



INVASIVE PLANTS OF MONROE COUNTY, WISCONSIN

Canada thistle

(*Cirsium arvense*)



Fallow fields, roadsides,
pastures, and disturbed ground

Identification Tips:

Blooms: July - September

Flowers: Rose-purple, lavender, or sometimes white

Stems: 1 ½ - 4 feet tall, smooth, multiple branching on
upper ¾ of stem

Leaves: Shiny green, crinkled, with stiff prickles on
the leaf margins

Note: Do Not Confuse with native thistles

Garlic mustard

(*Alliaria petiolata*)



Moist shaded woodlands, roadsides,
riparian zones, forest edges

Identification Tips:

Blooms: May-June

Flowers: Button-like clusters of small white flowers,
each with four petals in the shape of a cross

Stems: 1 - 4 feet tall the 2nd year; basal rosette of
leaves the 1st year which remain green in winter

Leaves: Triangular or heart shaped, coarsely toothed

Odor: Plant gives off strong garlic odor when crushed

Spotted knapweed

(*Centurea maculosa*)



Sandy disturbed ground,
roadsides

Identification Tips:

Blooms: June - August

Flowers: Purple, sometimes white

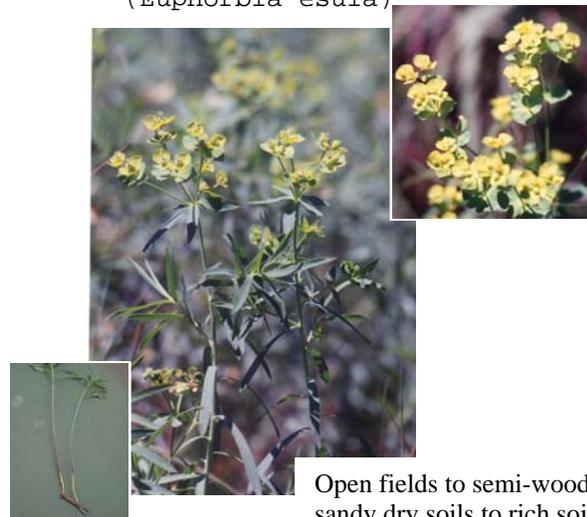
Stems: 3 - 4 feet tall, rough, wiry, branching and erect

Leaves: Trident shaped, alternate, 1-3 inches long, pale
green color

Other: Biennial or short lived perennial; 1st year - basal
rosette of leaves; 2nd year- tall erect and flowering

Leafy spurge

(*Euphorbia esula*)



Open fields to semi-wooded land;
sandy dry soils to rich soils

Identification Tips:

Blooms: June - August

Flowers: Small 3 part flowers with larger greenish-
yellow bracts

Stems: 2 - 3 ½ feet tall, erect, smooth, and branching;
produces milky white sap

Leaves: Small & linear with a bluish-greenish hue

Roots: Large vertical taproot and horizontal rhizomes

Purple loosestrife

(*Lythrum salicaria*)



Wetlands, drainage ditches,
riparian zones

Identification Tips:

Blooms: July - September

Flowers: Tall spike of magenta colored flowers, each
with 5 - 7 petals

Stems: Square shaped, woody, 4 - 10 feet tall, up to
50 stems from one rootstock

Leaves: Opposite or whorled around stem, lance
shaped and stalkless

Glossy & common buckthorn

(*Rhamnus* spp.)



Closed woodlands to open
fields, riparian zones and
seasonal wetlands

Identification Tips:

Blooms: May-June

Flowers: Small, stalked, yellowish - white flowers with 5 petals

Stems: Shrub up to 20 - 25 feet tall, up to 10 inches in diameter,
often 10 - 15 stems per rootstock

Leaves: Prominent parallel veins

Glossy: Shiny green above, dull green below

Common: Dull green on both sides of leaf

Fruit: Red pea sized berries, turn deep purple or black when mature

Invasive Plant Species

Invasive plant species are highly aggressive non-native plants that have been introduced to our environment. Due to the lack of natural predators and pathogens, invasive plants have the ability to out-compete and replace our native vegetation creating serious impacts to native plants, wildlife, agricultural crops, livestock production, soil conservation, water quality, recreation opportunities, etc...

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Additional information on identification and treatments for the plants listed on this sheet may be obtained from the following agencies:

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Monroe County Land Conservation – (608) 269-8973
Wisconsin Dept. of Natural Resources – (608) 789-5514
U.S. Fish and Wildlife Service – (608) 565-4415

Monroe County UW-Extension – (608) 269-8722
USDA-NRCS – (608) 269-8136, ext. 202
Fort McCoy (Wildlife Program) – (608) 388-5766

This brochure, along with other information on invasive plants, may be viewed and downloaded from the Monroe County web site at the following address: <http://www.co.monroe.wi.us>. Click on Departments, Land Conservation, Department Documents.

