non-native terrestrial plants

an identification guide for resource managers

rtment of Natural Resources
s and Waterways

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This field guide is designed to guide natural resource managers in the identification of the most invasive, non-native terrestrial plants known to date in Minnesota. The plants were chosen according to their level of invasiveness into natural plant communities. The thumbnail sketch of each plant with suggested control methods and color photo should help identify and control them early before they overtake weakened natural plant communities, and establish in restoration/reconstruction projects.

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Amur maple
Acer ginnala

Amur maple

Acer ginnala

Description:

Appearance:	Amur maple is a small tree up to 20' high with a broad crown, but often pruned as a hedge.
	Twigs are smooth and light colored.
Leaves:	Opposite, longer than wide and have three shallow lobes and double toothed edges, turning a brilliant red in fall.
Flowers:	Fragrant flowers appear in loose clusters with young leaves in May and June.
Fruit:	Numerous reddish, two-winged, inch-long fruit mature in late summer.

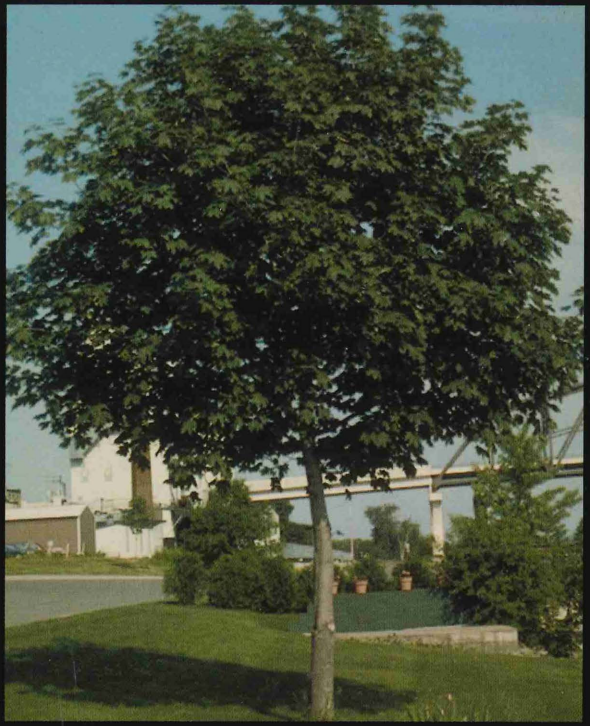
Ecological Threat:

- It displaces native shrubs and understory trees in open woods, and shades out native grasses and forbs in savanna habitat.
- A prolific seed producer, Amur maple is becoming a major weed in the northern U.S. Extensive wild populations have been found in Illinois and Missouri. It resprouts easily from the cut stump.
- Amur maple is a native of central and northern China, Manchuria and Japan, it was introduced to North America in the 1860s. It is still being frequently sold commercially as an ornamental, and for wildlife and shelterbelt plantings.

Control Methods:

Mechanical	Chemical
Prescribed burning will set it back but not eliminate Grubbing out small quantities	Cut-stump treatment with glyphosate

Norway maple
Acer platanoides



Norway maple

Acer platanoides

Description:

Appearance: Large deciduous tree, dense canopy, 60' high when mature. **Similar to native sugar maple except: broken leaf emits milky sap, upright green flower clusters, widely spreading winged fruit, regularly grooved bark, fall color always yellow.**

Leaves: Opposite, five lobed, coarsely toothed, pointed.

Flowers: Flat-topped upright cluster, yellowish green, appearing with the leaves, blooming in May.

Fruit: Widely spreading winged fruit, ripens in autumn.

Ecological Threat:

- It invades native woodlands by out-competing sugar maple as it is also very shade tolerant. Wildflower diversity is reduced beneath because it forms a more dense canopy.
- Although sold primarily as a boulevard tree it spreads by seeds into disturbed forest communities.
- It is native to Europe and Asia and widely sold in nurseries in the U.S.

Control Methods:

Mechanical	Chemical
Pulling seedlings when soil is moist	Cut-stump treatment with glyphosate

Japanese barberry
Berberis thunbergii

Japanese barberry *Berberis thunbergii*

Description:

Appearance: Small, compact, spiny shrub, 3 - 6' tall with slightly curving branches.

Leaves: Small rounded untoothed, arranged in clusters above single spines, appear early in the spring.

Flowers: Yellow, single or in clusters of 2 - 4 blossoms; blooming in May.

Fruit: Bright red, egg-shaped small berries, in clusters or single, mature in August and stay on the shrub through winter.

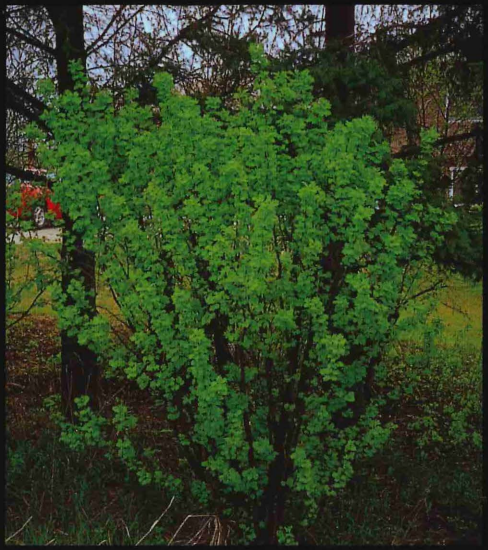
Ecological Threat:

- It invades oak woodlands and oak savanna and prefers well-drained soils.
- Once established its prolific spreading shades out native plants.
- It regenerates from seed, dispersed primarily by birds, and vegetatively through horizontal lower branches that root freely, sending up new sprouts.
- Japanese barberry was introduced to North America as ornamental as a living fence and for wildlife and erosion control.

Control Methods:

Mechanical	Chemical
Prescribed fire effectively kills the plant	Cut-stump treatment with glyphosate or triclopyr is effective
Regular mowing of resprouts after initial removal	
Pulling plants in small infestations	

Siberian peashrub
Caragana arborescens



Siberian peashrub

Caragana arborescens

Description:

Appearance:	Upright shrub or small tree, up to 18' high. Narrow branching, gray bark and branches; young twigs, yellowish-green.
Leaves:	Alternate, compound, 2-4" long consisting of 8-12 pairs of leaflets; leaflets elliptic.
Flowers:	Yellow, single, tubular, at the end of a stalk that grows from the leaf axil; blooms in May-June.
Fruit:	Pods 1-2" long, sharply pointed, brown and smooth.

Ecological Threat:

- It invades savanna and woodland edge environments where it competes with native shrubs. Invades disturbed grasslands as well.
- It is still sold as an ornamental and for shelterbelt and wildlife plantings.
- It is native to Siberia and Manchuria.

