed and rhizomes. Seeds typically remain viable for less than five years.



Amur silvergrass a. plants; b. infestation (a,b. Leslie Mehrhoff, University of Connecticut bugwood.org)



Amur silvergrass c. leaf blade with white midvein and stems with hairy nodes and ligules; d. flowering inflorescence; e. mature inflorescences (c-e. Leslie Mehrhoff, University of Connecticut, bugwood.org)

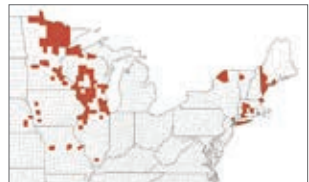
HABITAT: Amur silvergrass grows best in moist, disturbed areas in full sun to partial shade. It can be found along roadside ditches, woodland borders, field margins, and pond edges.

LOOK-ALIKES: Several native and exotic grasses resemble Amur silvergrass. The clumped but rhizomatous growth, hairy ligules, and white midveins help differentiate Amur silvergrass from jubata and pampas grass (*Cortaderia jubata* and *C. selloana*). The similar rhizomatous and linear-growing giant and common reeds (*Arundo donax* and *Phragmites australis*, respectively) both grow taller than Amur silvergrass and both are not as hairy at nodes and ligules. The closely related exotic Chinese silvergrass (*Miscanthus sinensis*) has wider and less upright inflorescences. The exotic Ravenna grass (*Saccharum ravennae*) has many similar traits but differs in that its roots are fibrous, its leaf bases are covered in much denser hairs, and it grows much taller with longer inflorescences.



Look-alike: Chinese silvergrass (Leslie Mehrhoff, University of Connecticut, bugwood.org)

NOXIOUS WEED LISTINGS: MA (Prohibited)



NOTES: This species is frequently used for soil erosion control and as an ornamental, but often escapes cultivation. A sterile cross of this species and Chinese silvergrass (*Miscanthus sinensis*) is being studied for its biofuel potential.

FEATHERTOP

Calamagrostis epigejos (L.) Roth

SYNONYMS: wood small-reed, chee reed grass, *Arundo epigejos* L., *C. epigeios* (L.) Roth

ORIGIN: Africa, Asia, Europe

GROWTH TRAITS: Perennial grass with flowering stems reaching 2-6.5' (60-200 cm) tall from a rhizomatous root system. Stems are hollow between nodes. Leaf blades are alternate, drooping, up to 28" (70 cm) long by 0.5" (12 mm) wide, green, with ribbed and rough upper surfaces. On the interior surface of the leaf where it meets the stem is a papery, triangular ligule 0.16-0.5" (4-12 mm) long. Florets occur on dense, branched inflorescences 6-12" (15-30 cm) long throughout summer. At maturity, inflorescences are a rich brown or tinged with purple. Each floret is enclosed by 2 narrow, pointed bracts 0.2-0.28" (5-7 mm) long. These gape open to reveal 2 narrow shorter bracts, the reproductive parts, and a mass of fine, white hairs. New stems sprout from rhizomes in spring.

REPRODUCTION: Spreads by seed and rhizomes. Seeds remain viable in the soil for at least five years.



Feathertop a. plants; b. infestation (a. Christian Fischer; b. Лобачев Владимир)



Feathertop c. leaf blade and stem node; d. ligule, stem, and base of leaf blade; e. inflorescence; f. floret (c,d,f. © Hermann Falkner; e. © Samuel Brinker, iNaturalist.org)

HABITAT: Feathertop can tolerate a wide variety of conditions including moist, brackish soil and dry conditions. It can be found escaping cultivation along fields, roadsides, and other disturbed places and also invading meadows and forest clearings.

LOOK-ALIKES: Native bluejoint (*Calamagrostis canadensis*) is very similar to feathertop, but it grows somewhat shorter with a smaller, narrower, less-dense inflorescence and narrower leaves. The ligule of bluejoint is also shorter (up to 0.16" or 4 mm long) and more flat at its tip. The native slimstem reedgrass (*C. stricta*) is also very similar but has even smaller features than bluejoint. Slimstem reedgrass is also typically a wetland species.



Look-alike: bluejoint (Lazaregagnidze)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: This species is sometimes cultivated as an ornamental grass, and is also used in revegetation and erosion control.



GOLDEN & YELLOW GROOVE BAMBOO

Phyllostachys aurea Carr. ex A.& C. Rivière & *P. aureosulcata* McClure

Golden bamboo a. plant; b. joints; c. stem with compressed basal internodes; d. leaves (a. Nancy Loewenstein, Auburn University; b. Chuck Barger, University of Georgia; c. David Stephens; d. James H. Miller, USDA FS; a-d. bugwood.org)



Yellow groove bamboo e. plants; f. stem close-up (yellow groove is faint due to thickness/age of mature stems); g. several stems; h. leaves (e,h. Daderot; f. Caryn Rickel, bugwood.org; g. Yongxing)

SYNONYMS: Golden bamboo (**GB**): fish-pole bamboo; Yellow groove bamboo (**YGB**): stake-and-forage bamboo, *Phyllostachys aureosulcata* f. *spectabilis* C. D. Chu & C. S. Chao

ORIGIN: **GB:** China, Taiwan; **YGB:** China

GROWTH TRAITS: Both species are giant, perennial grasses that resemble narrow trees with thin side branches. They typically grow 16-40' (5-12 m) tall from spreading, rhizomatous root systems. Stems are woody, hollow with solid joints (nodes), and typically 1-3.5" (2.5-9 cm) in diameter, though some grow to 6" (15 cm). Leaves are lance-shaped with long petioles. Flowering is rare for both species. Plants are evergreen; old leaves are gradually replaced by new ones late in spring. In very severe winters, stems may die back and be replaced by new shoots in spring. **GB:** Stems are generally green but turn yellow when exposed to full sun. Basal stem joints are closer together than joints further up the stem, resulting in compressed "internodes". Leaves are 3-6" (7.5-15 cm) long. **YGB:** Young stems are rough-feeling and deep green with a yellow groove on every other internode. The rough texture decreases, and the stem colors fade with age. Leaves are 3-7" (7.5-17.5 cm) long.

REPRODUCTION: Both species spread primarily via rhizomes.

HABITAT: Both species do best in full sun but can tolerate partial shade and are typically found on roadsides, hillsides, and spreading from old home sites where they were intentionally planted. Both species are very cold tolerant.

LOOK-ALIKES: Several similar species of *Phyllostachys* bamboo (all exotic) have been intentionally introduced to North America as ornamentals or for timber products. The compressed internodes of golden bamboo and the yellow stem stripe of yellow groove bamboo help differentiate these species from other bamboos and from each other. A few species of cane (*Arundinaria*) are native to North America. They differ from exotic bamboos by typically growing smaller and thinner.

NOXIOUS WEED LISTINGS: Both species: NY (Prohibited)

NOTES: Both species were introduced to the USA for their ornamental value and have been used in sound barriers and as fishing poles.



golden bamboo



yellow groove bamboo

RAVENNA GRASS

Saccharum ravennae (L.) L.

SYNONYMS: hardy pampas grass, elephant grass, plume grass, *Erianthus ravennae* (L.) Beauv., *Andropogon ravennae* L., *Ripidium ravennae* (L.) Trin., *Tripidium ravennae* (L.) H. Scholz

ORIGIN: Eurasia, the Mediterranean

GROWTH TRAITS: Perennial bunchgrass growing 8-13' (2.4-4 m) tall from a densely fibrous root system. Leaves are basal and also distributed up the stem to the bottom of the inflorescence. Leaves have serrated margins, a thick, white midvein on the upper sides of blades, and can be 1.6-3.3' (0.5-1 m) long and 0.5" (1.2 cm) wide. Leaf bases are unlobed and are densely covered with long, fuzzy hairs that typically hide the ligule. Dense flower plumes are purplish (maturing to silver to tan), up to 2' (0.6 m) long, and bloom from July through October. Florets are covered in tufts of silky hairs, giving the inflorescence an overall fluffy appearance.



Ravenna grass a. plant; b. infestation (a. Jennifer Andreas, Washington State University Extension; b. The Nature Conservancy Archive, The Nature Conservancy, bugwood.org)



Ravenna grass c. leaf blade with serrated margins and white midveins; d. hairy leaf base; e. inflorescences (c-e. Wendy DesCamp, Washington State Noxious Weed Control Board)

REPRODUCTION: Spreads by seed. Seed longevity is unknown but believed to be only a few years.

HABITAT: Ravenna grass can be found in open, disturbed locations such as roadsides and field margins at both moist and dry sites, and it is tolerant of cold weather.

LOOK-ALIKES: Several native and exotic grasses resemble Ravenna grass. The clumped bunches help differentiate Ravenna grass from the rhizomatous and linear-growing giant and common reeds (*Arundo donax* and *Phragmites australis*, respectively). Jubata and pampas grass (*Cortaderia jubata* and *C. selloana*) are similar-looking bunchgrasses, but both lack hairs at leaf and stem bases, their leaf margins are much sharper, and their leaf midveins are not thick and white on the upper sides of the blades. Most native plumegrass species (*Saccharum*) have much more compact inflorescences. Giant plumegrass (*S. giganteum*) and shortbeard plumegrass (*S. brevibarbe*) inflorescences may be open, but both species typically grow shorter than Ravenna grass with overall smaller features, and their leaf bases are far less hairy.



Look-alike: common reed (Andy.vac)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: This species is frequently used for soil erosion control and as an ornamental, but often escapes cultivation.



WAVYLEAF BASKETGRASS

Oplismenus undulatifolius (Ard.) P. Beauv.

SYNONYMS: *Oplismenus hirtellus* ssp. *undulatifolius* (Ard.) U. Scholz

ORIGIN: southern Europe, southern Asia

GROWTH TRAITS: Perennial, low-growing grass reaching only 8-12" (20-30 cm) tall from a shallow root system. Stems are stoloniferous and branch and root at lower nodes. Leaf blades are alternate, 1.5-4" (4-10 cm) long by 0.5" (1.3 cm) wide, elliptical, elongate, and sharply pointed. Leaves are a rich green with undulating ripples across their surface, resulting in the common name of "wavyleaf". Small hairs are scattered on both leaf surfaces; stem and node hairs are longer (up to 0.16" or 4 mm) and more dense. Flowering stems may be up to 20" (50 cm) tall and produce delicate-looking inflorescences from August through November. Florets are pinkish and have long, sticky awns that readily adhere to animals and people, aiding in dispersal. Leaves remain green through late fall, dying back over winter. New stems sprout from stolons in spring.



a



b

Wavyleaf basketgrass a. plants; b. infestation (a. Dalgial; b. Kerrie L. Kyde, Maryland Department of Natural Resources, bugwood.org)



Wavyleaf basketgrass c. leaf blades; d. hairy branching, rooting stems and stolon; e. inflorescence (c. Kerrie L. Kyde, Maryland Department of Natural Resources, bugwood.org; d. Garrett Waugaman, M-NCPPC Weed Warriors, bugwood.org; e. Yasunori Koide)

REPRODUCTION: Spreads by seed and stolons. Seeds remain viable in the soil for up to five years.

HABITAT: Wavyleaf basketgrass grows best in moist soil in full shade to partial sun, allowing it to thrive under forest canopies where it forms dense mats covering forest floors.

LOOK-ALIKES: Native bristle basketgrass (*Oplismenus hirtellus*) is very similar, but its stems have few if any hairs, and its inflorescence branches are longer and have more florets that are a deeper purple. The native deer-tongue (*Dichanthelium clandestinum*) has similar hairy stems and sometimes rippled leaves, but it grows taller and in clumps. The exotic small carpetgrass (*Arthraxon hispidus*) has low-growing hairy stems and sometimes rippled leaves, but its leaves are heart-shaped at their base and clasp the stem.



Look-alike: bristle basketgrass. (Forest & Kim Starr, Starr Environmental)

NOXIOUS WEED LISTINGS: NY (Prohibited), WI (Prohibited)



NOTES: First discovered in Maryland in 1996, this species is spreading rapidly. There is currently taxonomic uncertainty with this group. Some taxonomic sources refer to wavyleaf basketgrass as a subspecies of the native *Oplismenus hirtellus*, while others (including those used for this guide) consider it a separate species.

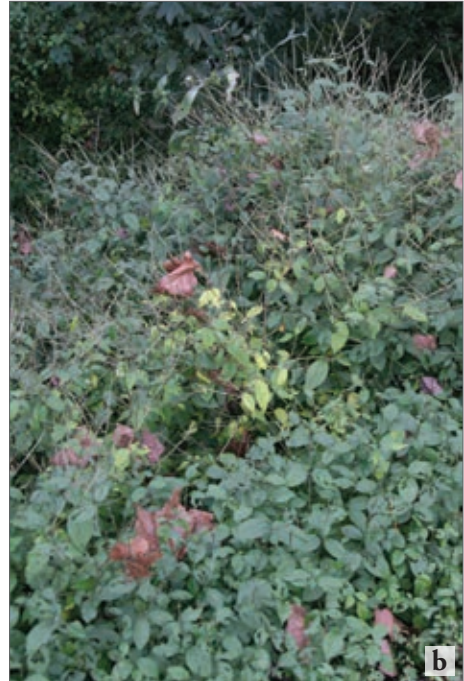
JAPANESE CHAFF FLOWER

Achyranthes japonica (Miq.) Nakai

SYNONYMS: Oriental chaff flower, *Achyranthes bidentata* var. *japonica* Miq.

ORIGIN: East Asia

GROWTH TRAITS: Herbaceous, upright perennial typically growing 1.6-6.6' tall (½-2 m) from a well-developed but non-rhizomatous root system. Young plants have one stem, while older plants have multiple stems arising from the same root crown. Stems are thin, wiry, 4-angled, branched, and often purple-tinged at their slightly swollen nodes. Leaves are opposite, elliptical, and have prominent veins and smooth (sometimes wavy) margins. Leaves are 4-8" long (10-20 cm), gradually becoming smaller up the stem. Leaves and stems are slightly hairy. Flowers are produced from late summer to early fall. They are tiny with no petals and 5 green stamens. Flowers initially occur in tight clusters on spikes at branch and stem tips, but as fruits appear, spikes elongate significantly. Flowers diverge at nearly a 90° angle from the spike, but as fruits mature they lay flat (downwards) against the spike. The fruits are slender and dry with a single hard seed, and have a pair of stiff bracts arising from their base.



Japanese chaff flower a. plant; b. infestation (a,b. Chris Evans, University of Illinois, bugwood.org)



Japanese chaff flower c. leaves; d. flowers; e. mature fruit and hairy stem (c-e. Chris Evans, University of Illinois, bugwood.org)

REPRODUCTION: Spreads by seed. Seeds have very high germination rates, though longevity is unknown.

HABITAT: Usually found in partial shade and moist soil, but it will also grow in drier areas in both sunny and densely-shaded habitats. Often found in bottomland forests, along waterways and roadsides, and at the edges of fields.

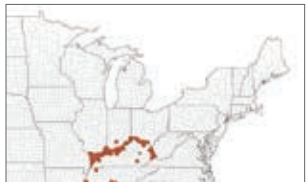
LOOK-ALIKES: Several related pigweed species (*Amaranthus*) are present in North America and have similar flowers and reddish stems. However, they have alternate leaves, unlike the opposite leaves of Japanese chaff flower. The native bloodleaf (*Iresine rhizomatosa*), American lopseed (*Phryma leptostachya*), and swamp verbena (*Verbena hastata*) all have opposite leaves and similar fruit. Bloodleaf has tiny white flowers with papery-white petals, and female flowers have tufts of hairs at their base. American lopseed and swamp verbena leaves are toothed, and their flowers have true petals with pinkish-white and purple petals, respectively. American lopseed is most similar in fall/winter but can be differentiated by its bracts arising from fruit tips instead of the fruit base as in Japanese chaff flower.



Look-alike: swamp verbena
(© Gerald D. Carr 2017)

NOXIOUS WEED LISTINGS: NY (Prohibited), WI (Prohibited)

NOTES: The pair of stiff bracts on the fruits aid in dispersal by readily attaching to clothes or fur.



SPINY EMEX

Rumex spinosus L.

SYNONYMS: devil's thorn, spiny threecorner Jack, prickly doc, *Emex spinosa* (L.) Campd.

ORIGIN: the Mediterranean

GROWTH TRAITS: Herbaceous annual that germinates in autumn or winter and grows 12-24" (30-60 cm) tall from a long, thick taproot. Stems are round, ridged, sometimes reddish, often somewhat sprawling, and branch periodically. Leaves are alternate, smooth, triangular to egg-shaped, 2-5" long (5-12.5 cm), and have slightly wavy margins. Leaves become increasingly smaller up the stem. Leaf stalks are long, hairless, and with membranous sheaths (ochreae) at their bases. Flowering occurs from early summer to winter with separate male and female flowers occurring on the same plant. Male flowers are small, inconspicuous, green, and occur in short clusters on stalks. Female flowers are spiny, without stalks, and occur in clusters around leaf axils. Fruits are produced on the stem and root crown. Stem fruits are triangular and green when young, turning reddish-brown, hardened, and with 3 sharp spines at maturity. Spines are up to 0.11" (3



Spiny emex a. plant; b. infestation (a,b. Forest & Kim Starr, Starr Environmental)



Spiny emex c. leaves; d. male flowers; e. immature fruits; f. mature fruits (c,d. Forest & Kim Starr, Starr Environmental; e. Rolf Engstrand; f. Julia Scher, USDA APHIS PPQ, bugwood.org)

mm) long. Fruits on the root crown are larger but less spiny. These are yellowish-red but turn brown with maturity. Each fruit contains a single glossy seed. When the plant dies back, its drying root pulls the crown seeds into the soil.

REPRODUCTION: Spreads by seed. Seeds remain viable in the soil for at least eight years.

HABITAT: Tolerates a wide variety of conditions but does best with disturbance. It is typically found along roadsides, railways, flood zones, field edges, pastures, grasslands, and other dry or sandy locations and can tolerate drought and cold temperatures.