Credits: Plant Conservation Alliance-Alien Plant Working Group, Washington, D.C. ; Wisconsin Department of Natural Resources, Madison, WI; USDA-Natural Resources Conservation Service, PLANTS Database; Wisconsin Manual of Control Recommendations for Ecologically Invasive Plants. WBER. May 1997; Integrated Pest Management Methods for Control of Invasive Exotic Plants Species at Midewin National Tallgrass Prairie. Carroll and White. 1997.

canada thistle

Cirsium arvense



NATIVE RANGE: Temperate regions of Europe and Asia.

DESCRIPTION: Canada thistle is an herbaceous perennial in the Aster family with erect stems 1½-4 feet tall, and an extensive creeping rootstock. Stems are branched, often slightly hairy, and ridged. Leaves are lance-shaped, irregularly lobed with spiny, toothed margins and are borne singly and alternately along the stem. Rose-purple, lavender, or sometimes white flower heads appear from July through September, and occur in rounded, umbrella-shaped clusters. The small, dry, single-seeded fruits of Canada thistle, called achenes, are 1-1½ inches long and have a feathery structure attached to the seed base. Many native species of thistle occur in the U.S., some of which are rare. Because of the possibility of confusion with native species, Canada thistle should be accurately identified before any control is attempted.

Canada Thistle is considered a noxious weed under Wisconsin law and should not be allowed to go to seed.

BACKGROUND: Canada thistle was introduced to the United States, probably by accident, in the early 1600s and, by 1954, had been declared a noxious weed in forty-three states. In Canada and the U.S., it is considered one of the most tenacious agricultural weeds, but only in recent years has it been recognized as a problem in natural areas.

ECOLOGICAL THREAT: Natural communities threatened by Canada thistle include relatively open grassland areas such as prairies, barrens, savannas, glades, sand dunes, fields and meadows that have been impacted by disturbance. As it establishes itself in an area, Canada thistle crowds out and replaces native plants, changes the structure and species composition of natural plant communities and reduces plant and animal diversity. This highly invasive thistle prevents the coexistence of other plant species through shading, competition for soil resources and possibly through the release of chemical toxins poisonous to other plants (allelopathic).

Canada thistle is declared a noxious weed throughout the U.S. and has long been recognized as a major agricultural pest, costing tens of millions of dollars in direct crop losses annually and additional millions in control costs.

HABITAT IN THE UNITED STATES: Canada thistle grows in barrens, glades, meadows, prairies, fields, pastures, and waste places. It does best in disturbed upland areas but also invades wet areas with fluctuating water levels such as streambank sedge meadows and wet prairies.

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DISTRIBUTION IN THE UNITED STATES/MONROE COUNTY: Canada thistle is distributed throughout the northern U.S., from northern California to Maine and southward to Virginia. It is also found in Canada, for which it was named. Canada thistle has been identified as a management problem on public and private lands in the upper Midwest, Plains states, and the Pacific northwest. ***In Monroe County, Canada thistle is found in agricultural areas countywide.***

METHODS OF REPRODUCTION & DISPERSAL: Canada thistle produces an abundance of bristly-plumed seeds, which are easily dispersed by the wind. Most of the seeds germinate within a year, but some may remain viable in the soil for up to twenty years or more. Vegetative reproduction in Canada thistle is aided by a fibrous taproot capable of sending out lateral roots as deep as 3 feet below ground, and from which shoots sprout up at frequent intervals. It also readily regenerates from root fragments less than an inch in length.

CURRENT MANAGEMENT APPROACHES: Management of Canada thistle can be achieved through hand-cutting, mowing, controlled burning, and chemical means, depending on the level of infestation and the type of area being managed. Due to its perennial nature, entire plants must be killed in order to prevent re-growth from rootstock. Hand cutting of individual plants or mowing of larger infestations should be conducted prior to seed set and must be repeated until the starch reserves in the roots are exhausted. Because early season burning of Canada thistle can stimulate its growth and flowering, controlled burns should be carried out late in the growing season for best effect.

Chemical control in natural areas should be undertaken with caution, as the herbicide may kill the native vegetation. Where Canada thistle is interspersed with desirable native plants, targeted applications of a glyphosate (e.g., Roundup® or Rodeo®), clopyralid (Transline® or Stinger®), or an amine formulation of 2,4-D using a wick applicator or hand sprayer may be effective. Care should be taken to protect desired vegetation. For extensive infestations in disturbed areas with little desirable vegetation, broad application of this type herbicide may be the most effective method. Repeated applications are usually necessary due to the long life of seeds stored in the soil. Persons wishing to attempt chemical control should seek the advice of a knowledgeable professional.

