USDA

United States
Department of
Agriculture

Forest Service

**Northern
Research Station**

General Technical
Report NRS-52

A Guide to Nonnative Invasive Plants Inventoried in the North by Forest Inventory and Analysis

Cassandra Olson
Anita F. Cholewa

Cover Photos

Front: clockwise from top left: spotted knapweed, photo by Cindy Roche, Bugwood.org; European privet, photo by Nava Tabak, Invasive Plant Atlas of New England, Bugwood.org; multiflora rose, photo by James H. Miller, U.S. Forest Service, www.forestryimages.com; Dame's rocket, photo used with permission, by Kelly Kearns, Wisconsin DNR.

Back: Northern Research Station Forest Inventory and Analysis field crew, photos by Cassandra Olson, U.S. Forest Service.

Published by:
U.S. FOREST SERVICE
11 CAMPUS BLVD SUITE 200
NEWTOWN SQUARE PA 19073

September 2009

For additional copies:
U.S. Forest Service
Publications Distribution
359 Main Road
Delaware, OH 43015-8640
Fax: (740)368-0152

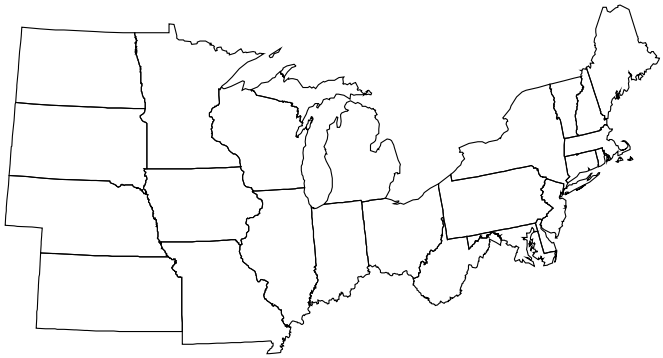
Visit our homepage at: **http://www.nrs.fs.fed.us/**

Printed on Recycled Paper

A Guide to Nonnative Invasive Plants Inventoried in the North by Forest Inventory and Analysis

Cassandra Olson
Ecologist, U.S. Forest Service,
Northern Research Station

Anita F. Cholewa
Curator, J.F. Bell Museum of Natural History,
University of Minnesota



Acknowledgments

Thanks to Katherine Johnson, Dale Gormanson, David Haugen, John Vissage, Keith Moser, James Blehm, Dan Kaisershot, Travis Rymal, and Barb Winters for helping with my various requests as this guide was put together.

Plant names and data for individual species distribution were taken from the January 2000 version of the NRCS Plants Database: http://plants.usda.gov. Other sources for individual species distribution are noted in the References section.

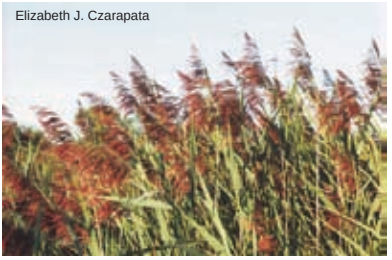
Foreword

This field guide is intended to aid Forest Inventory and Analysis (FIA) foresters in identifying 43 plants listed in Appendix I of the FIA Field Guide 4.0 (http://nrs.fs.fed.us/fia/data-collection/). This document will change as invasive species are added or removed from the list. For this reason, there are no page numbers and all species are arranged alphabetically by growth form (trees, woody, vines, etc.). Please send questions, ideas, new pictures, and any other information related to these species to Cassandra Olson (clolson@fs.fed.us).

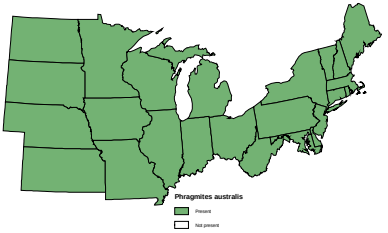
The first page for each nonnative invasive plant is arranged as follows:

Scientific name

Common name NRCS PLANTS Code



A picture showing infestation



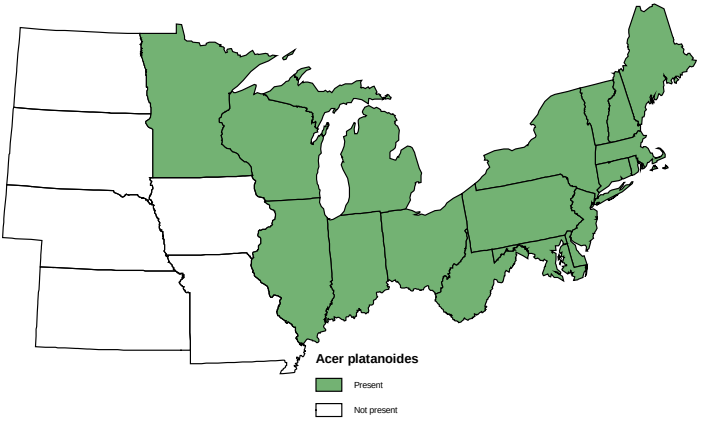
Distribution Map

Contents

Acer platanoides

Norway maple ACPL

Paul Wray, Iowa State University, www.forestryimages.org



Acer platanoides

Norway maple ACPL

Form: Deciduous tree 40-80 ft (12-25 m) tall.

Leaves: Opposite leaves palmately lobed with 5-7 lobes; the margins have a few large teeth. Buds large, over ¼ in. (0.6 cm), green or reddish, and blunt.

Flowers/fruit: Yellowish-green flowers in rounded clusters give way to large samara fruit.

Habitat: Vacant lots, successional forests, upland fields, and hedgerows.

Other distinguishing features/notes: Broken leafstalk of Norway maple yields milky juice (sugar maple yields clear juice). Also, wings of the samara on Norway maple diverge at almost 180 degrees (sugar maple diverges at a narrower angle, about 120 degrees). Winter: resembles sycamore maple, but edges of opposing leaf scars meet on Norway maple twigs.

Notes

Acer platanoides

Norway maple

Paul Wray, Iowa State University,
www.forestryimages.org

Paul Wray, Iowa State University,
www.forestryimages.org

Bill Cook Michigan State University,
www.forestryimages.org

Bill Cook Michigan State University,
www.forestryimages.org

Paul Wray, Iowa State University,
www.forestryimages.org

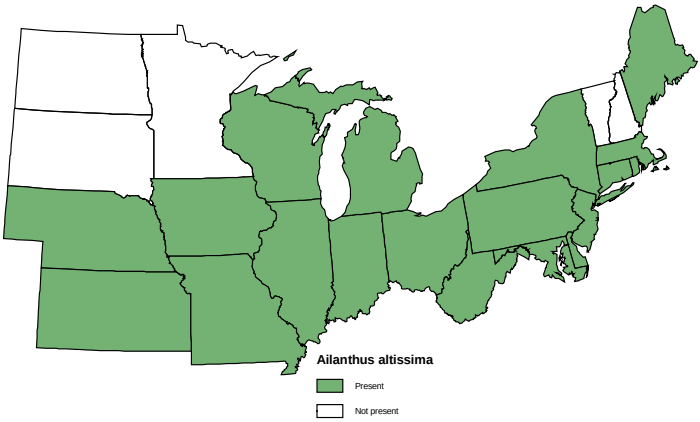
Bill Cook Michigan State University,
www.forestryimages.org

Paul Wray, Iowa State University,
www.forestryimages.org

Ailanthus altissima

Tree-of-heaven AIAL

Chris Evans, University of Georgia, www.forestryimages.org
(NOTE: small tree-of-heaven plants (center and lower right) growing among the very similar looking, and native, winged sumac (top left and top right)).



Ailanthus altissima

Tree-of-heaven AIAL

Form: Deciduous tree 80-98 ft (25-30 m) tall. Grows rapidly. Twigs hairless, yellow-brown, stout, with yellowish pith.

Leaves: Pinnately compound up to 3 ft (1 m) long; 11-41 leaflets not toothed except for a pair of gland-tipped teeth near bases. Leaf scars very large, somewhat triangular with many bundle scars.

Flowers/fruit: Blooms June-July. Flowers small, yellowish, often unisexual in pyramidal cluster; male blossoms emit foul odor. Fruits narrow, twisted samaras.

Habitat: Woodlands, urban areas, open fields, steep and shallow slopes, and closed canopy forest. Tolerates poor to rich soils.

Similar species: Resembles coffee-tree (*Gymnocladus dioica)*, which has large compound leaves and leaf scars, but fewer bundle scars, twice-compound leaves, and salmon-colored pith. Winter: stout twigs, false end buds, large leaf scars, and numerous bundle scars distinctive in tree-of-heaven.

Notes

Ailanthus altissima

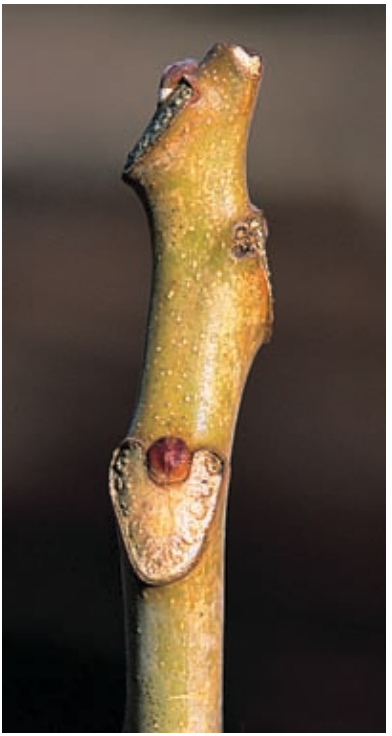
Tree-of-heaven

Barbara Tokarska-Guzik, University of Silesia, www.forestryimages.org

Barbara Tokarska-Guzik, University of Silesia, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org



James H. Miller, U.S. Forest Service,
www.forestryimages.org

Chris Evans, University of Georgia,
www.forestryimages.org

Chris Evans, University of Georgia,
www.forestryimages.org

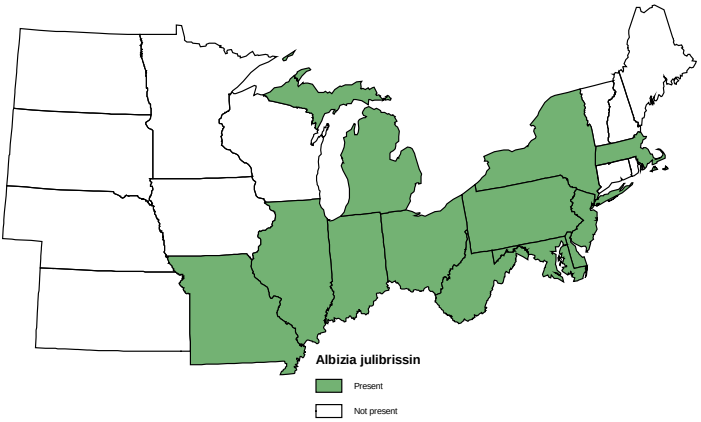
Chris Evans, University of Georgia,
www.forestryimages.org

Steve Dewey, Utah State University,
www.forestryimages.org

Albizia julibrissin

Silktree ALJU

James H. Miller, U.S. Forest Service,
www.forestryimages.org



Albizia julibrissin

Silktree ALJU

Form: Soft-wooded, deciduous tree 20-40 ft (6-12 m) tall. Twigs are hairless, slender. Leaf scars small with 3 bundle scars. Bark smooth, light brownish in color.

Leaves: Feathery, fern-like, twice-compound leaves. Buds few-scaled, small, blunt, not sunk in bark. End buds false. Pith whitish.

Flowers/fruit: Flowers June-August. Pink flower clusters resemble powder-puffs. Fruits dry, flattened, bean-like legumes that are 2-3 in. (5-7.5 cm) long.

Habitat: Dry to wet sites. Spreads along streambanks in open conditions, but can also persist in shade.

Similar species: Resembles honey-locust (*Gleditsia tricanthos*), which has only once-compound leaves and thorns on the twigs and the trunk. Seedlings resemble partridge pea (*Chamaecrista fasciculate*), an annual plant with once-pinnately compound leaves.

Notes

Albizia julibrissin

Silktree

James H. Miller, U.S. Forest Service, www.forestryimages.org

Chris Evans, University of Georgia, www.forestryimages.org

Ted Bodner, Southern Weed Science Society, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

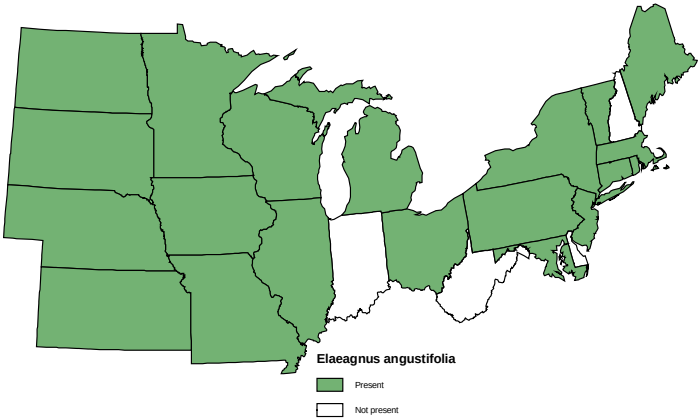
©Barry A. Rice, The Nature Conservancy

©Barry A. Rice, The Nature Conservancy

Elaeagnus angustifolia

Russian olive ELAN

Steve Dewey, Utah State University, www.forestryimages.org



Elaeagnus angustifolia

Russian olive ELAN

Form: Mid-sized, usually thorny shrub or small tree that grows to 33 ft (10 m) tall.

Leaves: Alternate, egg or lance-shaped, smooth margined, silvery on both surfaces.

Flowers/fruit: Blooms June-July. Highly aromatic, creamy yellow flowers. Drupelike clusters of abundant light green to yellow fruits (sometimes tinged with red).

Habitat: Forest openings, open forests, and along forest edges; shade intolerant. Thrives in sandy flood plains.

Similar species: Silver thorn or thorny olive (*E. pungens*) is an evergreen with brown scaly and hairy twigs, fruits reddish silver-scaly. Autumn olive (*E. umbellata*) has leaves that are non-scaly on the upper surface in summer; flowers in early summer and has many reddish, rounded drupes in fall and early winter.

Notes

Elaeagnus angustifolia

Russian olive

James H. Miller, U.S. Forest Service,
www.forestryimages.org

Patrick Breen, Oregon State University,
www.forestryimages.org

Steve Dewey, Utah State University,
www.forestryimages.org

Steve Dewey, Utah State University,
www.forestryimages.org

James H. Miller, U.S. Forest Service,
www.forestryimages.org

James H. Miller, U.S. Forest Service,
www.forestryimages.org

James H. Miller, U.S. Forest Service,
www.forestryimages.org

Chris Evans, University of Georgia, www.forestryimages.org

Melaleuca quinquenervia

Punktree MEQU
Melaleuca

Amy Ferritar, South Florida Water Management District,
www.forestryimages.org

Melaleuca quinquenervia

Punktree MEQU
Melaleuca

Form: Evergreen tree up to 108 ft (33 m) tall. Bark whitish (inner layers reddish), spongy, peeling, in many layers.

Leaves: Leathery, alternate, simple, grayish green, narrowly lance-shaped (or elliptical); up to 4 in. (10 cm) long and <1 in. (2 cm) wide. Leaf veins are parallel. Smells of camphor when crushed.

Flowers/fruit: Flowers creamy white in bottlebrush-like spikes up to 6½ in. (16 cm) long at branch tips. Fruit is a round, woody capsule, about ⅛ in. (3 mm) wide, with many tiny seeds.

Habitat: Prefers seasonally wet sites, but also does well in standing water and well-drained uplands.