Look-alike: southern threecorner Jack (Kevin Thiele)

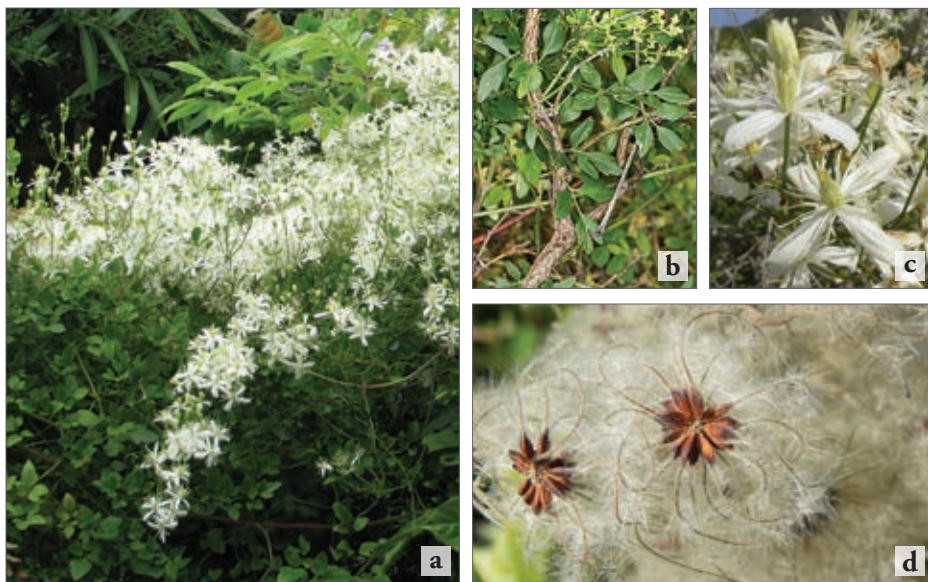
LOOK-ALIKES: While various native and exotic species have similar triangular wavy leaves, ochreae, non-showy male flower clusters, or spiny female flowers clustered around leaf axils, the combination of all of these traits helps differentiate spiny emex from most look-alikes. The closest relative of spiny emex (the exotic southern threecorner Jack, *Rumex hypogaeus*) is very similar but has larger spiny fruits, smaller leaves, and tends to grow more prostrate than spiny emex.



NOXIOUS WEED LISTINGS: MA (Prohibited), RI (Noxious), VT (B), WV

NOTES: The spiny fruits readily adhere to clothing/shoes, fur, and equipment, aiding in the weed's dispersal.

FRAGRANT CLEMATIS & TRAVELER'S JOY

Clematis flammula L. & *C. vitalba* L.

Fragrant clematis a. vines; b. leaves and leaflets; c. flowers; d. mature fruits (a. Peganum; b. © Drepanostoma, iNaturalist.org; c. © Jakob Fahr, iNaturalist.org; d. Mathieu Caunes)



Traveler's joy e. vines; f. leaf and leaflets; g. flowers; h. mature fruits (e.g. Robert Vidéki, Doronicum Kft., bugwood.org; f. Hectonichus; h. Isidre blanc)

SYNONYMS: Fragrant clematis (**FC**): fragrant virgin's bower; Traveler's joy (**TJ**): evergreen clematis, old man's beard

ORIGIN: Eurasia, the Mediterranean (both species)

GROWTH TRAITS: Both species are perennial climbing vines growing from fine, branched root systems. Vines (stems) are pliable when young, becoming woody with stringy bark. Vines smother trees, shrubs, walls, utility poles, etc. by climbing with tendril-like petioles. Vines grow erect between holds; where they grow along the ground, they root from nodes. Leaves are compound, green, opposite, and deciduous in cold climates. Leaflets are variable and may have either smooth margins or a few rounded teeth. Flowers are fragrant with 4 showy, white, petal-like sepals and numerous white stamens. Flowers occur in clusters at stem tips or in leaf axils in late summer. The fruit consists of numerous small seeds, each with a long feathery tail up to 1.2" long (3 cm) that give the fruits a pom-pom appearance. Fruits persist on vines throughout much of winter. **FC:** Vines can grow up to 20' (6 m) long. Leaves are dark green, glossy, typically twice compound, and split into 5-9 leaflets that are each 0.8-2" (2-5 cm) long. Flowers (profuse) are 0.8-1.2" (2-3 cm) across with narrow petal-like sepals. Seeds are strongly compressed and 0.2-0.24" (5-6 mm) long. **TJ:** Vines can grow up to 66' (20 m) long. Each leaf has 5 lance-shaped leaflets 1.2-4" (3-10 cm) long. Flowers are 0.8" (2 cm) across. Seeds are bulbous and 0.08-0.12" (2-3 mm) long.

REPRODUCTION: Both species spread by seed, rooting stems/segments, and sprouting from root crowns. Seeds may remain viable in the soil for up to 5 years.

HABITAT: Both species can be found along open sunny roadsides, riparian corridors, rocky slopes, fencerows, and in/along partially shaded woodlands.

LOOK-ALIKES: **FC** grows shorter, has more flowers with narrower sepals, smaller and glossier leaflets, and larger but compressed seeds compared to **TJ**. Many other *Clematis* spp. differ with their yellow or purple flowers. The native virgin's bower (*C. virginiana*) has 3 leaflets with coarse teeth. The exotic Japanese clematis (*C. terniflora*) has compressed seeds with less feathery tails.

NOXIOUS WEED: Neither species is listed as noxious in any NE/northcentral state.



fragrant clematis



traveler's joy

AMUR CORKTREE

Phellodendron amurense Rupr.

SYNONYMS: Japanese corktree, Chinese corktree, *Phellodendron japonicum* Maxim.

ORIGIN: temperate Asia

GROWTH TRAITS: Deciduous tree typically growing 30-50' (9-15 m) tall from a shallow, but wide-spreading root system. Trees have short, straight trunks that divide into numerous spreading branches to form a rounded but wide canopy. Outer bark is grayish-brown, soft, and corky, becoming more rough-textured and furrowed with age. Inner bark is bright yellow. Leaves are opposite and divided into 5-13 leaflets that are 2.5-5" (6.4-12.7 cm) long. Leaflets are lance-shaped to elliptical and have very slightly toothed margins that often appear smooth from a distance. Leaves are bright green throughout summer and turn yellow in autumn. Flowers are yellow-green (sometimes maroon), non-showy, less than 0.12" (3 mm) in diameter, and appear in loose clusters among leaves in late spring to early summer. Fruits are spherical, 0.4" (1 cm) across, berry-like, and



Amur corktree a. tree; b. bark (a. Isfisk; b. Chris Evans, University of Illinois, bugwood.org)



Amur corktree c. leaves; d. flowers; e. autumn foliage and fruits (c. Anneli Salo; d. Ettrig; e. Kurt Stüber)

green, turning black at maturity. Fruits remain on the tree through early winter. Crushed foliage and fruits are odorous, variously described as turpentine-like, skunk-like, or citrusy. Individuals are long-lived under some conditions.

REPRODUCTION: Spreads by seed. Seeds remain viable for several years.

HABITAT: Tolerates many soil types, though it does best in well-drained soil with a lot of organic material and in full sun. In North America, it has been found invading forest edges, canopy gaps, and areas of human disturbance, but can also persist in the understory of closed-canopy forests.



Look-alike: black ash (Keith Kanoti, Maine Forest Service, bugwood.org)

LOOK-ALIKES: The combination of yellow inner bark, opposite leaves, non-showy yellow-green flowers, berry-like odorous fruit help differentiate this species from most potential look-alikes. While other species may have a few similar features (such as the opposite, compound leaves of native *Fraxinus* or ash species), no other species exhibit *all* of these traits.

NOXIOUS WEED LISTINGS: MA, NY, WI (all Prohibited), ME

NOTES: Amur corktree is a popular ornamental shade tree (male clones) that was introduced intentionally into the USA in 1865.



JAPANESE ZELKOVA

Zelkova serrata (Thunb.) Makino

SYNONYMS: Japanese elm, zelkova

ORIGIN: Asia

GROWTH TRAITS: Deciduous tree typically growing 50-80' (15-24 m) tall from a deep root system. Trees have short trunks that divide into numerous erect branches to form a vase-shaped crown. The bark is grayish-brown and porous. At maturity, patches of bark begin to peel, revealing orangish bark beneath. Leaves have distinct veins and toothed margins, and are ovate, symmetrical, and alternately attached to the branch with petioles 0.08-0.2" (2-5 mm) long. Most leaves are up to 2" (5 cm) long, though some may be up to 4" (10 cm). Leaves are pale to dark green throughout summer and turn yellow, orange, or red in autumn. Buds diverge from branches at 45° angles, resulting in a zig-zag appearance. Flowers are yellow-green, non-showy, less than 0.12" (3 mm) in diameter, and appear in tight clusters along new stems in spring before new leaves emerge. Fruits are triangular to oval-shaped, 0.12" (3 mm) across, berry-like, and green, turning brown at maturity. Individuals can live for hundreds of years under some conditions.



Japanese zelkova a. tree; b. bark (a. Bruce Marlin; b. Geographer)



Japanese zelkova c. leaves; d. flowers and foliage; e. fruits (c. Steven J. Baskauf, bioimages.vanderbilt.edu; d. Kenpei; e. © Virginia Tech Department of Forest Resources and Environmental Conservation, <http://dendro.cnre.vt.edu/dendrology/>)

REPRODUCTION: Spreads by seed. Seeds may remain viable for up to four years.

HABITAT: Tolerates most soil types, though it does best in moist, deep, loamy soil in full to partial sun. It is typically found along forest edges and roadsides and in moist ravines, riparian areas, abandoned lands, and urban gardens. Established trees are fairly drought-tolerant, unless growing in sandy soils.

LOOK-ALIKES: The alternate, deeply toothed and veined leaves, divergent buds, and non-showy flowers help differentiate this tree from many unrelated look-alikes. Within the family, several native and exotic elms (*Ulmus* spp.) resemble Japanese zelkova with their similar leaves, flowers, bark, and growth form. Elms can be differentiated by having asymmetrical leaf bases and winged fruits.



Look-alike: American elm leaf (Paul Wray, Iowa State University, bugwood.org)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Japanese zelkova is a popular ornamental species with numerous cultivars available and used in yards and urban landscapes. It is highly resistant to Dutch elm disease, which has ravaged populations of native American elm.



PAPER MULBERRY

Broussonetia papyrifera (L.) Vent.

SYNONYMS: tapa cloth tree, *Morus papyrifera* L.

ORIGIN: Asia

GROWTH TRAITS: Fast-growing, deciduous tree typically reaching 30-50' (9-15 m) tall from a shallow root system. Trees have short, straight trunks that divide into stout spreading branches to form a rounded canopy. Branches are brittle and susceptible to wind damage. Branches may appear fuzzy when young; older bark is grayish-brown with shallow fissures. Leaves are alternate (some appear close to opposite), 3-10" (7.5-25 cm) long, and variable. Leaves varying from ovate and unlobed to mitten-shaped with deep lobes often appear on the same shoot. All leaves are typically hairy on both sides and have finely toothed margins. Milky sap is exuded from damaged tissue. Male and female flowers appear on different plants in spring. Male flowers are tiny, yellow-green, and appear in narrow catkins up to 3" (7.5 cm) long. Female flowers are non-showy and green, appearing on spherical heads and each trailing a long, pink threadlike



Paper mulberry a. tree; b. bark (a. Chuck Barger, University of Georgia; b. James H. Miller, USDA Forest Service; a,b. bugwood.org)



Paper mulberry c. variable leaves; d. male inflorescences; e. female inflorescences; f. fruit (c. Didier Descouens; d. Cillas; e. Daderot; f. Yugi)

floral part. Numerous fleshy, orangish-red fruits appear around spherical pendants 1.2" (3 cm) across. Cultivated individuals may live 25-50 years under some conditions.

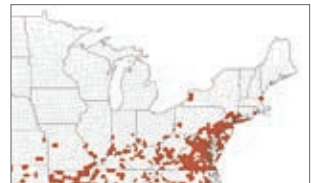
REPRODUCTION: Spreads by seed and suckering from the root system. Seed longevity is unknown.

HABITAT: Does best in moist soil and full sun. In North America, it has been found invading forest edges and gaps, floodplains, river terraces, old fields, and other areas of human disturbance.

LOOK-ALIKES: The combination of hairy twigs and leaves, variable leaves, male and female flowers appearing on separate trees, and the fleshy globular fruits helps differentiate paper mulberry from many potential look-alikes. The exotic white mulberry (*Morus alba*) has leaves with larger teeth and its fruits resemble raspberries or blackberries rather than spheres. The fruits of the native red mulberry (*M. rubra*) resemble cylindrical raspberries.



Look-alike: white mulberry (Vladimer Shioshvili)



NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Paper mulberry was intentionally introduced to North America as a fast-growing ornamental shade tree. In Asia, it has been used in paper-making. In Hawaii and parts of the South Pacific, its bark has been used to make cloth.

HIMALAYAN BALSAM

Impatiens glandulifera Royle

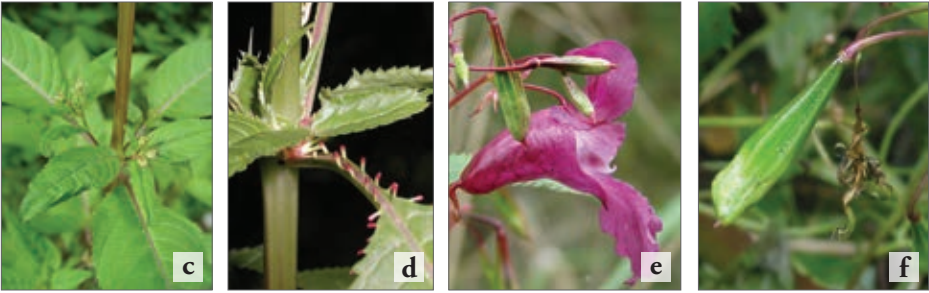
SYNONYMS: ornamental jewelweed, policeman's helmet, *Impatiens roylei* Walp.

ORIGIN: India

GROWTH TRAITS: Herbaceous annual growing 3-10' (0.9-1 m) tall from a shallow, fibrous root system. Stems are smooth, hairless, sharply angled, hollow, and often have a purplish tinge. Leaves are elliptical or lance-shaped with narrow tips, 2-9" (5-23 cm) long, and either opposite or in whorls of 3. Leaves have serrated margins and glandular stalks at their bases. Flowers appear from June to October on flower stalks in clusters at leaf nodes and stem tips. Flowers vary from white to deep pink, are ~1.3" tall (3-4 cm), and have 5 petals. Some of the petals are fused, giving the flower a unique shape resembling an old-fashioned English policeman's helmet. Seed pods are green, elongated teardrop-shaped, and 0.75-1.25" (2-3 cm) long. Seed pods explode when disturbed, scattering the small brown seeds up to 23' (7 m).



Himalayan balsam a. plant; b. infestation (a. Udo Schmidt; b. Wassily)



Himalayan balsam c. leaves and stem; d. stem and glandular stalks at leaf base; e. flower and fruit; f. mature and exploded seed pods (c. Markus Nolf; d. Leslie J. Mehrhoff, University of Connecticut, bugwood.org; e. Barbara Tokarska, Guzik University of Silesia, bugwood.org; f. Rasbak)

REPRODUCTION: Spreads by seed. Seeds may remain viable in the soil for up to 18 months.

HABITAT: Grows in partial shade to full sun in moist soil. It is regularly found in moist areas including woodlands, forest clearings, streambanks, meadows, and roadsides where water collects..

LOOK-ALIKES: Many native and exotic species of *Impatiens* resemble Himalayan balsam. Most look-alike relatives have smaller leaves (frequently alternate) and/or flowers with different colors. The native orange jewelweed (*I. capensis*) has orange flowers while the native pale jewelweed (*I. pallida*) has yellow flowers. Fireweed (*Chamaenerion angustifolium*, previously *Epilobium angustifolium*) is an unrelated native species that has similar leaves and deep pink flowers. However, petals of fireweed are not fused, and its leaves are alternate. The exotic hairy willowherb (*Epilobium hirsutum*) is also similar, but its flowers are more solitary and have 4 notched, unfused, and overlapping petals.



Look-alike: fireweed (Kallerna)

NOXIOUS WEED LISTINGS: CT, NH, WI (all Prohibited), ME (Noxious)

NOTES: This species is frequently sold as an ornamental and quickly escapes cultivation.



MILK THISTLE

Silybum marianum (L.) Gaertn.

SYNONYMS: blessed milkthistle, variegated thistle, *Carduus marianus* L., *Mariana mariana* (L.) Hill

ORIGIN: Eurasia, the Mediterranean

GROWTH TRAITS: Herbaceous winter annual or biennial growing 2-6' (0.6-1.8 m) tall from a long taproot. Rosettes form either in fall and overwinter, or they grow in spring. Stems bolt in later spring and are stout, rigid, and not spiny along their entire length. Leaves are deeply lobed, dark green, variegated with white markings along veins, and have spiny margins. Rosette leaves are up to 20" (50 cm) long; stem leaves are alternate, clasp the stem, and are much smaller, decreasing in size further up the stem. Flower heads are up to 2" (5 cm) in diameter and are solitary at the ends of stems. The bases of flower heads (receptacles) have rows of broad, leathery bracts tipped with very stiff spines fringed with smaller spines. Florets are magenta to purple and appear from May to August. Flower heads produce numerous brown or black seeds with a tuft of silky hairs at their tips.



Milk thistle a. plant; b. infestation (a. Eric Coombs, Oregon Department of Agriculture; b. Jan Samanek, Phytosanitary Administration; a,b. bugwood.org)



Milk thistle c. rosette leaves; d. flower head; e. senescing flower head and seeds (c,d. Eric Coombs, Oregon Department of Agriculture, e. Joseph M. DiTomaso, University of California - Davis; c-e. bugwood.org)

REPRODUCTION: Spreads by seed, which may remain viable for up to 9 years.

HABITAT: Grows best in full sun and in soils with high fertility and disturbance, including overgrazed pastures, roadsides, ditches, waste areas, and stockyards.

LOOK-ALIKES: Over 80 native thistle species and more than 20 exotic thistles occur in North America, and all resemble milk thistle to some extent. The variegated leaves and large flower heads with broad, leathery, spiny bracts help differentiate milk thistle from potential look-alike thistle species. The exotic musk thistle (*Carduus nutans*) has similar large flower heads and leaves, but its bracts are shorter and not leathery, and its leaves are only white along their margins.