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garlic mustard

Alliaria petiolata

NATIVE RANGE: Europe



DESCRIPTION: Garlic mustard is a cool season biennial herb in the mustard family (Brassicaceae) with stalked, triangular to heart-shaped, coarsely toothed leaves that give off an odor of garlic when crushed (especially in spring and early summer). First-year plants appear as a rosette of green leaves close to the ground. Rosettes remain green through the winter and develop into mature flowering plants the following spring. Flowering plants of garlic mustard reach from 1 to 4 feet in height and produce buttonlike clusters of small white flowers, each with four petals in the shape of a cross. Beginning in May, seeds are produced in erect, slender pods and become shiny black when mature. By late June, when most garlic mustard plants have died, they can be recognized only by the erect stalks of dry, pale-brown seedpods that remain.

In Wisconsin, garlic mustard is the only plant of this height in our woods with white flowers in May.

BACKGROUND: Garlic mustard was first recorded in the United States about 1868, from Long Island, New York. It was likely introduced by settlers for food or medicinal purposes.

ECOLOGICAL THREAT: Garlic mustard poses a severe threat to native plants and animals in forest communities in much of the eastern and midwestern U.S. Many native wildflowers that complete their life cycles in the springtime (e.g., spring beauty, wild ginger, bloodroot, hepatica, and trilliums) occur in the same habitat as garlic mustard. Once introduced to an area, garlic mustard outcompetes native plants by aggressively monopolizing light, moisture, nutrients, soil and space. Wildlife species that depend on these early plants for their foliage, pollen, nectar, fruits, seeds and roots, are deprived of these essential food sources when garlic mustard replaces them. Humans are also deprived of the vibrant display of beautiful spring wildflowers. *This plant is considered a major threat to the survival of Wisconsin's woodland herbaceous flora and the wildlife that depend on it.*

DISTRIBUTION IN THE UNITED STATES/MONROE COUNTY: Garlic mustard ranges from eastern Canada, south to Virginia and as far west as Kansas and Nebraska. In Wisconsin, distribution records indicate nearly a statewide presence with largest concentrations occurring in southeastern and northeastern counties. ***At the time of this printing, distribution in Monroe County is uncertain.***

HABITAT IN THE UNITED STATES: Garlic mustard frequently occurs in moist, shaded soil of river floodplains, forests, roadsides, edges of woods and trail edges and forest openings. Disturbed areas are most susceptible to rapid invasion and dominance. Though invasive under a wide range of light and soil conditions, garlic mustard is associated with calcareous soils and does not tolerate high acidity. Growing season inundation may limit invasion of garlic mustard to some extent.

METHODS OF REPRODUCTION & DISPERSAL: After spending the first half of its two-year life cycle as a rosette of leaves, garlic mustard plants develop rapidly the following spring into mature plants that flower, produce seed and die by late June. Seeds are produced in erect, slender, four-sided pods, called

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siliques, beginning in May. Siliques become tan and papery as they mature, and contain shiny black seeds in a row. The pods that remain after the plant dies may hold viable seeds throughout the summer.

A single plant can produce thousands of seeds, which scatter as much as several yards from the parent plant. Depending upon conditions, garlic mustard flowers either self-fertilize or are cross-pollinated by a variety of insects. Self-fertilized seed is genetically identical to the parent plant, enhancing its ability to colonize an area. Although water may transport seeds of garlic mustard, they do not float well and are probably not carried far by wind. Long distance dispersal is most likely aided by human activities and wildlife. Additionally, because white-tailed deer prefer native plants to garlic mustard, large deer populations may help to expand it by removing competing native plants and exposing the soil and seedbed through trampling.

CURRENT MANAGEMENT APPROACHES: Due to the long life of its seeds in the soil, which may be five years or more, effective management of garlic mustard requires a long-term commitment. The goal is to prevent seed production until the stored seed is exhausted. Hand removal of plants is possible for light infestations and when desirable native species co-occur. Care must be taken to remove the plant with its entire root system because new plants can sprout from root fragments. This is best achieved while plants are small and the soil is moist, by grasping the base of the plant firmly and tugging slowly and gently until the main root loosens from the soil and the entire plant pulls out. Pulled plants can be left onsite or removed.

For larger infestations of garlic mustard, or when hand pulling is not practical, flowering stems can be cut at ground level or within several inches of the ground, to prevent seed production. If stems are cut too high, the plant may produce additional flowers at leaf axils. Once seedpods are present, but before the seeds have matured or scattered, the stalks can be clipped, bagged and removed from the site to help prevent continued buildup of seed stores. This can be done through much of the summer.

For very heavy infestations, where the risk to desirable plant species is minimal, application of the systemic herbicide glyphosate (e.g., Roundup[®]) is also effective. Herbicide may be applied at any time of year, as long as the temperature is above 50 degrees F. and rain is not expected for about 8 hours. Extreme care must be taken not to get glyphosate on desirable plants, as the product is non-selective and will kill almost any plant it contacts. Spray shields may be used to better direct herbicide and limit non-intentional drift.

Fire has been used to control garlic mustard in some large natural settings but, because burning opens the understory, it can encourage germination of stored seeds and promote growth of emerging garlic mustard seedlings. For this reason, burns must be conducted for three to five consecutive years. Regardless of the control method employed, annual monitoring is necessary for a period of at least five years to ensure that seed stores of garlic mustard have been exhausted.