Notes

Melaleuca quinquenervia

Punktree
Melaleuca

Amy Ferritar, South Florida Water Management District, www.forestryimages.org

Amy Ferritar, South Florida Water Management District, www.forestryimages.org

David Nance, USDA Agricultural Research Service, www.forestryimages.org

Amy Ferritar, South Florida Water Management District, www.forestryimages.org

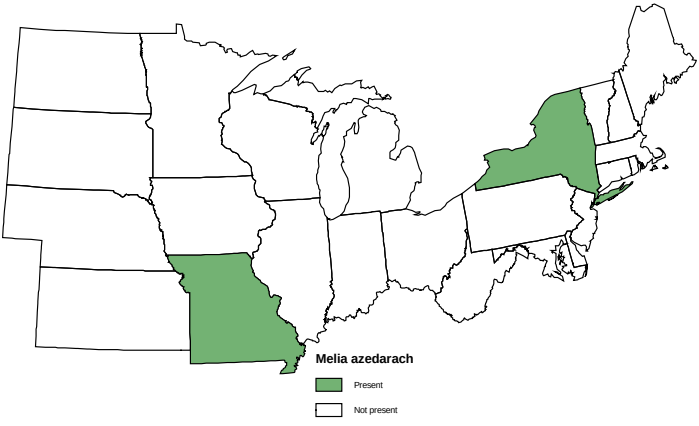
Amy Ferritar, South Florida Water Management District,
www.forestryimages.org

Amy Ferritar, South Florida Water Management District,
www.forestryimages.org

Melia azedarach

Chinaberry MEAZ

James H. Miller, U.S. Forest Service,
www.forestryimages.org



Melia azedarach

Chinaberry MEAZ

Form: Deciduous tree up to 50 ft (15 m) tall. Much branched with multiple boles.

Leaves: Alternately whorled, twice-pinnately compound, 12-23½ in. (30-60 cm) long. Dark green with lacy appearance. Leafstalk lime green with base slightly clasping stem. Individual leaflets 1-3 in. (3-7 cm) long, with margins entire to coarsely crenate to serrate and wavy.

Flowers/fruit: Flowers March-May. Pinkish-lavender to whitish petals, stamens united in dark purple tube. Fragrant. Fruit a spherical drupe ½-¾ in. (1.2-1.8 cm) wide. Light green turning yellowish green then yellowish tan. Poisonous to humans and livestock.

Habitat: Roadsides, forest margins, and around old homesites.

Similar species: Common elderberry (*Sambucus canadensis)*, a spreading crowned shrub with once-pinnately compound leaves, margins finely serrate, and green to dark-purple berries in flat-topped cluster.

Notes

Melia azedarach

Chinaberry

James H. Miller, U.S. Forest Service, www.forestryimages.org

Chris Evans, University of Georgia, www.forestryimages.org

Cheryl McCormick-Rote, University of Florida, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Ted Bodner, Southern Weed Science Society, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Chuck Bargeron, University of Georgia, www.forestryimages.org

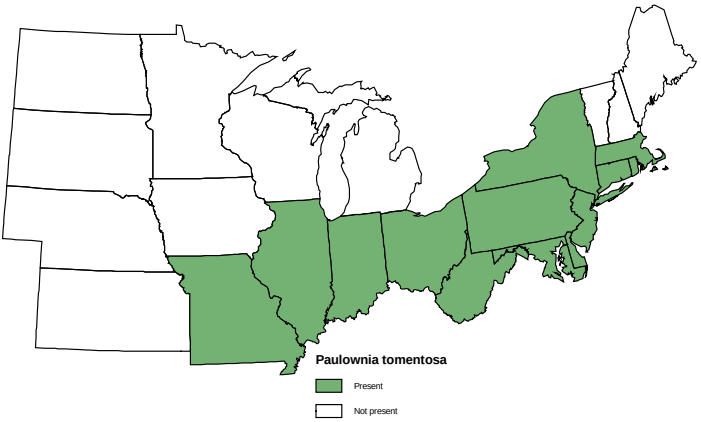
Seedling - Chris Evans, University of Georgia, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Paulownia tomentosa

Princesstree PATO2
Royal paulownia

Chris Evans, University of Georgia, www.forestryimages.org



Paulownia tomentosa

Princesstree PATO2
Royal paulownia

Form: Deciduous tree up to 60 ft (18 m) tall. Bark light to dark gray, roughened and becoming slightly fissured. Twigs and branches stout, glossy gray brown, and speckled with numerous lenticels. No terminal buds.

Leaves: Opposite, heart-shaped and densely hairy on both surfaces, 6-13 in. (15-30 cm) long. Petioles rough hairy, 2-8 in. (5-20 cm) long. Leaves larger on resprouts; 16-20 in. (40-50 cm) across. Flower buds fuzzy, linear, and becoming ovoid in summer and persistent on erect stalks over winter.

Flowers/fruit: Blooms before leaves in early spring. Fragrant. Flowers large, 2-3 in. (5-7 cm); showy, pale violet, flared-tubular corollas; in large erect panicles. Fruits terminal clusters of pecan-shaped capsules with pointed tips; 1-2 in. (2.5-5 cm) long and ½-1 in. (1.5-2.5 cm) wide. Pale green in summer turning tan in winter and eventually black, persistent into spring.

Habitat: Around old homes, roadsides, riparian areas, and forest margins.

Similar species: Resembles catalpa (*Catalpa bignonioides* and *C. speciosa)*, which have leaves with hair only on lower surfaces. Flowers are more fringed and fruits are long, slender, persistent capsules.

Notes

Paulownia tomentosa

Princesstree
Royal paulownia

James Allison, Georgia
Department of Natural Resources,
www.forestryimages.org

James H. Miller, U.S. Forest Service,
www.forestryimages.org

David J. Moorhead, University of Georgia,
www.forestryimages.org

James H. Miller, U.S. Forest Service,
www.forestryimages.org

Chris Evans, University of Georgia,
www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

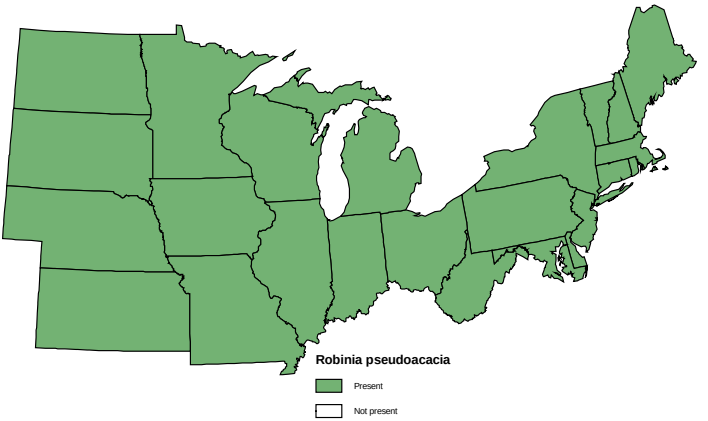
James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Robinia pseudoacacia

Black locust ROPS

Elizabeth Czarapata



Robinia pseudoacacia

Black locust ROPS

Form: Deciduous tree 65-80 ft (20-25 m) tall. Bark is gray or light brown, thick and fibrous, heavily ridged and furrowed when older, resembles a woven rope.

Leaves: Alternate, once-compound leaves. Leaflets 6-20, egg-shaped, margins entire, ¾-1½ in. (2-4 cm) long. Older twigs with pair of thick spines at leaf base.

Flowers/fruit: Blooms in mid to late spring. Flowers fragrant, white, 1 in. (2.5 cm) long and pea-like, borne in long 4-8 in. (10-20 cm) hanging clusters. Fruit is a flattened legume, mottled, light brown, 2-4 in. (5-10 cm) long; containing 4 to 8 kidney-shaped, smooth, red-brown seeds; ripening in the fall.

Habitat: Cove forests, open upland slopes, fence rows, disturbed ground, and limestone soils.

Other distinguishing features/notes: Sunken, white-hairy buds burst through leaf scars in spring. Native to the eastern seaboard but widely escaping elsewhere.

Similar species: Prickly ash (*Zanthoxylum americanum*) is smaller and has reddish exposed buds, minutely toothed leaflets, and usually spiny leafstalks. Honey-locust (*Gleditsia tricanthos*) has smaller leaflets and branched unpaired thorns along the twigs.

Notes

Robinia pseudoacacia

Black locust

Elizabeth Czarapata

Elizabeth Czarapata

Elizabeth Czarapata

Elizabeth Czarapata

Charles T. Bryson, USDA Agricultural Research Service, www.forestryimages.org

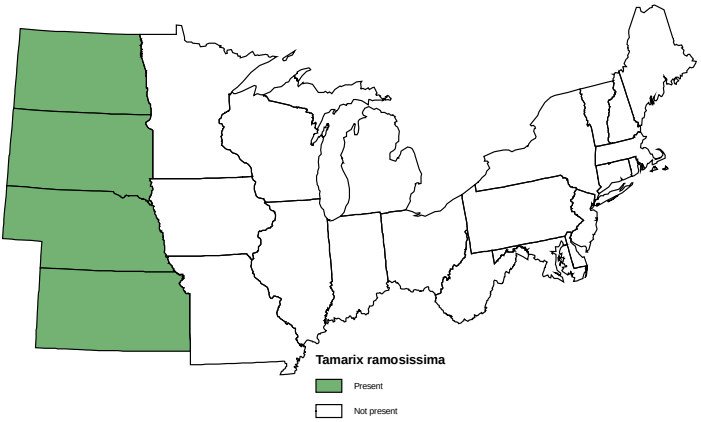
Wisconsin Department of Natural Resources

Tamarix ramosissima

Saltcedar
Tamarisk

TARA

Steve Dewey, Utah State University, www.forestryimages.org



Tamarix ramosissima

Saltcedar TARA
Tamarisk

Form: Small tree or shrub 3-20 ft (1-6 m) tall.

Leaves: Small, alternate, scale-like leaves. Sessile with a narrow base, < ¼ in. (1.5-3.5 mm) long.

Flowers/fruit: Small flowers pale pink to white; arranged in dense spike-like racemes. Fruit is a capsule.

Habitat: Flood plains, salt marshes, and roadsides.

Other distinguishing features/notes: Stems and leaves of mature plants secrete salt, which eventually forms a crust above and below ground that inhibits other plants. Also capable of absorbing up to 200 gallons of water a day, lowering ground water levels and drying up springs and marshy areas.

Similar species: Superficially resembles *Juniperus*.

Notes

Tamarix ramosissima

Saltcedar
Tamarisk

Steve Dewey, Utah State University, www.forestryimages.org

Steve Dewey, Utah State University, www.forestryimages.org

© John M. Randall, The Nature Conservancy

© John M. Randall, The Nature Conservancy

© John M. Randall, The Nature Conservancy

© John M. Randall, The Nature Conservancy

© John M. Randall, The Nature Conservancy

© John M. Randall, The Nature Conservancy

Triadica sebifera

Tallow tree TRSE6

Cheryl McCormick-Rote, University of Florida,
www.forestryimages.org

Triadica sebifera

Tallow tree TRSE6

Form: Deciduous tree up to 59 ft (18 m) tall.

Leaves: Alternately whorled, distinctly heart-shaped with rounded wide-angled base and a short or long attenuate tip. Blades 2-3 in. (5-8 cm) long and 1½-2½ in. (4-6 cm) wide. Hairless, lime-green petioles 1-3 in. (2.5 -8 cm).

Flowers/fruit: Slender, drooping spikes to 8 in. (20 cm) long of tiny flowers, yellowish-green sepals, but no petals. Fruit small terminal clusters of 3-lobed capsules (occasionally 4-5 lobed), ½-¾ in. (1.2-2 cm) across. Dark green in summer becoming black and splitting to reveal 3 wax coated seeds resembling popcorn.

Habitat: Streambanks, riverbanks, and wet areas like ditches as well as upland sites. Thrives in freshwater and saline soils. Also shade tolerant, flood tolerant, and allelopathic.

Similar species: Cottonwoods (*Populus* spp.) have wavy margined leaves and flaking bark.

Notes

Triadica sebifera

Tallow tree

Chris Evans, University of Georgia, www.forestryimages.org

Chuck Bargeron, University of Georgia, www.forestryimages.org

Charles T. Bryson, USDA Agricultural Research Service, www.forestryimages.org

Chris Evans, University of Georgia, www.forestryimages.org

Chuck Bargeron, University of Georgia, www.forestryimages.org

Cheryl McCormick-Rote, University of Florida,
www.forestryimages.org

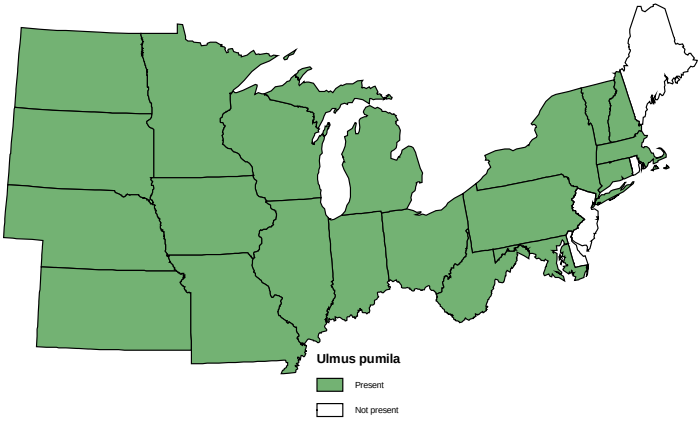
James H. Miller, U.S. Forest Service,
www.forestryimages.org

Chris Evans, University of Georgia,
www.forestryimages.org

Ulmus pumila

Siberian elm ULPU

Steve Dewey, Utah State University, www.forestryimages.org



Ulmus pumila

Siberian elm ULPU

Form: Deciduous tree up to 65 ft (20 m) tall. Bark is irregularly furrowed, light grayish brown, often streaked with lighter stains.

Leaves: Alternate, simple, singly-serrate, small, < 2¾ in. (< 7 cm). Nearly an equilateral base, dark green and smooth above, paler and smooth below.

Flowers/fruit: Blooms in early spring before leaves. Flowers small, pale green clusters. Fruit is a hairless samara, nearly round, notched at the top, ½ in. (1.2 cm) in diameter, initially pale green, later turning light brown when ripe in spring.

Habitat: Pastures, roadsides, prairies, and disturbed wooded sites.

Other distinguishing features/notes: All the native elms have doubly-serrate margins.

Notes

Ulmus pumila

Siberian elm

Patrick Breen, Oregon State University, www.forestryimages.org

Patrick Breen, Oregon State University, www.forestryimages.org

Steve Dewey, Utah State University, www.forestryimages.org

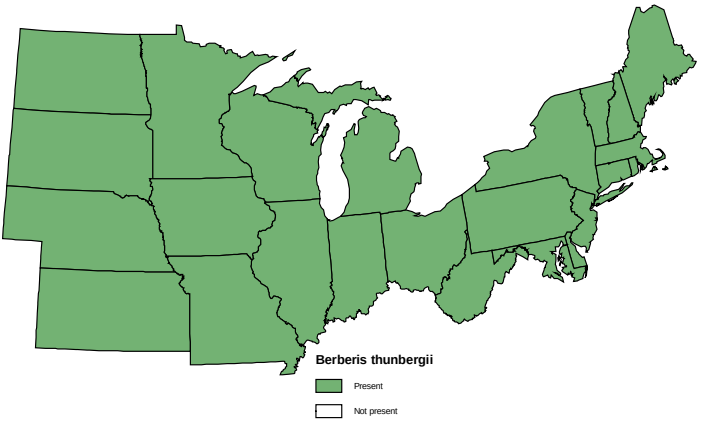
USDA NRCS Archives, www.forestryimages.org

USDA NRCS Archives, www.forestryimages.org

Berberis thunbergii

Japanese barberry BETH

Kelly Kearns, Wisconsin DNR



Berberis thunbergii

Japanese barberry BETH

Form: Deciduous shrub 1½-6½ ft (0.5-2 m) tall. Branches are deeply grooved, brown to purple, often with unbranched side (spur) shoots. Spines present on branches. Inner bark and wood yellow.

Leaves: Entire (toothed in most other species), mostly obovate (tapering to petiole); axillary clusters of leaves often present; ranging in color from green to bluish green or green to dark reddish purple.

Flowers/fruits: Blooms mid-April-May. Small axillary clusters or solitary, pale yellow flowers. Fruits berries, bright red and about ⅓ in. (1 cm) long; often persist through winter.

Habitat: Closed canopy forests, open woodlands, wetlands, pastures, meadows, and wastelands.