Look-alike: musk thistle (Mary Ellen (Mel) Harte, bugwood.org)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: This species is sometimes used in site remediation projects as it is capable of removing large amounts of lead, nitrates, and zinc from polluted soil. While all milk thistle plants are considered toxic to livestock, plants growing in polluted areas are especially toxic. Milk thistle is an ancient medicinal plant used in the treatment of liver disorders and is still sold by a number of garden seed suppliers in the USA.



RAGGED ROBIN

Silene flos-cuculi (L.) Greuter & Burdet

SYNONYMS: meadow campion, *Lychnis flos-cuculi* L.

ORIGIN: Europe, Eurasia

GROWTH TRAITS: Herbaceous perennial with upright flowering stems growing 8-31.5" (20-80 cm) tall from a shallow, fibrous root system. Stems are rigid, branched near their tips, and are covered in small, barbed, downward-pointing hairs that make the plant rough to the touch. Leaves are opposite, narrow, and have smooth margins. Basal leaves are wider at their tips while leaves further up the stem are more linear and lance-shaped with pointed tips. Flowers appear in small clusters at branch tips from May to August. Flowers are approximately 1.5" (3.8 cm) across and have 5 pink petals, each deeply divided into 4 lobes, giving the flower an untidy, ragged appearance. Flower bases are fused, appearing tubular. Fruits are small capsules 0.2-0.4" (6-10 mm) long that open at their tops to release several small seeds throughout fall.



Ragged robin a. plant; b. infestation (a. Stefan Jelfnaer; b. Leslie Mehrhoff, University of Connecticut, bugwood.org)



Ragged robin c. basal leaves and stem; d. flowers; e. fruit (c-e. Leslie Mehrhoff, University of Connecticut, bugwood.org)

REPRODUCTION: Spreads by seed. Buried seeds may remain viable for at least five years.

HABITAT: Grows best in full sun and in moist soil. It is regularly found in wet meadows and pastures, boggy areas, wetlands, and along irrigation ditches.

LOOK-ALIKES: The combination of opposite leaves, 5-petal flowers, and swollen tubular flower bases help differentiate ragged robin from most potential unrelated look-alikes. Within the family, several species of *Silene* occur in North America, and all resemble ragged robin to some extent. Ragged robin's pink petals that are deeply divided into four lobes each help differentiate it from its relatives. The exotic red catchfly (*S. dioica*) and sticky catchfly (*S. viscaria*) both have pink petals, but neither species has petals as deeply divided as ragged robin. The native fire pink (*S. virginica*) typically has red petals that are notched at the tips to form two sharp lobes.



Look-alike: red catchfly (Anneli Salo)

NOXIOUS WEED LISTINGS: CT (Prohibited)

NOTES: This species was likely introduced to North America in the late 1800s both intentionally in garden plantings and accidentally via ship ballast.



CHOCOLATE VINE

Akebia quinata (Houtt.) Decne.

SYNONYMS: fiveleaf, fiveleaf akebia

ORIGIN: China, Japan, Korea

GROWTH TRAITS: Perennial, twining vine with many stems growing from a rhizomatous root system. Vines are green when young, but at maturity become woody and grayish-brown with distinct lenticels. Vines are typically 26-49' (8-15 m) long and can form a creeping groundcover or twine around adjacent vegetation and structures. Leaves have long petioles, are alternate, and divided into 5 leaflets all arising from the same point. Leaflets are bright to deep green, smooth, 0.5-3.1" (1.3-8 cm) long, oval, and have smooth margins, a rounded base, and a rounded but slightly notched tip. Flowers appear in hanging clusters from leaf axils in spring. Separate male and female flowers are produced in the same cluster; both lack petals but have 3 showy sepals ranging from white to deep purple. Male flowers are up to 0.4" (1 cm) across with 6-7 incurved stamens. Female flowers are generally twice as large (0.8" or 2 cm across) and some may have a faint, sweet, chocolate odor. Fruits



Chocolate vine a. vine; b. infestation in forest understory (a. © Jeremy Rolfe; b. Chris Evans, University of Illinois, bugwood.org)



Chocolate vine c. leaves; d. large female flower and smaller male flowers; e. fruits (c. Chris Evans, University of Illinois, bugwood.org; d. Schurdli; e. Alpsdake)

are sausage-shaped pods up to 4" (10 cm) long that split at maturity, revealing white pulp and tiny black seeds. Flowers and fruit are uncommonly produced in the wild. In cold climates, plants die back in the fall and re-sprout from the root system in spring. At warm locations the plant can be evergreen.

REPRODUCTION: Spreads by seed (uncommon), but most spread is vegetative via rhizomes and rooting from stems. Seed longevity is unknown.

HABITAT: Tolerates full sun and drought to shady, moist sites with cold winters. New growth may be frost sensitive. Grows best in moist but well-drained soil and readily invades hedgerows, forest understories and margins, streamsides, and hillsides.

LOOK-ALIKES: The compound leaves with 5 leaflets arising from the same point may resemble the native vine Virginia creeper (*Parthenocissus quinquefolia*). Virginia creeper leaflets are toothed, and its fruits are bluish-black berries. The vine growth and hanging purple flowers also resemble native and exotic *Wisteria* species, but those differ in having leaflets arise opposite each other on a leaf stalk, rather than all from the same point.



Look-alike: Virginia creeper (Lazaregagnidze)



NOXIOUS WEED LISTINGS: WI (Prohibited)

NOTES: The fruit is edible and has been used in traditional cuisine, while the vines were historically used for basket weaving.

JAPANESE SPIRAEA

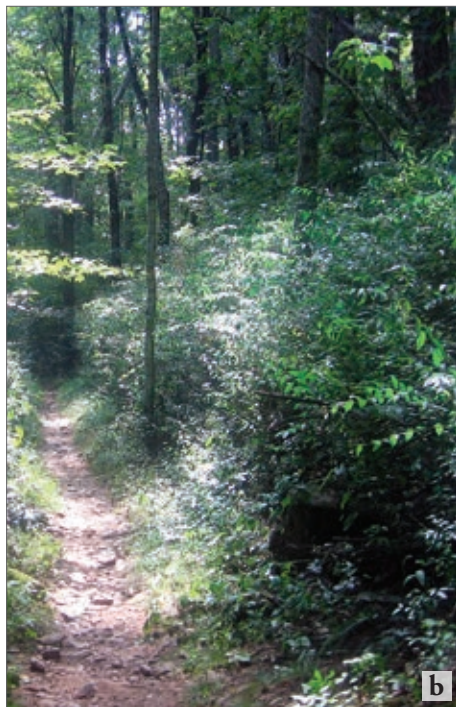
Spiraea japonica L. f.

SYNONYMS: Japanese meadowsweet

ORIGIN: China, Japan, Korea

GROWTH TRAITS: Rounded, deciduous shrub growing 4-6' (1.2-1.8 m) tall and equally wide from a fibrous root system. Stems are dense, slender, outward-arching, and branch predominantly from the base. Stems are brown to reddish-brown, round in cross-section, and sometimes hairy. Leaves are ovate or lance-shaped, alternate, 1-3" (2.5-7.5 cm) long, and have finely-toothed margins. Flowers appear in flat-topped clusters at branch tips from late spring to early summer. The tiny flowers have 5 rosy pink (sometimes white) petals. The fruits are inconspicuous, dry brown capsules that split open when ripe. Fruits often remain on branches through winter.

REPRODUCTION: Spreads by seed, which may remain viable for many years.



Japanese spiraea a. shrub; b. infestation in forest understory (a. Jerzy Opiola; b. Nancy Dagley, USDI National Park Service, bugwood.org)



Japanese spiraea c. leaves; d. flowers; e. fruits (c. James H. Miller, USDA Forest Service; d,e. Leslie J. Mehrhoff, University of Connecticut; c-e. bugwood.org)

HABITAT: Can tolerate a wide range of soil conditions and full sun to partial shade, but grows best in rich, moist soils in full sun. It readily invades forest understories and margins, bogs, streamsides, moist fields, and other disturbed sites.

LOOK-ALIKES: Several species of *Spiraea* present in North America closely resemble Japanese spiraea with their similar habitat, shrub shape, alternate leaves, and tightly clustered 5-petal flowers. Most potential look-alikes can be differentiated by having white petals. When varieties of Japanese spiraea have white petals, they differ from the exotic Thunberg's meadowsweet (*Spiraea thunbergii*) by having larger, thicker leaves and flowers occurring in flat-topped clusters instead of along branches. The native white meadowsweet (*S. alba*) has larger leaves, and its white flowers occur in large cone-shaped clusters. The native rose spiraea (*S. douglasii*) has pink flowers, but they appear in large cone-shaped clusters.



Look-alike: rose spiraea (Meggar)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: This species is still popular in the ornamental trade, and many varieties are commercially available, leading to variability in plant traits.



SHRUB LESPEDEZA

Lespedeza bicolor Turcz.

SYNONYMS: shrubby bushclover, bicolor lespedeza, two-colored bushclover

ORIGIN: Asia

GROWTH TRAITS: Highly variable species that can grow as a large forb or as an upright, deciduous shrub. Plants grow 3-10' (0.9-3 m) tall and equally wide from a dense, multi-branched root system. Stems are slender, arching, and have small roundish bumps at maturity. Leaves are alternate and divided into three leaflets. Leaflets are 0.75-2" (1.9-5 cm) long and typically elliptical on basal leaves, but lance-shaped on upper leaves. Leaflets are darker green on upper surfaces and lighter beneath, smooth-margined, and have a tiny hair-like tip. Flowers appear in upright, loose clusters at branch tips and from leaf axils throughout summer. Flowers are 0.5" (1.3 cm) long and pea-like (having a banner, wing and keel, typical of the pea family) with pinkish-purple petals. The fruits are flat, oval pods with long thin tips. They are 0.3" (8 mm) long and 1-seeded. Some cultivars are very winter hardy, while for others, entire stems or just stem tips can be winter-killed. Those individuals may re-sprout from the roots following winter damage.



Shrub lespedeza a. shrub; b. infestation (a. © daniel_folds, iNaturalist.org; b. James H. Miller, USDA Forest Service, bugwood.org)



Shrub lespedeza c. upper leaves (both surfaces); d. flowers; e. fruits (c. James H. Miller, USDA Forest Service; d. © Suzanne Cadwell; e. Karan A. Rawlins, University of Georgia; c,e. bugwood.org)

REPRODUCTION: Spreads by seed, but can also re-sprout from the root system following damage. Seeds may remain viable for over 20 years, possibly much longer.

HABITAT: Grows well in full sun to partial shade. This species capitalizes on disturbance, but readily spreads into undisturbed areas. It is typically found in old fields, meadows, forest margins and clearings, and even closed woodlands.

LOOK-ALIKES: The pea-like flowers, compound leaves, and oval pod fruit help differentiate shrub lespedeza from unrelated look-alikes. There are several native and exotic related *Lespedeza* species present in North America. Shrub lespedeza can be differentiated from many others that have white flowers, hairy foliage, and/or much narrower leaves. The exotic Thunberg's lespedeza (*L. thunbergii*) has similar leaves and pinkish-purple flowers, but its flower clusters typically droop, compared to the more upright flower clusters of shrub lespedeza.



Look-alike: Thunberg's lespedeza (BotBln)



NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Shrub lespedeza was once widely planted for wildlife habitat, especially for northern bobwhite quail. It is no longer recommended for planting, and native plant species have since been recognized as superior for wildlife habitat.

CHINABERRY TREE

Melia azedarach L.

SYNONYMS: cape lilac, Persian lilac, pride-of-India, umbrella tree, white cedar

ORIGIN: Asia, Australia

GROWTH TRAITS: Deciduous tree typically growing 20-50' (6.1-15.2 m) tall but reaching heights of 150' (45 m) in exceptional circumstances. Trees grow from a shallow root system and usually produce one trunk (2' or 60 cm in diameter) that is multi-branched and forms a loose, straggly canopy. The bark of new branches is reddish-brown with distinct round lenticels, but becomes grayish-brown with longitudinal furrows with age. Leaves are alternate and attached to the branch with long petioles. Leaves are 1-2' (30-60 cm) long and two- or three-times divided into 3-7 pairs of opposite leaflets. Leaflets are 1-3" (2.5-7.5 cm) long, ovate, elliptical, or obovate with toothed margins and prominent midveins. Leaves are green and turn yellow in autumn before falling to the ground for winter. Flowers appear in loose clusters from leaf axils in spring. Each flower is 0.7" (1.8 cm) across, star-shaped, and has 5 pink to lilac petals. Flowers are fragrant and have



Chinaberry tree a. tree; b. bark with lenticels and fissures (a. Chuck Bargeron, University of Georgia; b. Karan A. Rawlins, University of Georgia; a,b. bugwood.org)



Chinaberry tree c. leaflets; d. flowers; e. fruit (c. Karan A. Rawlins, University of Georgia; d. Chris Evans, University of Illinois; e. Franklin Bonner, USFS; c-e. bugwood.org)

purplish-red fringed centers. The clustered, spherical, berry-like fruits are 0.5" (1.3 cm) wide and green at first but turn yellow at maturity. Some fruits remain on the trees through winter; others drop in the fall and can become safety hazards on sidewalks. Plants live 20 years on average, but some can live much longer.

REPRODUCTION: Spreads by seed but can also re-sprout from the root system following damage, creating dense thickets. Seeds are viable for up to two years.

HABITAT: Capitalizes on disturbance but then readily spreads into undisturbed areas. In North America, it can be found along roadsides and fences, in floodplain woodlands, marshes, and upland woods.

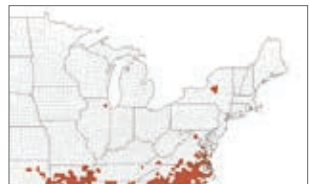
LOOK-ALIKES: While numerous unrelated species have similar alternate, compound leaves and grow to a similar size in the same habitat, most unrelated potential look-alikes differ by having samara or pod fruits and flowers that are either non-showy or not symmetrical like chinaberry tree. The related exotic but cultivated neem (*Azadirachta indica*) has white flowers, longer fruits.

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Chinaberry tree fruits are reportedly highly poisonous to humans and other mammals.



Look-alike: neem (William M. Ciesla, Forest Health Management International, bugwood.org)



JAPANESE MAPLE

Acer palmatum Thunb.

SYNONYMS: palmate maple, *Acer palmatum* var. *dissectum* (Thunb.) Miq.

ORIGIN: Japan, Korea

GROWTH TRAITS: Small deciduous tree or large multi-stemmed shrub typically growing 10-25' (3-8 m) tall. Trees grow from a shallow root system, and its low branches form a broad, rounded canopy. There are hundreds of cultivars which vary dramatically in their size, shape, and the color/shape of leaves and bark. The bark of many cultivars is greenish-red on new growth but typically grayish-brown at maturity. Leaves are opposite and attached to the branch with long petioles. Leaves are 2-5" (5-13 cm) wide with 5 or 7 (sometimes 9) lobes, and are shaped like the palm of a hand. Each lobe is toothed and very pointed at the tips. Lobes of some cultivars are very finely divided. Leaf color varies from green to bright red to deep maroon, and leaves may turn yellow, bronze, and reddish-purple in autumn before falling to the ground. Flowers appear in clusters of 10-20 in spring as leaves open. Each flower is up to 0.25" (6 mm) across and has 5 purplish-red sepals and 5 yellow-green to pale pink petals. The fruits are up to 2" (5 cm) wide, are double



Japanese maple a. tree with green foliage; b. shrub with red foliage (a. AnRo0002; b. John Ruter, University of Georgia, bugwood.org)



Japanese maple c. green leaves; d. red, finely divided leaf; e. flowers; f. fruit (samara)(c. Kenpei; d. James Steakley; e. Sten Porse; f. © lopezheim, iNaturalist.org)

samaras with two winged seeds fused together, and vary from green to red. Plants may live up to 100 years, but typically less under cultivation.

REPRODUCTION: Spreads by seed. The majority of seeds germinate within one year, though some may remain viable longer.

HABITAT: Capitalizes on disturbance or intentional planting to establish initially, but then readily spreads into undisturbed areas. It does well in moist soil and full sun in colder climates and partial shade in hot climates. It can be found at forest edges, along streams and roadsides, and in urban gardens.



Look-alike: silver maple leaf (Paul Wray, Iowa State University, bugwood.org)

LOOK-ALIKES: The opposite, palmately lobed leaves and samara fruits help differentiate this species from unrelated look-alikes. Within the family, many maples differ by having smoothly lobed leaves and fruits fused at different angles. The native silver maple (*Acer saccharinum*) has deeply divided leaves that may resemble some Japanese maple cultivars. It differs by having more rounded leaf lobes and tips and growing as a tree 50-80' (15-24 m) tall.

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Japanese maple is a popular ornamental with hundreds of cultivars available, and it is also frequently used in bonsai.



BABY'S BREATH

Gypsophila paniculata L.

SYNONYMS: common gypsophila, panicled baby's-breath

ORIGIN: Eurasia

GROWTH TRAITS: Herbaceous, perennial growing 1.3-3.3' (0.4-1 m) tall from a thick, deep taproot. Plants develop one shoot the first year and numerous branched stems in subsequent years. Stems are slender and swollen at nodes. Leaves are opposite, lance-shaped, narrow, and 0.8-3.5" (2-9 cm) by 0.08-0.4" (2-10 mm) wide. Leaves are light green and leathery with smooth margins and a distinct midvein on their undersides. Beginning in its third year, the plant flowers profusely throughout summer and into fall. Flowers are up to 0.3" (8 mm) in diameter and have 5 petals, long, narrow sepals, and long stamens. Flowers are typically white, though some may be light pinkish-purple. Fruits are spherical capsules that contain several black, rough, and bean-shaped seeds 0.04-0.08" (1-2 mm) long.

REPRODUCTION: Reproduces by seed. Seeds remain viable for 5-7 years.



Baby's breath a. plant; b. infestation (a. © nmori; b. Stefan.lefnaer)



Baby's breath c. leaves and stem; d. flowers; e. seeds (c. Stefan.Iefnaer; d. Joseph M. DiTomaso, University of California Davis, bugwood.org; e. John Alan Elson)

HABITAT: Grows best in full sun and coarse soil. In North America, it is typically found in flood plains, fields, roadsides, beaches and other open, disturbed sites.

