**European Buckthorn
Rhamnus cathartica

Japanese Knotweed
Fallopia japonica

*Purple Loosestrife
Lythrum salicaria

*Spotted Knapweed
Centaurea maculosa

*Plumeless Thistle
Carduus acanthoides

*Canada Thistle
Cirsium arvense

Stop the spread & Transport Of Invasive Plants! Protect our Native Habitat.

Step Up Efforts To Stop Invasive Plants.

- ✓ Locate, map, and control invasive plants in your area.
- ✓ Spot spray or mow invasive plants at the right times, using the most effective herbicide or technology.
- ✓ Ensure that all material and equipment brought on-site is weed free.
- ✓ Minimize disturbance to healthy vegetation and soils.
- ✓ Clean off mud, seed, or other plant parts from all equipment between jobs or infestations.
- ✓ Dispose of invasive plants at a landfill – do not compost.
- ✓ Use native species in all plantings, if possible.

*State Prohibited Noxious Weeds - M.S. 18.75-18.91 & 160.23
**State Restricted Noxious Weed - M.S. 18.75-18.91

*Leafy Spurge
Euphorbia esula

*Garlic Mustard
Alliaria petiolata

Photos: www.forestryimages.org

*Wild Parsnip
Pastinaca sativa

*Common Tansy
Tanacetum vulgare

*Oriental Bittersweet
Celastrus orbiculatus

Queen Anne's Lace
Daucus carota

Why Does it Matter What Grows in Roadsides?

Invasive species threaten our native flora and fauna, such as native butterfly weed and native pollinators.

Invasive plants, such as sow thistle are prolific seeders and have aggressive growth rates.

Spot mow or spot spray invasive species.

Invasive plants are a serious problem

Roadsides are often vectors of invasive plants. Invasive plants can spread rapidly and form large, dense, single-species stands that reduce plant diversity and wildlife habitat.

Address the problem

Road authorities are responsible for controlling prohibited noxious weeds and other invasive plants in the right-of-ways. Road authorities and landowners have the opportunity to make our roadsides safer, to reduce the risk of contaminating groundwater supplies, and to restore our native vegetation.

Solve the problem in a responsible way

- Learn to identify invasive plants in your area.
- Prevent invasive plants before they arrive.
- Early detection and rapid response saves money. Find new infestations, report them, and eliminate them before they become established.
- Control and manage existing infestations with minimal impacts to the environment.
- Rehabilitate and restore native habitats and ecosystems.

Definitions

Invasive Plants – A nonnative species that can cause economic or environmental harm or harm to human health; may threaten natural resources or the use of those resources. Not all invasive plants are Noxious Weeds and covered under the Noxious Weed Law.

Native Species – A native plant species is one that occurs naturally in a particular region, state, ecosystem, and habitat without direct or indirect human actions. Most native plants have been in the same area for centuries or longer and natural spread can continue to occur.

Noxious Weeds – Plants are listed as "noxious" by the state or county. These lists change periodically so obtain a current list from your county agricultural (weed) inspector. There are 12 Statewide Prohibited Noxious Weed species that must be controlled on all lands in the state.

Prohibited Noxious Weed: Eradicate List – all above and belowground parts of the plant must be destroyed: Grecian foxglove, Oriental bittersweet, yellow star thistle.

Prohibited Noxious Weed: Control List – must prevent reproduction and spread: Canada thistle, common tansy, garlic mustard, leafy spurge, musk thistle, plumeless thistle, purple loosestrife, spotted knapweed, wild parsnip.

Restricted Noxious Weeds – Cannot be sold or transported in Minnesota: glossy buckthorn (all cultivars) and European buckthorn.

Specially Regulated Plant – Poison ivy (native to MN) – must controlled in areas where it can affect public safety

Biological Control – Involves using a parasite, predator, pathogen, or competitive organism intentionally released for the purpose of reducing the pest population. Any introduced pest predator or parasite must undergo exhaustive testing before being released to be sure it will not harm non-target organisms.

Mechanical (Cultural) Control – Includes mowing, hand cutting and pulling, girdling, burning and the use of cover crops and mulching.

Chemical Control – Using herbicides to control invasive species must be used with caution to ensure environmental and personal safety. Herbicides must be used at the correct time in a plant's life and at the proper rates.

Herbicides – A chemical used to kill plants. Some herbicides are selective, for example, killing particular broadleaf plants, but not grasses.

Organic Herbicides – herbicides than can be used on organic farms. They are generally used along with cultural and mechanical weed control. Some organic herbicides include acetic acid (vinegar), citric acid, corn gluten meal (an organic pre-emergent), and soap-based herbicides.

Pesticides – substances used for controlling pests. For example: herbicides to control plants or insecticides to control insects.

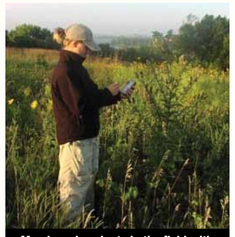
Controlling Invasive plants

Prevent the Spread - Preventing the introduction of non-native species is the best form of management. Invasive plants should be excluded from any construction site by using certified weed-free compost, clean soil amendments and mulches, weed-free seed, and uncontaminated equipment. Following construction, monitor for new introductions and control immediately. When working with invasive plants, clean shoes, and equipment thoroughly before moving to the next site.