Researchers are investigating potential biological control agents for garlic mustard, which may greatly improve the control of this insidious weed.

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spotted knapweed

Centaurea maculosa



NATIVE RANGE: Europe and Asia

DESCRIPTION: Spotted knapweed is a biennial or short-lived (typically 3-5 years) taprooted perennial forb. It commonly grows to 3-4 feet in height. Stems are slender and hairy, and grow to a height varying from 2 feet on upland sites to 4 feet on wetter sites. Plants grow in an erect and branched arrangement. The leaves are alternate and pale, growing from 1-3 inches in length. The leaf margins on lower leaves are indented or divided about halfway to the midrib and the leaf surface is rough. Single thistle-like flower heads occur from late June through August. The flower heads are purple or occasionally white. Each flower head has stiff bracts marked with fine, vertical streaks and tipped with dark fringes that give the flower head a "spotted" appearance. Seeds are ¼ inch in length and have a short tuft of bristles at the tip.

BACKGROUND: Spotted knapweed was probably introduced in the United States in the 1890's as a contaminant in alfalfa or hay seed from Europe and Asia.

ECOLOGICAL THREAT: Spotted knapweed has become a serious problem in the rangelands of the northwest United States where it out-competes more desirable grazing plants. There is some evidence that this plant produces chemical compounds that affect other plants (allelopathic). Spotted knapweed has the potential to greatly reduce nesting cover for songbirds, as well as destroying habitat for other wildlife species. Knapweed infestation can also increase surface run-off and sedimentation by eliminating ground cover.

DISTRIBUTION IN THE UNITED STATES/MONROE COUNTY: Spotted knapweed can be found throughout the country, but is especially problematic in the western states from Washington to North Dakota and south to New Mexico, Arizona, and California. In Wisconsin, it is especially problematic in the central sands, northern Wisconsin, and near the Great Lakes. ***In Monroe County, this plant is common along Interstate 90 and along Highway 21 through Fort McCoy. It is becoming quite common along many roads and in idle fields in the sandier parts of the county.***

HABITAT IN THE UNITED STATES: Until recently, spotted knapweed was presumed to inhabit only heavily disturbed areas such as road ditches, agricultural field margins, railroad beds, pipelines, and recently installed utility lines. The plant has now been found in dry prairie sites, oak and pine barrens, and on lake dunes and sandy ridges.

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METHODS OF REPRODUCTION & DISPERSAL: Spotted knapweed reproduces solely by seeds. Individual flower heads bloom from late June through August for 2-6 days each. The bracts reopen after about 20 days and scatter seeds. The tuft of bristles at the seed tip aid in wind dispersal. Plants average about 1,000 seeds per plant. Seeds are viable for 7 years, and germinate throughout the growing season. Seedlings emerging in the fall develop into a rosette of leaves that resume growth in spring.

CURRENT MANAGEMENT APPROACHES: Small populations of spotted knapweed can be removed by digging or pulling. This should be done where the soil is moist. The entire root should be removed. Mowing is not effective, as plants re-flower at a lower height. Established populations may be reduced by hot prescribed burns in combination with follow-up pulling and digging. Burned areas should be reseeded with native species.

Chemical controls have shown to be effective in controlling spotted knapweed, but care needs to be taken to avoid non-target species. Several herbicides are being used for knapweed control. Persons wanting to use chemical treatment should seek advice from a knowledgeable professional.

Several biological controls exist, including 2 root-mining moths, a flower moth, and a root-mining beetle. These have met with varying degrees of success. Most promising are the 2 seed-head attacking flies, *Urophora affinis* and *U. quadrifasciata*. Used together, these 2 flies have reduced seed production by 95% in experimental populations. In Wisconsin, both flies are still being used experimentally, and their effectiveness is still unknown.

WARNING: Persons choosing to hand-pull spotted knapweed should wear gloves, long sleeved shirt, and long pants while doing so. There is some evidence that this plant possesses carcinogenic properties.

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leafy spurge

Euphorbia esula L.



NATIVE RANGE: Europe and Asia

DESCRIPTION: Leafy spurge is a member of the spurge family, or Euphorbiaceae, characterized by plants containing a white milky sap and flower parts in three's. Leafy spurge is an erect, branching, perennial herb 2 to 3½ feet tall, with smooth stems and clusters of showy yellow flower bracts that open in late May or early June. The ¼ inch diameter flowers are borne in greenish-yellow structures surrounded by the yellow bracts. Stems frequently occur in clusters from a vertical root that can extend many feet underground. The leaves are small, oval to lance-shaped, somewhat frosted and slightly wavy along the margin.

Leafy spurge is considered a noxious weed under Wisconsin law, which requires landowners to attempt eradication of the species.

BACKGROUND: Leafy spurge was transported to the U.S. possibly as a seed impurity in the early 1800s. First recorded from Massachusetts in 1827, leafy spurge spread quickly and reached North Dakota within about 80 years.