Control Methods:

Mechanical	Chemical
Repeated prescribed burning, it will stump sprout but be weakened Pulling	Cut-stump treatment with glyphosate

Russian olive
Elaeagnus angustifolia

Russian olive

Elaeagnus angustifolia

Description:

Appearance:	Large deciduous shrub or small tree, up to 25' tall. Spreading branches form into a dense rounded crown. Thin bark comes off in narrow, elongate, fibrous strips. Twigs are very flexible and bear a terminal spine.
Leaves:	Alternate, distinctive silver-gray lanceolate.
Flowers:	Yellow spicy-fragrant flowers are borne either individually or in small clusters in the leaf axils, blooming in late spring.
Fruit:	Dry, olive-like, hard; seeds remain viable in the soil for three years.
Roots:	Deep taproot, is capable of fixing nitrogen in the soil.

Ecological Threat:

- Russian olive quickly takes over streambanks, lake shores and prairies, choking out native vegetation of riparian habitat. It tolerates shade and a variety of soil moisture conditions. It interferes with nutrient cycling and taxes water reserves.
- It also propagates vegetatively by sprouts from buds formed on the root crown and by root suckers.
- Russian olive is a native of southern Europe and western Asia it was introduced to North America as an ornamental and as a windbreak plant in the late 1800s.
- It can grow on bare mineral soil which encouraged planting it on mine spoils.

Control Methods:

Chemical	Biological
Cutting and stump treatment with herbicide is effective for large trees. The plant is fire resistant.	Natural disease affect Russian olive to a great extent, such as Verticillium wilt and Phomopsis canker.

Exotic honeysuckles

Lonicera tartarica, Lonicera morrowii, Lonicera x bella

Exotic honeysuckles

Lonicera tartarica, Lonicera morrowii, Lonicera x bella

Description:

Appearance: Upright deciduous shrubs, 5 - 10' high. Lonicera x bella is a horticultural hybrid. Older stems have shaggy bark and are often hollow.

Leaves: Opposite, simple, oval, and untoothed. L. tartarica has smooth, hairless leaves, L. morrowii has downy leaves.

Flowers: Fragrant, tubular, bloom in May and June, white, red, but most often pink.

Fruit: Fruits are red or yellow, situated in pairs in the leaf axils.

Roots: Roots are fibrous and shallow.

Ecological Threat:

- Exotic honeysuckle replace native forest shrubs and forbs by their invasive nature and early leaf-out, by shading the herbaceous ground cover and depleting soil moisture.
- Seeds are readily dispersed by birds.
- Some research suggests that the plant inhibits the growth of other plants in its vicinity.
- Introduced to North America as ornamental shrubs and beneficial to wildlife. Commercial propagation continues with many cultivars available from nurseries.

Control Methods:

Mechanical	Chemical
Pulling seedlings in small infestations when soil is moist	Stump treatment with glyphosate solution
Prescribed burning will kill seedlings and top kill mature shrubs, repeated burns may be needed	Foliage spraying with glyphosate solution, where burning is not possible, prior to leaf out of native species

Common buckthorn
Rhamnus cathartica

Common buckthorn

Rhamnus cathartica

Description:

Appearance: Tall understory shrub or small tree up to 20' high with a spreading loosely branched crown, often multiple stems at the base. Brown bark with elongate silvery corky projections (**Caution:** native plums or cherries have a similar bark).

Female and male plants.

Branches: Cut branch exposes yellow sapwood and orange heartwood. Twigs often end in stout thorns.

Leaves: Alternate, sometimes opposite; broadly elliptic pointed at the tip, smooth, dark glossy and small-toothed. Leaves stay green late into fall.

Flowers: Inconspicuous, appear in May or June, clustered in the axils of leaves.

Fruit: Clusters of black ¼ inch fruit ripen on female plants in August and September. Seeds are viable for 2 - 3 years in the soil.

Roots: Extensive fibrous root system.

Ecological Threat:

- Aggressively invades oak forests, savannas, prairies and riparian woods, completely eliminating native plant diversity in the understory over time. It thrives particularly on well-drained soils.
- Plants leaf out early and retain leaves late into the fall creating dense shade.
- Seeds have laxative effect on birds who disperse them.
- Introduced to North America as ornamental shrubs. Regulations forbid its sale in Minnesota. It is considered a restricted noxious weed.

Control Methods:

Mechanical
Prescribed fire for seedlings
Pulling in small infestations (weed wrench)
Chemical
Cut-stump treatment with glyphosate or triclopyr
Basal bark treatment on stems less than 3"

Glossy or alder buckthorn
Rhamnus frangula

Glossy or alder buckthorn

Rhamnus frangula

Description:

Appearance: Tall understory shrub or small tree, grows up to 20' high, has a spreading loosely branched crown, often multiple stems at the base. Brown bark with elongate silvery corky projections (**Caution:** native plums or cherries have a similar bark).

Branches: Cut branch exposes yellow sapwood and orange heartwood.

Leaves: Alternate, think, and ovate or elliptic smooth, dark glossy, margins are not toothed; stay green late into fall.

Flowers: Inconspicuous, appear in May or June, clustered in the axils of leaves.

Fruit: Ripens progressively from a distinctive red to a dark purple in August and September. Seeds are viable for 2 - 3 years in the soil.

Roots: Extensive fibrous root system.

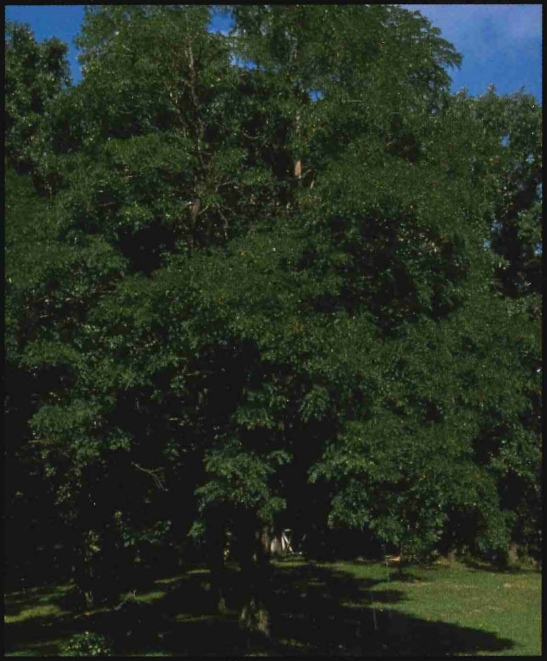
Ecological Threat:

- Aggressively invades wetlands including acidic bogs, calcareous fens and sedge meadows. Also grows in upland habitats, tolerates full sun to deep shade.
- Plants leaf out early and retain leaves late into the fall creating dense shade.
- Seeds have laxative effect on birds who disperse them.
- Introduced to North America as ornamental shrub, often planted in hedgerows. Regulations forbid its sale in Minnesota, it is considered a restricted noxious weed.

Control Methods:

Mechanical
Prescribed fire for seedlings
Pulling in small infestations (weed wrench)
Chemical
Cut-stump treatment with glyphosate or triclopyr
Basal bark treatment on stems less than 3"

Black locust
Robinia pseudoacacia



Black locust

Robinia pseudoacacia

Description:

Appearance: Fast growing tree up to 75' in height with an open crown. The bark is black and deeply furrowed with flat-topped ridges.