LOOK-ALIKES: The combination of its bushy appearance and numerous tiny white flowers that each have 5 petals, long sepals, and long stamens help differentiate baby's breath from many potential look-alikes. Other species of *Gypsophila* (all exotic) are present in North America and all resemble baby's breath to some extent. Showy baby's breath (*G. elegans*) differs with its annual or biennial life cycle and having more slender roots. Glandular baby's breath (*G. scorzonerifolia*) has glandular hairs covering its bracts and flower stalks. Creeping baby's breath (*G. repens*) is a mat-forming species that grows much shorter and has smaller leaves than baby's breath.



Look-alike: creeping baby's breath (© experiencealaska, iNaturalist.org)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: This species is frequently grown as an ornamental and has escaped cultivation at many locations.



BROADLEAVED PEPPERWEED

Lepidium latifolium L.

SYNONYMS: perennial pepperweed, broadleaf peppergrass, broadleaf pepperwort, dittander, peppergrass, perennial peppergrass, perennial pepperwort, tall whitetop

ORIGIN: Asia, Europe, the Mediterranean

GROWTH TRAITS: Herbaceous, perennial growing 1-5' (0.3-1.5 m) tall from an extensive creeping root system. Rosettes develop in late fall to early spring and have waxy, toothed leaves that are 4-12" (10-30 cm) long and 1-2" (2.5-5 cm) wide. Stems emerge from semi-woody crowns or the creeping roots. Stem leaves are waxy, alternate, oblong, and often have toothed margins. Stem leaves are up to 4" (10 cm) long and decrease in size higher up on the stem. Lower leaves have petioles while upper leaves do not. Flowers appear spring through summer in dense clusters at stem tips. Flowers are white, up to 0.1" (3 mm) in diameter, and have 4 petals and 6 stamens. Fruits are spherical to slightly oval, up to 0.8" (2 mm) long, contain 2 seeds, and are typically smooth but may be slightly hairy.



Broadleaved pepperweed a. plant; b. infestation (a. Mary Ellen (Mel) Harte; b. Leslie J. Mehrhoff, University of Connecticut; a,b. bugwood.org)



Broadleaved pepperweed c. leaves and stem; d. flowers; e. matured and dried out fruits (c. Mary Ellen (Mel) Harte; d,e. Leslie J. Mehrhoff, University of Connecticut; c-e. bugwood.org)

REPRODUCTION: Reproduces occasionally by seed, but most spread is vegetative by sending new shoots up from its creeping root system (or fragments) and its semi-woody crown. Seeds may remain viable for at least two years.

HABITAT: Tolerates a wide variety of conditions. It is a frequent invader of moist sites such as riparian areas and wetlands, but readily spreads into other habitats, including arid rangelands, open mountainsides, roadsides, and other disturbed sites.



Look-alike: whitetop (Luis Fernández García)

LOOK-ALIKES: Several related species are present in North America and resemble broadleaved pepperweed with their similar leaves and/or tiny flowers with 4 petals and 6 stamens. Many look-alikes have yellow flowers and linear fruit. Of those with white flowers, several look alike have different leaf and fruit shape and grow smaller than broadleaved pepperweed. The exotic whitetop (*Lepidium draba*) can look very similar, but typically only grows 16-20" (40-50 cm) tall and has heart-shaped fruit. The native but weedy common pepperweed (*L. densiflorum*) has longer inflorescences and flattened fruits.

NOXIOUS WEED LISTINGS: CT, MA, NH, NY, WI (all Prohibited)

NOTES: This species alters the ecosystem in which it grows by changing the concentration of different chemical constituents throughout the soil profile, affecting both the type and number of species capable of growing there.



BURNET-SAXIFRAGE

Pimpinella saxifraga L.

SYNONYMS: solidstem burnet saxifrage, pimpinella, scarlet pimperl

ORIGIN: temperate Asia, temperate Europe

GROWTH TRAITS: Herbaceous, erect perennial typically growing 1-3' (0.3-0.9 m) tall from a large, strongly scented taproot. Stems are slender, solid (not hollow), faintly ribbed, and covered in very short hairs. Leaves are alternate and divided into multiple leaflets. Basal leaves are 3-12" (7.5-30 cm) long with coarsely toothed lobes. Leaves get progressively smaller up the stem and leaflets become increasingly narrow. Flowers appear throughout summer. The umbel inflorescence (all flower stalks arising from the same point) is compound; there are 7-20 groups (umbellets), each containing 10-20 flowers. Each tiny flower is 0.16" (4 mm) across and has 5 white petals. Fruits are slightly ribbed, oval pods up to 0.12" (3 mm) long that each contain 2 seeds flattened, ovate seeds.

REPRODUCTION: Spreads by seed. The majority of seeds germinate within the first year.



Burnet-saxifrage a. plant; b. infestation (a. © alderash, iNaturalist.org; b. Jeffrey Flory, bugwood.org)



Burnet saxifrage c. basal leaves; d. stem leaf and stem; e. inflorescence; f. fruits (c-e. Jeffrey Flory, bugwood.org; f. Andreas Rockstein)

HABITAT: Grows best in full sun and does well in chalky, disturbed soils. It can be found in moist to dry soils of meadows, grasslands, and open woodlands.

LOOK-ALIKES: The white umbel inflorescences, 5-petal flowers, and odorous taproot of burnet-saxifrage differentiate it from unrelated look-alikes. Numerous relatives in the Apiaceae are present in North America and many resemble burnet-saxifrage. The native wild carrot (*Daucus carota*) has a similar white umbel inflorescence, divided leaves, short stem hairs, and odorous root. Wild carrot differs by being a biennial and in having numerous divided and lobed bracts beneath its inflorescence and more finely divided leaves. The seedlings and basal leaves of wild parsnip (*Pastinaca sativa*) closely resemble those of burnet-saxifrage, however wild parsnip grows much taller and denser and produces yellow flowers on its umbels.



Look-alike: wild carrot (Tigerente)

NOXIOUS WEED LISTINGS: WI (Restricted)

NOTES: In Great Britain, this species was intentionally cultivated on chalky soils as nutritious fodder for sheep and cattle. It is occasionally sold in North America as an ornamental or in homeopathy. Because it closely resembles many toxic species, extreme caution should be used when collecting this species for homeopathic uses.



GOATSRUE

Galega officinalis L.

SYNONYMS: professor weed

ORIGIN: Europe, the Mediterranean

GROWTH TRAITS: Herbaceous perennial that grows up to 6' tall (1.8 m) from a deep taproot. Plants are often bushy and multi-stemmed. Stems are somewhat hollow and cylindrical. Leaves are alternate and compound, divided into 6-10 pairs of leaflets and a single terminal leaflet. Flowers occur in clusters at stem tips or leaf axils from June to July. Flowers are white to light purple and pea-like (having a banner, wing and keel, typical of the pea family). Fruits are small, narrow, bean-like pods just over 1" long (3 cm) that contain up to 9 seeds each.

REPRODUCTION: Reproduces by seed. Seeds may remain viable in the soil for up to 10 years.

HABITAT: Grows best in full sun and moist soil. In North America, it can be



Goatsrue a. plant; b. infestation (a. Sasha Shaw, King County NCWB; b. Carl Bullock)



Goatsrue c. leaves and leaflets; d. flowers and flower buds; e. seed pods (c,e. Sasha Shaw, King County NWCB; d. H. Zell)

found in or along cropland, ditchbanks, irrigation waterways, uncut pastures, fence lines, roadways and wet, marshy areas, capitalizing on disturbance.

LOOK-ALIKES: The unique, pea-like flowers in combination with the compound leaves help differentiate this species from all other plants outside of the Fabaceae. Within the family, a number of milkvetch (*Astragalus*) and vetch (*Vicia*) species resemble goatsrue. Milkvetch leaves also have one terminal leaflet, but they tend to have more leaflet pairs (10-16). Vetches are more vining in habit, and have clasping tendrils in place of the terminal leaflet.



Look-alike: bush vetch (Erlend Bjørtvedt)

NOXIOUS WEED LISTINGS: MA (Prohibited), PA, RI, VT, WV (all Noxious)

NOTES: This species was initially introduced to North America as a potential forage plant; however, the leaves and stems contain a poisonous alkaloid that makes the plant unpalatable to livestock and is toxic in large quantities.



ITALIAN ARUM

Arum italicum Mill.

SYNONYMS: Italian lords-and-ladies, orange candleflower, cuckoo's pint

ORIGIN: Eurasia, Mediterranean

GROWTH TRAITS: Herbaceous, stemless perennial growing 1-1.5' (30-45 cm) tall from a tuberous root system. Main tubers produce a number of daughter tubers that are attached during the growing season, but separate from the main tubers over time, forming separate plants. In mild climates, new leaves appear in autumn; in cold climates, leaves die back for winter and new leaves appear in spring. Leaves are typically 3.5-8" (9-20 cm) long and have long petioles (6-14" or 15-35 cm). Leaves are oval to arrowhead-shaped, have smooth margins, and may be solid green or variegated with veins colored silver-gray to yellow-green. Tiny white flowers are produced in spring on a long, narrow spadix surrounded by a large greenish-white spathe. The leaves and spathe die back after flowering, leaving only the spadix, which produces tight clusters of green berries that turn orange-red with maturity.



Italian arum a. plant; b. infestation (a. Consultaplantas; b. Wendy DesCamp, Washington State Noxious Weed Control Board)



Italian arum c. variegated leaves; d. spadix and spathe; e. cutaway of spadix and spathe; f. fruit (c. © Anne Parsons, iNaturalist.org; d. Orchi; e. Pancrat; f. Dominicus Johannes Bergsma)

REPRODUCTION: Spreads by seed and vegetatively via daughter tubers. Seeds are reportedly only viable for a short time.

HABITAT: Prefers moist and partially shaded habitats, but also grows well in full sun. It is found in open woodlands, forest edges and understories, riparian areas, old gardens, and disturbed locations near urban development.



Look-alike: water arum (Anneli Salo)

LOOK-ALIKES: Though the leaves of Italian arum may resemble unrelated species, the spadix/spathe inflorescence distinguishes this species from all potential look-alikes outside the Araceae. Within the family, the white flowers, arrow-head leaves, and terrestrial habitat largely help differentiate Italian arum. The similar green arrow arum (*Peltandra virginica*) and water arum (*Calla palustris*) occur in bogs and marshes. The native green dragon (*Arisaema dracontium*) and Jack-in-the-pulpit (*Arisaema triphyllum*) have similar fruit. Green dragon has only one leaf which is divided into 5-13 long, elliptical leaflets. Jack-in-the-pulpit typically has two leaves, each divided into 3 leaflets, and its spathe is typically green or purple on the outside and dark purple with greenish-white stripes inside (coloration varies).

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: All parts of the plant are poisonous and irritating to the skin.



QUEEN OF THE MEADOW

Filipendula ulmaria (L.) Maxim.

SYNONYMS: meadowsweet, European meadowsweet, mead wort, double lady of the meadow, *Spiraea ulmaria* L., *Thecanisia ulmaria* (L.) Raf.

ORIGIN: temperate Asia

GROWTH TRAITS: Upright, herbaceous perennial typically growing 3-5' (0.9-1.5 m) tall and half as wide from a rhizomatous root system. Stems are rigid and often tinged in red. Leaves are alternate and divided into 3-5 pairs of opposite leaflets with one terminal leaflet. Terminal leaflets are deeply lobed into 3 segments, each segment resembling a side leaflet. Side leaflets are ovate with a pointed tip and have distinct venation and doubly-toothed margins. Side leaflets are up to 3" (7.5 cm) long with lighter-colored and hairy undersides. At the base of the leaf stalk is a pair of leafy appendages that appear to clasp the stem. Very fragrant flowers bloom in early to mid summer. The tiny flowers are up to 0.3" (08 mm) in diameter, have 5 white petals, numerous long stamens, and appear in large clusters at stem tips or upper leaf axils. The fruits are intertwined, twisted achenes up to 0.25" (6 mm) long that are green initially, but mature to brown.



Queen of the meadow a. plant; b. infestation (a. Christian Fischer; b. Alethe)



Queen of the meadow c. leaf with leaflets; d. flowers; e. fruit (c. Erlend Bjørtvedt; d. © Almantas Kulbis, iNaturalist.org; e. GFDL)

REPRODUCTION: Spreads by seed and rhizomes. Seed longevity is unknown.

HABITAT: Prefers damp or wet sites where the water levels fluctuate but where the soil is not continuously water-logged. In North America, this includes streams and irrigation ditches, moist meadows, roadsides where water gathers, and wetlands.

LOOK-ALIKES: Several unrelated species resemble queen of the meadow with their compound, toothed leaves and large clusters of tiny, white, 5-petal flowers, such as the native American elderberry (*Sambucus nigra* ssp. *canadensis*). American elderberry differs by growing as a shrub or small tree and having black berry-like fruits. Several related species of *Spiraea* also closely resemble queen of the meadow, however species in that genus grow as shrubs. The more closely related dropwort (*Filipendula vulgaris*) and queen of the prairie (*F. rubra*) have a similar overall shape, but neither has twisted fruits. The leaves of dropwort are more divided as to appear fern-like, and the flowers of queen of the prairie are pink.



Look-alike: dropwort (Magnus Manske)

NOXIOUS WEED LISTINGS: WI (Restricted)

NOTES: This species has long been utilized in herbal remedies for its medicinal properties and as an ornamental for its sweet-smelling flowers. It frequently escapes cultivation in North America.



TARA VINE

Actinidia arguta (Siebold & Zucc.) Planch. ex Miq.

SYNONYMS: hardy kiwi

ORIGIN: Asia

GROWTH TRAITS: Perennial, deciduous, twining vine with many stems growing from a fleshy root system. Vines are greenish when young, but at maturity become woody and grayish-brown with distinct lenticels. Vines grow vigorously, typically reaching 15-25' (4.6-7.6 m) long by 8' (2.4 m), and can form a creeping groundcover or twine around adjacent vegetation and structures. Leaves are alternate, have long red petioles, are green, and often remain green late into fall. Leaves are 3-5" (7.5-12.7 cm) long and broadly lance-shaped with pointed tips and toothed margins. Flowers appear in small clusters from leaf axils in summer. Male and female flowers are produced on separate plants. Both have 4-6 whitish-green petals with numerous dark-tipped stamens and are 0.4-0.8" (1-2 cm) across. Female flowers have a raised center with white, radiating filaments. Fruits are oblong, fragrant, greenish-pink berries up to 1.2" (3 cm)



Tara vine a. vine; b. infestation (a. © Wendy Cutler; b. Sten Porse)



Tara vine c. leaves; d. female flower; e. fruit; f. fruit cross-section (c. Appaloosa, bugwood.org; d,e. © Melanie J Watts; f. © harum.koh, iNaturalist.org)

long that contain green, fleshy pulp and tiny brown seeds. In cold climates, plants die back in the fall and re-sprout from the root system in spring.

REPRODUCTION: Spreads by seed. Seed longevity is unknown.

HABITAT: Tolerates full sun as well as shady, moist sites with cold winters. New growth may be frost sensitive. Grows best in moist but well-drained soil and readily escapes gardens to invade forest understories and margins, streamsides, and meadows.



Look-alike: kiwifruit (Lazaregagnidze)

LOOK-ALIKES: The regularly cultivated commercial kiwifruit (*Actinidia chinensis*) has leaves with blunt tips and fruits that are up to 2.5" (6.3 cm) long and covered in brown fuzz. The exotic Oriental bittersweet (*Celastrus orbiculatus*) and native American bittersweet (*C. scandens*) are similar vines with large, toothed, alternate leaves and small white flowers; they differ by producing bright reddish orange-berry fruits.

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.



NOTES: This species is a popular ornamental. Its fruit are sweeter than commercial kiwifruit (*A. chinensis*), and it is much more cold tolerant. More recently it is escaping gardens and becoming invasive.

DEUTZIA

Deutzia scabra Thunb.

SYNONYMS: fuzzy pride-of-Rochester, fuzzy deutzia

ORIGIN: Japan

GROWTH TRAITS: Deciduous, multi-stemmed, rounded shrub growing 6-10' (1.8-3 m) tall by 6-8' (1.8-2.4 m) wide from a suckering root system. Stems are upright initially, but arch and become leggy with age. The orangish-brown bark of older stems is exfoliating, sloughing off to reveal lighter brown bark beneath. Leaves are medium to dark green, opposite, 2-4" (5-10 cm) long by up to 2" (5 cm) wide, and elliptical with a pointed tip. Leaves have slightly toothed margins and are rough-textured and slightly hairy on both sides. Flowers bloom profusely in late spring/early summer in large clusters 3-6" (7.5-15 cm) long from leaf axils and stem tips. Flowers are fragrant, star-shaped, and up to 0.8" (2 cm) in diameter. The most common cultivar has "double flowers" which appear as a mass of white petals that may be tinged with pale pink on their undersides. Escaped individuals often revert back to a more wild form without the doubled flower. Fruits are round capsules up to 0.2" (0.5 cm) wide that turn from green to brown with maturity and open to release numerous small seeds. Fruits often remain on stems through winter.



a



b

Deutzia a. plant; b. bark (a. Wouter Hagens; b. © Steven J. Baskauf, bioimages.vanderbilt.edu/)



Deutzia c. leaves; d. flowers; e. fruits and 3-parted leaf (c. Krzysztof Golik; d,e. Wouter Hagens)

REPRODUCTION: Spreads by seed and suckering from its root system. Seeds may remain viable for at least three years.

HABITAT: Grows best in moist, well-drained soils in full sun, but can tolerate shade and drought once established. It is a frequent escapee from gardens and readily invades open, disturbed areas.