ECOLOGICAL THREAT: Leafy spurge is an aggressive invader, displacing native vegetation in prairie habitats and fields through shading and by dominating available water and nutrients. Leafy spurge appears to be allelopathic (toxins in the plant prevent growth of other plants underneath it). This plant, inedible or unpalatable to cattle and deer, can be catastrophic to grasslands for both economic and ecological reasons.

DISTRIBUTION IN THE UNITED STATES/MONROE COUNTY: Leafy spurge occurs across much of the northern U.S., with the most extensive infestations reported for Montana, North Dakota, Nebraska, South Dakota, and Wyoming. It has been identified as a serious pest on a number of national parks. ***This plant is becoming common in Monroe County, and can be seen readily in prairies and abandoned fields at Fort McCoy.***



single leafy spurge plant



seed head, leafy spurge



Root system of leafy spurge

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HABITAT IN THE UNITED STATES: Leafy spurge tolerates moist to dry soil conditions but is most aggressive under dry conditions where competition from native plants is reduced. It is capable of invading disturbed sites, including prairies, savannas, pastures, abandoned fields and roadside areas. In Wisconsin, it is usually found in lighter, dry soils.

METHODS OF REPRODUCTION & DISPERSAL: Leafy spurge reproduces readily by seeds that have a high germination rate and may remain viable in the soil for at least seven years, enhancing its chances of recovery over time. Its seed capsules open explosively, dispersing seed up to 15 feet from the parent plant and may be carried further by water and wildlife. Leafy spurge also spreads vegetatively at a rate of several feet per year, allowing the plant to spread outward and dominate a site. The complex root system can reach 15 or more feet into the ground, may have numerous buds, and is extremely difficult to eradicate when mature.

CURRENT MANAGEMENT APPROACHES: Because of its persistent nature and ability to regenerate from small pieces of root, leafy spurge is extremely difficult to eradicate. Management of this species focuses on control, not eradication. Mechanical controls do not work effectively because destruction of the root system is not accomplished. Biological control offers a promising management tactic for leafy spurge. The U.S. Department of Agriculture has shown success using six natural enemies of leafy spurge imported from Europe. These include a stem and root-boring beetle (*Oberea erythrocephala*), four root-mining flea beetles (*Aphthona* spp.) and a shoot-tip gall midge (*Spurgia esulae*). Large-scale field-rearing and release programs are carried out cooperatively by federal and state officials in many northern states. The results are not as immediate as when herbicides are used, but if pesticide use is kept to a minimum, large numbers of these agents build up within a few years and have shown good results in some cases. Persons wishing to attempt biological control should seek professional advice, as it is important to use the correct beetle species for individual sites.

Systemic herbicides have been used when the flowers and seeds are developing (Tordon[®]), or in early to mid-September, when the plants are moving nutrients downward into the roots (Plateau[®]). Preliminary research suggests that chemical treatment in the fall followed by a spring burn to kill germinating seed may be an effective strategy for reducing leafy spurge infestations. Multiple treatments are necessary every year for several years, making leafy spurge control an extremely expensive undertaking. If left uncontrolled for a single year, leafy spurge can re-infest rapidly. People wishing to attempt chemical control should seek professional advice.

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purple loosestrife

Lythrum salicaria



NATIVE RANGE: Eurasia; throughout Great Britain, and across central and southern Europe to central Russia, Japan, Manchuria China, southeast Asia and northern India.

DESCRIPTION: Purple loosestrife is an erect perennial herb in the loosestrife family, with a square, woody stem and opposite or whorled leaves. Mature plants can have from 30 to 50 stems arising from a single rootstock. Leaves are lance-shaped, stalkless, and heart-shaped or rounded at the base. Plants are usually covered by soft, fine hair. Loosestrife plants grow from four to ten feet high, depending upon conditions. Plants produce a showy display of magenta-colored flower spikes from July through August. Flowers have five to seven petals.

BACKGROUND: Purple loosestrife was introduced to the northeastern U.S. and Canada in the 1800s, for ornamental and medicinal uses. It is still widely sold as an ornamental. Currently, about 24 states have laws prohibiting its importation or distribution.

By law, purple loosestrife is a nuisance species in Wisconsin. It is illegal to sell, distribute, or cultivate the plants or seeds including any of its cultivars.

ECOLOGICAL THREAT: Purple loosestrife readily invades natural and disturbed wetlands. The highly invasive nature of purple loosestrife allows it to form dense, homogeneous stands that restrict native wetland plant species, and reduce habitat and forage for wildlife such as waterfowl.

DISTRIBUTION IN THE UNITED STATES/MONROE COUNTY: According to the U.S. Fish and Wildlife Service, purple loosestrife now occurs in every state except Florida.

Purple loosestrife is common in the wetlands of Monroe County. Heavy infestations occur in wetlands and backwaters of the La Crosse River system.