Notes

Berberis thunbergii

Japanese barberry

Kelly Kearns, Wisconsin DNR

Elizabeth Czarapata

Elizabeth Czarapata

Britt Slattery,
U.S. Fish and Wildlife Service

Cassandra Olson, U.S. Forest Service

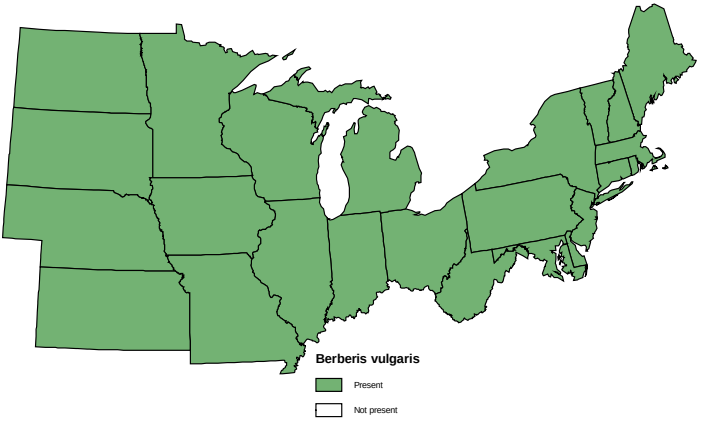
© Barry A. Rice, The Nature Conservancy

© John M. Randall, The Nature Conservancy

Berberis vulgaris

Common barberry BEVU

Original book source: Prof. Dr. Otto Wilhelm Thome Flora von Deutschland, Osterreich und der Schweiz 1885, Gera, Germany (now in public domain)



Berberis vulgaris

Common barberry BEVU

Form: Deciduous shrub up to 10 ft (3 m) tall. Branches are grooved, gray, and usually have groupings of three spines (can be as few as one) along them.

Leaves: Alternate or fascicled, ¾-2 in. (2-5 cm) long. Dull green, obovate to obovate-oblong with finely serrate margins (occasionally the serrations are more prominent).

Flowers/fruits: Bright yellow flowers have unpleasant smell, in a pendant raceme 1-2½ in. (3-6 cm) long with 10-20 flowers. Fruit is ellipsoid, red, ⅓ in. (1 cm) long, containing 1-3 small, black seeds.

Habitat: Open canopy forests and sometimes along roads; also very successful in calcareous soils.

Notes

Berberis vulgaris

Common barberry

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

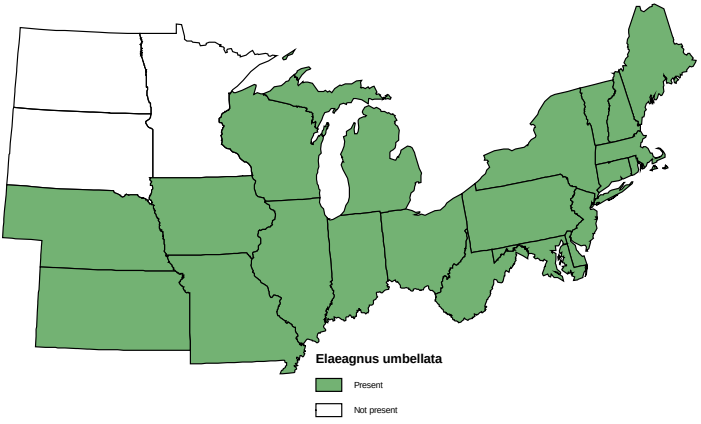
J.F. Gaffard, Wikipedia.org

Sten Porse, Wikipedia.org

Elaeagnus umbellata

Autumn olive ELUM

Chris Evans, University of Georgia, www.forestryimages.org



Elaeagnus umbellata

Autumn olive ELUM

Form: Shrubby tree up to 23 ft (7 m) tall with scattered thorny branches.

Leaves: Alternate, elliptic, 2-3 in. (5.5 -7.5 cm) long by <2 in. (0.5 -5 cm) wide; margins entire and wavy; bright green to gray green above, densely silver scaly beneath or sometimes with stellate hairs; petioles short and silvery.

Flowers/fruit: Axillary clusters of 5-10 tubular flowers with 4 lobes; silvery white to yellow, fragrant. Fruits are drupes, <⅓ in. (6-8 mm) long; red and finely dotted with silvery to silvery-brown scales.

Habitat: Forest openings and open forests.

Similar species: Could be confused with Russian olive (*Elaeagnus angustifolia*), which has silver scaly twigs and leaves; flowers in early summer with many yellow drupes in fall and winter. Autumn olive (*E. umbellata)* has silver and brown scaly twigs; flowers in early summer with many reddish, rounded drupes in fall and early winter. See **Trees** section for more on Russian olive (*E. angustifolia)*.

Notes

Elaeagnus umbellata

Autumn olive

Chris Evans, University of Georgia,
www.forestryimages.org

James H. Miller, U.S. Forest Service,
www.forestryimages.org

James H. Miller, U.S. Forest Service,
www.forestryimages.org

James H. Miller, U.S. Forest Service,
www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Nancy Loewenstein, Auburn University, Bugwood.org

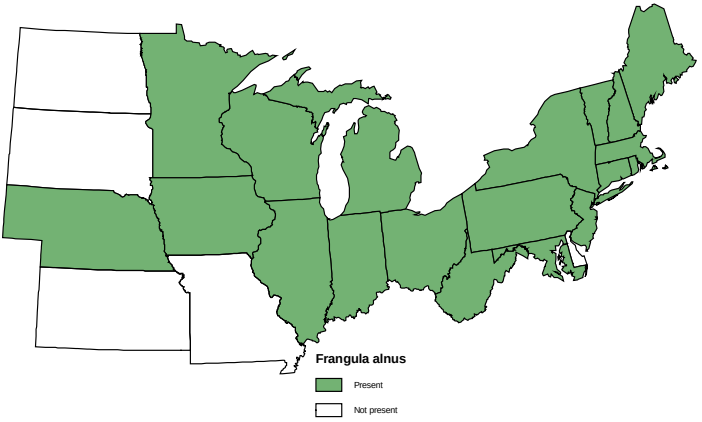
James Allison, Georgia DNR, www.forestryimages.org

James Allison, Georgia DNR, www.forestryimages.org

Frangula alnus

Glossy buckthorn FRAL4
European alder
Alder buckthorn

Buckthorn cultivar. Elizabeth Czarapata.



Frangula alnus

Glossy buckthorn FRAL4
European alder
Alder buckthorn

Form: Understory shrub/tree up to 23 ft (7 m) tall; often with multiple stems at the base.

Leaves: With several pectinate lateral veins; margins mostly entire (sometimes with some marginal glands); mostly alternate, 1-3 in. (2.5 -7.5 cm) long, usually more than half as wide as long. Leaves stay green well into autumn.

Flowers/fruit: Flowers bisexual, unlike most relatives; sepals, petals, and stamens 5; pale yellow. Fruit red to black with 2-3 seeds.

Habitat: Wetlands including acidic bogs, calcareous fens, and sedge meadows. Also does well in upland habitats. Can tolerate full sun to deep shade.

Other distinguishing features/notes: Bark is brown with silvery, slightly "corky" lenticels that make it resemble native cherries or plums. Cutting a branch will expose yellow sapwood and orange heartwood. Similar to Carolina buckthorn (*Rhamnus caroliniana*) except not as tall. *R. caroliniana* can get as tall as 39 ft (12 m).

Winter/early spring ID tip: Buds are naked (common buckthorn and alderleaf buckthorn have scaly buds). Carolina buckthorn also has naked buds, but Carolina buckthorn is taller than glossy buckthorn.

Notes

_____

_____

_____

_____

Frangula alnus

Glossy buckthorn
European alder
Alder buckthorn

© John M. Randall, The Nature Conservancy

Elizabeth Czarapata

Elizabeth Czarapata

Kelly Kearns, Wisconsin DNR

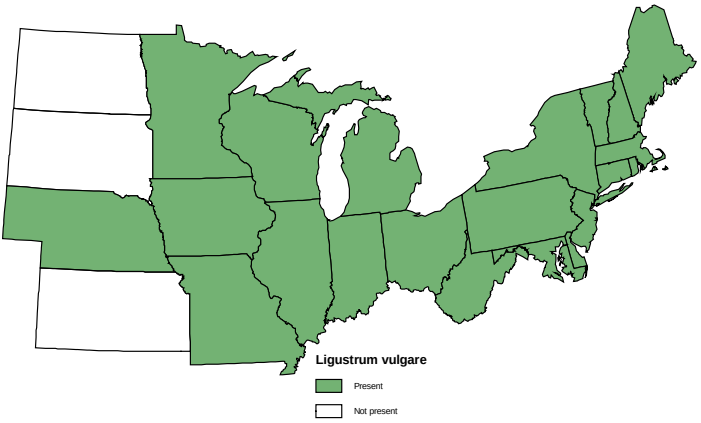
Elizabeth Czarapata

Kelly Kearns, Wisconsin DNR

Ligustrum vulgare

European privet LIVU

Elizabeth Czarapata



Ligustrum vulgare

European privet LIVU

Form: Shrub up to 16 ft (5 m) tall. Twigs stiff and minutely pubescent, slender-⅛ in. (2 mm) thick or less.

Leaves: Dark green, opposite, narrowly elliptical, 1-2 in. (2.5-5 cm) long; firm without being tough and leathery.

Flowers/fruit: Small, white flowers in dense panicles; tubular with flaring lobes, < ¼ in. (0.5 cm) wide; corolla tube much longer than lobes. Fruits small black drupes.

Habitat: Bottomland forests, thickets, and roadsides.

Notes

Ligustrum vulgare

European privet

Kelly Kearns, Wisconsin DNR

Nava Tabak, Invasive Plant Atlas of New England, Bugwood.org

Elizabeth Czarapata

Elizabeth Czarapata

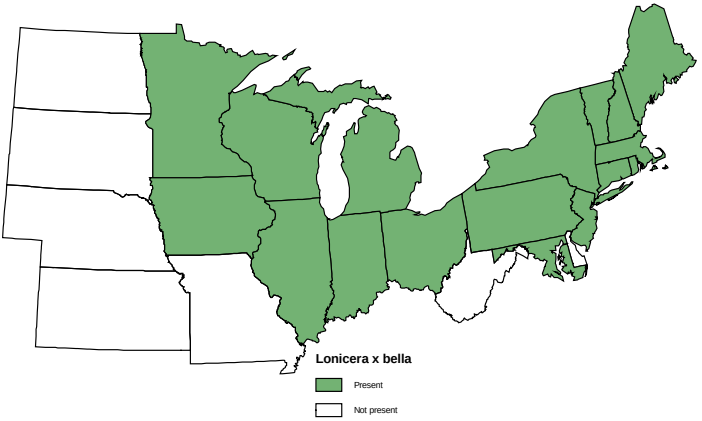
Kelly Kearns, Wisconsin DNR

The Dow Gardens Archive,
bugwood.org

Lonicera ˣbella

Showy fly honeysuckle LOBE

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org



Lonicera ˣbella

Showy fly honeysuckle LOBE

Form: Deciduous, upright, arching-branched shrub up to 20 ft (6 m) tall. Twigs often pubescent, typically hollow.

Leaves: Opposite, simple, ovate to oblong, margins entire; slightly hairy beneath. Sometimes persistent into winter.

Flowers/fruit: Flowers paired in leaf axils. Pink turning yellow with age; exterior surface of corolla usually glabrous; on peduncles ~½ in. (5-15 mm) long. Fruit generally a red berry. See **Appendix B** for a comparison of nonnative species.

Habitat: Open forests, forest edge, pastures, roadsides, and fields.

Other distinguishing features/notes: The shrubby native forms of *Lonicera* have white solid pith. The nonnative forms have dark, usually hollow pith. In the NRS region, the most commonly encountered nonnative species are *L. tatarica* and the hybrid *L. ˣbella* (a hybrid of *L. morrowii* and *L. tatarica*). Because this is a hybrid, it tends also to be the most variable in terms of pubescence and leaf shape.

Notes

Lonicera ˣbella

Showy fly honeysuckle

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

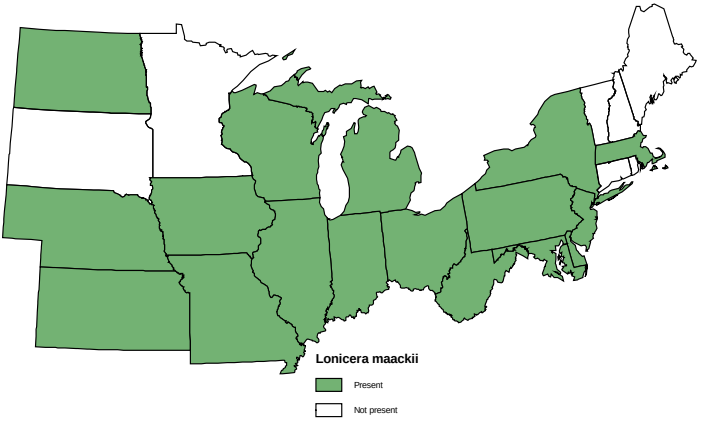
Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Elizabeth Czarapata

Lonicera maackii

Amur honeysuckle LOMA6

James H. Miller, U.S. Forest Service, www.forestryimages.org



Lonicera maackii

Amur honeysuckle LOMA6

Form: Deciduous, upright, arching-branched shrub up to 16 ft (5 m) tall. Twigs densely pubescent and typically hollow.

Leaves: Opposite, petiolate, simple. Petioles tomentose. Blades elliptic to ovate to somewhat lanceolate, acuminate, entire; up to 3½ in. (~9 cm) long and 1½ in. (~4 cm) broad; typically densely pubescent at least along lower veins.

Flowers/fruit: Flowers paired, in leaf axils. White, turning yellow with age, outer surface of corolla usually glabrous; peduncles less than ¼ in. (5 mm), shorter than petioles. Berries dark red. See **Appendix B** for a comparison of nonnative species.

Habitat: Open forests, forest edge, pastures, roadsides, and fields.

Other distinguishing features/notes: Generally speaking, the shrubby native forms of *Lonicera* have white solid pith. The nonnative forms have dark, usually hollow pith. In the NRS region, the most commonly encountered nonnative species are *L. tatarica* and the hybrid *L.* ˣ*bella* (a hybrid of *L. morrowii* and *L. tatarica*).

Notes

Lonicera maackii

Amur honeysuckle

James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Warner Park Nature Center Archive, Bugwood.org

Chuck Bargeron, University of Georgia, www.forestryimages.org

Chris Evans, University of Georgia,
www.forestryimages.org

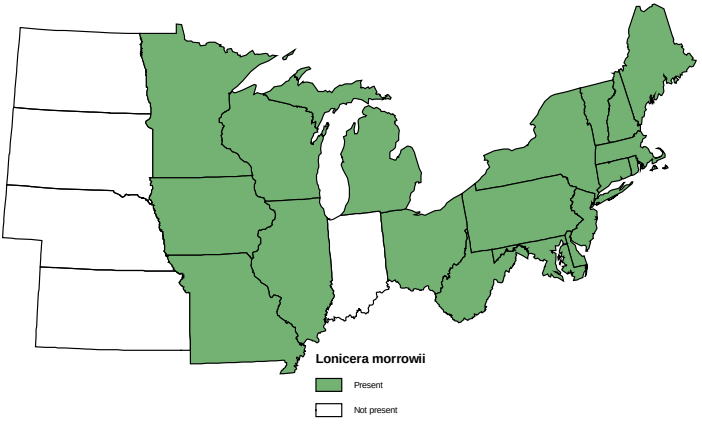
Leslie J. Mehrhoff, University of
Connecticut, Bugwood.org

Elizabeth Czarapata

Lonicera morrowii

Morrow's honeysuckle LOMO2

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org



Lonicera morrowii

Morrow's honeysuckle LOMO2

Form: Deciduous, upright, arching-branched shrub up to 10 ft (3 m) tall. Twigs pubescent, typically hollow.

Leaves: Opposite, simple, ovate to elliptical to oval, margins entire, apex obtuse to acute; ±densely pubescent over the whole undersurface. Sometimes persistent into winter.

Flowers/fruit: Flowers paired in leaf axils; white turning yellow with age; on long peduncles, ~½ in. (5-15 mm), outer surface of corolla with scattered hairs. Fruit generally a red or yellow berry. See **Appendix B** for a comparison of nonnative species.