LOOK-ALIKES: The shrubby growth and opposite, elliptical leaves resemble many species of exotic bush honeysuckles (*Lonicera* spp.), including Amur honeysuckle (*L. maackii*). These species are easily differentiated during flowering and fruiting, however, as bush honeysuckle flowers are asymmetrical with (generally) two lips and are tubular at their base. Bush honeysuckles also produce berry fruit. The exotic sweet mock orange (*Philadelphus coronarius*) has very similar shape, bark, leaves, and fruit. Sweet mock orange flowers are larger in diameter (up to 1.5" or 4 cm) and have 4 large white petals with numerous yellow stamens. The related exotic ornamental slender deutzia (*Deutzia gracilis*) grows shorter, has narrower and smooth leaves, and its flowers have 5 petals and numerous yellow stamens.



Look-alike: Amur honeysuckle (Daderot)



NOXIOUS WEED LISTINGS: Not listed as noxious in any northeaster/northcentral state.

NOTES: This species is a popular ornamental for gardens in temperate regions and easily escapes cultivation. Escapees frequently lose the "double flowers".

JAPANESE PACHYSANDRA

Pachysandra terminalis Siebold & Zucc.

SYNONYMS: carpet-box, Japanese spurge

ORIGIN: temperate Asia

GROWTH TRAITS: Evergreen shrub growing 4-10" (5-25 cm) tall from a stoloniferous root system. Underground and aboveground runners root at nodes and send up stems, eventually forming dense mats. Leaves are sometimes alternate but are frequently whorled at branch tips and are ovate to elliptical to obovate and coarsely toothed at their tips. Most leaves are 2-4" (5-10 cm) long, waxy, and a rich dark, glossy green, but some cultivars are variegated white and green. Foliage typically remains green throughout winter. Flowers appear in erect clusters 1-2" (2.5-5 cm) long at branch tips in early spring. Flowers are 0.5" (1.3 cm) long with white, bristle-like petals and maroon-tipped stamens. Fruits are white, berry-like, and 0.5" (1.3 cm) long, but are rarely produced in North America.

REPRODUCTION: Spreads primarily via stolons.



Japanese pachysandra a. plant; b. infestation (a,b. Karan A. Rawlins, bugwood.org)



Japanese pachysandra c. solid green leaves; d. variegated leaves; e. flowers (c. Karan A. Rawlins, University of Georgia, bugwood.org; d. Krzysztof Ziarnek, Kenraiz; e. Algirdas)

HABITAT: Grows in a variety of soils but does best in well-drained soils rich in organic matter and in partial to full shade. It can be found invading forest understories, often spreading from locations where it was intentionally planted.

LOOK-ALIKES: Several native and exotic understory groundcover species are present in North America and resemble Japanese pachysandra with their evergreen, waxy leaves and short height. The combination of whorled, obovate leaves toothed at their tips, clusters of small, bristly-looking white flowers, and typical lack of fruit help differentiate this species from most potential look-alikes. The native Allegheny spurge (*Pachysandra procumbens*) has similar bristly-looking flowers and leaves toothed at their tips. Allegheny spurge differs by having leaves being either deciduous or more tattered over winter, longer flower clusters, and flowers that are pale pink instead of creamy white.



Look-alike: Allegheny spurge (*Salicyna*)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Japanese pachysandra is a popular ornamental groundcover, frequently used in garden understories because of its shade tolerance and evergreen foliage. However, its rhizomatous roots allow it to spread rapidly into natural settings.



PRIVETS

Ligustrum spp.



a



b



c

California privet a. plant; b. leaves; c. inflorescence (a. Georges Jansoone; b. Robert Vidéki, Doronicum Kft., bugwood.org; c. Leslie J. Mehrhoff, University of Connecticut, bugwood.org)



d



e



f

Chinese privet d. plant; e. leaves; f. inflorescence (d. Chris Evans, University of Illinois; e. Karan A. Rawlins, University of Georgia; f. Bidgee)(d,e. bugwood.org)



Glossy privet g. plant; h. leaves; i. inflorescence (g,h. Karan A. Rawlins, University of Georgia, bugwood.org; i. Krzysztof Ziarnik, Kenraiz)



Japanese privet j. plant; k. leaves; l. inflorescence (j. John Ruter, University of Georgia; k. James H. Miller, USDA Forest Service; l. Karan A. Rawlins, University of Georgia; j-l. bugwood.org)

PRIVETS (CONTINUED)

Ligustrum spp.

NAMES: California privet (**CalP**): *Ligustrum ovalifolium* Hassk.
 Chinese privet (**ChiP**): *Ligustrum sinense* Lour.
 Glossy privet (**GP**): *Ligustrum lucidum* W.T. Aiton
 Japanese privet (**JP**): *Ligustrum japonicum* Thunb.

SYNONYMS: **CalP:** Korean privet, garden privet, oval-leaved privet; **ChiP:** small-leaf privet, *L. microcarpum* Kaneh. & Sasaki; **GP:** tree privet, broadleaf privet, giant privet, large-leaf privet; **JP:** wax leaf privet

ORIGIN: **CalP** and **JP:** Japan, Korea; **ChiP:** China, Laos, Taiwan, Vietnam; **GP:** China

TRAIT	CALIFORNIA <i>L. ovalifolium</i>	CHINESE <i>L. sinense</i>	GLOSSY <i>L. lucidum</i>	JAPANESE <i>L. japonicum</i>
TYPICAL HEIGHT	8-15' (2.4-4.6 m)	10-18' (3-5.5 m)	Up to 33' (10 m)	8-12' (2.4-3.7 m)
LEAVES	1.2-2.4" (3-6 cm) long; elliptical with rounded tips; veins distinct	1.2-2" (3-5 cm) long; elliptical with tips more rounded than base; veins distinct; underside of midrib hairy	3-4.7" (8-12 cm) long; ovate with tips more pointed than base; veins distinct	2-3" (5-8 cm) long; ovate with tips more pointed than base; veins indistinct
FLOWERS	Flower tube 2-3x longer than free petals; stamens don't extend beyond petals; strong odor	Flower tube typically shorter than free petals; stamens extend beyond petals; strong odor	Flower tube typically shorter than free petals; stamens don't extend beyond petals	Flower tube nearly as long as free petals; stamens extend beyond petals
FRUIT	0.25" (6 mm) dia.; nearly spherical; purple-black	Less than 0.25" (6 mm) long; slightly oval; blue-black	0.4" (10 mm) long; oblong; blue-black	0.25" (6 mm) long; slightly oval; purple-black

GROWTH TRAITS: All four species are shrubs or small trees with single or multiple stems and long, leafy branches that grow from a shallow, suckering root system. Stem bark is smooth, pale brown to gray, and has lighter-colored lenticels. Leaves are opposite, leathery, dark glossy green above and lighter green below, and have smooth margins. All four species are evergreen in warm climates, but leaves become semi- or fully deciduous in areas with cold winters. Flowers appear in clusters from late spring through early summer. Flowers are small and creamy white with 4 recurved petals that are fused and tubular at their base. Berry-like fruits mature a purple-black or blue-black in fall and persist into winter.

California privet (CaP): Typically grows as a multi-stemmed shrub 8-15' (2.4-4.6 m) tall, though some may grow taller as small trees. Most leaves are 1.2-2.4" (3-6 cm) long with petioles up to 0.25" (6 mm) long and are yellowish-green on their undersides. They are elliptical, have slightly rounded tips, and have obvious midribs with distinct side veins. Flowers appear in clusters at branch tips. The flower tube is 2-3x longer than the free petals, and the stamens typically don't extend beyond the petals. Flowers have a strong odor. Fruits are nearly spherical, 0.25" (6 mm) across, and purple-black.



California privet

Chinese privet (ChiP): Typically grows as a multi-stemmed shrub 10-18' (3-5.5 m) tall, though some may grow taller as small trees. Branchlets are round and often hairy. Most leaves are 1.2-2" (3-5 cm) long with petioles up to 0.3" (8 mm) long. Leaves are elliptical with tips more rounded than their base. Leaf tips are often slightly indented. Leaves have obvious midribs with distinct side veins, and the underside of the midrib is hairy. Flowers appear in clusters at the tips of terminal and axillary branches. The flower tube is typically shorter than the free petals, and the stamens typically don't extend beyond the petals. Flowers have a strong odor. Fruits are slightly oval-shaped, less than 0.25" (6 mm) long, and blue-black at maturity.



Chinese privet

Glossy privet (GP): Grows as a multi-stemmed shrub or (more typically) a single-stemmed tree up 33' (10 m) tall. Most leaves are 3-4.7" (8-12 cm) long with petioles 0.4-0.8" (1-2 cm) long. They are ovate, have tips more pointed than the base, and have obvious midribs and distinct side veins. Many glossy privet leaves appear to fold slightly inward toward to the midvein. Flowers appear in clusters at branch tips. The flower tube is typically shorter than the free petals, and the stamens typically don't extend beyond the petals. Fruits are oblong, less than 0.4" (10 mm) long, and blue-black at maturity.



Glossy privet

Japanese privet (JP): Typically grows as a multi-stemmed shrub 8-12' (2.4-3.7 m) tall, though some may grow taller as small trees. Most leaves are 2-3" (5-8 cm) long with petioles up to 0.5" (1.2 cm) long. They are ovate to elliptical, have tips slightly more pointed than the base, and have obvious midribs and

PRIVETS (CONTINUED)

Ligustrum spp.

indistinct side veins. Leaf margins frequently curl under slightly. Flowers appear in clusters at branch tips. The flower tube is nearly as long as the free petals, and the stamens extend beyond the petals. Fruits are oval-shaped, less than 0.25" (6 mm) long, and purple-black at maturity.



Japanese privet

REPRODUCTION: All four species spread by seed and suckering from the root system. The seeds of all four species are typically only viable for one year.

HABITAT: All four species tolerate a wide range of soil conditions and can grow in full sun to heavy shade. All grow best in mesic soil in full to partial sun and are typically found at forest edges or in floodplains, fields, and disturbed forests.

LOOK-ALIKES: Several additional privet species have been introduced to North America and are difficult to differentiate. They vary slightly in leaf size, fruit shape and size, petal length, stamen length, and the presence/absence of hairs on stems. Perhaps the most frequently encountered in the northeastern and northcentral USA include European privet (*L. vulgare*) and border privet (*L. obtusifolium*). European privet is a multi-branched shrub, typically 10-15' (3-4.5 m) tall and wide with lance-shaped leaves up to 2.5" (6 cm) long. Leaves are typically glossy and have obvious midribs with indistinct side veins. European privet flower tubes are about as long as the free petals, and the stamens extend beyond the petals only slightly. Flowers have a strong odor. European privet fruits are spherical, just over 0.25" (6 mm) in diameter, and glossy black at maturity. Border privet is an arching, multi-branched shrub typically growing 10-12' (3-3.7 m) tall and up to 15' (4.5 m) wide. Branchlets are round and often hairy. Most leaves are up to 2.5" (6 cm) long, elliptical with either rounded or pointed tips, and have obvious midribs with less distinct side veins. The underside of the midrib is hairy. Border privet flowers are often hairy and also have a strong odor. Flower tubes are 2-3x longer than the free petals, and the stamens typically don't extend beyond the petals. Fruits are oval-shaped, 0.25" (6 mm) long, and a waxy bluish-black at maturity.

NOXIOUS WEED LISTINGS: None of these four species are listed as noxious in any northeastern/northcentral state.

NOTES: Privets were introduced to North America in the 1800s. They are often planted as ornamentals and in hedgerows and regularly escape cultivation.

VIBURNUMS

Viburnum spp.

TRAIT	DOUBLEFILE <i>V. plicatum</i> var. <i>tomentosum</i>	LINDEN <i>V. dilatatum</i>	SIEBOLD'S <i>V. sieboldii</i>
TYPICAL HEIGHT	8-10' (2.4-3 m)	8-10' (2.4-3 m)	15-20' (4.6-6.1 m)
BARK	Smooth, gray-brown, prominent orange lenticels	Smooth, gray-brown, prominent orange lenticels	Rough, furrowed, prominent lenticels
LEAVES	2-4" (5-10 cm) long; elliptical or ovate; hairy on undersides and petiole; burgundy in fall	2-5" (5-12.5 cm) long; variable shape; covered in soft hairs; bronze or burgundy in fall	2-5" (5-12.5 cm) long; elliptical or ovate; hairy on veins and petiole; no fall color; foul odor when crushed
FLOWERS	Flat-topped cluster in doublefile form along branches; outer flowers sterile, showy; inner flowers fertile, tiny, non-showy	Flat-topped cluster at branch tips; each flower 0.25" (6 mm) in diameter	Flat-topped cluster at branch tips; each flower 0.25" (6 mm) in diameter
FRUIT	0.5" (13 mm) long; oblong; black at maturity	0.3" (8 mm) long; slightly oblong; red at maturity	0.3-0.5" (8-13 mm) long; spherical to oblong; black at maturity



Doublefile viburnum a. plant; b. leaves and inflorescence; c. several immature (red) and one mature fruit (black) (a. W.Baumgartner; b. Wouter Hagens; c. © Phil Bendle, Friends of Te Henui, T.E.R.:R.A.I.N)



Linden viburnum d. plant; e. ovate, lobed leaves and inflorescence; f. rounded leaves and mature fruit (d. James Steakley; e. bastus917; f. Kenpei)



Siebold's arrowwood g. plant; h. leaves and inflorescence; i. immature (red) and mature fruit (black) (g. © Richard Howard, Smithsonian Institution; h. Qwert1234; i. © Margaret Roach, awaytogarden.com)

VIBURNUMS (CONTINUED)

Viburnum spp.

NAMES: Doublefile viburnum (**DV**): *Viburnum plicatum* Thunb. var. *tomentosum* Miq.
 Linden viburnum (**LV**): *Viburnum dilatatum* Thunb.
 Siebold's arrowwood (**SA**): *Viburnum sieboldii* Miq.

SYNONYMS: **DV**: doublefile viburnum, *Viburnum plicatum* Thunb.; **LV**: linden arrowwood; **SA**: Siebold viburnum

ORIGIN: **DV**: China, Japan, Korea, Taiwan; **LV**: China, Japan, Korea; **SA**: Japan

GROWTH TRAITS: All three species are shrubs or small trees with multiple leafy stems that grow from a shallow root system. Leaves are opposite with prominent veins, coarsely toothed margins, and wrinkled surfaces. Flowers appear in clusters from May-June. Flowers are creamy white, star-shaped, and typically have 5 petals. Berry-like fruits mature in fall and persist into winter.

Doublefile viburnum (DV): There are multiple forms and varieties of *Viburnum plicatum*. This description and the corresponding images and distribution map pertain to one form with fertile florets, frequently referred to as *V. plicatum* var. *tomentosum* or doublefile viburnum. This plant typically grows as a multi-stemmed shrub 8-10' (2.4-3 m) tall and is wider than tall, though some individuals may grow to 15' (4.6 m) in height. Branches extend horizontally, giving the plant a layered appearance. Young stems may be covered in soft hairs. The bark is mostly smooth and gray-brown with distinct orange lenticels. Leaves are elliptical to ovate, 2-4" (5-10 cm) long, and hairy on the undersides and the petiole. They are green in summer, turning burgundy in the fall. Flowers appear in flattened clusters in 'doublefile form' along branches. Each cluster contains an outer ring of large, showy, sterile florets surrounding a mass of tiny, non-showy fertile florets. Fruits are oval-shaped, 0.5" (13 mm) long, and green initially but turn red and then black at maturity.

Linden viburnum (LV): Typically grows as a multi-stemmed shrub 8-10' (2.4-3 m) tall. The bark is mostly smooth and gray-brown with distinct orange lenticels. Stems and leaves are often covered in soft hairs. Leaf shape is variable, ranging from nearly round to elliptical to lobed. Leaves are 2-5" (5-12.5 cm) long and are green in summer, turning bronze or burgundy in the fall. Flowers appear in flattened clusters at branch tips. Each flower is 0.25" (6 mm) in diameter. Fruits are slightly oval-shaped, 0.3" (8 mm) long, and green initially but red at maturity.

Siebold's arrowwood (SA): Grows as a multi-stemmed shrub or small tree 15-20' (4.6-6.1 m) tall. The bark is gray-brown, rough, and furrowed with

prominent lenticels. Leaves are elliptical to oval-shaped and may have blunt tips. Leaves are 2-5" (5-12.5 cm) long, often leathery, and hairy on the veins and the petiole. They are deep green in summer and typically do not have a fall color. Crushed leaves often emit a foul odor, though some describe this as the smell of green peppers. Flowers appear in flattened clusters at branch tips. Each flower is 0.25" (6 mm) in diameter. Fruits are spherical to oval-shaped, 0.3-0.5" (8-13 mm) long, and green initially but turn red and then black at maturity.

REPRODUCTION: All three species spread by seed but can also re-sprout from the root system following damage. Seeds of many viburnums remain viable for up to 10 years.

HABITAT: All three species tolerate a wide range of soil conditions and can grow in full sun to partial shade. All grow best in mesic soil in full to partial sun and are typically found at forest edges, fields, and disturbed forests.

LOOK-ALIKES: Several additional viburnum species are native to or have been introduced to North America, and many are difficult to differentiate. They vary slightly in leaf shape, fruit color, buds, and flower and fruit structure.

NOXIOUS WEED LISTINGS: None of these species are listed as noxious in any northeastern/northcentral state.

NOTES: These exotic viburnums were intentionally introduced to North America in the 1800s. They are often planted as ornamentals and in hedgerows and regularly escape.



doublefile viburnum



linden viburnum



Siebold's arrowwood

CASTOR ARALIA

Kalopanax septemlobus (Thunb.) Koidz.