HABITAT IN THE UNITED STATES: Purple loosestrife is capable of invading many wetland types, including freshwater wet meadows, tidal and non-tidal marshes, river and stream banks, pond edges, reservoirs, and ditches.

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METHODS OF REPRODUCTION & DISPERSAL: Purple loosestrife enjoys an extended flowering season, generally from July to September, which allows it to produce vast quantities of seed. The flowers require pollination by insects, for which it supplies an abundant source of nectar. A mature plant may have as many as thirty flowering stems capable of producing an estimated two to three million minute seeds per year.

Purple loosestrife also readily reproduces vegetatively through underground stems at a rate of about one foot per year. Many new stems may emerge vegetatively from a single rootstock of the previous year. "Guaranteed sterile" cultivars of purple loosestrife are actually highly fertile and able to cross freely with purple loosestrife and with other native *Lythrum* species. ***Therefore, outside of its native range, purple loosestrife of any form should be avoided.***

CURRENT MANAGEMENT APPROACHES: Small infestations of young purple loosestrife plants may be pulled by hand, bagged, and removed, preferably before seed set. For older plants, spot treating with a glyphosate type herbicide (e.g., Rodeo® for wetlands, Roundup® for uplands) is recommended. These herbicides may be most effective when applied late in the season when plants are preparing for dormancy. However, it may be best to do a mid-summer and a late season treatment, to reduce the amount of seed produced. Rodeo and Roundup are non-selective herbicides and should be used with caution. When using herbicides, advice from a knowledgeable professional is recommended.

While herbicides and hand removal may be useful for controlling individual plants or small populations, biological control is seen as the most likely candidate for effective long term control of large infestations of purple loosestrife. As of 1997, the U.S. Department of Agriculture has approved three insect species from Europe for use as biological control agents. These plant-eating insects include a root-mining weevil (*Hylobius transversovittatus*), and two leaf-feeding beetles (*Galerucella californiensis* and *Galerucella pusilla*). Two flower-feeding beetles (*Nanophyes marmoratus*) that feed on various parts of purple loosestrife plants are still under investigation. *Galerucella* and *Hylobius* have been released experimentally in natural areas in 16 northern states, from Oregon to New York. Although these beetles have been observed occasionally feeding on native plant species, their potential impact to non-target species is considered to be low. These species are still considered experimental, and the Wisconsin DNR is seeking cooperators to release and monitor the insects.

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Additional information on identification and treatment of invasive plants may be obtained from the following project sponsors:
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Monroe County Land Conservation Dept. – (608) 269-8973
Wisconsin Dept. of Natural Resources – (608) 789-5514
U.S. Fish and Wildlife Service – (608) 565-4415
Monroe County UW-Extension – (608) 269-8722
USDA-NRCS – (608) 269-8136, ext. 202
Fort McCoy (Wildlife Program) – (608) 388-5766

This brochure, along with other information on invasive plants, may be viewed and downloaded from the Monroe County web site at the following address: <http://www.co.monroe.wi.us>. Click on Departments, Land Conservation, Department Documents.

credits: Plant Conservation Alliance-Alien Plant Working Group, Washington, D.C.
Wisconsin Department of Natural Resources, Madison, WI
USDA-Natural Resources Conservation Service, PLANTS Database

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glossy and common buckthorn

Rhamnus spp.



Native Range: Europe & Asia

DESCRIPTION: Buckthorn grows as a shrub or small tree varying from a single stem to a clump of 10-15 stems. Relatively old or mature plants commonly exhibit basal trunk diameters of 3-4 inches, but may reach 8-10 inches with heights of 20 ft. Leaf shapes are oval to elliptic. **Leaf development starts in April or May, often before many of the native species. Similarly, leaves generally remain on the plant well into the fall after leaf-drop has occurred on most natives.** Leaves of common buckthorn are dull green on both surfaces, while those of glossy buckthorn are bright

green or glossy on the upper surface and duller beneath. Leaves are generally not hairy. Leaf margins of common buckthorn can be minutely toothed, while those of glossy buckthorn are slightly wavy but not toothed. Leaf venation is prominent, with straight lateral veins extending at a slight angle from the main mid-vein. Common buckthorn can have thorn-like spurs along the twigs. The bark is generally brownish gray with light colored spots (lenticels) running parallel with the twig length rather than around the twig circumference. Lenticels are especially visible on the younger shoots and twigs. The outer sapwood and inner bark surface is yellowish while the inner heartwood is orangish. Yellowish-white flowers are visible in May and June, with round berries forming in July and gradually changing from green and red to dark purple or black in late summer and fall.



Top view of flower



Pink and white cross-section of trunk



Ripe berry, size of a pea



Prominent leaf veins

BACKGROUND: Buckthorn was introduced from Eurasia for use as ornamental plantings, hedgerows, wildlife cover, etc. It was planted in Wisconsin as early as 1849, and is presently well established throughout the northeast and aggressively invading new areas. Buckthorn successfully out-competes seedlings of native forest trees as well as understory forbs and shrubs. It has been reported to host a leaf rust that effects agricultural oat production.