Reduce Disturbance

- For safety, the first 8' of the shoulder may be mowed before the grass is 12" high. Grass that is 4-12" long is more resistant to drought and weed infestation.
- Where there are invasive plants, adjust mowing to the blooming cycle of the invasive specie. Mow during bud or early blooming stage to reduce seed production.
- Mow again in late summer when invasive plants attempt to bloom again, and before they set seeds.
- Mow areas infested with invasive plants separate from un-infested areas.
- Set mower height correctly to avoid shaving off vegetation while mowing.
- Stay out of wet areas to avoid rutting.
- Most ditch bottoms and back slopes only need to be mowed every 3-5 years.

Peak nesting for grassland birds is April-July. Only spot mow for invasives during this time.



Map invasive plants in the field with a GPS unit.

Don't spray within one mile of an apiary between 8 a.m. and 6 p.m.

Select your herbicide carefully and know if it can be used near water or not.

Early Detection – Develop a plan for monitoring invasive plants at least once a year; a GPS unit is an excellent monitoring tool. Use field guides to identify plants. Some native wildflowers can look very similar to invasive plants. Local agricultural inspectors, SWCD, NRCS, and DNR offices are good resources.

Rapid Response – Respond to new invaders quickly. Tackle small patches aggressively before they become a major problem. Follow-up in future years.

Good Neighbor – Are there organic farms, vineyards, orchards, apiaries (bees), or other sensitive land uses adjacent to an infested area? Communicate with landowners prior to invasive species control to mitigate any possible damages.

Efficiency of Spraying vs. Mowing – Road authorities need to evaluate the various options available, and select those which are the most effective and least harmful to the ecosystem, to people, to their property, and to cultural resources. Broadcast spraying of roadsides is expensive, environmentally damaging, and rarely necessary. It's in everyone's interest to avoid all unnecessary pesticide use. Use mechanical, cultural, or biological tactics when possible. Spot mowing most invasive plants 2-3 times per summer will significantly set them back and prevent seed production. Spot spray if herbicides are needed. Know how to use pesticides safely, legally, and effectively. Select a product that is effective and presents the least hazard to water quality and wildlife. If wind speeds exceed 10 mph do not spray. Avoid off-target plants, especially native wildflowers, crops and private property. In most cases the project should focus on reducing the spread of the target weeds by eliminating outlying populations first and then working toward the center of the weed population.

Perseverance – Most control methods will need to be repeated. Total eradication is often not feasible in heavily infested areas. Work with the MN Dept. of Agriculture for **biological control** in large infestations of spotted knapweed and leafy spurge. Contact Minnesota Department of Natural Resources for purple loosestrife biocontrol.

Long-term Management – Once eliminated, invasive plants can be replaced with native grasses and forbs to help control erosion, prevent future infestations, and to attract pollinators and birds. Plant competition can be the most successful form of biological control. Plant native prairie seed after invasive plants have been controlled.

Native plant: Western prairie fringed orchid

Invasive Species, Pesticides, and Wildlife

- Invasive species threaten native communities by replacing vegetation, altering food webs, and impacting natural ecosystem processes.
- Dense stands of invasive species can become impenetrable and provide lower quality wildlife cover than native stands.
- Most invasive species have little or no nutritional value for wildlife.
- Insecticides are generally more toxic than herbicides to fish and wildlife.
- Pesticides with petroleum-based carriers can coat eggs, causing the embryo to suffocate. These chemicals should not be used during nesting season of April-July.
- Broadcast spraying of herbicides also kills native plants which insects, pollinators, and wildlife depend on for food and cover.
- Birds are more sensitive to commonly used pesticides than mammals.
- Pesticides also impact fish and amphibians. Avoid contaminating wetlands, lakes, streams, and other waterways.
- In order to protect bees from pesticide applications, owners of apiaries should register the location of their apiaries with the state apiarist. Commercial pesticide applicators should keep records of the time pesticide application began and ended.

What kills broadleaf weeds also kills wildflowers.

Wild Parsnip Warning! - When working near wild parsnip, always wear long sleeve shirts, pants, gloves, and eye protection. If the sap gets onto skin and exposed to sunlight, it can cause blisters and burns. In severe cases tell doctor to treat the area as a third degree burn. The best protection from wild parsnip is to recognize the plant and cover skin. Giant hogweed can also cause blisters.

Procedures for Moving Equipment - Field sanitation is essential to avoid transporting seed material out of an infested area.

- Before leaving work station, visually inspect mower, trailer, and tow vehicle and remove any seeds, plants, and soil with a brush or compressed air, including wheel wells, grills, and blades.
- After mowing, visually inspect and remove any plants, seeds, and soil with a brush or compressed air from the mower before loading it onto a trailer and moving to another site. Remove soil and seeds from clothes, boots, and tools.
- Clean mowing equipment at the end of the day with power washer if possible.

Remove seeds, plants and soil from equipment after working in an infested area.