Habitat: Open forests, forest edge, pastures, roadsides, fields.

Other distinguishing features/notes: Generally speaking, the shrubby native forms of *Lonicera* have white solid pith. The nonnative forms have dark usually hollow pith. In the NRS region, the most commonly encountered nonnative species are L. *tatarica* and the hybrid *L.* ˣ*bella* (a hybrid of *L. morrowii* and *L. tatarica*).

Notes

Lonicera morrowii

Morrow's honeysuckle

© John M. Randall, The Nature Conservancy

Chris Evans, University of Georgia, www.forestryimages.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Stacey Leicht, University of Connecticut, Bugwood.org

© John M. Randall, The Nature Conservancy

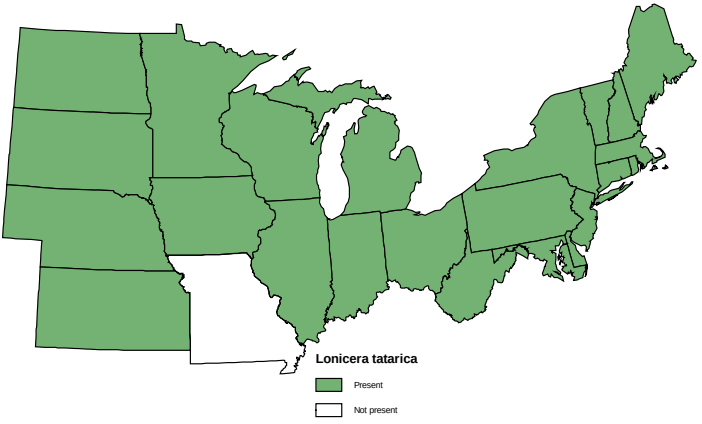
Courtesy Missouri Botanical PlantFinder

Elizabeth Czarapata

Lonicera tatarica

Tatarian honeysuckle LOTA

Patrick Breen, Oregon State University, www.forestryimages.org



Lonicera tatarica

Tatarian honeysuckle LOTA

Form: Deciduous, upright, arching-branched shrubs up to 10 ft (3 m) tall. Twigs glabrous, typically hollow.

Leaves: Opposite, simple, ovate to oblong, margins entire, apex acute to obtuse, glabrous; sometimes persistent into winter.

Flowers/fruit: Flowers paired in leaf axils; pink or white, usually not fading to yellow; exterior surface of corolla glabrous; on peduncles ½-1 in. (1.5-2.5 cm) long. Fruit generally a red (rarely yellow) berry. See **Appendix B** for a comparison of nonnative species.

Habitat: Open forests, forest edge, pastures, roadsides, and fields.

Other distinguishing features/notes: Generally speaking, the shrubby native forms of *Lonicera* have white solid pith. The nonnative forms have dark, usually hollow pith. In the NRS region, the most commonly encountered nonnative species are *L. tatarica* and the hybrid *L. ×bella* (a hybrid of *L. morrowii* and *L. tatarica*).

Notes

Lonicera tatarica

Tatarian honeysuckle

Patrick Breen, Oregon State University, www.forestryimages.org

Richard Old, XID Services, Inc., Bugwood.org

Chris Evans, University of Georgia, www.forestryimages.org

Elizabeth Czarapata

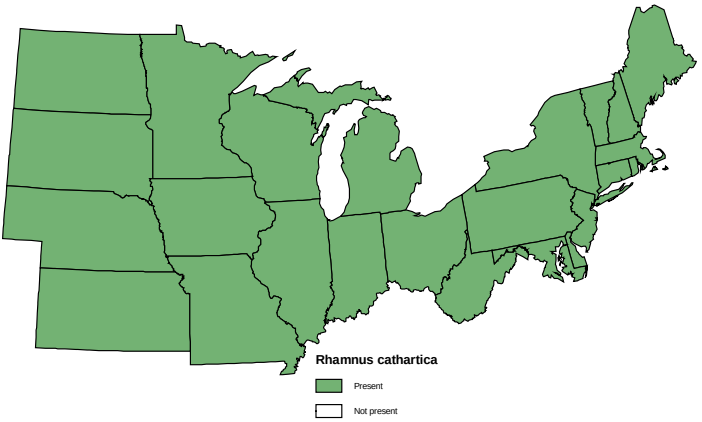
Ohio State Weed Lab Archives

Ohio State Weed Lab Archives

Rhamnus cathartica

Common buckthorn RHCA3

Chris Evans, University of Georgia, www.forestryimages.org



Rhamnus cathartica

Common buckthorn RHCA3

Form: Shrub or small tree up to 23 ft (7 m) tall; often with multiple stems at the base.

Leaves: Mostly opposite with 2-4 pairs of lateral veins curving toward leaf apex; margins toothed.

Flowers: Unisexual; sepals, petals, and stamens 4. Fruit black with 4 seeds.

Habitat: Forests, savannas, prairies. Thrives on well-drained soils.

Other distinguishing features/notes: Thorn-tipped twigs and the yellow inner bark are distinctive characteristics of common buckthorn. Also, other buckthorns have alternate leaves, while common buckthorn has opposite leaves and twigs are often tipped with a spine.

Similar species: Native alderleaf buckthorn (*R. alnifolia)* has scaly buds but alternate leaves, sepals and stamens 5, no petals, and black fruit with 3 seeds.

Notes

Rhamnus cathartica

Common buckthorn

Elizabeth Czarapata

Elizabeth Czarapata

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Kelly Kearns, Wisconsin DNR

Kelly Kearns, Wisconsin DNR

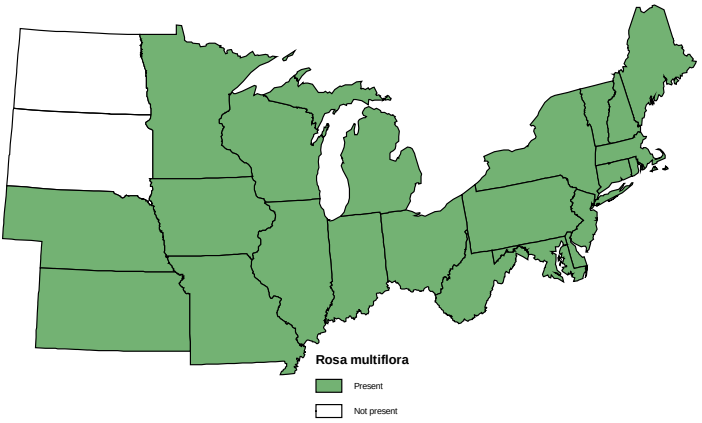
Elizabeth Czarapata

Elizabeth Czarapata

Rosa multiflora

Multiflora rose ROMU

James H. Miller, U.S. Forest Service, www.forestryimages.org



Rosa multiflora

Multiflora rose ROM

Form: Shrubs with slender, arching or trailing, flowering stems up to 10 ft (3 m) long.

Leaves: Leaf stipules conspicuously pectinately toothed (deeply fringed) and glandular with 5-11 leaflets.

Flowers/fruits: White, small, ~½ in. (about 1 cm wide); styles united and protruding from the hypanthium (most roses have separate styles and only the stigmas are visible above the hypanthium); not to be confused with protruding stamens. Rose hips, ~½-¾ in. (.5 -1.5 cm), ripen to a glossy red.

Habitat: Fields, forests, prairies, some wetlands, and roadsides.

Other distinguishing features/notes: Most rose species in NRS have pink flowers; multiflora rose (*R. multiflora*) is one of just a few species that have white flowers. Also, fringed stipules extend about half the length of the leafstalks.

Notes

Rosa multiflora

Multiflora rose

James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Chris Evans, University of Georgia, www.forestryimages.org

Elizabeth Czarapata

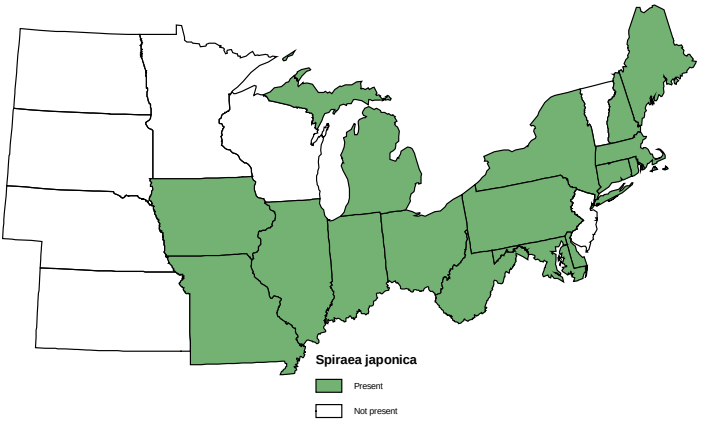
James H. Miller, U.S. Forest Service, www.forestryimages.org

Ted Bodner, Southern Weed Science Society, www.forestryimages.org

Spiraea japonica

Japanese meadowsweet SPJA

UConn Plant Database, www.hort.uconn.edu/plants, Bugwood.org



Spiraea japonica

Japanese meadowsweet SPJA

Form: Perennial, deciduous shrub in rose family. Grows 4-6 ft (1.2-1.8 m) tall and about the same in width. Naturally variable in form; many varieties in the horticultural trade.

Leaves: Alternate, serrate, generally lanceolate to ovate, apex acute, ½-3 in. (1-7.5 cm) long.

Flowers/fruit: Rosy-pink, borne at the tips of branches in flat-topped clusters, 2 in. (5 cm) wide. Fruits about 1/8 in. (2.5 mm) long; small lustrous capsules.

Habitat: Adapted to disturbed areas; tolerates a wide range of soil conditions and grows in full sun to partial shade. Commonly found along streams and rivers, forest edges, roadsides, and in successional fields and power line rights-of-way.

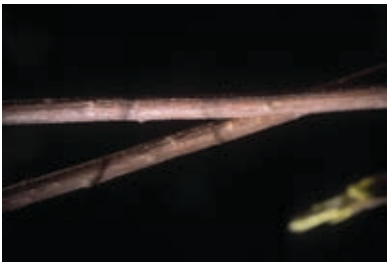
Similar species: Japanese meadowsweet (*S. japonica*) is similar to Virginia meadowsweet (*S. virginiana*), but has gray-hairy twigs and long-pointed, narrow, toothed leaves.

Notes

Spiraea japonica

Japanese meadowsweet

James H. Miller, U.S. Forest Service, www.forestryimages.org



James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

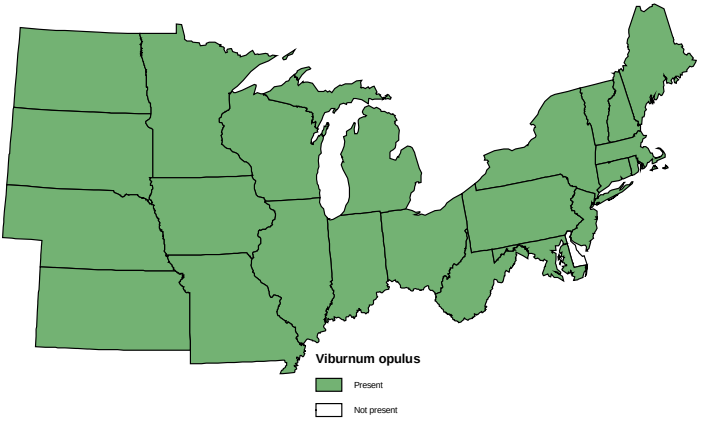
The Dow Gardens Archive, Bugwood.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Viburnum opulus

European cranberrybush VIOP
Snowball bush

The Dow Gardens Archive, Bugwood.org



Viburnum opulus

European cranberrybush VIOP
Snowball bush

Form: Deciduous shrub 3-16 ft (1-5 m) tall.

Leaves: Opposite, palmately lobed and veined (maple-like); margins with a few coarse teeth; pubescent on abaxial surface (at least on veins); petioles with sessile glands that are concave and wider than high.

Flowers/fruit: White with narrow to broadly campanulate corollas, in large clusters; outer flowers somewhat larger and with broadly flaring corollas. Fruit a reddish drupe about ½ in. (1 cm) in diameter.

Habitat: Moist to wet soils along lake margins, slopes, or open woods; also found in cultivated fields.

Similar species: Cranberry viburnum or highbush-cranberry (*Viburnum trilobum* or *V. opulus var. americanum*) has stalked petiole glands that are rounded and higher than wide.

Notes

Viburnum opulus

European cranberrybush
Snowball bush

The Dow Gardens Archive, Bugwood.org

The Dow Gardens Archive, Bugwood.org

Richard Webb, Self-employed horticulurist, Bugwood.org

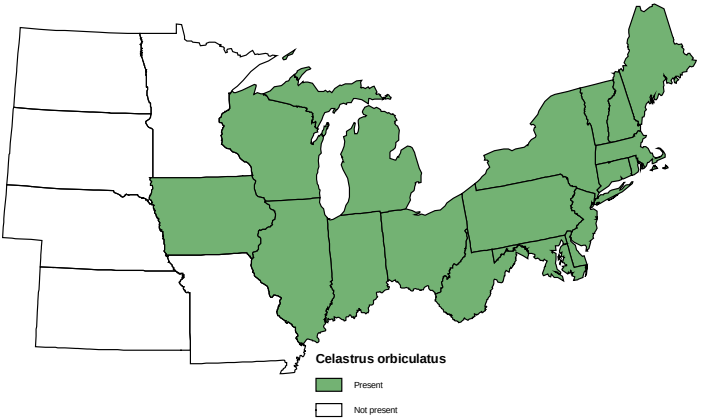
Richard Webb, Self-employed horticulurist, Bugwood.org

Iain Harrison, images.swinburne.edu.au/handle/1111.1/193

Celastrus orbiculatus

Asian bittersweet CEOR7

Kelly Kearns, Wisconsin DNR



Celastrus orbiculatus

Asian bittersweet CEOR7

Form: Deciduous twining vine up to 65 ft (20 m) long. Stems can measure up to 4 in. (10 cm) in diameter; olive drab with many raised, whitish lenticels.

Leaves: Alternate, mostly oval, sometimes slightly tapering to petiole, margins with broadly rounded teeth.

Flowers/fruit: Flowers unisexual (and plants dioecious); bloom in spring. Fruits 3-valved capsule; seeds with a fleshy red aril.

Habitat: Thickets, fence rows, meadows, forest openings, margins, and roadsides.

Similar species: Similar to American bittersweet (*C. scandens*) except leaves are nearly circular.

Notes

Celastrus orbiculatus

Asian bittersweet

Kelly Kearns, Wisconsin DNR

Kelly Kearns, Wisconsin DNR

Elizabeth Czarapata

James H. Miller,
U.S. Forest Service,
www.forestryimages.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

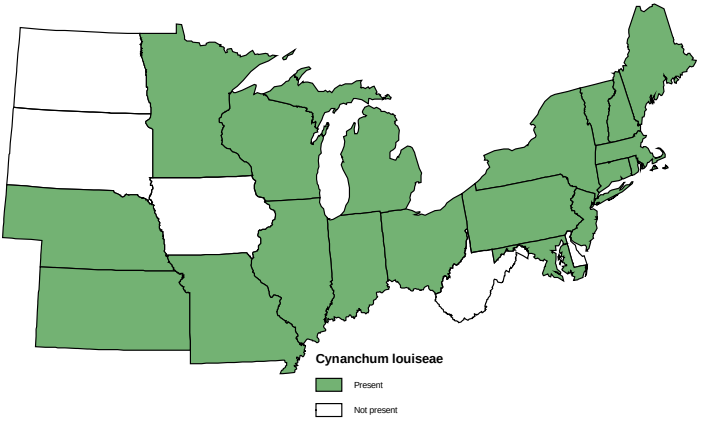
James H. Miller, U.S. Forest Service, www.forestryimages.org

Cynanchum louiseae

(Syn.: ***Vincetoxicum nigrum****)*

Black swallow-wort CYLO11
Louise's swallow-wort

Kelly Kearns, Wisconsin DNR



Cynanchum louiseae

*(Syn.: **Vincetoxicum nigrum**)*

Black swallow-wort CYLO11
Louise's swallow-wort

Form: Scrambling or climbing vine up to 6½ ft (2 m) long. Stems mostly very slender.