Seedlings and root sprouts have long thorns and grow rapidly.

Leaves: Alternate, pinnately compound (leaflets on both sides of a common stalk) with 7-21 elliptic, untoothed leaflets, with one leaflet at the tip. A pair of short, sharp thorns sit at the base of each leaf where it is attached to the twig.

Flowers: Fragrant, drooping white flowers arranged in elongated clusters appear in late May and June.

Seeds: Seed pods are smooth, 2-4" long; they mature in September and persist through winter.

Roots: Extensive fibrous root system. Spreads vegetatively as well as through root suckering.

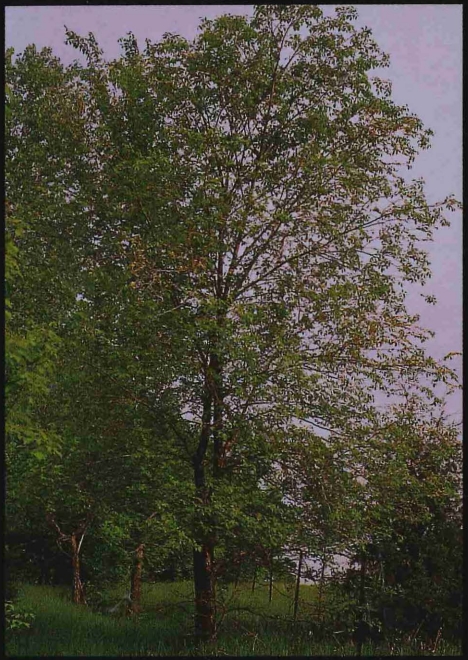
Ecological Threat:

- Invades primarily disturbed habitats, degraded wood, thickets and old fields crowding out native vegetation of prairies, oak savannas and upland forests, forming monotypic stands.
- It reproduces vigorously by root suckering and stump sprouting forming a common connecting root system.
- It is native to the U.S. and occurs naturally on the lower Appalachian mountain slopes. It has been extensively planted for its nitrogen-fixing qualities and its hard wood.

Control Methods:

Mechanical
Mowing and burning is only temporarily effective because of the tree's ability to resprout and spread vegetatively
Chemical
Cut-stump treatment with glyphosate or triclopyr (only in dormant season) is effective but must be done repeatedly
Foliar spray in monotypic stands with glyphosate

Siberian elm
Ulmus pumila



Siberian elm

Ulmus pumila

Description:

Appearance: Deciduous tree, 30 - 60' high with an open rounded crown and slender, spreading branches. Bark is dark gray and shallowly furrowed on a mature tree. Silver-gray twigs have a zig-zag shape with a leaf bud at each turn.

Leaves: Alternate, small, (1 - 2"), elliptic, toothed, short-pointed at the tip, slightly uneven at the base (much less than American elm).

Flowers: Greenish, lacking petals and occurring in small, compact, drooping clusters of 2 - 5, appear before leaves develop.

Fruit: Winged, round, and smooth, contains on seed; fruit hangs in clusters.

Roots: Extensive, shallow

Ecological Threat:

- The tree can invade and dominate disturbed prairies in just a few years.
- Seed germination rate is high and seedlings establish quickly in sparsely vegetated areas.
- It grows readily in disturbed areas with poor soils and low moisture.
- A native of eastern Asia, Siberian elm was introduced to the U.S. in the 1860s for its hardiness, fast growth, and ability to grow in various moisture conditions. It is still sold commercially as a shelterbelt and windbreak tree.

Control Methods:

Mechanical	Chemical
Girdling in late spring, plants will die over 1 - 2 years Prescribed burning Pulling seedlings	Cut-stump treatment with glyphosate during the growing season

Garlic mustard
Alliaria petiolata

Garlic mustard

Alliaria petiolata

Description:

Appearance: Biennial forb with weak single stems 12-36" high in its second and flowering year. Only plant of this height blooming white in wooded environments in May.

Leaves: Round, scallop-edged, dark green; first year, rosettes of 3 or 4 leaves; second year plants have alternate stem leaves. Leaves and stems smell like onion or garlic when crushed.

Flowers: White, small and numerous, with four separate petals. Each plant has one or two flowering stems on second year plants.

Seeds: Slender capsules 1-2½" long, containing a single row of oblong black seeds. Seeds are viable in the soil for 5 years.

Roots: White, slender taproot, "S"-shaped at the top.

Ecological Threat:

- Garlic mustard spreads into high quality woodlands upland and floodplain forests, not just into disturbed areas.
- Invaded sites undergo a decline on native herbaceous cover within 10 years.
- Garlic mustard alters habitat suitability for native insects and thereby birds and mammals.
- This European exotic occurs now in 27 midwestern and northeastern states and in Canada.
- Garlic mustard is on the prohibited noxious weed list in Minnesota.

Control Methods:

Mechanical
Pulling in areas of light infestations
Flowering stem cutting at ground level
Prescribed burning if there is enough fuel to carry the flames
Chemical
Spot application of 2% glyphosate in early spring or late fall when native plants are dormant

Hoary alyssum
Berteroa incana

Hoary alyssum

Berteroa incana

Description:

Appearance: Annual, occasionally biennial forb 1½-2' tall with an erect branched downy stem.

Leaves: Alternate, small lance-shaped and covered with a grayish down.

Flowers: Tiny white flowers are arranged in elongated clusters along a central stem, each flower with four deeply divided petals; blooming June through August.

Seeds: Seeds are round to oblong narrowly winged.

Roots: Taproot.

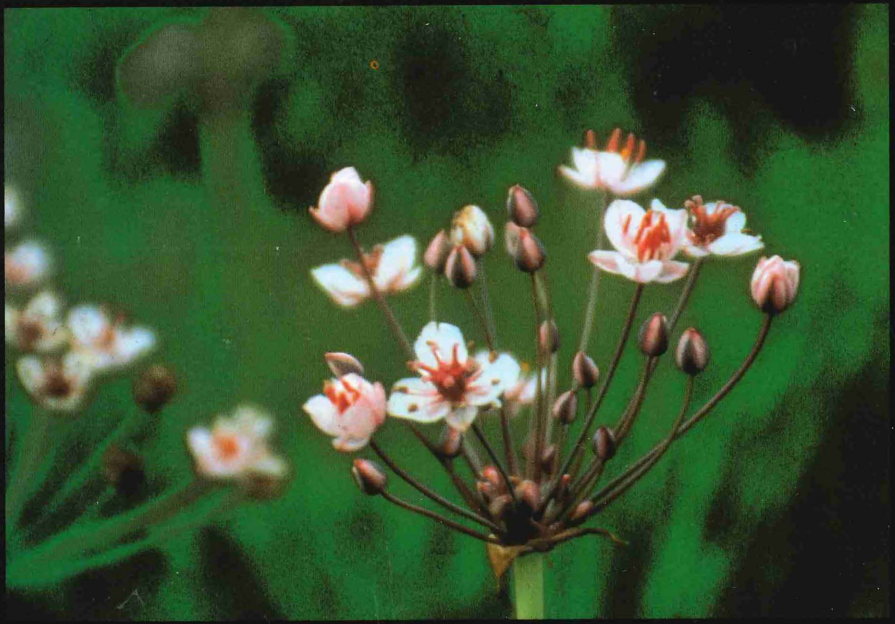
Ecological Threat:

- Hoary alyssum, a native of Europe, does not pose a threat to intact native grasslands at this time.
- It displaces native species particularly in dry prairies and sand blowouts where vegetation is sparse. It is most abundant in disturbed dry areas, fields and waste places.
- It can be a nuisance in prairie reconstruction and is listed on the secondary noxious weed list in Minnesota.