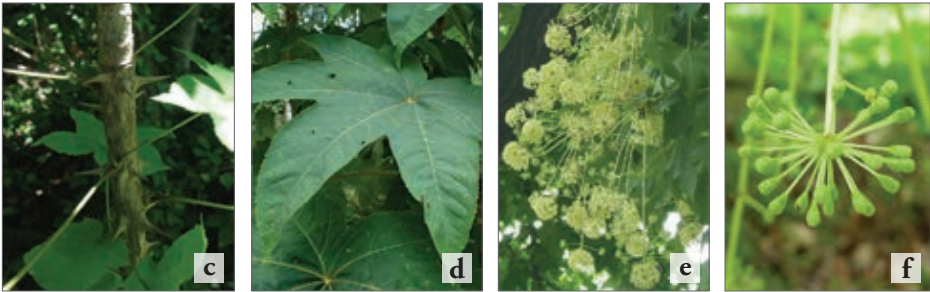
SYNONYMS: prickly castor-oil tree, tree aralia

ORIGIN: Asia

GROWTH TRAITS: Deciduous tree typically growing 40-60' (12.2-18.3 m) tall, though individuals can grow much taller in their native range. Trees grow from a shallow, fleshy root system that may occasionally send up root sprouts. There is often one main trunk that branches to form an upright, oval canopy. Young bark is armed with long, thick spines; mature bark is generally spine-less, grayish-brown, and deeply furrowed. Leaves are 7-12" (18-30 cm) across, alternate, and attached to the branch with long petioles. Leaves, typically with 5-7 lobes, are shaped like the palm of a hand. Lobes may be shallow, or deeply divided nearly to the leaf base. Lobe margins are finely toothed. Leaves are dark glossy green initially, turning dull yellow to red in fall, but are not particularly showy. Flowers appear profusely in large clusters of umbels at stem branches in late summer. Each flower is tiny with 4-5 creamy white petals. The tiny, berry-like fruits occur in ball-like clusters and are black at maturity. Trees generally live over 40 years.



Castor aralia a. tree; b. bark (a,b. T. Davis Sydnor, Ohio State University, bugwood.org)



Castor aralia c. spiny young stem; d. leaf; e. inflorescences; f. immature fruit (c. Andrew Gentry, bugwood.org; d. Krzysztof Ziarnek, Kenraiz; e. Dalgjal; f. Magnus Manske)

REPRODUCTION: Spreads by seed and sprouting from the root system. Though the seeds are considered short-lived, some remain viable for at least two years.

HABITAT: Tolerates partial shade to full sun and grows best in deep, moist, fertile, well-drained soil. Castor aralia prefers cool, moist climates and is very cold tolerant. It can be found escaping landscaping and invading field and forest margins.



Look-alike: sweetgum (Mohamed Rezk)

LOOK-ALIKES: The combination of tree habit, grayish furrowed bark, lobed leaves resembling the palm of a hand, and ball-like fruiting structures help differentiate castor aralia from most potential look-alikes. The native sweetgum (*Liquidambar styraciflua*) has similar bark, toothed leaves with 5 palm-like lobes, and a ball-like fruiting structure. It differs from castor aralia by having thorn-less young bark, dense clusters of very non-showy green flowers, and fruits that become woody at maturity rather than consisting of numerous black, berry-like fruits. The native devil's walking stick (*Aralia spinosa*) resembles young castor aralia with its somewhat similar flowers and fruit and its stems armed with long spines. Devil's walking stick grows smaller and its leaves are very large and compound with numerous ovate leaflets.

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.



NOTES: The common name castor aralia arose from its leaves resembling castor bean (*Ricinus communis*).

KOUSA DOGWOOD

Cornus kousa F.Bürger ex Hance

SYNONYMS: kousa, Japanese dogwood

ORIGIN: East Asia

GROWTH TRAITS: Small deciduous tree or large multi-stemmed shrub typically growing 15-30' (4.5-9 m) tall from a far-reaching but shallow root system. Plants at first produce a vase-shaped canopy with upright branches, though branching becomes more horizontal and tiered with age, gradually creating a rounded canopy. Bark is grayish-brown and may begin peeling at maturity. Leaves are opposite, 2-4" (5-10 cm) long, up to 1" (2.5 cm) wide, and attached to the branch with long petioles. Leaves are ovate to elliptical and have smooth but sometimes wavy margins and veins that curve towards the tip. Leaves are shiny green at first and turn pink in autumn before falling to the ground for winter. Flowers are produced in late spring to early summer, arising upright from leaf axils all along branches. Flowers are tiny, green, and non-showy in central clusters. They are surrounded by 4 showy white bracts that resemble petals. Each bract is 1-2" (2.5-5 cm) long and ovate with a pointed tip. The fruits are berry-like pendants typically 1.2" (3



Kousa dogwood a. tree; b. bark (a. A. Engelhardt; b. Dalgial)



Kousa dogwood c. leaves; d. flowers; e. mature fruits (c. © Murodilla Fatkhullaev, iNaturalist.org; d. © belvedere04, iNaturalist.org; e. Vellella)

cm) across that resemble large raspberries when ripe. Trees generally live 15 years in cultivation but many live much longer in their native habitat.

REPRODUCTION: Spreads by seed. Many seeds remain viable for up to 3 years.

HABITAT: Capitalizes on disturbance or intentional planting to establish initially, but can then spread into undisturbed areas. It grows well in full sun to partial shade and prefers moist, well-drained soil. In North America, it can be found on forest margins and abandoned lands and in urban gardens.



LOOK-ALIKES: The opposite leaves with veins curving toward the tip, in combination with the non-showy flowers surrounded by 4 showy white bracts, help differentiate this species from most potential look-alikes. The native flowering dogwood (*Cornus florida*) has similar growth form, leaves, and flowers. It differs with its flower bracts being rounded and notched at the tips, flowering earlier, and having clusters of smaller berry-like fruits that resemble rose hips rather than raspberries.

Look-alike: flowering dogwood (John Ruter, University of Georgia, bugwood.org)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Kousa dogwood is a popular ornamental that has escaped cultivation. Fruits are edible and sweet and are sometimes used in wine making.



COMMON DAFFODIL

Narcissus pseudonarcissus L.

SYNONYMS: wild lent lily, Tenby daffodil, trumpet narcissus, wild daffodil

ORIGIN: Europe

GROWTH TRAITS: Herbaceous perennial that grows 8-18" (20-45 cm) tall from a bulbous root system. Leaves and flowers appear from March to May. All leaves are basal, emerging from the plant base. Leaves are grayish-green, leathery, and have smooth margins and rounded tips. Leaves are very linear; they can be as tall as the flower stem (18" or 45 cm) but are typically only 0.2-0.5" (0.5-1.3 cm) wide. Flowers are generally produced individually on long, delicate, finely grooved, and leafless stalks. Each flower consists of a dark yellow 'trumpet' surrounded by a ring of 3 petals and 3 petal-like structures, which are a slightly lighter yellow and often twisted. The trumpet is up to 2.4" (6 cm) long, and the ring is up to 2.4" (6 cm) across. The fruits are capsules that split at maturity to release small, brown, and somewhat triangular seeds. When plants germinate from seeds, flowering often does not occur for 5-7 years.



Common daffodil a. plants; b. infestation (a. Dirtywilly, William Sandras; b. Sapin88)



Common daffodil c. leaves; d. flowers; e. opened fruits and seeds (c. Krzysztof Golik; d. BerndH; e. Roger Culos)

REPRODUCTION: Spreads by seed and sprouting from bulbs. Seeds remain viable for at least two years; bulb longevity is typically less than 12 months.

HABITAT: Common daffodil capitalizes on disturbance and typically spreads within and from ornamental gardens. It grows in partial shade to full sun and tolerates a variety of soils, though it grows best in well-drained soil. In North America it can be found in meadows, fields, woodlands, roadsides, and other disturbed areas adjacent to intentional plantings.

LOOK-ALIKES: While many bulbed flowers have leaves similar to common daffodil, most potential look-alikes lack the open trumpet and symmetrical ring on their flowers. Other exotic species of *Narcissus* have been introduced to North America. Most of these can be differentiated by having much shorter trumpets and/or white petal rings. Jonquil (*N. jonquilla*) has a yellow trumpet and petal ring, but it differs in having narrow leaves, a much shorter trumpet, and a very long tube at the base of the flower.



Look-alike: jonquil (Gustav Svensson)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: The leaves, stems, seed pods and bulbs all contain toxic alkaloids that cause illness if ingested.



DALMATIAN TOADFLAX

Linaria dalmatica (L.) Mill.

SYNONYMS: broad-leaved toadflax, *Linaria genistifolia* (L.) Mill., *L. genistifolia* (L.) Mill. ssp. *dalmatica* (L.) Maire & Petitm.

ORIGIN: Eurasia

GROWTH TRAITS: Herbaceous perennial typically growing numerous upright and prostrate stems 1-4' (0.3-1.2 m) tall from a deep taproot with lateral branches. Leaves are alternate, leathery, green to blue-green, and often have a waxy surface. Leaves are heart-shaped at the base, clasp the stem, and are typically 1-2" long (2.5-5.0 cm) and nearly as wide. Flowers are bright yellow and snapdragon-like with a distinct upper and lower lip and a long spur pointing downward. Each has a fuzzy, yellowish-orange throat and is 1.4-2" (3.5-5 cm) long, including the spur. Flowers occur in spiked clusters emerging from leaf axils and branch tips throughout summer. Each flower produces a round capsule fruit holding several small, brown, and somewhat triangular seeds.



Dalmatian toadflax a. plant; b. infestation (a. K. George Beck & James Sebastian, Colorado State University, bugwood.org; b. Jennifer Andreas, Washington State University Extension)



Dalmatian toadflax c. leaves; d. flower; e. fruits (c,d. Bonnie Million, National Park Service, bugwood.org; e. Linda Wilson)

REPRODUCTION: Spreads by seed and root fragments. Seeds may remain viable in the soil for up to 10 years.

HABITAT: Dalmatian toadflax is often found in or along disturbed areas such as railroads, roadsides, riversides, abandoned pastures and fields, and open forest slash piles. It does well in cool, semiarid climates and on coarse-textured soils.

LOOK-ALIKES: The combination of yellow, snapdragon-like flowers and waxy, heart-shaped leaves help differentiate Dalmatian toadflax from most potential look-alike species. The exotic myrtle spurge (*Euphorbia myrsinites*) has similar leaves, but myrtle spurge stems lean over instead of growing upright, they produce a milky sap when wounded, and they have typical spurge-type flowers that are green, inconspicuous, and surrounded by yellow-green bracts. The related and cultivated yellow snapdragon (*Antirrhinum majus*) has similar flowers and size, but its leaves are toothed and not waxy. The exotic yellow toadflax (*L. vulgaris*) also has similar flowers, but its leaves are narrow-linear and not waxy. Dalmatian and yellow toadflax are highly variable in North America and can hybridize.



Look-alike: yellow snapdragon (Acabashi)

NOXIOUS WEED LISTINGS: MN (Noxious Eradicate), WI (Restricted)

NOTES: Dalmatian toadflax is very problematic in the midwestern and western USA.



FIG BUTTERCUP

Ficaria verna Huds.

SYNONYMS: lesser celandine, pilewort, *Ranunculus ficaria* L.

ORIGIN: Europe, the Mediterranean, temperate Asia

GROWTH TRAITS: Herbaceous, perennial groundcover plant that grows up to 12" (30 cm) tall from thick tuberous roots with tubers and bulblets. Some individuals also produce bulblets in leaf axils. It is a spring ephemeral, sprouting in late winter, flowering in March and April and dying back to its roots by the end of spring. Leaves are produced in a basal rosette and are up to 2" (5 cm) long and wide with wavy margins and long petioles. Leaves are dark green above, lighter below, shiny, thickened, and kidney- to heart-shaped. Flowers are produced individually on long, delicate stalks that rise above the leaves. Flowers typically have 8 (sometimes up to 12) bright yellow and glossy petals and are usually 1" (2.5 cm) in diameter. Each flower produces up to 15 seeds that are hairy and tipped with bristles.

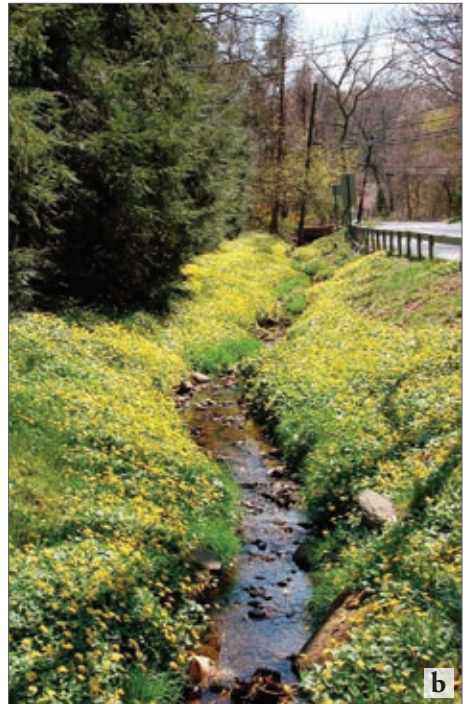


Fig buttercup a. plant; b. infestation (a. Krzysztof Ziarnik, Kenraiz; b. John M. Randall, The Nature Conservancy, bugwood.org)



Fig buttercup c. upper and lower sides of leaves; d. flower; e. fruits; f. bulblets (c. Janie Marlow, NameThatPlant.net; d. Greene Storm, St. John's University; e. Stefan.lefnaer; f. David L. Clement, University of Maryland; c,d,f bugwood.org)

REPRODUCTION: Spreads by seed, tubers, and bulblets. Seeds remain viable for at least 18 months; tuber and bulblet longevity is unknown.

HABITAT: Typically found in moist areas, including forested floodplains, damp meadows, and along streams and ditches.

LOOK-ALIKES: The native marsh marigold (*Caltha palustris*) grows in similar habitat and has similar glossy yellow flowers and kidney-shaped leaves with wavy margins. It differs by having fewer petals (5-9), not producing tubers or bulblets, and growing in clumps instead of a continuous carpet like fig buttercup. Extreme care should be used when managing fig buttercup to ensure it is not the native and rare marsh marigold. The native celandine poppy (*Stylophorum diphyllum*) and exotic celandine (*Chelidonium majus*) also have similar habitat, flowers, and growth form. Both of these potential look-alikes differ by having divided leaves and flowers with only four petals.



Look-alike: marsh marigold (Linda Haugen, USDA Forest Service, bugwood.org)

NOXIOUS WEED LISTINGS: CT, IL, MA, NY, and WI (all Prohibited), MD (Tier 1)



NOTES: Fig buttercup was introduced to North America as an ornamental. It is poisonous if ingested raw and potentially fatal to grazing animals.

OLDWOMAN

Artemisia stelleriana Besser

SYNONYMS: dusty miller, beach wormwood, hoary sagebrush

ORIGIN: East Asia, Alaska (western tip of Aleutian islands)

GROWTH TRAITS: Herbaceous perennial typically growing one to several upright stems up to 2' (60 cm) tall from a rhizomatous root system. Leaves are alternate, silver-gray, 1.2-4" (3-10 cm) long by up to 1" (2.5 cm) wide, and covered in woolly hairs that give leaves a velvety texture. Leaves generally have deep, rounded, but variable lobes along their margins and are often aromatic. Numerous flower heads are tightly clustered at the tips of flowering stems from late summer to early fall. Flower heads are 0.3" (8 mm) across and consist of tiny yellow disc florets. Each floret produces a tiny brown seed.

REPRODUCTION: Spreads by seed and rhizomes. Most seeds are viable for only one year.



Oldwoman a. plant; b. infestation (a,b. © Lewnanny Richardson, iNaturalist.org)



Oldwoman c. leaves; d. flower heads; e. senescing heads with seeds (c. David J. Stang; d. Qwert1234; e. © George Safford Torrey Herbarium [CONN])

HABITAT: Does best in sandy soils in full sun and can be found on coastal beaches and cliffs, sand dunes, and disturbed sites with well-drained soil. It tolerates drought well.

LOOK-ALIKES: The combination of silver-gray, woolly, and lobed leaves, non-showy flower heads with tiny disc florets, and aromatic foliage help differentiate oldwoman from many unrelated look-alikes. Within the genus, many species lack the silver-gray, woolly foliage. Most of the similar-looking species occur only in western North America. In the East, the exotic absinthe wormwood (*A. absinthium*) grows larger and has more finely divided leaves and fibrous roots. The native white sagebrush (*A. ludoviciana*) has more pointed leaves, its flower heads droop, and its crushed leaves have a strong camphor odor.



Look-alike: absinthe wormwood (AfroBrazilian)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Oldwoman is still popular in the ornamental trade for its attractive foliage capable of growing in dry, sandy locations. It frequently escapes cultivation.



TANSY RAGWORT

Jacobaea vulgaris Gaertn.

SYNONYMS: ragwort, tansy, stinking Willy, *Senecio jacobaea* L.

ORIGIN: Europe, Eurasia, the Mediterranean

GROWTH TRAITS: Upright, herbaceous plant typically growing 1-3' (0.3-1 m) tall from a soft, fleshy root system. Where winters are mild, the plant typically acts as a biennial. Rosettes grow during winter, remain as rosettes the following year, bolt the second spring, and flower from summer to early fall before dying in winter. Flowering may occasionally occur the first year (winter annual), but is usually delayed until the second. At locations with harsh winters and shorter growing seasons, the plant may behave as a short-lived perennial. Rosette leaves are deeply lobed with wrinkled and round-toothed margins, have petioles, and are 3-8" (7.5-20 cm) long. Stem leaves are alternate, more deeply divided and toothed, and further up they stem they decrease in size and clasp the stem. Stems arise singly or in clumps and branch near the top with multiple inflorescences. Flower heads are 0.5-1" (1.3-2.5 cm) across and consist of tiny



Tansy ragwort a. plant; b. infestation (a. Jennifer Andreas, Washington State University Extension; b. Leslie J. Mehrhoff, University of Connecticut, bugwood.org)



Tansy ragwort c. rosette leaf; d. stem leaf; e. flower head with disc (center) and ray (outer, petal-like) florets; f. mature seeds (c,d. Marianna Szucs, Colorado State University; e. Strobilomyces; f. Rasbak)

yellow disc (center) and ray (outer) florets. Ray florets (usually 13) resemble petals and grow 0.3-0.75" long (0.8-2 cm) long. Brown seeds are topped by tufts of silky hairs, resembling dandelion seeds.

REPRODUCTION: Spreads primarily by seed but shoots may also sprout from damaged roots and root fragments. Seeds may remain viable in the soil for up to 15 years.

HABITAT: Tansy ragwort tolerates partial shade but grows best in full sun in lighter, well-drained soils. It can be found in pastures, coastal grasslands, forest margins and clearings, roadsides, burned areas, and other disturbed places.