Leaves: Opposite, narrowly to broadly ovate; apex long-tapering or acute.

Flowers/fruit: Few-flowered clusters axillary to the leaves; flowers small, 5-petaled, star-shaped; corolla purple to purplish-black. Milkweed-like fruits 1½-3 in. (4-7 cm) long and slender, with pubescent seeds.

Habitat: Moist, sunny places including woods.

Other distinguishing features/notes: Also known as *Vincetoxicum nigrum*.

Similar species: European or pale swallow-wort (*Cynanchum rossicum)* has creamy pink to reddish brown flowers. Its twining habit and opposite, smooth leaves with somewhat shiny or reflective quality distinguish C*ynanchum louiseae* from other native and introduced species in the northeastern quarter of the U.S. and adjacent Canada.

Notes

Cynanchum louiseae

*(Syn.: **Vincetoxicum nigrum**)*

Black swallow-wort
Louise's swallow-wort

Kelly Kearns, Wisconsin DNR

Kelly Kearns, Wisconsin DNR

Elizabeth Czarapata

Kelly Kearns, Wisconsin DNR

Kelly Kearns, Wisconsin DNR

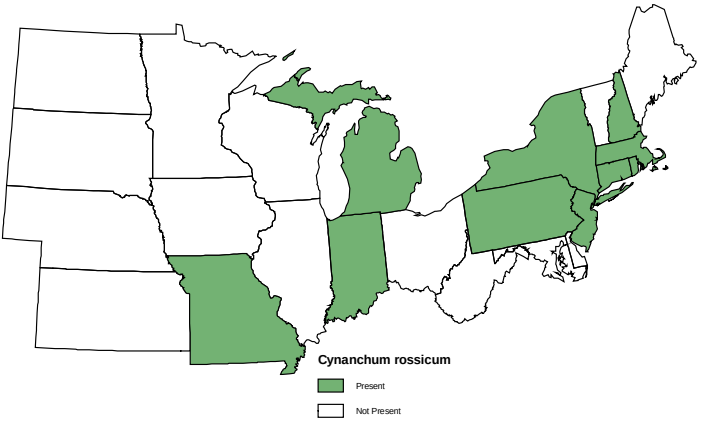
Elizabeth Czarapata

Cynanchum rossicum

*(Syn.: **Vincetoxicum hirundinaria**)*

European swallow-wort CYRO8
Pale swallow-wort

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org



Cynanchum rossicum

*(Syn.: **Vincetoxicum hirundinaria**)*

European swallow-wort CYRO8
Pale swallow-wort

Form: Perennial, twining, herbaceous vine up to 6½ ft (2 m) long.

Leaves: Oval shaped with pointed tips, 3-4 in. (7-10 cm) long by 2-3 in. (5-7 cm) wide, occurring in pairs along the stem.

Flowers/fruit: Few-flowered clusters axillary to leaves; small, 5-petaled, star shaped, creamy pink to pale maroon; about ¼ in. (0.6 cm) across. Milkweed-like fruits are nearly identical to black swallow-wort.

Habitat: Roadsides, fields, edges of woods, rocky areas.

Other distinguishing features/notes: Also known as *Vincetoxicum hirundinaria*.

Similar species: Black swallow-wort *(Cynanchum louiseae)* has purple to purplish black flowers and does not have rhizomes. Honeyvine (*Cynanchum leave)*, a native species, has white flowers; leaves have distinct heart-shaped bases and do not have shiny surfaces. The twining habit and opposite, smooth leaves with their somewhat shiny or reflective quality distinguish black swallow-wort from other native and introduced species in the northeastern quarter of the U.S. and adjacent Canada.

Notes

Cynanchum rossicum

(Syn.: ***Vincetoxicum hirundinaria****)*

European swallow-wort
Pale swallow-wort

© John M. Randall, The Nature Conservancy

© John M. Randall, The Nature Conservancy

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

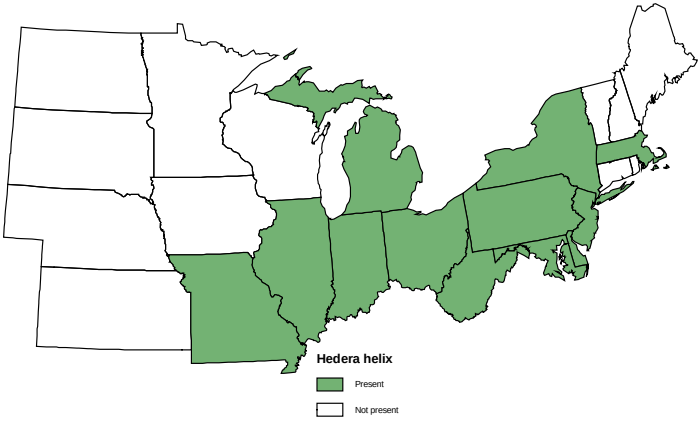
Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Hedera helix

English ivy HEHE

David J. Moorhead, University of Georgia,
www.forestryimages.org



Hedera helix

English ivy HEHE

Form: Evergreen climbing vine. Stems attach to the bark of trees, brickwork, and other surfaces by way of numerous, small rootlike structures that exude a glue-like substance. Older vines are known to reach 12 in. (30 cm) in diameter. Young shoots densely covered with stellate hairs.

Leaves: Alternate, dark green, waxy, somewhat leathery. Many recognized leaf forms, the most common a 3-lobed leaf with a heart-shaped base. Leaves in full sun are often unlobed, oval, and have wedge-shaped bases.

Flowers/fruit: Umbrella-like clusters of small, greenish-white flowers bloom in the fall. Fruit is black with a fleshy outer covering enclosing one to a few hard, stone-like seeds. Fruiting occurs in spring.

Habitat: Woodlands, forest edges, fields, hedgerows, coastal areas, salt marsh edges, and other upland areas, especially where some soil moisture is present. Does not grow well in extremely wet conditions and is often associated with some form of land disturbance.

Notes

Hedera helix

English ivy

James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Chris Evans, University of Georgia, www.forestryimages.org

Chuck Bargeron, University of Georgia,
www.forestryimages.org

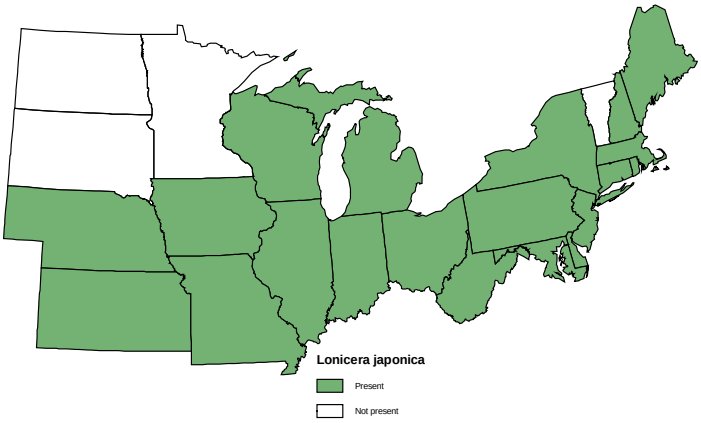
Jan Samanek, State Phytosanitary
Administration, Czechia

Forest and Kim Starr,
U.S. Geological Survey

Lonicera japonica

Japanese honeysuckle LOJA

Chuck Bargeron, University of Georgia, www.forestryimages.org



Lonicera japonica

Japanese honeysuckle LOJA

Form: Trailing or climbing vine up to 80 ft (25 m) long. Young stems finely pubescent; older stems reddish-brown and the bark sometimes shredding.

Leaves: Opposite, mostly ovate, apex with an abrupt tooth or cusp; margins entire, but can be lobed in early spring; undersides appear whitish. Semi-evergreen.

Flowers/fruit: Axillary pairs on a bracted stalk. Flowers white to pale cream. Corolla tube approximately equals the lobes. Blooms in springtime. Fruit a black berry.

Habitat: Disturbed woods, fields, thickets, and forest edges.

Other distinguishing features/notes: This looks similar to the native vine *Lonicera hirsuta* (hairy honeysuckle) when not in flower. However, once *L. hirsuta* begins flowering, it forms distinctive connate terminal leaves. If not in flower yet, check the site condition. *L. japonica* will be found on disturbed sites. If berries are present, *L. hirsuta* has red ones.

Notes

Lonicera japonica

Japanese honeysuckle

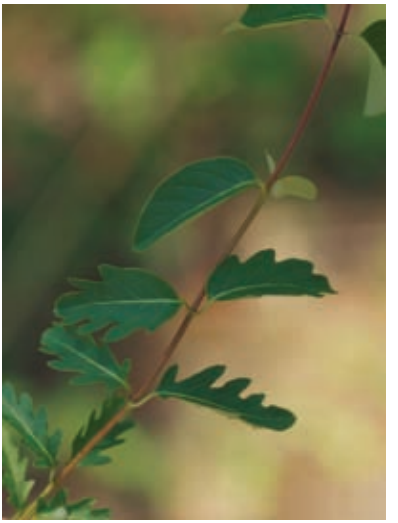
Chuck Bargeron, University of Georgia, www.forestryimages.org

Chuck Bargeron, University of Georgia, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Elizabeth Czarapata

Ted Bodner, Southern Weed Science Society, www.forestryimages.org



Ted Bodner, Southern Weed Science Society, www.forestryimages.org

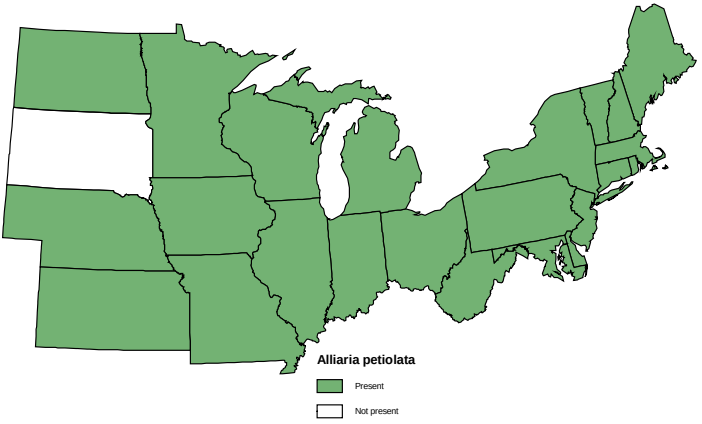
James H. Miller, U.S. Forest Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Alliaria petiolata

Garlic mustard ALPE4

Victoria Nuzzo, Natural Area Consultants, Bugwood.org



Alliaria petiolata

Garlic mustard ALPE4

Form: Herbaceous biennial plant 1½ -6½ ft (.5-2 m) tall; glabrous or with a few simple hairs. First-year plants appear as a rosette of green leaves close to the ground, which remain throughout the winter developing into mature plants the following spring.

Leaves: Deltoid or cordate (lower leaves often rounded or reniform); margins coarsely toothed.

Flowers/fruit: Flowers white. Fruit a silique (pod), 1½-2½ in. (4-6 cm) long, 4-angled, narrowly linear with a conspicuous midnerve.

Habitat: Moist, shaded soil on river flood plains, forests, roadsides, forest edge, along trails, and in forest openings.

Other distinguishing features/notes: Smells of garlic when crushed.

Notes

Alliaria petiolata

Garlic mustard

Elizabeth Czarapata

Elizabeth Czarapata

Elizabeth Czarapata

Steven Katovich, U.S. Forest Service, Bugwood.org

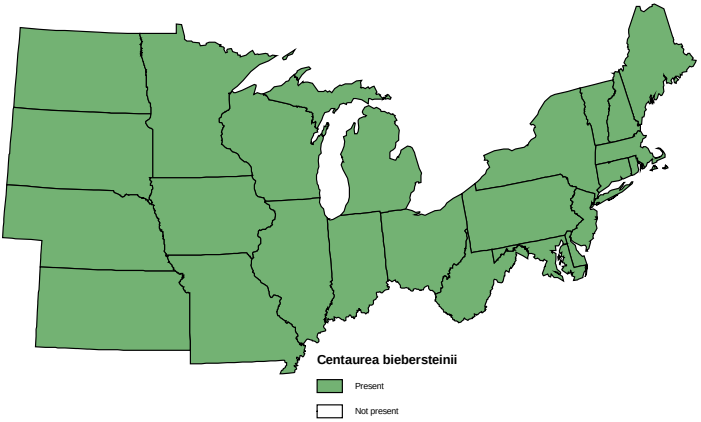
Chris Evans, University of Georgia, www.forestryimages.org

Jody Shimp, Illinois DNR, Bugwood.org

Centaurea biebersteinii

Spotted knapweed CEBI2

Elizabeth Czarapata



Centaurea biebersteinii

Spotted knapweed CEBI2

Form: Herbaceous plant 1½ -5 ft (0.5-1.5 m) tall.

Leaves: Pinnatifid with narrow lobes (wormwood-like), sparsely pubescent.

Flowers/fruit: Pink-purple flowers in thistle-like heads. Heads discoid but marginal flowers enlarged and with irregular corollas. Involucral bracts overlapping in several layers, upper margins darkly fringed, often pinkish. Fruits achenes <¼ in. (2.5-3.5 mm) long, pale brown to blackish.

Habitat: Fields, roadsides, wasteplaces, prairies, oak and pine barrens, dunes, and sandy ridges.

Notes

Centaurea biebersteinii

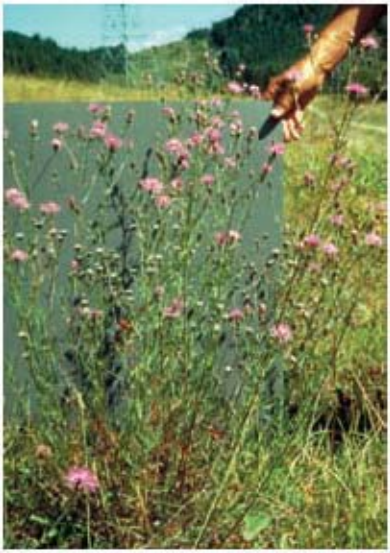
Spotted knapweed

Elizabeth Czarapata

Cindy Roche, Bugwood.org

Elizabeth Czarapata

Kelly Kearns, Wisconsin DNR



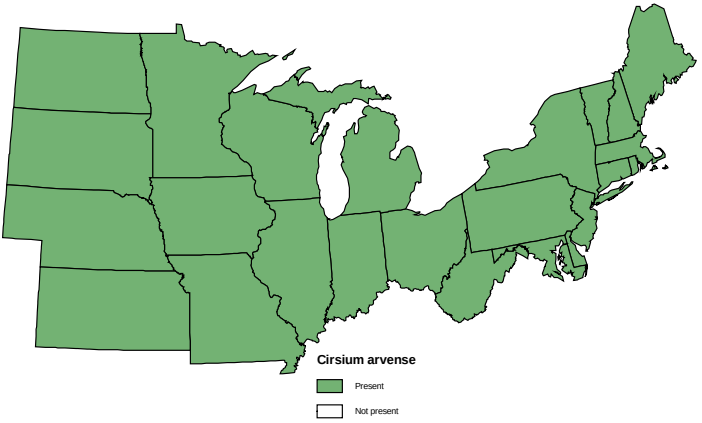
Cindy Roche, Bugwood.org

Kelly Kearns, Wisconsin DNR

Cirsium arvense

Canada thistle CIAR4

UAF Cooperative Extension Archives, University of Alaska - Fairbanks, www.forestryimages.org



Cirsium arvense

Canada thistle CIAR4

Form: Dioecious perennial 1-4 ft (0.3-1.2 m) tall; plant nearly glabrous to sparsely hairy. Deep-seated creeping roots.

Leaves: Alternate with a basal rosette, oblong, and irregularly lobed with very prickly margins. Green on both sides, glabrous to pubescent underneath. Stems ridged and hairy.

Flowers/fruit: Purple to occasionally white; heads up to ½ in. (1.3 cm) in diameter, discoid, and 1 in. (2.5 cm) or less high. Fruit is an achene ⅛-½ in. (2.5-4 mm) long with a feathery pappus attached to the apex (which lets it float through the air).

Habitat: Open habitats including prairies, savannas, fields, pastures, wet meadows, and open forests.