Control Methods:

Mechanical
Mowing, pulling and prescribed burning

Flowering rush
Butomus umbellatus



Flowering rush

Butomus umbellatus

Description:

Appearance:	Perennial aquatic emergent forb. It grows 1-4' high on an erect stem along shores. In deeper water it grows submerged without producing flowers.
Leaves:	Leaves are sword-shaped, triangular in cross section.
Flowers:	Pink flowers are arranged in umbels.
Seeds:	Populations in the eastern U.S. produce seeds. Only one Minnesota population (Forest Lake) produces viable seeds.
Roots:	Reproduces by vegetative spread from its rootstock in form of bulb-lets. Both seeds and bulb-lets are dispersed by water current.

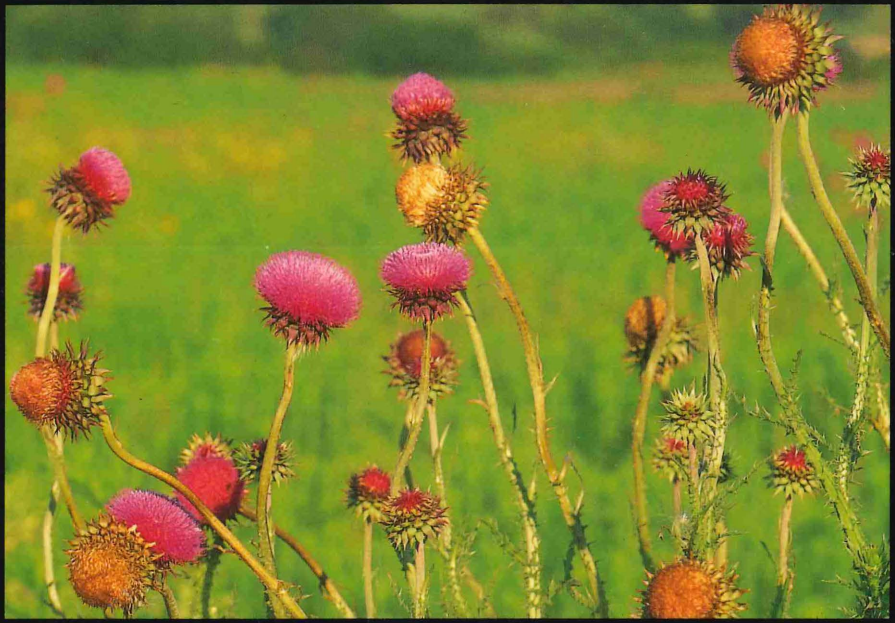
Ecological Threat:

- Flowering rush is actively expanding. It has spread from a limited area around the Great Lakes and the St. Lawrence river to sporadically appear in the northern U.S. and southern Canada.
- It competes with native emergent vegetation.
- It is a Eurasian plant that was sold commercially for use in garden pools. It is now illegal to buy, sell or possess the plant.
- There is documentation from a site in Idaho, between 1956 and 1973, where flowering rush appeared to be out-competing willows and cattails.

Control Methods:

Mechanical	Chemical
Cutting and digging	Treat with glyphosate (Rodeo for aquatic areas)

Musk or nodding thistle
Carduus nutans



Musk or nodding thistle

Carduus nutans

Description:

Appearance: Biennial forb, between 1½-6' tall, multi-branched stem. Plants overwinter in the rosette stage.

Leaves: Alternate, coarsely lobed, dark green with light-green midrib, smooth and hairless.

Large first year rosette leaves.

Flowers: Disk-shaped flowerheads contain hundreds of tiny individual purple flowers which bloom from June to August. Flowerheads droop to a 90 degree angle from the stem when mature.

Seeds: 10,000 straw-colored seeds with plume-like bristles. They remain viable in the soil for over 10 years.

Roots: Each plant has a fibrous taproot.

Ecological Threat:

- It generally does not pose a threat to high quality areas. It colonizes primarily in disturbed areas.
- Musk thistle is unpalatable and therefore invites selective grazing on native grasslands, giving the thistle a competitive edge.
- It grows best in disturbed areas such as pastures, roadsides, and ditchbanks, but also in hayfields and disturbed prairies.
- A native of western Europe it was introduced to the U.S. in the early 1800s, and is declared an agricultural pest.
- Musk thistle is on the prohibited noxious weed list in Minnesota.

Control Methods:

Mechanical	Chemical	Biological
Pulling or mowing in early bud or bloom stage, then dispose	Spot-spraying when plants are in rosette stage (first year) in the fall when non-target plants are less susceptible Do not use in high quality natural areas	Thistlehead-feeding weevil and rosette-feeding weevil. **Caution:** Observations of weevils feeding on native thistles

Spotted knapweed
Centaurea maculosa

Spotted knapweed

Centaurea maculosa

Description:

Appearance: Biennial or short-lived perennial, 2 - 3' high. Basal leaves form a rosette the first year from which grow 1 - 20 wiry, hoary, branched stems during the second year.

Leaves: Alternate, grayish, hoary, and divided into lanceolate lobes decreasing in size at the top.

Flowers: Thistle-like pink to purple flowers sit at the tips of terminal and axillary stems, bloom from July through September.

Seeds: Brownish, ¼" long with small tuft of bristles, dispersal mostly stationary, over distance by rodents, livestock and commercial hay. Seed viable in the soil for 7 years.

Roots: Stout taproot.

Ecological Threat:

- Especially threatens dry prairie, oak and pine barrens, dunes and sandy ridges.
- Spotted knapweed is poisonous to other plants (phytotoxic).
- Spreads rapidly in artificial corridors, gravel pits, agricultural field margins and overgrazed pastures.
- A native of Europe and Asia it has become a serious problem in pastures and rangeland of the western states.

Caution: Wear long sleeves and gloves, can be a skin irritant to some people.

Control Methods:

Mechanical	Chemical	Biological
Early detection and pulling	Effective means of control with selective herbicides, s.a. picloram and clopyralid but caution in quality natural areas, it targets native perennials of the daisy and pea families as well	Thirteen insects identified
Mowing at peak flowering, removing flowers from site		Two seedhead flies are most promising
Prescribed burning, only very hot burns are effective which may also damage native plants		

Oxeye daisy
Chrysanthemum leucanthemum
or *Leucanthemum vulgare*

Oxeye daisy

Chrysanthemum leucanthemum or *Leucanthemum vulgare*

Description:

Appearance:	Perennial forb, thin 1 - 2' tall stems typically branch above to produce two or more flower heads; smells like sage. It is the only large white daisy and has escaped gardens.
Leaves:	Alternate, deeply cut and lobed.
Flowers:	White daisies with yellow central disc, 2" across, bloom all summer.
Seeds:	Tufted, dispersed by wind.
Roots:	Spreads vegetatively by horizontal roots under the soil surface (rhizomes).