ECOLOGICAL THREAT: Buckthorn poses a severe threat to native plants and animals. High rates of seed viability ensure buckthorn's ability to invade new areas. By producing leaves earlier in spring and maintaining them later in the fall, buckthorn gains an extended growing season that gives it a competitive advantage to shade out native plant and tree species. This allows buckthorn to produce large thick, monotypic stands that reduce the diversity of wildlife habitat structure and food sources. It can quickly choke out seasonally dry wetlands and forest woodlots, and restrict or eliminate the regeneration of timber and pulp producing tree species. It is believed that the berries produced by buckthorn have a laxative-like affect on various bird species, allowing the berries to quickly pass through the birds and may cause digestive distress in various species. **Despite their devastating impacts, these plants are still sold as ornamental shrubs in many commercial markets.**

DISTRIBUTION IN THE UNITED STATES/MONROE COUNTY: Buckthorn is found throughout Nova Scotia to Saskatchewan, south to Missouri, east to New England, and west to Minnesota. It has taken over much of the woodlots in the southeastern corner of Wisconsin and **can be found in many wetland pockets, stream corridors, and drainage ditches throughout the Tomah and Sparta area.**

HABITAT IN THE UNITED STATES: Buckthorn invades the understory of oak-maple and pine woodlands. Glossy Buckthorn is an especially aggressive invader of wetlands and riparian woodlands. Both species may also occur in full sun of abandoned fields, roadsides, prairies, and savannas. Site disturbance assists buckthorn invasion but is not necessary.

METHODS OF REPRODUCTION & DISPERSAL: Buckthorn produces a large number of berries each year which are readily spread by birds and maintain a high level of viability. Buckthorn has been reported to produce up to 5,000 seedlings per square meter. It also has the ability to regenerate from cut or top-killed stumps, often multiplying the number of stems previously growing from the rootstock. Herbicide is currently the most efficient way to kill mature roots and end the plant's ability to re-sprout.

CURRENT MANAGEMENT APPROACHES:

Mechanical: It is often possible to remove young plants less than 1 inch in diameter by hand pulling, especially when soil is sandy and root systems are shallow due to high water tables. A disadvantage to this method is further disturbance to the ground surface and exposure of bare soil which may promote germination of existing seed. Burning will kill very young buckthorn plants, but typical fire regimes are usually not hot enough to kill mature plants, which vigorously re-sprout the following year. Re-sprouting also occurs with cutting or girdling unless herbicide treatments are also incorporated. The plant most often grows with multiple stems so girdling is harder to accomplish than simply cutting the entire stem.

Chemical: Larger diameter or more deeply rooted plants generally require herbicide treatments. Buckthorn does not need to be vigorously growing at the time of treatment, and at least 90% success has been attained when treatments are conducted between early winter and early spring. Triclopyr is an effective herbicide for buckthorn and is sold under the trade name of Garlon™. Basal bark treatments of 10-33% Garlon™ solution applied along the bottom 15 inches of uncut stems, or to the surface of stems cut approximately 3 inches above the ground are successful. Garlon™ should not be sprayed in wetland conditions or when precipitation may cause surface runoff to nearby wetlands. Diluent, a refined mineral oil, is an environmentally preferable alternative to various fuel oils that are most often used as surfactants with Garlon™ 4. Garlon™ 3a is mixed with water.

Glyphosate is another often-used herbicide, sold under the trade names of Rodeo® and Roundup®, with the former being usable in or near standing water. Glyphosate treatments require cutting of the stem within 3 inches of the ground surface, and applications should be made immediately after cutting. Other herbicides that have been used with success on cut stumps include Weedone 170® and Ortho Bush Killer®.

Follow-Up: As a follow-up treatment to mechanical and chemical control, it is suggested that sites be burned after sufficient drying times to remove any young seedlings either missed during initial treatments or recently germinated from existing seed. Cutting treatments used in conjunction with herbicides should enhance destruction of new seedlings due to increased fuel loads from the cut woody material being left on the ground.

Biological: There does not appear to be any proven biological controls at this time, presumably due to the effectiveness of mechanical and chemical controls.

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credits: Wisconsin Manual of Control Recommendations for Ecologically Invasive Plants. WBER. May 1997.
Integrated Pest Management Methods for Control of Invasive Exotic Plants Species at Midewin National Tallgrass Prairie. Caroll and White.

wild parsnip

Pastinaca sativa



Native Range: Europe & Asia

DESCRIPTION: Wild parsnip is a monocarpic perennial herbaceous plant (plant spends one or more years in rosette stage, blooms under favorable conditions, and then dies) of the parsley family. Wild parsnip commonly grows 6 inches high in the rosette stage, and 3-6 feet in the flowering stage. Flowers are flat topped umbels 3-6 inches wide with numerous five-petaled yellow flowers. The plant typically blooms from mid-June to early-August. Leaves are alternate and made up of 5-15 oval-shaped, sharply toothed leaflets along both sides of the stalk. It has a long, thick carrot like (edible) taproot. The plant produces ¼ inch round, flat seeds that can be viable in the soil for up to 4 years.