Notes

Cirsium arvense

Canada thistle

Chris Evans, University of Georgia,
www.forestryimages.org

Mary Ellen (Mel) Harte,
www.forestryimages.org

Chris Evans, University of Georgia,
www.forestryimages.org

Chris Evans, University of Georgia,
www.forestryimages.org

Mary Ellen (Mel) Harte,
www.forestryimages.org

Mary Ellen (Mel) Harte,
www.forestryimages.org

Steve Dewey, Utah State University,
www.forestryimages.org

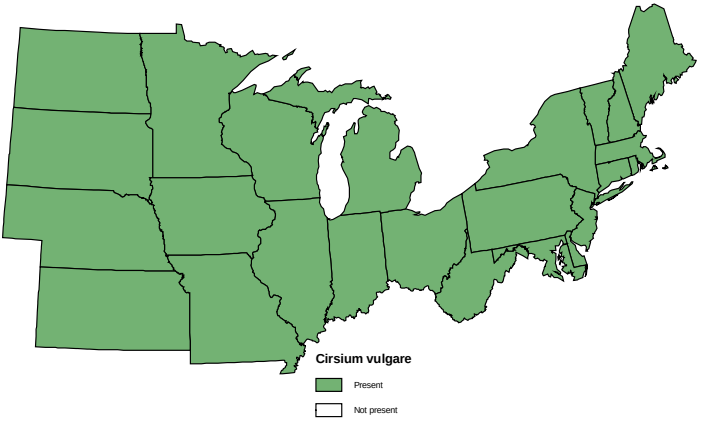
Mary Ellen (Mel) Harte,
www.forestryimages.org

Steve Dewey, Utah State University,
www.forestryimages.org

Cirsium vulgare

Bull thistle CIVU

Eric Coombs, Oregon Department of Agriculture, www.forestryimages.org



Cirsium vulgare

Bull thistle CIVU

Form: Biennial herb up to 6½ ft (2 m) tall. Erect and bushy; stem stout, often branched, and hairy; conspicuously spiny; winged by the decurrent leaf bases.

Leaves: Oblong to lanceolate; green with coarse hairs on upper side, grayish-green with woolly gray hairs on underside. Long, pointed, yellow spines extend from the leaf blade at midrib and at each lobe. Leaf bases extend downward on stem forming long prickly wings.

Flowers/fruit: Purple, 1-2 in. (2.5-5 cm) in diameter, densely discoid borne singly at the tip of a stem. Fruits are achenes, light brown, usually with darker streaks, <¼ in. (3-4.5 mm) long, with a feathery pappus at the apex.

Habitat: Capable of invading fields, pastures, wastelands, and along roadsides, but will not survive in cultivated fields. Not typically found on sand or soils with high humus content and is absent from pure clay soils. Does not grow well in shade and drought conditions.

Similar species: Bull thistle differs from Canada thistle, (*Cirsium arvense*), in that leaves are pubescent on both sides, while those of Canada thistle are pubescent only on the lower side. Flower bracts of bull thistle have spines, in contrast to those of Canada thistle.

Notes

Cirsium vulgare

Bull thistle

Utah State University Archives,
www.forestryimages.org

Michael Shephard, U.S. Forest Service,
www.forestryimages.org

Steve Dewey, Utah State University,
www.forestryimages.org

Steve Dewey, Utah State University,
www.forestryimages.org

Loke T. Kok, Virginia Polytechnic
Institute and University,
www.forestryimages.org

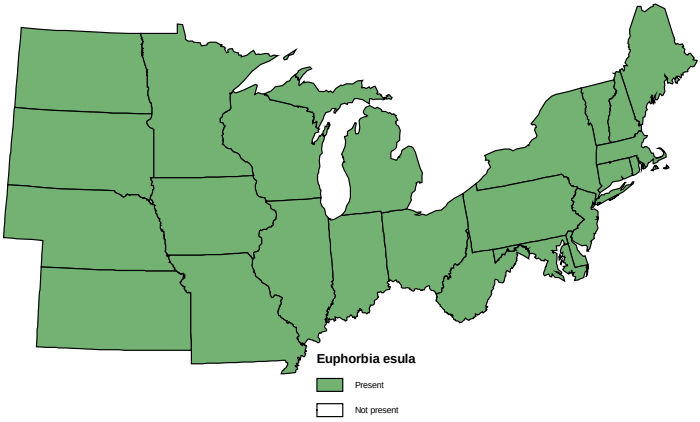
Ohio State Weed Lab Archive, The Ohio State University

Forest and Kim Starr,
U.S. Geological Survey

Euphorbia esula

Leafy spurge EUES

William M. Ciesla, Forest Health Management International, www.forestryimages.org



Euphorbia esula

Leafy spurge EUES

Form: Herbaceous plant up to 3½ ft (1 m) tall; vigorously colonial.

Leaves: Linear to very narrowly elliptical, <½ in. (<1 cm) wide, essentially 1-veined, mostly alternate but those in and near the inflorescence opposite or whorled.

Flowers/fruit: Floral bracts (often mistaken for petals) broadly oval, greenish-yellow; carpels apparently stalked, but actually these are individual flowers.

Habitat: Roadsides and wasteplaces, stream valleys, open woodlands, and fields.

Similar species: Resembles butter-and-eggs (*Linaria vulgaris*). Leafy spurge (*E. esula*) exudes a milky sap when leaves or stem are broken while *L. vulgaris* does not.

Notes

Euphorbia esula

Leafy spurge

Elizabeth Czarapata

Elizabeth Czarapata

© John M. Randall,
The Nature Conservancy

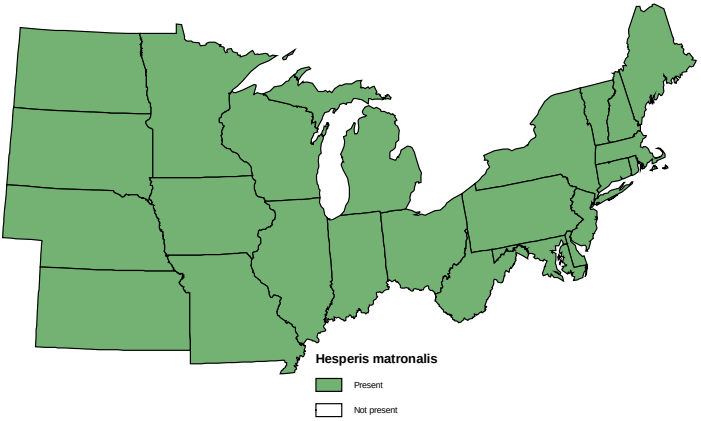
William M. Ciesla, Forest Health Management International, www.forestryimages.org

Norman E. Rees, USDA Agricultural Research Service, www.forestryimages.org

Hesperis matronalis

Dame's rocket HEMA3

Elizabeth Czarapata



Hesperis matronalis

Dame's rocket HEMA3

Form: Herbaceous biennial or perennial plant 2-3 ft (0.6-1 m) tall.

Leaves: Pubescent with both simple (especially on upper surface) and branched (especially on lower surfaces) hairs; margins dentate.

Flowers/fruit: Purplish, fragrant flowers with 4 sepals, petals and stamens. Fruit a silique, 2-5 in. (5-12 cm) long, somewhat angular, lumpy from underlying seeds; seeds in 1 row.

Habitat: Along roads, open woods, and moist bottom lands.

Notes

Hesperis matronalis

Dame’s rocket

Kelly Kearns, Wisconsin DNR

Elizabeth Czarapata

Kelly Kearns, Wisconsin DNR

Elizabeth Czarapata

Mark Frey, The Presidio Trust, Bugwood.org

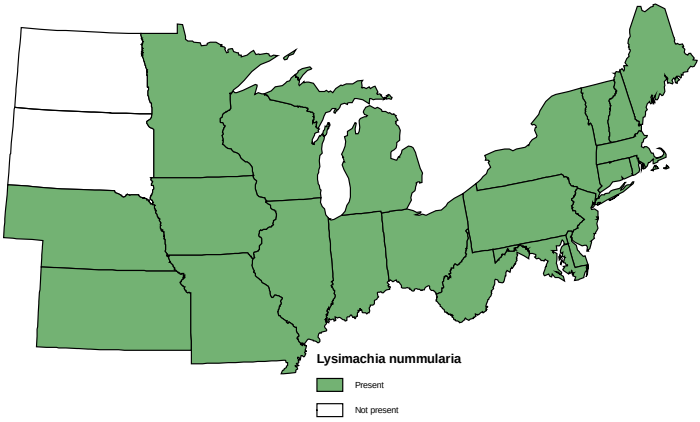
Mark Frey, The Presidio Trust, Bugwood.org

Lysimachia nummularia

Creeping jenny
moneywort

LYNU

Richard Old, XID Services, Inc., Bugwood.org



Lysimachia nummularia

Creeping jenny LYNU
moneywort

Form: Creeping perennial plant 6-24 in. (15-60 cm) long, rooting at nodes. Often forms mats.

Leaves: Opposite or whorled, oval, ½-1 in. (1-2.5 cm) long. Glabrous, fleshy, and somewhat cordate at the base.

Flowers/fruit: Flowers May-August. Yellow flowers about 1 in. (2.5 cm) wide, long stalked, solitary in the axils. Fruit a capsule.

Habitat: Streambanks, river bottoms, ditches, and roadsides.

Notes

Lysimachia nummularia

Creeping jenny
moneywort

Richard Old, XID Services, Inc.,
Bugwood.org

Richard Old, XID Services, Inc.,
Bugwood.org

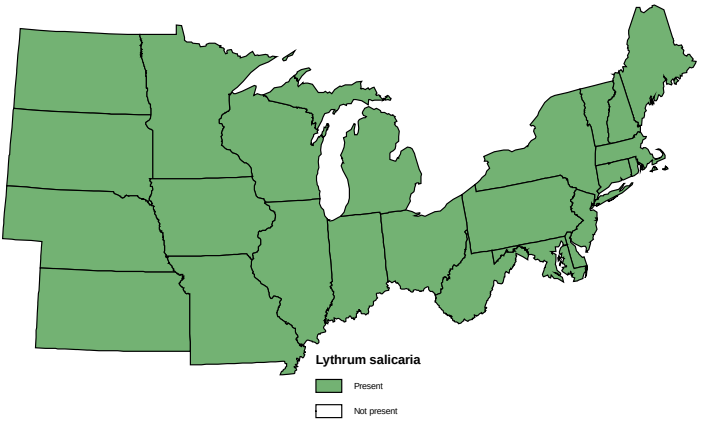
© Mandy Tu, The Nature Conservancy

© Mandy Tu, The Nature Conservancy

Lythrum salicaria

Purple loosestrife LYSA2

Eric Coombs, Oregon Department of Agriculture,
www.forestryimages.org



Lythrum salicaria

Purple loosestrife LYSA2

Form: Perennial plant 3-10 ft (1-3 m) tall, numerous 5- or 6-sided woody, square stems arising from a single rootstock.

Leaves: Opposite or whorled, lance-shaped, sessile, heart-shaped or rounded at the base.

Flowers/fruit: Magenta, dense flower spikes. Individual flowers have 5-7 petals. Fruit a capsule.

Habitat: Easily reproduces vegetatively. Capable of invading many wetland types, including freshwater wet meadows, tidal and non-tidal marshes, river and stream banks, pond edges, reservoirs, and ditches.

Similar species: Winged loosestrife (*Lythrum alatum)* is a rare plant, usually shorter, 6-24 in. (0.2-0.7 m) tall, with alternate leaves (except for the very lowest). Winged loosestrife flowers are solitary in the upper axils, while purple loosestrife flowers are in dense spikes. The square stems will aid in distinguishing purple loosestrife from other plants with purple flowers, such as vervain.

Notes

Lythrum salicaria

Purple loosestrife

Steve Dewey, Utah State University,
www.forestryimages.org

Linda Wilson, University of Idaho,
www.forestryimages.org

Britt Slattery,
U.S. Fish and Wildlife Service

David Cappaert, www.forestryimages.org

© John M. Randall, The Nature Conservancy

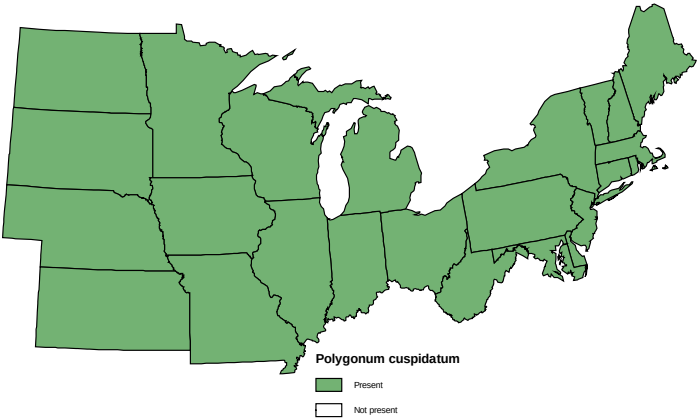
Richard Old, XID Services, Inc.,
Bugwood.org

Ohio State Weed Lab Archive,
The Ohio State University

Polygonum cuspidatum

Japanese knotweed POCU6
Mexican bamboo

Jack Ranney, University of Tennessee, Bugwood.org



Polygonum cuspidatum

Japanese knotweed POCU6
Mexican bamboo

Form: Stout rhizomatous plant up to 10 ft (3 m) tall; stems become ridged or lined; solid; profusely branched.

Leaves: Alternate, petiolate ~½-1½ in. (1-4 cm long); blade 2-6 in. (5-15 cm) long and ¾-4 in. (2-10 cm) wide, broadly ovate, with a rounded apex with abruptly-pointed tip and usually truncate (to somewhat tapering) base. Lower surface minutely roughened with short <⅛ in. (<0.1 mm), blunt-tipped hairs along veins.

Flowers/fruit: Often erect branched clusters (panicles) arise from leaf axils; flowers bisexual or carpellate (female only) and then on separate plants; perianth white or greenish-white to pinkish. Fruits 3-sided, dark brown achenes.

Habitat: Upland forests and riparian areas as well as wasteplaces and roadsides.

Other distinguishing features/notes: Herbaceous perennial, but stems often very stout and almost woody. See **Appendix F** for further information about *Polygonum* spp.

Notes

Polygonum cuspidatum

Japanese knotweed
Mexican bamboo

Elizabeth Czarapata

Ben Legler, The Burke Museum of Natural History and Culture

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Jil M. Swearingen, USDI National Park Service, www.forestryimages.org

Jil M. Swearingen, USDI National Park Service, www.forestryimages.org

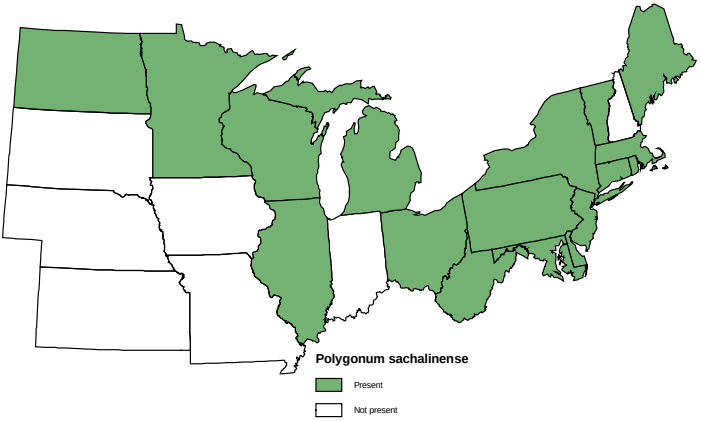
Jack Ranney, University of Tennessee, Bugwood.org

Ben Legler, The Burke Museum of Natural History and Culture

Polygonum sachalinense

Giant knotweed POSA4

Tom Heutte, U.S. Forest Service, Bugwood.org



Polygonum sachalinense

Giant knotweed POSA4

Form: Stout perennial plant 3-16 ft (1-5 m) tall.

Leaves: Alternate, petiolate, petioles ½-1½ in. (1-4 cm) long; blade 6-12 in. (15-30 cm) long and 3-10 in. (7-25 cm) wide, ovate-oblong, with an obtuse to acute apex and cordate base, lower surface with short <1/16 in. (0.2-0.6 mm) pointed, often twisted, hairs along veins. Leaf strongly heart-shaped (cordate).