Ecological Threat:

- It is not a threat to intact prairies and savannas.
- It frequently invades disturbed fields and meadows, competing with native plants, especially under grazing pressure.
- Probably introduced as an ornamental from Europe and escaped to become one of the most common roadside weeds.
- Oxeye daisy is on the "secondary noxious weed" list in Minnesota.

Control Methods:

Mechanical
Repeated pulling on small infestations is effective

Canada thistle
Cirsium arvense

Canada thistle

Cirsium arvense

Description:

Appearance: Perennial forb, 2 - 5' tall with slender grooved stems that branch only at the top. It has male and female plants.

Leaves: Alternate, smooth, oblong, tapering, and directly attached to the stem, deeply divided, with prickly margins.

Flowers: Numerous small purple flowers appear on top of the upper branched stems between June and September.

Seeds: Small light brown seeds are tufted for dispersal by the wind. Seeds remain viable in the soil for over 20 years.

Roots: Each plant has a fibrous taproot with wide spreading horizontal roots. Each small section of root can form a new plant enabling the plant to spread vegetatively.

Ecological Threat:

- Canada thistle invades natural areas such as prairies, savannas, glades and dunes if some degree of disturbance already exists. It also invades wet areas with fluctuating water levels such as streambanks, sedge meadows and wet prairies.
- Once it has established itself it spreads quickly replacing native plants, diminishing diversity. It grows in circular patches spreading vegetatively through horizontal roots which can spread 10 - 12' in one season.
- Canada thistle occurs throughout the northern U.S. from northern California to Maine and southward to Virginia and in Canada.
- It has been declared a noxious weed in 43 states as one of the most tenacious agricultural weeds.
- Canada thistle is on the "prohibited noxious weed" list in Minnesota

Control Methods:

Mechanical	Chemical
Repeated pulling and mowing will weaken roots, mowing when flower buds are just to open	Spot application with glyphosate or with selective herbicide clopyralid (Transline)
Late spring burns May/June are most detrimental, but also stimulates seed germination; burn consecutively for 3 years	

Bull thistle
Cirsium vulgare

Bull thistle

Cirsium vulgare

Description:

Appearance: Bull thistle is a biennial plant, between 3 - 6' tall with one erect branched stem. It grows a rosette in its first year and blooms in its second year.

Leaves: Alternate, coarsely lobed, each lobe with a spine at its tip. Spines extend downward from the leaves along prominent ridges of the stem. Upper leaf surface is rough.

Flowers: Disk-shaped flowerheads contain hundreds of tiny individual purple flowers which bloom from June to August.

Seeds: Reproduction occurs through up to 10,000 straw-colored seeds with plume-like bristles. They remain viable in the soil for over 10 years.

Roots: Each plant has a fleshy taproot.

Ecological Threat:

- It colonizes primarily in disturbed areas such as pastures, roadsides, and ditchbanks, but also in hayfields and disturbed prairies.
- Bull thistle is unpalatable to most grazing animals and therefore invites selective grazing, giving the thistle a competitive edge.
- It generally does not pose a threat to high quality areas. Does not withstand cultivation.
- It was introduced to the U.S. in the early 1800s from Europe and Asia.
- Bull thistle is on the "prohibited noxious weed" list in Minnesota.

Control Methods:

Mechanical	Chemical	Biological
Pulling or mowing in early bud or bloom stage, and dispose off-site	Spot-spraying when plants are in rosette stage (first year) in the fall when non-target plants are less susceptible Do not use this method in high quality natural areas	Thistlehead-feeding weevil and rosette-feeding weevil. **Caution:** There have been observations of weevils feeding on native thistles

Crown vetch, axseed
Coronilla varia

Crown vetch, axseed

Coronilla varia

Description:

Appearance: Perennial forb growing 2 - 6' long stems with a reclining and trailing growth pattern. In winter and early spring crown vetch can be easily recognized as brown unsightly patches.

Leaves: Pinnately compound, (leaflets on both sides of a common stalk) with 15 - 25 pairs of oblong leaflets.

Flowers: Clustered in flat-topped umbels ranging from pink, lavender to white on extended stalks which grow from the leaf axils; blooming from May through August.

Seeds: Slender seeds are contained in finger-like pods; they remain viable in the soil for 15 years.

Roots: Rhizomateous roots can grow up to 10' long, contributing to extensive vegetative spread.

Ecological Threat:

- It is now a serious invader of prairies and dunes.
- It is found in disturbed remnant prairies and woodland edges, gravel bars along streams, as well as agricultural land and roadsides. It prefers open and sunny areas.
- It was introduced from Europe and southeast Asia during the 1950s as groundcover, bank and slope stabilizer along roads and waterways, and as green fertilizer crop, and it is still sold commercially.

Control Methods:

Mechanical
Prescribed burning in late spring for several successive years
Mowing in June and late August for several successive years
Chemical
Foliar application in early spring with clopyralid a selective herbicide eliminating herbaceous plants of the sunflower and pea families

Queen Ann's lace, *Daucus carota*

Queen Ann's lace

Daucus carota

Description:

Appearance: Biennial forb, 3 - 4' tall, consists of one or several hairy hollow stems, growing from one central stem, each with a flower umbel at the top. Plant smells like a carrot, it is the ancestor of the garden carrot. Appears as rosette in its first year.

Leaves: Alternate, start immediately below the flower, increasing in size down the stem. They are pinnately divided (leaflets are arranged on both sides of a common stalk).

Flowers: Compound, flat-topped umbels (small umbels within a large umbel) umbels becoming concave when mature; bloom May through October.

Seeds: Barbed small seeds, promotes dispersal by animals and wind, seeds stay viable in the soil for 1 - 2 years.

Roots: Slender, woody taproot, carrot-like in smell and taste.

Ecological Threat:

- It invades disturbed dry prairies, abandoned fields, waste places, and road sides. It is a threat to recovering grasslands and can be persistent on clay soils.
- A native of Europe and Asia it now occurs throughout the U.S.
- Low priority for control tends to decline as native grasses and forbs become established.
- Queen Ann's lace is on the "secondary noxious weed" list in Minnesota.

Control Methods:

Mechanical
Hand-pulling or mowing in mid to late summer before seed set

Grecian foxglove
Digitalis lanata

Grecian foxglove

Digitalis lanata

Description:

Appearance:	Perennial forb; first year rosette; second year single coarse erect stem 3 - 4' high.
Leaves:	First year rosette leaves spear-shaped and dark green, second year alternate along stem.
Flowers:	Elongated flower cluster, conspicuous cream colored, tubular flowers, with purplish-brown veins, blooming in June.
Seeds:	In pods with small hooks which attach easily to fur and clothes.