Look-alike: common tansy (Matt Lavin, Bozeman MT)

LOOK-ALIKES: Several native and exotic species of related *Packera* and *Senecio* resemble tansy ragwort with their flower heads containing both ray and disc florets. Most of these potential look-alikes do not have the same large size, large, deeply lobed, and rounded leaves, and large flower heads as tansy ragwort. The exotic common tansy (*Tanacetum vulgare*) has divided leaves and yellow flower heads, but common tansy has disc florets only.

NOXIOUS WEED LISTINGS: CT and MA (Prohibited)

NOTES: All parts of tansy ragwort contain pyrrolizidine alkaloids, substances that are broken down into compounds toxic to livestock and deer.



YELLOW HORNPOPPY

Glaucium flavum Crantz

SYNONYMS: horned poppy, sea poppy, bruisewort, *Glaucium luteum* Scopoli, *Chelidonium glaucium* L.

ORIGIN: Eurasia, the Mediterranean

GROWTH TRAITS: Herbaceous biennial to short-lived perennial typically growing 1-3' (0.3-0.9 m) from a stout taproot. Leaves are blue-green, hairy, and sometimes waxy and leathery. They are 3-8" (7.5-20 cm) long, 1-2" (2.5-5 cm) wide, and deeply lobed with wrinkled margins, often appearing scrunched. Basal leaves have petioles; stem leaves are alternate, and further up they stem they decrease in size and clasp the stem. Flowers occur on stout stalks arising from leaf axils or stem tips throughout summer. Each flower is 2-3" (5-9 cm) across, has several yellow stamens, and has 4 yellow obovate petals that overlap and have wrinkled margins. Each flower produces a rough capsule fruit 6-12" (15-30 cm) long that holds several seeds.



Yellow hornpoppy a. plant; b. infestation (a. Haplochromis; b. Leslie Mehrhoff, University of Connecticut, bugwood.org)



Yellow hornpoppy c. leaves; d. flower; e. flower, fruit, and leaf segments (c. Jerzy Opiola; d. Peter A. Mansfeld; e. © Lisa Bennett, iNaturalist.org)

REPRODUCTION: Spreads by seed. Seeds may remain viable in the soil for at least three years.

HABITAT: Yellow hornpoppy grows best in coarse, well-drained soils and full sun. It can be found on beaches above the high tide line as well as sand dunes and cliff tops.

LOOK-ALIKES: The combination of 4-petal yellow flowers, heavily divided leaves, and capsule fruit help differentiate yellow hornpoppy from most unrelated look-alikes. Within the family, the native celandine poppy (*Stylophorum diphyllum*) and exotic celandine (*Chelidonium majus*) have similar flowers and their leaves are also divided, but their leaves are more flat (rather than crumpled) compared to yellow hornpoppy, and their capsule fruits are much shorter.



Look-alike: celandine poppy (David Mortensen)

NOXIOUS WEED LISTINGS: MA (Prohibited)



NOTES: This species has likely been introduced to North America multiple times, both in ship's ballast and as intentional horticultural plantings.

WINTERGREEN BARBERRY

Berberis julianae C.K. Schneid.

SYNONYMS: Chinese barberry

ORIGIN: China

GROWTH TRAITS: Evergreen shrub typically growing 4-8' (1.2-2.4 m) tall and equally wide from an extensive fibrous root system. Multiple branched stems give the plant an overall rounded appearance. New stem growth is pale yellow while older branches are more grayish-brown and often grooved. Stems have 3 spines 0.4-1.6" (1-4 cm) long at each leaf node. Leaves are alternate or appear whorled at each node. Each leaf is shiny dark green, leathery, 1.2-4" (3-10 cm) long by 0.5" (1.3 cm) wide, elliptical or obovate, and has spiny margins. Leaves often turn a deep bronze or wine red in the fall and winter. Flowers appear in clusters of up to 25 from leaf axils in spring. Each flower is less than 0.5" (1.2 cm) across and typically has 6 yellow petals and 6 yellow petal-like sepals. Berry fruits are oblong, up to 0.3" (8 mm) long, and covered with a waxy silver-blue that eventually wears off to reveal the black fruit beneath.



Wintergreen barberry a. plant; b. infestation (a. John Ruter, University of Georgia, bugwood.org; b. Wouter Hagens)



Wintergreen barberry c. leaves, stem, flowers, and spines; d. flowers; e. fruit (c. Wouter Hagens; d. Denis.prévôt; e. © Carrie Seltzer, iNaturalist.org)

REPRODUCTION: Spreads by seed. Seeds are typically viable in the soil for up to one year.

HABITAT: Wintergreen barberry can tolerate a variety of conditions. It is most limited by waterlogged soil. It tolerates partial shade but grows best in full sun, and is very cold tolerant. It can be found in abandoned fields, forests and forest clearings, floodplains, roadsides, and urban landscapes.



Look-alike: Japanese barberry (Alpsdake)

LOOK-ALIKES: The glossy green, leathery, spiny, evergreen leaves in combination with small yellow flowers and shrubby growth helps differentiate wintergreen barberry from unrelated look-alikes. There are several native and exotic species and cultivars of *Berberis* present in North America. Many that have similar foliage to wintergreen barberry have compound leaves. The native American barberry (*B. canadensis*) and the exotic Japanese (*B. thunbergii*) and European barberry (*B. vulgaris*) are most similar but are deciduous and have smaller stem spines, generally smaller and more rounded leaves, and fruits that are red at maturity rather than black.

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.



NOTES: This species was intentionally introduced to North America as an ornamental, and it is still frequently utilized horticulturally as a hedge plant.

BOG BULRUSH

Schoenoplectiella mucronata (L.) J.Jung & H.K.Choi

SYNONYMS: ricefield bulrush, rough-seed bulrush, *Schoenoplectus mucronatus* (L.) Palla ex A. Kern., *Scirpus mucronatus* L.

ORIGIN: Africa, Asia, Australia, Europe

GROWTH TRAITS: Annual (with fibrous roots) or perennial (with short, hard rhizomes) sedge that forms clumps 1-3' (0.6-0.9 m) tall. True leaves are barely noticeable; they are reduced to small sheaths that encase the bottoms of stems. Stems are triangular in cross-section and may droop slightly. Clustered inflorescences of 4-25 cone-shaped spikelets occur just below stem tips. An angled, stiff bract extends from inflorescences and may resemble a continuation of the stem. Stems and bracts are bright green with smooth, straight margins. Flowers are green at first but mature to brown and bloom summer to fall. They are followed by small, bulb-shaped seeds ('nuts') that have tiny, thin bristles and mature to dark brown.



Bog bulrush a. plants; b. infestation (a. © Bob O'Kennon, iNaturalist.org; b. Wibowo Djatmiko, Wie146)



Bog bulrush c. stems; d. inflorescences and angled bract; e. bristled seeds (c. Wibowo Djatmiko, Wie146; d. © Bob O'Kennon, iNaturalist.org; e. Steve Hurst, USDA-NRCS PLANTS Database)

REPRODUCTION: Spreads by seed and rhizomes. Seeds may remain viable in the soil for many years.

HABITAT: Bog bulrush is a weed of wet and boggy areas that can also grow in shallow water. It is found in disturbed and early successional wetlands and wetland restorations and along the margins of lakes and rivers. Plants grow best in full sun.



LOOK-ALIKES: The triangular stems, non-showy green flowers that mature to brown, and nut-like fruit are all characteristic of the sedge family and help differentiate bog bulrush and other sedges from similar, unrelated species. Within the family, the cone-like spikelets and bristled fruits help differentiate bog bulrush from other sedges. The native Hall's bulrush (*Schoenoplectiella hallii*), weakstalk bulrush (*S. purshiana*), and Smith's bulrush (*S. smithii*) all have shorter and more delicate stems that droop much more. The native common threesquare (*Schoenoplectus pungens*) has similar stems, but its inflorescences have much longer stamens, and the bract extending from the inflorescence is not angled as it is for bog bulrush.

Look-alike: common threesquare (Rob Routledge, Sault College, bugwood.org)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Around the world, bog bulrush is a frequent weed in rice fields.



VARIABLE FLATSEDGE

Cyperus difformis L.

SYNONYMS: smallflower umbrella sedge, rice sedge, small-flowered nutsedge

ORIGIN: Africa, Asia, Australia, Europe

GROWTH TRAITS: Annual, aquatic sedge growing 3-32" (7.5-81 cm) tall from a fibrous root system. Stems are, smooth, erect, slightly winged, triangular in cross-section, and up to 0.12" (3 mm) thick. Leaves are basal, flat, linear, generally up to 2/3 the length of the stems, and up to 0.25" (6 mm) wide. Leaves are typically smooth, but may be slightly rough along their center or margins. Inflorescences are loose umbels with numerous globular clusters of 10-60 spikelets. Flowers are green at first but mature to brown. Beneath each inflorescence are 1-4 leaf-like bracts that are angled away from plant stems. Bracts are 10" (25 cm) long and resemble stiff leaves. Flowers are followed by small, triangular fruits ('nuts') that mature to light brown. Plants can complete their life cycle from seed to seed within a month. In warm climates, seed production continues year-round; in temperate areas, seed production is restricted to spring through fall.



Variable flatsedge a. plant; b. infestation (a. Forest & Kim Starr, Starr Environmental; b. Charles T. Bryson, USDA ARS, bugwood.org)



Variable flatsedge c. bract that resembles a leaf d. inflorescence; e. tiny green (immature) flowers (c,e. Nadiah Vololomboahangy Manjato; d. Charles Rakotovoao; c-e. tropicos.org)

REPRODUCTION: Spreads by seed. Seeds may remain viable in the soil for many years.

HABITAT: Variable flatsedge is a weed of wet and boggy areas and can grow in shallow water, including wetlands and along the margins of lakes and rivers. Plants can also invade upland areas with moist soil and grow best in full sun.



Look-alike: drain flatsedge (John Tann)

LOOK-ALIKES: The triangular stems, non-showy green flowers that mature to brown, and nut-like fruit are all characteristic of the sedge family and help differentiate variable flatsedge and other sedges from similar, unrelated species. There are several native and exotic *Cyperus* species present in the USA which resemble variable flatsedge in their immature stages. Variable flatsedge can be differentiated during flowering by its globular, tightly packed clusters of 10-60 spikelets. Other *Cyperus* species, such as the native drain flatsedge (*Cyperus eragrostis*), have non-spherical clusters or their spikelets are fewer in number.

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: Though its distribution in the USA is currently low, variable flatsedge is considered one of the world's worst weeds, being a frequent invader in rice, sugarcane, tea, and maize.



EUROPEAN FROG-BIT

Hydrocharis morsus-ranae L.

SYNONYMS: common frogbit

ORIGIN: Europe, Eurasia, the Mediterranean

GROWTH TRAITS: Herbaceous, aquatic perennial with a fibrous root system that is unbranched and free-floating (not anchored to the sediment). Leaves are bright shiny green above and either green or dark purple beneath, leathery, and have a thick spongy layer on their undersides near the midvein that helps them float. Leaves are round or heart-shaped with an indented base, 0.5-2.4" (1-6 cm) wide, and have long slender petioles and veins all arising from the indented base. The plant sends out stolons that can float on water and produce new rosettes with leaves and submerged roots. This often leads to dense mats forming on pond or lake surfaces. Flowers are produced throughout summer on long stalks. Male and female flowers occur on separate plants, or at least separate rosettes. Male flowers occur in clusters of 1-5 while female flowers occur singly on longer stalks. Both types of flowers have 3 membranous white petals and yellow centers and are 0.4-0.8" (1-2 cm) across. Though uncommon, fruits are berry-like and



European frog-bit a. plants; b. infestation (a,b. Christian Fischer)



European frog-bit c. leaves; d. turion; e. flowers (c-e. Christian Fischer)

contain seeds up to 0.04" (1 mm) long. In the fall, stolons produce green, oval turions (winter buds) up to 0.25" (7 mm) long. These sink over winter and float in spring, giving rise to new plants.

REPRODUCTION: Despite flowering profusely, spread by seed is uncommon. Most population spread is via stolons and turions. Seed longevity is unknown.

HABITAT: Does best in slowly moving water including ponds and marshes and along the protected banks of streams and lakes.

LOOK-ALIKES: The 3-petal white flowers and small, round, heart-shaped leaves help differentiate this species from most potential look-alikes. The native American frogbit (*Limnobium spongia*) has similar leaves but has ridged petioles, flowers that appear fringed, and leaves with the spongy layer in a central disk rather than near the midvein. The native little floating heart (*Nymphoides cordata*) has 5-petal flowers. Water lilies (*Nymphaea* spp.) have larger leaves and larger, layered flowers.



Look-alike: American frogbit (Chris Evans, University of Illinois, bugwood.org)

NOXIOUS WEED LISTINGS: IL (Aquatic Injurious Plant), IN and NH (Prohibited Aquatic), ME (Noxious), MI, NY, and WI (all Prohibited), VT (Noxious B)



NOTES: This species is popular in the aquarium trade, and many wild populations in the USA are the result of inappropriate aquarium dumping.

EUROPEAN SPEEDWELL

Veronica beccabunga L.

SYNONYMS: European brooklime

ORIGIN: Asia, Europe, the Mediterranean

GROWTH TRAITS: Emergent, herbaceous aquatic perennial that is rooted to the substrate with branched stems growing 8"-2' (20-60 cm) long and forming creeping clumps by regularly rooting at stem nodes. Stems are smooth, thick, often prostrate but erect at their tips, and green but turning reddish with maturity. Leaves are opposite, ovate, coarsely toothed, smooth, often fleshy, and have prominent veins. Leaves are up to 1.5" (3.8 cm) long and have short petioles; they do not clasp the stem. Flowers are produced in small, spreading clusters in opposite pairs from leaf axils in spring and early summer. These are often obscured by larger leaves. Each flower has 4 small, bluish-purple, darkly-veined petals and a white center. Fruits are small, round, flattened capsules that split at maturity to release numerous smooth, winged, flattened seeds. In temperate regions, plants die back to roots and may re-sprout the following spring.



European speedwell a. plant; b. infestation (a. © Drepanostoma; b. © anohturfft; a,b. iNaturalist.org)



European speedwell c. leaves; d. flowers; e. fruits (c. © Pat Deacon, iNaturalist.org; d. TeunSpaans; e. © 2017 Paul Busselen, gobotany.newenglandwild.org)

REPRODUCTION: Spreads by seed and fragmentation. Seed longevity is unknown, but seeds of other *Veronica* species are viable for three to many years. Stem fragments root from nodes.

HABITAT: Colonizes marshy wetlands and the edges of rivers, lakes, and streams. It can be found in full sun to partial shade.

LOOK-ALIKES: Though many other aquatic species have emergent purplish flowers and/or opposite leaves, European speedwell can be differentiated by having 4-petal flowers with white centers, and relatively short leaves than most unrelated look-alikes. There are several native and exotic species of *Veronica* in North America. European speedwell differs from many in being aquatic with smooth stems. The very similar native American speedwell (*V. americana*) often grows taller (up to 3.3' or 1 m), has longer, lance-shaped leaves up to 3.2" or 8 cm long, and its petioles are so short that leaves often appear to clasp the stem.



Look-alike: American speedwell (Rob Routledge, Sault College, bugwood.org)

NOXIOUS WEED LISTINGS: Not listed as noxious in any northeastern/northcentral state.

NOTES: This species was likely accidentally introduced into the continental United States in the 1880s in ship's ballast.



EUROPEAN WATERSTARWORT

Callitriche stagnalis Scop.

SYNONYMS: pond water-starwort, common waterstarwort, water chickweed

ORIGIN: Asia, Europe, the Mediterranean

GROWTH TRAITS: Herbaceous, aquatic perennial (sometimes annual) that is anchored in the sediment by slender, linear roots. Stems are flexible, 4-12" (10-30 cm) long, and root from nodes. Leaves are bright green, opposite, thick, and have smooth margins. Floating and emergent leaves are oval to spoon-shaped, up to 0.8" (2 cm) long and nearly as wide, and are often crowded at stem tips. Floating leaves and stems often form dense mats at the water surface. Submerged leaves are typically more linear, up to 0.4" (1 cm) long, and more widely spaced. However, some submerged leaves more closely resemble the shape and size of floating leaves. Flowers are produced throughout summer in the leaf axils of both floating and submerged leaves. Flowers are tiny and have no petals, but have 2-4 small, white, inflated bracts. Fruits are nearly round, up to 0.08" (2



European waterstarwort a. plants; b. infestation (a. © Gerald D. Carr 2017; b. Leslie J. Mehrhoff, University of Connecticut, bugwood.org)



European waterstarwort c. floating and emergent leaves; d. flowers and fruit from above; e. flowers and fruit in profile (c-e. © Gerald D. Carr 2017)

mm) long, and have 4 compartments. Each compartment has a tiny wing along its margin.

REPRODUCTION: Spreads by seed and fragmentation. Seed longevity is unknown. Stem fragments root from nodes.

HABITAT: Does best in slowly moving water including ponds and marshes and along the protected banks of streams and lakes.

LOOK-ALIKES: Multiple species of native and exotic waterstarworts are present in North America, including vernal waterstarwort (*Callitriche palustris*). Due to variability in leaf shape and size, all of these closely resemble European waterstarwort. Fruits are needed for proper identification; fruits of European waterstarwort differ by being nearly round and having tiny wings along the margins of the compartments.



Look-alike: vernal waterstarwort, submerged (Show_ryu)

NOXIOUS WEED LISTINGS: CT (Prohibited)

NOTES: This species was likely introduced via shipping contaminants. It was also popular in the aquarium trade by the end of the 19th century and likely became established in disjunct populations in the USA via the inappropriate dumping of aquarium contents.



GIANT SALVINIA

Salvinia molesta D.S. Mitch.

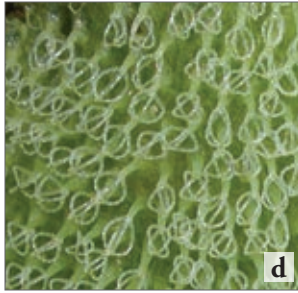
SYNONYMS: watermoss, water fern, salvinia, kariba-weed, African pyle

ORIGIN: South America

GROWTH TRAITS: Aquatic, free-floating fern that grows as an annual or short-lived perennial and has no true roots. Horizontal branching rhizomes float just below the surface and bear three leaves (fronds) at each node. Two leaves are floating and one is submersed and divided into several filaments that resemble (but do not function as) roots. Floating leaves are oval-shaped and up to 1.6" (4 cm) long and have smooth margins and distinct midribs. Water repellent, white hairs on the upper surface of floating leaves have 4 branches that join back together at the tip, giving them an "egg beater" appearance. Hairs on the undersides of leaves and filaments are unbranched and chestnut-colored. Depending on nutrient and space availability, plants may be slender with small leaves or dense mats with large, crowded, folded leaves. Spore-producing structures (sporocarps) shaped like small eggs are arranged in chains on submersed filaments.