Flowers/fruit: Erect or spreading branched clusters (panicles) arise from leaf axils; flowers bisexual or carpellate (female only) and then on separate plants; perianth generally greenish. Fruits 3-sided, brown achenes.

Habitat: Upland forests and riparian areas as well as wasteplaces and roadsides.

Other distinguishing features/notes: Undersides of the leaf have longer hairs than Japanese (*P. cuspidatum*) and bohemian knotweed (*P. ˣbohemicum*). See **Appendix F** for further information about *Polygonum* spp.

Notes

Polygonum sachalinense

Giant knotweed

Ben Legler, The Burke Museum of Natural History and Culture

Ben Legler, The Burke Museum of Natural History and Culture

Ben Legler, The Burke Museum of Natural History and Culture

Ben Legler, The Burke Museum of Natural History and Culture

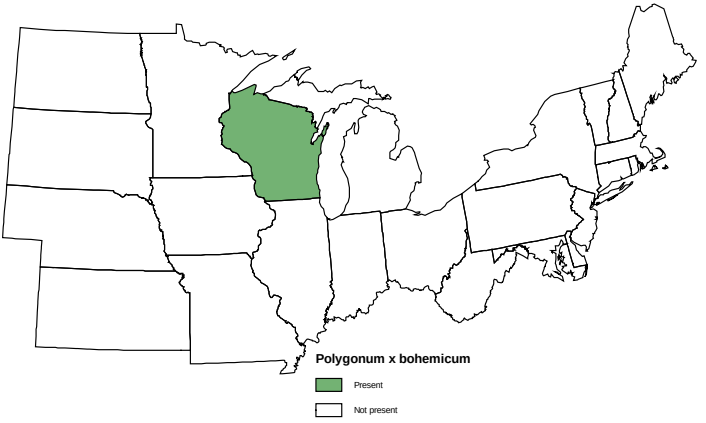
Ben Legler, The Burke Museum of Natural History and Culture

Tom Heutte, U.S. Forest Service, Bugwood.org

Polygonum ˣbohemicum

Bohemian knotweed POBO10

Ben Legler, The Burke Museum of Natural History and Culture



Polygonum ˣbohemicum

Bohemian knotweed POBO10

Form: Stout perennial up to 8 ft (2.5 m) tall. Hybrid of *Polygonum cuspidatum* and *P. sachalinense*.

Leaves: Similar to parents. Blades ovate, 2-10 in. (5-25 cm) long and ¾-4 in. (2-10 cm) wide, with rounded apex with abruptly pointed tip and truncate to cordate base; lower veins with short <⅛ in. (<0.1 mm), pointed hairs.

Flowers/fruit: Clusters of flowers often with fewer branches, otherwise similar to Japanese knotweed (*P. cuspidatum).*

Habitat: Generally found on disturbed sites, wasteplaces, and roadsides.

Other distinguishing features/notes: Compare to Japanese (*P. cuspidatum*) and giant knotweed (*P. sachalinense*). Bohemian knotweed has only recently been noticed; it is easily mistaken for and more closely resembles Japanese knotweed. Fruits partially or fully fertile, but reproduction mostly vegetative. See **Appendix F** for further information about *Polygonum* spp.

Notes

Polygonum ˣbohemicum

Bohemian knotweed

Ben Legler, The Burke Museum of Natural History and Culture

Ben Legler, The Burke Museum of Natural History and Culture

Ben Legler, The Burke Museum of Natural History and Culture

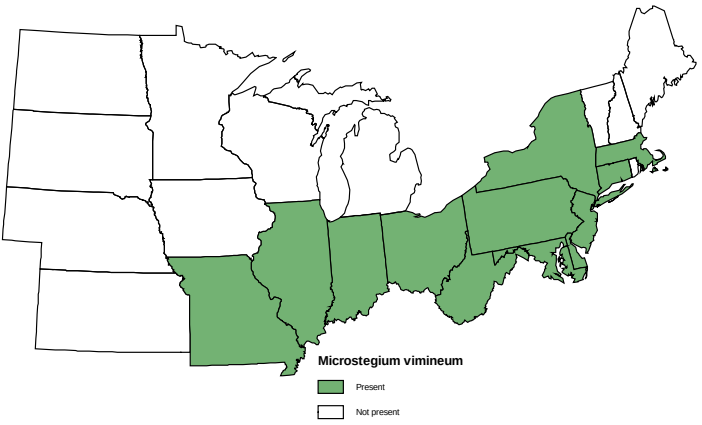
Ben Legler, The Burke Museum of Natural History and Culture

Ben Legler, The Burke Museum of Natural History and Culture

Microstegium vimineum

Nepalese browntop MIVI
Japanese stiltgrass

Chris Evans, University of Georgia, www.forestryimages.org



Microstegium vimineum

Nepalese browntop MIVI
Japanese stiltgrass

Form: Sprawling annual grass, ½-3 ft (0.2-1 m) tall.

Leaves: Alternate; narrowly lanceolate 2-4 in. (5-10 cm) long; blades flat and sparsely hairy on both surfaces, as well as along the margins, or sometimes glabrous.

Flowers/fruit: Inflorescence a digitate cluster of 2-4 narrow spike-like branches; pubescent; awns usually present on at least some lemmas. Spikelets paired (one sessile, one pedicellate); lower glume keeled, upper flat.

Habitat: Flood plains, streamsides, forest edge, roadsides, swamps, wet fields, and trailsides.

Other distinguishing features/notes: Although annual, the sprawling stems easily root from the nodes, forming dense colonies. Sometimes confused with *Leersia*, browntop can be distinguished vegetatively by glabrous nodes and hairs on the leaf sheaths near the collar.

Notes

Microstegium vimineum

Nepalese browntop
Japanese stiltgrass

Elizabeth Czarapata

Ted Bodner, Southern Weed Science Society, www.forestryimages.org

Elizabeth Czarapata

James H. Miller, U.S. Forest Service, www.forestryimages.org

Chuck Bargeron, University of Georgia, www.forestryimages.org

Ted Bodner, Southern Weed Science Society, www.forestryimages.org

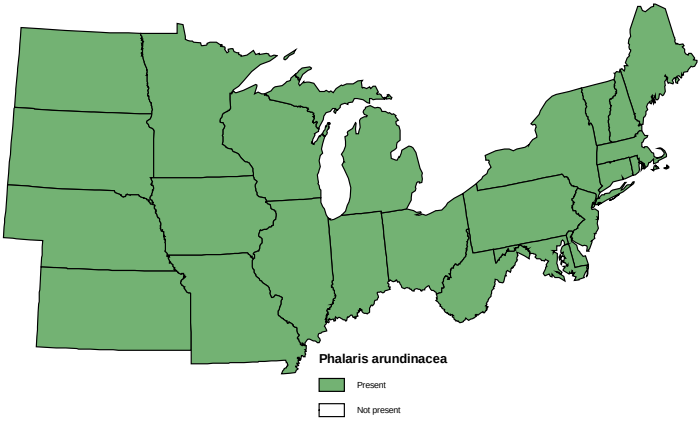
Jil M. Swearingen, USDI National Park Service, www.forestryimages.org

James H. Miller, U.S. Forest Service, www.forestryimages.org

Phalaris arundinacea

Reed canary grass PHAR3

Elizabeth Czarapata



Phalaris arundinacea

Reed canary grass PHAR3

Form: Moderately tall, erect grass up to 5 ft (1.5 m); perennial.

Leaves: Leaves ¼-¾ in. (0.5-2 cm) wide, ligules membranous and large up to ½ in. (10 mm) long; upper surface of blades usually scabrous.

Flowers/fruit: Inflorescence often purplish to gray-green; spikelets seemingly 1-flowered (actually 2 membranous flaps represent sterile florets), glumes compressed and keeled, lemmas awnless.

Habitat: Wetland forests, streambanks, lakeshores, marshes, along ditches and moist ground.

Other distinguishing features/notes: Native and introduced forms are found in North America but are not distinguishable.

Notes

Phalaris arundinacea

Reed canary grass

Elizabeth Czarapata

Elizabeth Czarapata

Elizabeth Czarapata

Elizabeth Czarapata

Cassandra Olson, U.S. Forest Service

Kelly Kearns, Wisconsin DNR

Mike Haddock, Kansas State University

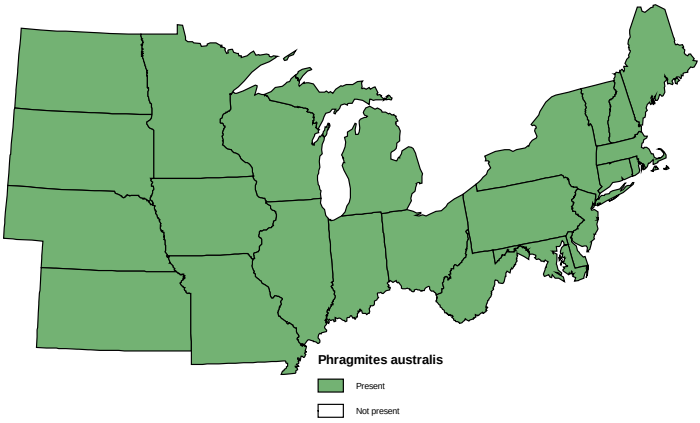
This is the ligule on a stalk of Reed canary grass.

“The highly transparent ligule of Reed canary grass is helpful on distinguishing it from other species” Invasive Plants of the Upper Midwest. Elizabeth J. Czarapata. The University of Wisconsin Press. 2005.

Phragmites australis

Common reed PHAU7
Phragmites

James H. Miller, U.S. Forest Service,
www.forestryimages.org



Phragmites australis

Common reed PHAU7
Phragmites

Form: Large grass up to 13 ft (4 m) tall with stout rhizomes; stems hollow.

Leaves: Leaves ¾-1½ in. (2-4 cm) wide, ligules short about 1/16 in. (1 mm), truncate and fringed.

Flowers/fruit: Inflorescence densely pubescent, often purplish when young; glumes unequal, lemmas narrow and long-tapering.

Habitat: Wetland forests, swamps, and wet shores.

Other distinguishing features/notes: Both native and nonnative *Phragmites* occur in the United States. Nonnative genotype has become invasive and invasive populations can be distinguished from probable native populations by the density of the population. Native populations tend to be sparser and intermixed with other plants. See this Web site for a great PowerPoint that shows a few characteristics that can help narrow this grass down in the field: http://www.nps.gov/plants/alien/fact/pdf/phau1-powerpoint.pdf

Notes

Phragmites australis

Common reed
Phragmites

Elizabeth Czarapata

Elizabeth Czarapata

James H. Miller, U.S. Forest Service,
www.forestryimages.org

James Allison, Georgia DNR,
www.forestryimages.org

Kelly Kearns, Wisconsin DNR

Elizabeth Czarapata

Joseph McCauley, U.S. Fish and Wildlife Service, Bugwood.org

References

Flora of North America Editorial Committee. 1997 and 2003. **Flora of North America, North of Mexico. Vols. 3, 25.** New York, NY: Oxford University Press.

Gleason, H.A.; Cronquist, A. 1991. **Manual of Vascular Plants of Northeastern United States and Adjacent Canada, 2nd ed.** Bronx, NY: New York Botanical Garden.

Great Plains Flora Association. 1986. **Flora of the Great Plains.** Lawrence, KS: University Press of Kansas.

Miller, James A. 2003. **Nonnative Invasive Plants of Southern Forests: A Field Guide for Identification and Control.** Revised. Gen. Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station.

Newcomb, Lawrence. 1977. **Newcomb's Wildflower Guide.** Boston-New York-London: Little, Brown and Company.

Petrides, George A. 1972. **Peterson Field Guide Series: Trees and Shrubs.** New York, NY: Houghton Mifflin.

Additional resources for individual species distribution shown on maps:

Alliaria petiolata, *Cynanchum rossicum* in Rhode Island: http://www.crmc.ri.gov/invasives/RI_Invasives.pdf

Polygonum cuspidatum and *P. sachalinense* in North Dakota: http://www.agdepartment.com/noxiousweeds/searchweeds.asp

Polygonum sachalinense in South Dakota: http://www.state.sd.us/doa/das/noxious.htm

Alliaria petiolata in South Dakota. Tatina, Robert. 1998. **Garlic mustard: an addition to the flora of South Dakota.** Prairie Naturalist. March 30(1): 52.

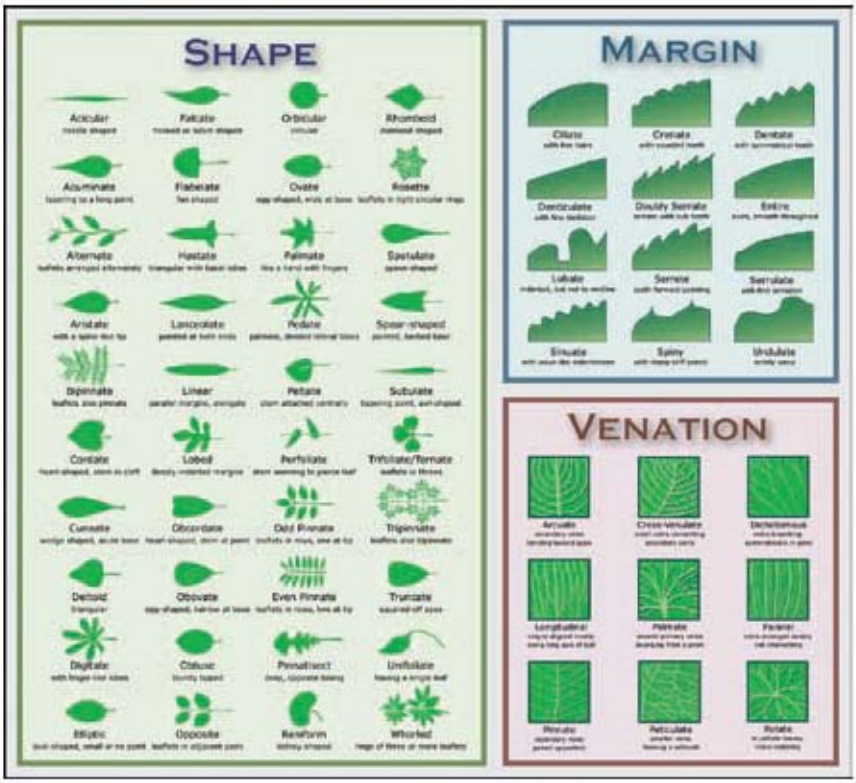
Polygonum ˣ bohemicum in New York: http://www.springerlink.com/content/7680722675q1777u/

Polygonum ˣ bohemicum in Wisconsin: http://wisplants.uwsp.edu/scripts/detail.asp?SpCode=POLxBOH

Polygonum ˣ bohemicum in Minnesota: http://www.bellmuseum.org/plants/checklist2008.pdf

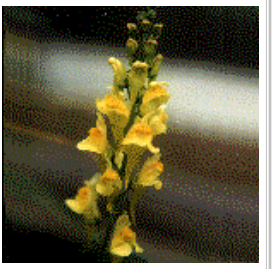
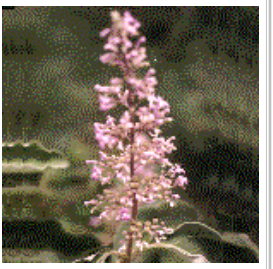
Appendix A
Leaf and inflorescence morphology

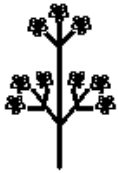
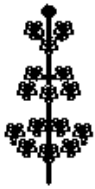
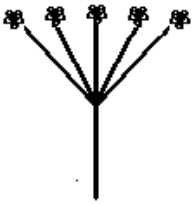
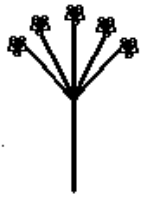
Leaf Morphology

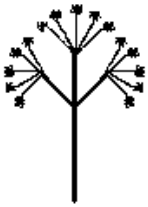


Source: http://en.wikipedia.org/wiki/File:Leaf_morphology_no_title.png

Descriptive Inflorescence Terms

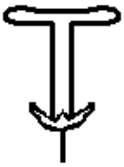
Shape	Name and Description	Example
	**Single** Sometimes, there is only one flower on each stem, or the flowers are borne so far apart that they cannot be described as being part of the same flowering cluster. They are often large flowers, so do not need the support of other flowers to attract pollinators. The example is *Papaver orientale*.	
	**Spike** A Spike is a group of flowers arising from the main stem, without individual flower stalks (sessile). The example is *Agastache foeniculum*.	
	**Raceme** A Raceme is a flower spike where the flowers have stalks of equal length, and the tip of the stem continues to grow and produce more flowers. Flowers open from the bottom up. The example is *Linaria vulgaris*.	
	**Panicle** A Panicle is a branched raceme, each branch having a smaller raceme of flowers. The terminal bud of each branch continues to grow, producing more side shoots and more flowers. The example is *Lagerstroemia indica*.	