Ecological Threat:

- In Minnesota it has been found primarily in Washington County in the vicinity of the St. Croix River along sunny to semi-shaded road ditches.
- It grows in monotypic stands and is a potential threat to savanna and prairie communities.
- It is toxic to humans and animals.
- It is native to southeastern Europe's scrub oak forests.

Control Methods:

Mechanical	Chemical
Pulling and cultivation	Spot spraying with glyphosate

Leafy spurge
Euphorbia esula

Leafy spurge

Euphorbia esula

Description:

Appearance: Perennial forb, 2 - 3½' tall, erect branching, smooth stems growing from a deep vertical root. Stems, flowers, and leaves emit a white milky sap when broken.

Leaves: Alternate, small, oblong to lance-shaped, on the upper part of stem; scale-like on the lower part of the stem.

Flowers: Small, borne by showy yellow-green bracts which open in late May; flowers bloom from June into fall. Umbel-like flower cluster, 7 - 10, at the top of each stem, single, stemmed flowers grow from leaf axils below.

Seeds: Explosive dispersal from a seed capsule up to 15'; high germination rate; seeds remain viable in the soil for 7 years.

Roots: Extensive deep root system, vegetative reproduction from crown and root buds.

Ecological Threat:

- Rapidly invades primarily non-cropland disturbed environments.
- Is a threat primarily to mesic and dry prairies and savannas, quickly displacing native plants.
- Tolerant of a wide range of habitats, from dry to moist, and sunny to semi-shade. Most aggressive in dry soil conditions where there is less competition from native plants.
- Native to Europe and Asia it occurs across much of the northern U.S. in the grasslands and savannas of the Great Plains.
- Leafy spurge is on the prohibited noxious weed list in Minnesota.

Control Methods:

Mechanical & Chemical	Biological
Prescribed burning in conjunction with repeated treatment with glyphosate	Root-boring beetle, four root-mining beetles, shoot-tip gall midge; grazing goats
All require repeated applications 2x per year and over several years to be effective; picloram (Tordon) is most effective	

Creeping Charlie, ground ivy, gill-over-the-ground
Glechoma hederacea

Creeping Charlie, ground ivy, gill-over-the ground;

Glechoma hederacea

Description:

Appearance: Perennial forb with creeping square stems (indicates member of the mint family) that grow about 2' long, flowering stems are erect.

Leaves: Opposite, long stalked and bluntly toothed, bright green and shiny with palmate veins.

Flowers: Light blue to bluish-purple, tubular, directed to one side of the stem. They bloom from April to June.

Seeds: Small flat nutlets.

Roots: Roots grow from each leaf node that creeps along the soil surface spreading vegetatively as well.

Ecological Threat:

- It is not a threat to healthy native plant communities.
- Ground ivy grows best in semi-shaded to shaded moist soils and forms a dense mat, smothering other vegetation.
- It is a common urban weed and grows mostly in disturbed, degraded places.
- Ground ivy is found in most of the world of similar climate. It is know to have medicinal properties.

Control Methods:

Mechanical	Chemical
Pulling can control small infestations	Spraying with glyphosate

Yellow iris
Iris pseudacorus

Yellow iris

Iris pseudacorus

Description:

Appearance: Perennial aquatic emergent forb, grows 2 - 3' tall along shores.

Leaves: Broad, flat, sword-shaped, stalkless, leaves embracing flower stalk.

Flowers: Deep yellow, 2 or 3 on one stalk, flower stalk round, shorter than outer leaves, three outer drooping sepals, with brownish mottled markings, surrounding the true flower; blooms May through July.

Seeds: Capsule containing numerous smooth, flattened seeds.

Roots: Reproduces vegetatively through creeping rhizomes.

Ecological Threat:

- It competes with native emergent vegetation.
- It is a Eurasian plant that is still sold commercially for use in garden pools.

Control Methods:

Mechanical	Chemical
Digging to eliminate vegetative spreading	Spraying with glyphosate (Rodeo for aquatic areas)

Butter and eggs or common toadflax
Linaria vulgaris

Butter and eggs or common toadflax *Linaria vulgaris*

Description:

Appearance: Butter and eggs is a 1 - 2' high perennial forb with multiple erect stems growing from rootstalks.

Leaves: Alternate, smooth, ½ - 1½" long and narrow.

Flowers: Bright yellow flowers with a long spur are arranged in an elongated cluster of 15 - 20 flowers along each stem; blooming from mid July until late September.

Seeds: Small seeds are easily dispersed by wind and water, and stay viable in the soil for up to 8 years.

Roots: Root buds form on the taproot and lateral roots. Spreads also vegetatively, root fragments the size of ½" are capable of producing a new plant.

Ecological Threat:

- This plant has the ability to adapt to various site conditions, in Minnesota it grows on gravelly to sandy soil along roadsides, railroad yards, waste places, dry fields, pastures and croplands.
- It competes well against less aggressive native species in gravelly and sandy soils; its capability to spread also vegetatively is largely responsible for its invasive behavior.
- It presents a problem in prairie reconstruction projects, once it has established itself.
- This plant is a serious problem in Alberta and is on the state noxious weed list in New Mexico and Arizona.
- This plant was introduced into North America as an ornamental from the steppes of Europe and Asia in the 1700s, and is still commercially available.

Control Methods:

Mechanical	Biological
Frequent mowing to weaken the plant	Two European beetles that feed on buds, flowers and seed capsules

Birdsfoot trefoil
Lotus corniculatus

Birdsfoot trefoil

Lotus corniculatus

Description:

Appearance: Birdsfoot trefoil is a perennial forb. The clover-like plant has a sprawling growth pattern, and gets 12 - 24" tall.

Leaves: Three clover-like leaflets on a short stem with two additional leaflets at the base of the stem.

Flowers: Yellow pea-like flowers occur typically in flat-topped clusters of 3 - 12, ½" long flowers which are sometimes tinged with red. Blooms most of the summer.

Fruit: One-inch long brown seed pods are produced in clusters, resembling a bird's foot.

Ecological Threat:

- Birdsfoot trefoil forms dense mats choking and shading out most other vegetation.
- It grows best in the Midwest and is most problematic in prairies and open areas.
- Prescribed burns increase seed germination making it troublesome in native prairies.
- This European species has been introduced to the U.S. and Canada for livestock forage and erosion control along roadsides. It is still sold commercially.

Control Methods:

Mechanical	Chemical
Mowing frequently at a height of less than 2" for several years, (this will be stressful to native plants as well).	Spot spraying affected areas, after re-greening from a burn or mowing, with clopyralid (transline+silken surfactant+dye). (This selective herbicide kills also native plants of the sunflower and pea families.)

Purple loosestrife
Lythrum salicaria

Purple loosestrife

Lythrum salicaria

Description:

Appearance: Perennial forb, 3 - 7' tall with multiple (30 - 50) five or six-sided woody stems arising from a single rootstock.