WARNING – Care should be taken to avoid getting sap from the plant on your skin. The sap of wild parsnip, when on the skin and in the presence of sunlight, can cause a severe rash with blistering and discoloration that may result in scarring. This chemical reaction is referred to as phytophotodermatitis.



Rosette Leaves



Bolting Stage



Flower Head



Seeds



Skin Rash

BACKGROUND: It is believed that wild parsnip was brought into the country to be cultivated as a food source. Records for Wisconsin indicate that it was present in the state as far back as 1894. Its spread across the country is most likely a result of seeds being dispersed by mowing practices and vehicles.

ECOLOGICAL THREAT: Wild parsnip poses a severe threat to native plants and humans. This plant readily moves into disturbed habitats and along road edges. Once populations build, they can spread rapidly and quickly displace native vegetation. During July, wild parsnip is one of the dominant yellow-flowered weeds along many roadsides and other right-of-ways. From roadsides it can spread into woodland openings, prairies, and drainages. The ability for this plant to encroach on a wide range of habitats can have profound impacts on sensitive areas.

DISTRIBUTION AND HABITAT TYPES IN THE UNITED STATES/MONROE COUNTY: Found in open places along roadsides, pasture lands, disturbed sites, and in waste places throughout the United States and Canada, from British Columbia to California and Vermont south to Florida. This plant is very common and found throughout Monroe County. It endures a wide range of edaphic conditions, usually dry to mesic soils, but occasionally will be found in wet meadows. Plants grow best on calcareous, alkaline soils and do not tolerate shade well.

METHODS OF REPRODUCTION & DISPERSAL: In order for a rosette-stage plant to bolt into a mature flowering plant it must be subjected to a cold period (winter). This process is known as vernalization. Not all plants flower after their first vernal period. Most plants flower in the second, third, or fourth season after germination. Seeds ripen in late summer and disperse throughout the fall. Cattle will not eat wild parsnip, but deer may feed on the plant. Birds and small mammals may consume the seeds. Seed dispersal from mowing and off-road driving also contributes to its spread.

CURRENT MANAGEMENT APPROACHES:

Mechanical: Wild parsnip can become abundant along irregularly mowed roadsides as inconsistent mowing seems to facilitate seed dispersal. A single mowing late into the growing season (mid July thru August) will result in high seed dispersal as seeds have matured and are transported by mowing equipment. Because of this, mowing should be done prior to seed formation (June) with follow-up mowing throughout the summer to avoid flowering and seeding out (timely mowing). Mowing can however also stress other plant species that have the potential to be good competitors against parsnip.

Manual: Hand-pulling of rosettes and small plants can be an effective means of removal, depending on soil types and moisture. For larger patches, weeding with a shovel is an effective control measure. Flowering plants should be severed 1-2 inches below ground level before seed drop. Since the plants do not all flower at once, the area should be checked several weeks after the first cut for late bolting plants. The area should be revisited the following year to remove any new flowering plants. All removed plants should be placed in bags and disposed of in a landfill (check local regulations) or burned. Remember to avoid contact with plant tissues and sap. It is best to wear long sleeve shirt, pants, and gloves.

Fire: Burning alone has proven not to be a very effective means of controlling wild parsnip. Burning a site removes the litter layer and provides readily available nutrients to parsnip plants, resulting in taller plants and greater stem density. Treating newly sprouted parsnip rosettes with herbicide after a fire can be a very effective strategy, because parsnip is one of the first plants to re-sprout after a fire. In higher quality sites fire may be an effective tool to invigorate native plants to out-compete the invasive parsnip and reduce the seed bank.

Chemical: If herbicide treatments are the preferred method of control or sites are too large for manual removal, applications of 2,4-D, Escort[®] or glyphosate have proven to be effective. Timing of application will determine overall effectiveness of herbicide treatments. Adult plants should be spot treated in mid-May to mid-June (time of plant bolting until flowering) or in the fall, targeting rosette plants. Application of herbicide in the fall minimizes the impact to non-target species. Sites may need to be re-treated for several years until the seed bank has been exhausted. It is recommended that herbicide treatments of wild parsnip be done sparingly in higher quality habitats.

Biological: The parsnip webworm (*Depressaria pastinacella*) is the most recognized insect known to feed on wild parsnip. The adult webworm deposits eggs on unopened flower heads (umbels) between May and June. Hatched larvae then construct a web around the umbel and feed on the flowers and seeds. Once larvae have matured they travel to the base of the stem and bore into the plant and over-winter in a pupated state. Adults then emerge the following summer. While the webworm may intensively damage some plants and prevent seed dispersal, they rarely take over a large patch of wild parsnip. As a result, parsnip webworm is not likely to be an effective biocontrol agent.

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