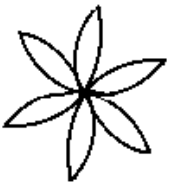
	**Cyme** A Cyme is a group of flowers in which the end of each growing point produces a flower, so new growth comes from side shoots and the oldest flowers are at the top. The example is *Geranium pratense*.	
	**Verticillaster** A Verticillaster is a whorled inflorescence, where the flowers are borne in rings at intervals up the stem. The tip continues to grow, producing more whorls. This type of inflorescence is common in members of the Deadnettle/Mint Family (Lamiaceae). The example is *Phlomis russelliana*.	
	**Corymb** A Corymb is a flower cluster where all the flowers are at the same level, with flower stalks of different lengths, forming a flat-topped flower cluster. The example is *Achillea millefolium*.	
	**Umbel** An Umbel is a flower head in which all the flower stalks are of the same length, so that the flower head is rounded like an umbrella. Many bulbs have this type of flower head. The example is *Nerine bowdenii*.	

	**Compound Umbel** A Compound Umbel is an umbel where each stalk of the umbel produces a smaller umbel of flowers. This type of inflorescence is typical of members of the Celery Family (Apiaceae). The example is *Crithmum maritimum*.	
	**Capitulum** A Capitulum is a flower head composed of many separate unstalked flowers close together. This type of inflorescence is typical of the Daisy Family (Asteraceae), where the outer flowers have one conspicuous large petal and the central disk is formed of flowers with smaller petals. The example is a *Senecio* species.	

Source: http://theseedsite.co.uk/inflorescences.html

Descriptive Flower Shapes

Shape	Name and Description	Example
	**Campanulate** (Bell-shaped) A flower with a wide tube and flared lobes (petal tips), typical of the Bellflower family (Campanulaceae). The length of the tube is variable, and the open-ness of the flower, but campanulate is generally shorter and fatter than tubular, and more closed than stellate. The example is *Campanula cochlearifolia*.	
	**Funnelform** (Funnel-shaped) A flower that widens gradually from the base, ending in an open or flared shape. The example is *Cyrtanthus elatus*.	
	**Trumpet-shaped** A flower that starts as a narrow tube, but widens into a flared mouth, where the petals often turn back. The example is *Petunia grandiflora*.	
	**Salverform** A flower with a long, thin tube, that widens suddenly into a flat-faced flower. The example is *Plumbago auriculata*.	

	**Tubular** A flower with a long, thin, straight-sided tube formed of united petals, often separating at the mouth into a flared shape. The example is a *Kniphofia* hybrid.	
	**Urceolate** (Urn-shaped) A flower in which the petals are fused into an almost enclosed globe shape, separating at the mouth into individual flared petals. The example is *Erica tetralix*.	
	**Bowl-shaped** A flower with a deep dish shape, roughly hemispherical, with straight sides or with a very slight flare at the tips. Much the same as cup-shaped. The example is *Argemone mexicana*.	
	**Saucer-shaped** A flower that is almost flat, with slightly upturned petal tips. The example is *Geranium wallichianum*.	
	**Stellate** (Star-shaped) A flower with many narrow petals arising separately from a central point. The example is *Sisyrinchium bermudianum* album.	

	**Cruciform** (Cross-shaped) A flower with four petals at right angles to one another. Typical of members of the Cabbage Family (Brassicaceae). The example is an unknown tropical species.	
	**Labiate** (Lipped) A flower divided into an upper 'hood' and a lower flat or pouched lip, typical of members of the Deadnettle/Mint Family (Lamiaceae). The example is *Salvia texensis*.	
	**Papilionaceous** (Pea-shaped) The flower shape typical of members of the Papilionaceae, having a large upper petal called the standard, two large side petals called wings, and two lower petals, often fused together, called the keel, which encloses the stamens and stigma. The example is *Parochetus communis*.	
	**Ligulate** (Strap-shaped) A flower with one large, long, thin petal, typical of ray-florets of the Aster/Daisy Family (Asteraceae). These look like single petals but are all individual flowers, each one capable of producing its own seed. The example is *Cosmos bipinnatus*.	

Source: http://theseedsite.co.uk/flowershapes.html

Appendix B

Comparison of nonnative shrubby *Lonicera*

	L. maackii	*L. morrowii*	*L. tatarica*	*L. ˣbella*
Shrub height	to 5 m	to 3 m	to 3 m	to 6 m
Twigs	pubescent	pubescent	**glabrous**	pubescent
Leaf blade shape	elliptic to ovate to lanceolate	oval to elliptic to ovate	ovate to oblong	generally ovate
Leaf blade length	3.5-8.5 cm	2.5-4 cm	3-6 cm	1.8-6 cm
Leaf apex	**acuminate**	obtuse to acute	acute to obtuse	acute
Leaf surface (lower)	**densely pubescent at least along lower veins**	**densely pubescent**	**glabrous**	**scattered pubescence to nearly glabrous**
Peduncles	**2-4 mm, shorter than petioles**	5-15 mm, longer than petioles	15-25 mm, longer than petioles	5-15 mm, longer than petioles
Corolla color	white, fading to yellow	creamy white fading to yellow	**white to pink, not fading to yellow**	**pink (or white) fading to yellow**
Corolla surface (exterior)	usually glabrous	**pubescent**	glabrous	usually glabrous
Berry color	dark red to blackish	deep red	red (occ. Yellow)	reddish

Appendix C

Key to the species *Lonicera*

1. Woody vines...2
1. Shrubs...4

2. Flowers and fruits sessile; all leaves petiolate...*Lonicera japonica*
2. Flowers and fruits stalked; upper leaves connate...3

3. Corolla strongly bilabiate, less than 2.7 cm long; all leaves connate...*Lonicera dioica*
3. Corolla scarcely bilabiate, more than 2.7 cm long; some lower leaves petiolate...*Lonicera sempervirens*

4. Flowers and fruits sessile...*Lonicera maackii*
4. Flowers and fruits stalked...5

5. Flowers appearing before the leaves expand...*Lonicera fragrantissima*
5. Flowers appearing after the leaves expand...6

6. Style glabrous...*Lonicera canadensis*
6. Style hirsute...7

7. Corolla strongly bilabiate...*Lonicera xylosteum*
7. Corolla scarcely bilabiate...8

8. Leaves glabrous beneath; peduncles 1.5-2.5 cm...*Lonicera tatarica*
8. Leaves hairy beneath; peduncles 0.5-1.5 cm...*Lonicera morrowii*

(Note: *Lonicera ×bella*, the hybrid between *L. tatarica* and *L. morrowii*, combines characters of both species and is very difficult to separate from its parents.)

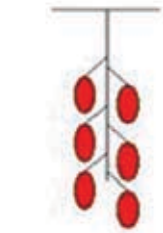
Definitions:
Sessile - attached directly to the base, without a stalk.
Glabrous - smooth, without hairs or glands.
Bilabiate - two-lipped.
Peduncle - stalk of an inflorescence or of a solitary flower.

Appendix D

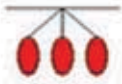
Comparison of nonnative *Berberis* species

Comparison of inflorescences of *B. vulgaris* and *B. thunbergii*

Character	*Berberis vulgaris*	*Berberis thunbergii*
Branch spines	3 (can be 1)	1 (can have up to 3)
Inflorescence	Raceme	Sessile umbel
Leaf margin	Serrate	Entire
Berry consistency	Juicy	Dry



Berberis vulgaris



Berberis thunbergii

Appendix E

Key to the species *Berberis*

1. Leaves evergreen...*Berberis julianae*
1. Leaves deciduous...2

2. Leaf margins spinulose-toothed; leaves 1.5-9 cm; twigs gray; thorns often with 2 side branches as long as the center spine; flowers racemose...*Berberis vulgaris*
2. Leaf margins smooth; leaves 1-4 cm; twigs brown; thorns often solitary, or with 2 small side branches; flowers in small clusters or solitary...*Berberis thunbergii*

Appendix F

Notes about the *Polygonum* (*Fallopia*) species

Japanese knotweed (*Polygonum cuspidatum*) grows to 10 ft. (3 m), profusely branched. Hairs along the lower leaf veins are short, less than 1/16 in. (<0.1 mm) and blunt tipped. Leaf bases usually truncate (to somewhat tapering).

Giant knotweed (*Polygonum sachalinense*) can grow as tall as 16 ft. (5 m), is more sparingly branched than Japanese knotweed. It has hairs along the lower leaf veins that are less than 1/16 in. (0.2-0.6 mm) long and the leaf bases are always cordate.

Bohemian knotweed (*Polygonum* × *bohemicum*) is a hybrid between the preceding two species. Resembles Japanese knotweed in stature, growing to 8 ft. (2.5 m). Hairs along the lower leaf veins are less than 1/16 in. (<0.1 mm) long but pointed instead of blunt-tipped. Leaf bases truncate to cordate.

Note about scientific name: The genus was recently switched to *Fallopia*. However, for FIA purposes, we are still using the genus *Polygonum* because that is the standardized code from the NRCS PLANTS database January 2000 version maintained by the FIA IM group.

Appendix G

Key to the species *Elaeagnus*

1. Leaves silvery on both sides; twigs often with thorns...2
1. Leaves silvery beneath, soon greenish above; twigs lacking thorns...3

2. Branches silvery; fruit yellow...*Elaeagnus angustifolia*
2. Branches brown; fruit silvery...*Elaeagnus commutata*

3. Bracts silvery; fruit subglobose to ovoid on stalks 0.8-1.2 cm long...*Elaeagnus umbellata*
3. Bracts brown; fruit ovoid to oblong on stalks 1.2-2.5 cm long... *Elaeagnus multiflora*

GLOSSARY

Achene - Type of dry, indehiscent fruit, small and one-seeded, lacking any specialized features.

Acute - Sharp-pointed (as to shape, but not necessarily as to texture).

Adnate - Grown together, or attached; applied only to unlike parts, as stipules adnate to the petiole, or stamens adnate to the corolla.

Allelopathic - Suppression of growth of a plant by a toxin released from a nearby plant of the same or other species.

Aril - Specialized, usually fleshy outgrowth from the funiculus that covers or is attached to the mature seed; more loosely, any appendage or thickening of the seed coat.

Awn - Slender, usually terminal bristle.

Axil - Upper angle formed between the leaf and the stem.

Axillary - Point where the leaf base or leaf petiole meets the stem.

Basal - Situated at the base.

Berry - Fleshy fruit with multiple seeds.

Biennial - Plant that completes its life cycle in 2 years and then dies. The first year is often just a basal rosette of leaves and flowering stalks appear in the second year.

Bract - Very small or modified leaf, usually growing at the base of a flower or flower cluster.

Carpel - Reproductive organ of an angiosperm, which bears the ovules.

Calyx - Collective term for all the sepals of a flower.

Cordate - Shaped like a stylized heart, with the notch at the base.

Corolla - Collective term for all the petals of a flower.

Deciduous - Losing its leaves at the end of the growing season; nonevergreen.

Decurrent - With an adnate wing or margin extending down the stem or axis below the point of insertion.

Deltoid - Shaped like an equilateral triangle.

Dentate - Spreading, pointed teeth.

Digitate - Arranged like fingers on a hand—cluster at one point.

Dioecious - Producing male and female flowers on different plants.

Discoid - In the Asteraceae, with all the flowers of a head bisexual and fertile, usually also tubular.

Foliaceous - Leaf-like in flatness, color, and texture.

Funiculus - Stalk connecting an ovule or seed with the placenta.

Glabrous - Smooth, without hairs or glands.

Glume - One of a pair of bracts, found at the base of a grass spikelet.

Herbaceous - Non-woody.

Hip - Fruit type of roses in which the hypanthium becomes fleshy and surrounds the matured carpels.

Hypanthium - Cup-like base of a flower to which the stamens, sepals, and petals are attached.

Indehiscent - Remaining closed at maturity, or not opening along regular lines, as in the acorn or coconut.

Inflorescence - Cluster of flowers and their stalks.

Internode - Part of the stem between two successive nodes.

Involucre - Set of bracts beneath dense capitate inflorescences.

Keel - Sharp or conspicuous longitudinal ridge.

Lanceolate - Lance-shaped; broader toward one end (usually the base) and tapering to the other.

Leaflet - Division of a compound leaf.

Lemma - Lower bract that, with the palea, encloses the flower in grasses.

Lenticel - Raised, often lighter colored, area on the bark.

Ligule - Thin, often membranous appendage found at the junction of a grass leaf and its sheath.

Node - Place on a stem where a leaf is (or has been) attached.

Ocrea, ochrea - Sheath around the stem at the base of the leaf, derived from stipules, as in many Polygonaceae.

Pappus - Modified perianth forming a crown on an achene.

Palea - Upper bract that, with the lemma, encloses the flower in grasses.

Panicle - Branched flower cluster, usually multibranched.

Pectinate - Arranged like the teeth on a comb.

Pedicel - Stalk of a single flower in an inflorescence.

Perennial - Plant that lives for more than 2 years.

Perianth - All of the sepals and petals (or tepals) of a flower, collectively.

Petiole - Leafstalk.

Pinnate - With 2 rows of lateral branches or appendages, or parts along an axis, like barbs on a feather.

Pinnatifid - More or less deeply cut in a pinnate fashion.

Reniform - Kidney shaped.

Rhizome - Creeping underground stem.

Rosette - Cluster of basal leaves (often flattened against the ground).

Scabrous - Rough to the touch due to the presence of short, stiff hairs.

Scarious - Thin, dry, membranous, and not green.

Sepal - Member of the outermost set of floral leaves, typically green or greenish and leafy in texture.

Sessile - Attached directly to the base, without a stalk.

Silique - Elongate, dry, dehiscent fruit with a septum separating the two valves.

Spikelet - Literally, a small spike; in grasses and many sedges, one of the ultimate flower clusters, each consisting of 1 to many flowers plus their subtending bracts.

Stamen - Pollen-producing structure of a flower; consisting of a slender stalk (filament) and a knoblike, pollen-bearing tip (anther).

Stellate - Star-shaped.

Stigma - Pollen-receiving tip of the carpel.

Stipule - Small leaflike growth at the base of a leaf stalk.

Style - Stalklike structure, connecting the ovary and the stigma of a carpel.

Tomentose - Covered with tangled or matted, woolly hairs.

Trigonous - With 3 angles (applied to solid bodies)

Truncate - With the apex (or base) transversely straight or nearly so, as if cut off.

Olson Cassandra; Cholewa, Anita F. 2009. **A Guide to nonnative invasive plants inventoried in the north by Forest Inventory and Analysis.** Gen. Tech. Rep. NRS-52. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 194 p.

The Forest Inventory and Analysis (FIA) program of the U.S. Forest Service is an ongoing endeavor mandated by Congress to determine the extent, condition, volume, growth, and depletions of timber on the Nation's forest land. FIA has responded to a growing demand for other information about our forests including, but not limited to, soils, vegetation, down woody material, and invasive plants. The intent of this guide is to aid FIA field staff in identifying 44 invasive plant species in the 24-state Northern Research Station region (Maine south to Delaware west to Kansas and north to North Dakota). However, this guide can be used by anyone interested in learning about these invasive plants. It contains distribution maps, short descriptions, space for notes, and numerous pictures of each plant.

KEY WORDS: nonnative, invasive, vegetation monitoring

Manuscript received for publication 3 March 2009

Northern
RESEARCH STATION
USDA Forest Service