Leaves: Opposite or alternating in 90° angles, sometimes appearing in groups of three, lance-shaped, downy with smooth edges and stalkless.

Flowers: Magenta-colored flower spikes bloom all summer. Individual flowers have 5 or 6 petals.

Seeds: Tiny, 2-7 million per plant annually, viable in the soil for many years.

Roots: Large, woody taproot with extending fibrous rhizomes forming a dense mat.

Ecological Threat:

- Purple loosestrife invades many wetland types including wet meadows, stream banks, pond or lake edges and ditches. It's ability to also reproduce vegetatively allows it to expand quickly and form monotypic stands that choke out native plants.
- Purple loosestrife was introduced from Europe as a garden perennial.
- Regulations forbid its sale in 24 states including Minnesota, Wisconsin and Illinois.

Control Methods:

Mechanical	Chemical	Biological
Pulling and digging small infestations of young plants, or when growing in sandy soil, before seed ripens. For larger plants use a garden fork. Cutting at groundlevel at blooming time	Spot spraying with glyphosate (Rodeo for aquatic areas) in midsummer. Most effective in fall when plant is preparing for dormancy.	Two leaf-eating beetles, *Galerucella* spp., are available for control of purple loosestrife. The beetles have been very effective at reducing loosestrife infestations at many locations nationwide.

White and yellow sweet clover

Melilotus alba, Melilotus officinalis

White and yellow sweet clover *Melilotus alba, Melilotus officinalis*

Description:

Appearance: Biennial forbs, they are very similar. Yellow sweet clover is usually shorter and blooms earlier. First year plants do not bloom. Second year plants grow 3 - 5' high and are bush-like. Sweet clovers are very fragrant.

Leaves: Alternate, divided into three finely toothed leaflets, middle leaflet is stalked.

Flowers: Crowded densely at the top four inches along a central stem, each flower is attached by a minute stalk; bloom June through August on second year plants.

Seeds: One or two hard small seeds per flower; they stay viable in the soil for 30 years.

Roots: Strong taproot.

Ecological Threat:

- Sweet clover invades and degrades native grasslands by overtopping and shading native sun-loving plants thereby reducing diversity. It grows abundantly on disturbed lands, roadsides and abandoned fields.
- It responds favorable to prescribed burns by scarifying seeds thereby stimulating germination. First year plants are hard to detect.
- Native to Europe it was brought to the U.S. in the late 1600s and still used today as a forage crop and soil enhancer predominantly in the Great Plains and Upper Midwest.

Control Methods:

Mechanical	Chemical
Prescribed burning, a hot early complete first year burn followed by a hot late spring second year burn, (repeat after two years) Hand pulling, effective on small infestations when the soil is moist Cutting, before flowers emerge	Spray emergent seedlings with 2,4-D amine or mecamine after a fall burn, or after a spring burn before native vegetation emerges
The key to controlling sweet clovers is to halt the flowering stage and then concentrate on depleting viable seeds in the soil. Be aware that too frequent measures can also hurt native plants.	

Wild parsnip
Pastinaca sativa

Wild parsnip

Pastinaca sativa

Description:

Appearance: Monocarpic perennial (plant spends one or more years in rosette stage, blooms under favorable conditions, and then dies); grows 6" high in the rosette stage and 4' high on stout, grooved stems in the flowering stage.

Leaves: Alternate, leaf is made up of 5-15 egg-shaped leaflets along both sides of a common stalk; leaflets sharply-toothed or lobed at the margins; upper leaves smaller.

Flowers: Flat-topped broad flower cluster 2-6" wide, numerous five-petaled yellow flowers; bloom from June to late summer.

Seeds: Small, flat, round, slightly ribbed, straw-colored, abundant take 3 weeks to ripen before they can reseed; viable in the soil for 4 years.

Roots: Long, thick, edible taproot.

Warning – Avoid skin contact with the toxic sap of the plant tissue by wearing gloves, long sleeves and long pants. The juice of wild parsnip in contact with skin in the presence of sunlight can cause a rash and blistering and discoloration of the skin (phytophotodermatitis).

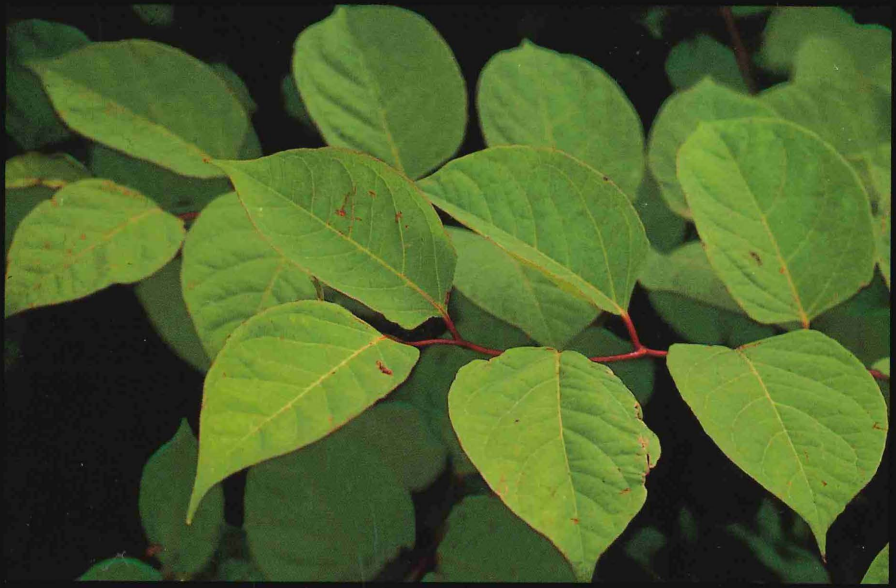
Ecological Threat:

- Well established prairies are not likely to be invaded by wild parsnip, but it readily moves into disturbed habitats, along edges and or in disturbed patches. It invades slowly, but once population builds it spreads rapidly and can severely modify open dry, mesic, and wet-mesic habitats.
- It is primarily a problem in southeastern Minnesota in prairies and oak openings.
- A native of Europe and Asia this plant has escaped from cultivation, it is grown as root vegetable, and is common throughout the U.S.

Control Methods:

Mechanical
Do nothing in healthy prairies, natives can sometimes outcompete the parsnip
Hand pulling and removing of plants
Cut the plant below the root crown before seeds set, and remove the cut plant
Mow or cut the base of the flowering stem and remove
Chemical
Use sparingly in quality habitats
Spot application with glyphosite after a prescribed burn, parsnip is one of the first plants to green up

Japanese knotweed
Polygonum cuspidatum



Japanese knotweed

Polygonum cuspidatum

Description:

Appearance:	Shrub-like, arching perennial forb, over 10' high, reddish-brown stems, smooth, stout hollow and swollen at the joint where the leaf meets the stem.
Leaves:	Alternate broadly oval and pointed at the tip, about 6" long, 3 - 4" wide.
Flowers:	Greenish-white, branched clusters which grow from leaf axils, near the end of stems, blooming in late summer.
Fruit:	Small winged, carry triangular, shiny and very small seeds.
Roots:	Long, stout rhizomes allow the plant to spread vegetatively as well.