Giant salvinia a. plant with crowded leaves; b. infestation (a. Leslie Mehrhoff, University of Connecticut; b. Kenneth Calcote, Mississippi Dept. of Agriculture and Commerce; a,b bugwood.org)

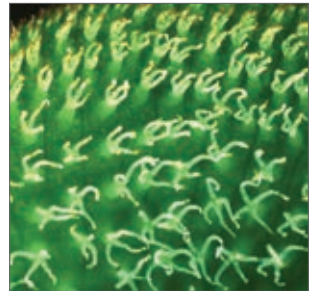


Giant salvinia c. floating leaves on a non-crowded plant; d. “egg beater” hairs on upper surface of floating leaf; e. senescing plant with rusty floating leaves and filaments with sporocarps (c,e. Leslie J. Mehrhoff, University of Connecticut; d. Mic Julien, CSIRO; c-e bugwood.org)

REPRODUCTION: Though sporocarps can be found on submersed filaments, this species is not known to produce fertile spores in the USA, and all reproduction occurs vegetatively via regular fragmentation of the rhizomes.

HABITAT: Giant salvinia grows best in still, shallow water with high organic content where it often forms dense mats. It does not tolerate saline environments.

LOOK-ALIKES: There are at least four exotic species known as giant salvinia present in the USA, of which *S. molesta* is the most common; sporocarps are generally needed to tell them apart. The exotic and invasive common salvinia (*Salvinia minima*) is half the size of the giant salvinias, and its upper leaf hairs are free near the tips while the upper leaf hairs of giant salvinias come together at the tips. Native mosquitoferns (*Azolla* spp.) may superficially resemble giant salvinia. Mosquitofern plants are much smaller, typically less than 1" (2.5 cm) wide with numerous tiny, overlapping leaves.



Look-alike: common salvinia branching hairs on leaf surface (Mic Julien, CSIRO)

NOXIOUS WEED LISTINGS: CT, MA, MI, WI (all Prohibited), IL (Aquatic Injurious), IN (Prohibited Aquatic), VT (A), RI (Noxious), WV



NOTES: This species is frequently introduced via improper disposal of aquarium contents in natural settings or spreading from ornamental ponds.

MUDMAT

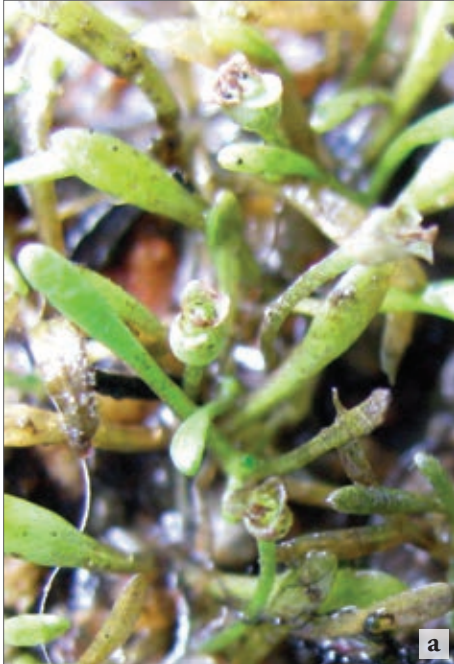
Glossostigma cleistanthum W.R. Barker

SYNONYMS: mudmats

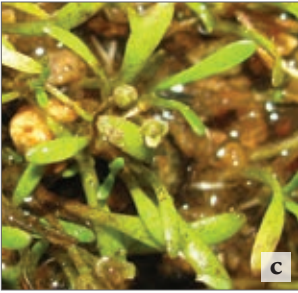
ORIGIN: Australia, New Zealand

GROWTH TRAITS: Small herbaceous, aquatic that is anchored to the sediment by a rhizomatous root system. Plants grow either submerged in fresh water or emergent along shorelines. Rhizomes grow just below the soil surface and produce roots and two leaves at each node. Leaves are bright green, 0.4-1.2" (1-3 cm) long, and spatula-shaped with rounded tips and smooth margins. Flowers are produced throughout summer. Flowers on emergent plants are tiny, bell-shaped, and pinkish-white. They appear on slender stalks arising from rhizome nodes. On submerged plants, closed, self-fertilized flowers (cleistogams) are produced at rhizome nodes. Fruits are small capsules containing numerous tiny seeds. Emergent plants grow as annuals, dying back in the winter. Submerged plants are perennial, remaining green and producing fruit throughout winter.

REPRODUCTION: Spreads by seed and rhizomes. Seed longevity is unknown.



Mudmat a. plants; b. infestation (a,b. Leslie J. Mehrhoff, University of Connecticut, bugwood.org)



Mudmat c. leaves and flowers; d. plants, rhizomes, and cleistogams; e. flowers (c-e. Leslie J. Mehrhoff, University of Connecticut, bugwood.org)

HABITAT: Grows submerged or along sandy to muddy shorelines of freshwater lakes and rivers and fresh tidal reaches. When growing submerged, the clarity of the water determines its depth. It is typically restricted to shallow water, but has been found 13' (4 m) deep in very clear water.

LOOK-ALIKES: The small, spatula-shaped leaves and tiny whitish flowers of mudmat resemble those of native mudwort species, including water mudwort (*Limosella aquatica*). Water mudwort differs by having multiple leaves per plant (node), larger leaves, and flowers with 5 petals. Emergent leaves of some bladderwort species (*Utricularia*) may be confused for mudmat. Bladderworts can be differentiated by having larger yellow flowers.



NOXIOUS WEED LISTINGS: WI (Prohibited)

Look-alike: water mudwort
(Mary Ellen (Mel) Harte)

NOTES: This species was introduced to North America in the aquarium trade and likely became established in disjunct populations in the USA via the inappropriate dumping of aquarium contents.



ONEROW YELLOWCRESS

Nasturtium microphyllum Boenn. ex Rchb.

SYNONYMS: onerow watercress, *Nasturtium officinale* var. *microphyllum* (Boenn. ex Rchb.) Thell., *Rorippa microphylla* (Boenn. ex Rchb.) Hyl. ex Á. Löve & D. Löve, *Rorippa nasturtium-aquaticum* var. *longisiliqua* (Irmisch) B. Boivin

ORIGIN: Asia, Europe, the Mediterranean

GROWTH TRAITS: Herbaceous, perennial aquatic or semi-aquatic that is rooted to the substrate with a taproot and fibrous root system. Stems typically creep on soil or float on open water, growing up to 3.3' (1 m) long and forming sprawling clumps by regularly rooting at stem nodes. Stems are smooth, ridged, green, and hollow. Leaves are green (sometimes bronze), 1-4" (2.5-10 cm) long, and divided into 3-7 leaflets. Leaflets are obovate with smooth or slightly wavy margins. The terminal leaflet is larger than the side leaflets. Stem leaves are alternate and decrease in size further up the stem. Flowers are produced in clusters at stem tips in spring and summer. Each flower is typically 0.25" (6 mm) in diameter and has 4 small white petals and 6 stamens. Fruits are up to 1" (2.5 cm) long, thin, and



Onerow yellowcress a. plant; b. infestation (a. Leslie J. Mehrhoff, University of Connecticut, bugwood.org; b. © Colin Meurk, iNaturalist.org)



Onerow yellowcress c. leaves; d. flowers; e. fruits (c-e. Leslie Mehrhoff, U. of Connecticut, bugwood.org)

contain numerous tiny seeds that are generally in one row (sometimes a wavy row rather than a straight line). Fruits split at maturity to release seeds. In temperate regions, plants die back to roots and may re-sprout the following spring.

REPRODUCTION: Spreads by seed and fragmentation. Seeds are viable for up to five years. Stem fragments root from nodes.

HABITAT: Colonizes the edges of moving water and can be found in/along rivers, streams, ditches, and springs. It can be found in full sun to partial shade.

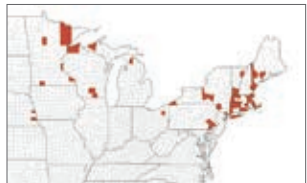
LOOK-ALIKES: Several related species are present in North America and resemble onerow yellowcress with their similar leaves and tiny flowers with 4 petals and 6 stamens. Many look-alikes have yellow flowers and are terrestrial. The exotic watercress (*Nasturtium officinale*) most closely resembles onerow yellowcress by being aquatic and having white flowers. Watercress differs by growing larger and having seeds arranged in two rows within its fruit.



Look-alike: watercress (Matt Lavin, Bozeman MT)

NOXIOUS WEED LISTINGS: CT (Prohibited)

NOTES: Though not intentionally cultivated like the related watercress, onerow yellowcress is an important food source in some countries where it is native or long naturalized. It frequently carries the common liver fluke when growing in places near livestock grazing.



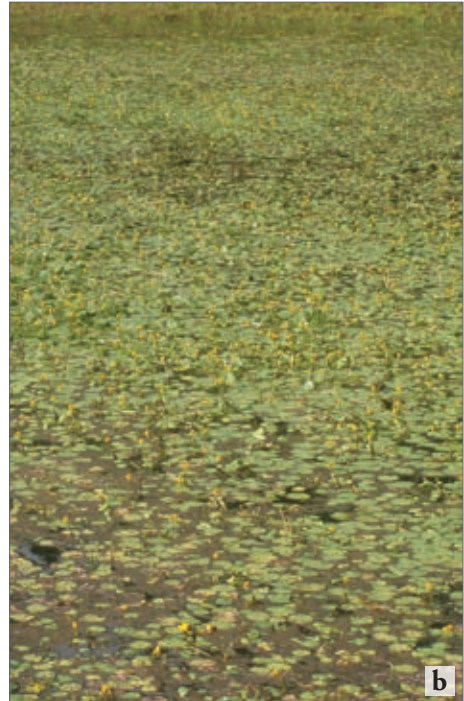
YELLOW FLOATINGHEART

Nymphoides peltata (S. G. Gmel.) Kuntze

SYNONYMS: fringed water lily, water fringe

ORIGIN: Eurasia

GROWTH TRAITS: Herbaceous, aquatic perennial with a fibrous and rhizomatous root system that is anchored to the sediment. The plant sends out branched stolons up to 3.3' (1 m) long that produce new rosettes with leaves and submerged roots. This often leads to dense mats forming on pond or lake surfaces. Leaves are leathery, bright shiny green above, typically dark purple beneath, and have wavy margins. Leaves are round or heart-shaped with an indented base, 2-6" (5-15 cm) wide and long, and have long slender petioles that attach to stolons. Flowers are produced throughout summer on long stalks held above the water surface. Flowers are up to 1.6" (4 cm) in diameter and have 5 yellow petals with fringed margins. Fruits are beaked capsules 0.5-1" (1.3-2.5 cm) long that contain many flat, oval, winged seeds. In the fall, plants die back to the rhizomes, and new shoots emerge in spring.



Yellow floatingheart a. plant; b. infestation (a. Krzysztof Ziarnek, Kenraiz; b. Rob Andress, bugwood.org)



Yellow floatingheart c. leaves; d. flower; e. fruits (c-e. Leslie Mehrhoff, University of Connecticut, bugwood.org)

REPRODUCTION: Spreads by seed and stolons. Some seeds reportedly remain viable for over 10 years.

HABITAT: Does best in slowly moving water including ponds and marshes and along the protected banks of streams and lakes. This species can grow on damp mud but cannot grow in shade.

LOOK-ALIKES: The native pond lilies or spatterdocks (*Nuphar* spp.) have similar-shaped leaves and yellow flowers; however their leaves are much larger and their cup-like flowers lack fringed petals. The native water shield (*Brasenia schreberi*) has similar small, oval floating leaves, but often with a jelly like covering on the undersides, and it has small purple flowers. Other species of *Nymphoides* are smaller than yellow floatingheart and/or have white flowers, including the native little floating heart (*Nymphoides cordata*). Water lilies (*Nymphaea* spp.) have larger leaves and larger, layered flowers.



Look-alike: Rocky Mountain pond lily (Paul Bolstad, University of Minnesota, bugwood.org)



NOXIOUS WEED LISTINGS: CT, MA, MI, NY, WI (all Prohibited), IL (Aquatic Injurious Plant), IN and NH (Prohibited Aquatic), ME (Noxious), VT (Noxious B)

NOTES: This species is popular in water gardening, and many wild populations in the USA are the result of garden plants escaping into nearby water bodies.

GLOSSARY

Term	Definition
achene	A small, one-seeded fruit that does not split at maturity
alternate	Where leaves appear singly at stem nodes, on alternate sides of the stem
annual	A plant that completes its life cycle in one year and then dies
awn	A hair- or bristle-like appendage extending from florets of many grasses
axil	The angle between the upper side of a leaf or stem and the stem or branch that supports it
banner	The upper petal of a pea flower (Fabaceae)
basal	Located at the base of a plant or plant part
biennial	A plant that flowers and then dies in its second year
bolting	Plant stage at which the flower stalk begins to grow
bract	A small, leaf-like structure below a flower
bulbil	A small bulblike structure, often in the axil of a leaf or at the base of a stem, that may form a new plant
bulblet	A bulb arising from another bulb and acting as a thick storage organ
compound leaf	A leaf consisting of two or more leaflets borne on the same leaf stalk
corm	Rootstock with a fleshy, swollen stem base that is usually underground and stores food reserves
cormel	Smaller tuberous offshoots of corms
crown	Location where a plant's stems meets its roots
deciduous	Sheds its leaves annually
density	Number of individuals per unit area (e.g. plants, stems, or leaves)
divided	Synonym for compound leaf

Term	Definition
elliptical	Shaped like a flattened circle, symmetrical, tapering equally both to the tip and the base
erect	Grows upright and vertical as opposed to prostrate (spreading on the ground)
exotic	Not native
floret	One of the small, closely clustered flowers forming the head of a composite flower in the sunflower family or the flowering unit of a grass spikelet, consisting of the flower and its two enveloping bracts
flower head	A special type of inflorescence consisting of a receptacle and numerous florets that actually look like one flower. Typical of plants in the sunflower family
forb	Herbaceous plant (does not have solid woody stems)
herbaceous	Does not have solid woody stems
hyperaccumulator	A plant capable of growing in soils with very high concentrations of substances (usually metals or toxins), absorbing these substances through their roots, and concentrating extremely high levels of the substances in their tissues
inflorescence	The flowering part of a plant
involucre	A circle of bracts under an inflorescence
lag phase	First stage of a typical plant invasion during which populations remain at low levels for several years. Plants often become abundant during the next phase
leaflet	A leaf-like part of a compound leaf. Though it resembles an entire leaf, a leaflet is not attached to the main plant stem or branch as a leaf is, but rather on the leaf stalk
lenticels	Raised pores in the stem of a woody plant that allow gas exchange between the atmosphere and the internal tissues
ligule	A thin outgrowth at the junction of leaf and leafstalk of many grasses and sedges and some other species

Term	Definition
lobed	A leaf with shallow or deep, rounded segments, as in a thistle rosette leaf
native	A plant that originated in the geographic area of discussion
node	Part of the stem of a plant from which a leaf, branch, or root grows
ochrea (pl. ochreae)	A saucer-shaped structure that sheathes the stems of certain plants, formed from united stipules or leaf bases
opposite	Where leaves appear in twos at stem nodes, on opposite sides of the stem
obovate	Shaped like an upside-down egg with the tip wider than the base
ovate	Shaped like an egg, with the base wider than the tip
perennial	A plant that lives for more than two years
petiole	Leaf stalk that attaches the leaf to a plant stem
prostrate	Grows flat along the ground as opposed to growing erect (upright)
receptacle	Part of the stem to which the flower is attached
recurved	Curved backward or downward
rhizome	A modified stem of a plant that grows horizontally underground, often sending out roots and shoots from its nodes
rosette	A compact, circular, and normally basal cluster of leaves
samara	An achene fruit with a flattened, papery wing
scarification	Cutting the seed coat using abrasion, thermal stress, or chemicals to encourage germination
senescence	Final stage in a plant's life cycle
sepal	Typically green segments occurring beneath flower petals that protect the flower in bud and petals when in bloom. Some may resemble petals

Term	Definition
serrated	Toothed with asymmetrical teeth pointing forward as in the cutting edge of a saw
sheath	A tubular or rolled part of an organ, e.g. the lower part of the leaf in most grasses
spadix	Inflorescence with several tiny flowers clustered on a narrow, fleshy stem
spathe	Leaf-like curved bract, typically surrounding a spadix
stamen	The pollen-producing reproductive organ of a flower
stolon	Stem which grows at the soil (or water) surface or just below ground that forms adventitious roots at nodes, and new plants from buds (also called runner)
sporocarp	A fruiting body containing spores
taxonomy	The classification of organisms in an ordered system that indicates natural relationships. The science, laws, or principles of classification; systematics
toothed (margin)	Saw-like leaf margin with teeth on the edge that may be different in size. Also called serrated
turion	Bud that gives rise to a new plant after it breaks free from the parent plant and sprouts. May be on a stolon, leaf, or subterranean or submerged rootstock
tussock	Tuft or clump of growing bunchgrass
umbel	An inflorescence which consists of a number of short flower stalks which spread from a common point, somewhat like umbrella ribs. They can be simple or compound (the single flowers are replaced by many smaller umbels called umbellets)
variegated	Plant foliage having leaves that are edged or patterned in a second color, especially white as well as green
whorled	Where multiple leaves or flowers radiate outward from a single stem node
winter annual	A plant that germinates in autumn, lives through winter, and produces seed and dies in the following season

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ENGLISH TO METRIC CONVERSIONS (LENGTH)

Symbol	When You Know	Multiply By	To Find	Symbol
in or "	inches	2.54	centimeters	cm
ft or '	feet	0.305	meters	m
yd	yards	0.914	meters	m