An excellent DVD "Dangerous Travelers: Controlling Invasive Plants Along America's Roadways" is available free at www.fs.fed.us/invasivespecies/prevention/dangeroustravelers.html

Future Invaders to Watch For

To report new invaders, call the MDA "Arrest the Pest" hotline at 888-545-6684 or contacts on MDA website below. Check Midwest Invasive Plant Network for other new invaders.

Giant hogweed | Cut-leaved teasel | Black swallow-wort | Dalmatian toadflax

Yellow star thistle | Oriental bittersweet | Grecian foxglove

Prohibited Noxious: Eradicate List

For More Information

Minnesota Department of Agriculture (MDA) Noxious and Invasive Weed Program 651-201-6538 **http://www.mda.state.mn.us/weedcontrol**

Biological Control info **www.mda.state.mn.us/plants/pestmanagement/biocontrol.aspx**

Mn/DOT Herbicide Policy & Guidelines & Invasive Species Info **www.dot.state.mn.us/environment/forestry/veg_mgmt/herbicide.html**

Minnesota Invasive Species Advisory Council **www.mda.state.mn.us/misac**

Minnesota Department of Natural Resources **www.mndnr.gov/eco/invasives**

National Invasive Species Information Center **www.invasivespeciesinfo.gov**

U of MN Extension Pesticide Safety **www.extension.umn.edu/pesticides/**

Wisconsin DNR Invasive Species **www.dnr.wi.gov/invasives**

Midwest Invasive Plant Network **www.mipn.org**

For info about native plant communities, native plant species, and Minnesota ecology **www.mndnr.gov/prairierestoration**

For terrestrial invasive plant information (MN DNR) **Laura.Vanriper@state.mn.us** 651-259-5090

For MN Roadsides for Wildlife information, plans, presentations, training, and legal mandates **www.mndnr.gov/roadsidesforwildlife** **Carmelita.Nelson@state.mn.us** 651-259-5014

For free roadside signs, brochures, annual youth poster contest, and nest box info: **Larinda.Burg@state.mn.us** 507-359-6035

Calendar of Integrated Roadside Vegetation Management

Timing is very important with control of many invasive species.

January
- Develop annual roadside plan

February
- Get equipment ready for spring
- Begin frost prairie seeding on formerly treated sites

March
- Contact landowners adjacent to roadside projects
- Finish frost prairie seeding

April
- **Watch for:** leafy spurge in late April
- Certify herbicide applicators as needed
- Spring seeding of native prairie mixes
- Spot spray garlic mustard
- For biological control agent availability contact MN Dept. of Agriculture (leafy spurge and spotted knapweed) and MN Dept. of Natural Resources (purple loosestrife).

May
- **Watch for:** leafy spurge, garlic mustard and pull flowering stems in small patches
- Continue to spot spray thistle rosettes with a selected herbicide
- Continue burns and seeding
- Collect and release purple loosestrife agents
- Remove buckthorn and honeysuckle

June
- **Watch for:** leafy spurge, garlic mustard, wild parsnip pull flowering stems in small patches
- Spot mow thistle patches prior to seed development (side-booms work well)
- Complete prairie plantings
- Monitor biocontrol release sites; collect and release leafy spurge bioagents
- Remove buckthorn and honeysuckle

July
- **Watch for:** wild parsnip, purple loosestrife, perennial sow thistle, non-native thistles, common tansy, spotted knapweed, Japanese knotweed, Grecian foxglove
- Spot mow or spot spray invasive species
- Collect and release spotted knapweed bioagents

August
- **Watch for:** purple loosestrife, perennial sow thistle, non-native thistles, common tansy, spotted knapweed, Japanese knotweed, Queen Anne's lace, Grecian foxglove
- Conduct windshield survey of roadside vegetation
- Mow ditch bottoms and back slopes as needed for safety and brush control
- Summer seeding of native prairie seed

September
- **Watch for:** purple loosestrife, perennial sow thistle, non-native thistles, common tansy, spotted knapweed, Japanese knotweed, buckthorn, Queen Anne's lace
- Complete roadside vegetation survey
- Spot spray thistle plants/rosettes, overseed area with native grasses and forbs
- Foliar spray roadside brush if unable to control by mowing

October
- **Watch for:** buckthorn and thistle rosettes and seedlings, Oriental bittersweet
- Spray leafy spurge in the fall when native plants are dormant
- Spot spray thistle plants/rosettes
- Late fall is the best time to control garlic mustard rosettes using a selective herbicide
- Cut brush and buckthorn and apply basal bark herbicide

November
- Dormant seeding of native prairie seed
- Order herbicide for next year
- Cut brush and buckthorn, treat stumps with herbicide
- Watch for Oriental bittersweet – fruits are visible all winter

December
- Cut brush and treat stumps with herbicide
- Cut and stump treat buckthorn
- Watch for Oriental bittersweet – fruits are visible all winter

Queen Anne's lace is a roadside problem in southern Minnesota.

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Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4040
(651) 296-6157 (Metro Area)
1-888-MINNDNR (646-6367) (MN Toll Free)
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