Ecological Threat:

- Japanese knotweed spreads primarily vegetatively to form dense thickets that suppress native vegetation.
- It can pose a significant threat to riparian areas, such as disturbed stream sides and other low lying areas, where it can rapidly colonize. It tolerates full shade, high temperatures, high salinity and drought.
- It is currently occurring from Maine to Minnesota and south to Louisiana and scattered in midwestern and western states. It was introduced to the U.S. in the late 1800s for ornamental purposes and erosion control.

Control Methods:

Mechanical	Chemical
Digging plants is effective for small infestations and in sensitive areas Pulling of juvenile plants	Cut stem treatment with glyphosate or triclopyr Foliar spray in large monotypic populations

Sow thistle
Sonchus arvensis

Sow thistle

Sonchus arvensis

Description:

Appearance: Perennial forb, 2 - 5' tall erect, single stem, branches near the top into several flower stalks. Broken stems emit a sticky milky bitter juice with a sour odor.

Leaves: Alternate, lower leaves are deeply lobed, upper leaves clasp the stem; similar to dandelion leaves except with teeth ending in small weak prickles.

Flowers: Bright yellow up to 2" wide daisies, blooming from June through August.

Seeds: Tufted, dispersed by the wind.

Roots: Widely spreading white brittle roots penetrating five to ten feet, producing new plants from small root pieces.

Ecological Threat:

- Spreads vegetatively as well as through windborn seeds. Each tiny piece of root can grow another plant.
- It colonizes in cultivated fields, pastures, woodlands, roadsides and gardens.
- It is not a serious threat to intact native plant communities.
- It is common throughout the U.S. and is considered a noxious weed in Minnesota.
- Sow thistle is on the prohibited noxious weed list in Minnesota.

Control Methods:

Mechanical	Chemical
Cuting and pulling	Spraying with glyphosate

Cow vetch and hairy vetch

Vicia cracca and vicia villosa

Cow vetch and hairy vetch

Vicia cracca and vicia villosa

Description:

Appearance: Both plants are annual or short-lived perennial forbs. Their weak stems grow 2 - 3' high and clamber over other vegetation, smothering it. The stem of hairy vetch has spreading hairs.

Leaves: Alternate, pinnately compound (leaflets on both sides of a common stalk); 8 - 12 pairs of narrow oval-shaped opposite leaflets.

Flowers: Violet-blue on cow vetch and blue and white on hairy vetch. They are clustered on one-sided spikes and bloom from May to August.

Seeds: Seeds are contained in numerous inch long pods. Pods of cow vetch are brownish lance-shaped and flat; pods of hairy vetch are gray to black and hairy.

Roots: Both plants have a 1 - 3' long taproot.

Ecological Threat:

- Both vetches are not a threat to healthy native prairies at this time, but can be a problem in prairie reconstructions and on disturbed sites.
- They grow best on the dry sandy soils of disturbed fields and thickets.
- Both vetches are naturalized in the U.S. and are grown for forage, green fertilizer or cover crop. They occur throughout the eastern and midwestern states extending into southern Canada.

Control Methods:

Mechanical	Chemical
Pulling small infestations before seeds develop, to free native plants	Spray with selective herbicide such as clopyralid (Transline).

Smooth brome grass
Bromus inermis

Smooth brome grass

Bromus inermis

Description:

Appearance: Perennial cool season grass, 2 - 3' high, hairless erect stem.

Leaf blade: Conspicuous "M"- or "W"-shaped constriction, blade is about ¼" wide.

Flower: Open panicle (main axis with subdivided branching), erect with ascending branches, blooming in June and July.

Seeds: Reproduces by seed and vegetatively by rhizomes.

Ecological Threat:

- It spreads into degraded prairies, roadsides and ditches and moist wooded areas.
- It is widely planted as a forage grass and for hay production.
- Smooth brome was imported in the late 1800s and is widely used as a forage grass and for erosion control.
- It is tolerant of a wide variety of conditions, but prefers moist soils and sunny locations.

Control Methods:

Mechanical	Chemical
Late spring prescribed burns will decrease it	Mowing and then after a flush of growth spraying repeatedly with glyphosate

Silver banner grass
Miscanthus sinensis

Silver banner grass

Miscanthus sinensis

Description:

Appearance: Perennial warm season grass, 6-10' tall, very showy and vigorous, forms dense mats.

Leaves: Arching leaf blades with distinct whitish midrib, less than 1" wide.

Flowers: Silky plume-like, late summer and fall; resemble corn tassles but are more dense and arch to one side of the stalk.

Roots: Spreads vigorously by rhizomes, eventually forming a dense mat.

Ecological Threat:

- It invades disturbed sunny to semi-shaded environments, such as road sides, woodland borders, and clearings.
- Although not a severe threat at this time it forms monotypic stands. It should be monitored and eliminated in the open landscape.
- Silver banner grass is native to eastern Asia and is a popular ornamental grass. it is found primarily in the eastern U.S., but exists also in Minnesota.

Control Methods:

Mechanical	Chemical
Digging entire roots, resprouts from root pieces	Cutting and spot treatment with glyphosate, continued periodically until flowering

Reed canary grass
Phalaris arundinacea

Reed canary grass

Phalaris arundinacea

Description:

Appearance: Perennial coarse cool season grass that grows 2 - 6' high. It had been especially selected for its vigor, and is one of the first to sprout in spring. Erect hairless stems.

Leaf blades: ¼"-⅓" wide, gradually tapering, up to 10" long. It has a highly transparent ligule (a membrane where blade and sheath meet) which distinguishes it from the native bluejoint grass.

Flowers: Densely clustered single florets, green to purple changing to beige over time, blooms May to mid-June.

Roots: Rhizomatous roots, (stems that grow under or along the ground sending new shoots above the ground and roots below), creating a thick impenetrable mat at or directly below the soil surface.

Ecological Threat:

- Reed canary is a major threat to natural wetlands. It out competes most native species.
- It presents a major challenge in wetland mitigation efforts.
- It forms large, single-species stands, with which other species cannot compete.
- If cut during the growing season a second growth spurt occurs in the fall.
- Invasion is associated with disturbances, such as ditch building, stream channeling sedimentation and intentional planting.
- This Eurasian species has been planted throughout the U.S. since the 1800s for forage and erosion control. It is still being planted.

Control Methods:

Mechanical	Chemical
Consecutive annual burns spring or fall	Application of glyphosate (Rodeo)
Mowing mid-June and October to reduce seed and encourage native species	Preliminary research indicates that fall chemical application may be most effective
Frequent cultivation followed by fall seeding	

C. Reinhardt and S. Galatowitsch. 2000. Best management practices for minimizing reed canary grass prior to wetland restoration. Final report to Minnesota Dept. of Natural Resources, Ramsey Washington Metro Watershed District and Minnesota Dept. of Transportation. Dec. 5, 2000. 40 pp.