

Top 10 Management Invasive Weed List 2010

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| 1. Garlic mustard | <i>Alliaria petiolata</i> |
| 2. Spotted Knapweed | <i>Centaurea biebersteinii</i> |
| 3. Canada thistle | <i>Cirsium arvense</i> |
| 4. Leafy spurge | <i>Euphorbia esula</i> |
| 5. Purple loosestrife | <i>Lythrum salicaria</i> |
| 6. Buckthorns | <i>Rhamnus frangula</i> |
| 7. Eurasian water milfoil | <i>Myriophyllum spicatum</i> |
| 8. Japanese Knotweed | <i>Polygonum cuspidatum</i> |
| 9. Scotch Pine | <i>Pinus sylvestris</i> |
| 10. Common reed | <i>Phragmites australis</i> |

***Alliaria petiolata* - Garlic Mustard**

Ecosystems Threatened: Mesic forest, and other shaded woodlands; not a lot on the HNF or the UP yet, but a truly destructive weed in northern hardwoods.

Manual/Mechanical Control: Small patches, flowering plants (second year plants) can be hand-pulled to prevent seed production (spring). Cutting plants low with a weed whip, just before flowerings an option when the patch is dense. Pulling and cutting plants will prevent flowering. If plants have started to form seed pods when they are cut or pulled, they must be bagged and removed from site. A second site visit a few weeks later is required to catch adults missed during the initial treatment. Propane weed torch may be used to scorch first year plants in the spring. Weed torch works not by starting a ground fire, but by using the torch's flame to wilt the target leaves and kill plant. This can be done in very early spring as species is green and susceptible while native plants are still under the ground. Torching or pulling will continue for 5-7 years on a site to deplete the seed bank. If monitoring shows this to be ineffective, herbicide use will be considered.

Chemical Control: Foliar spot spray/broadleaf selective - triclopyr (ex. Garlon3A); stump treatment and foliar/non-selective (ex. glyphosate/Roundup). Large patches (>.004 acre) are best controlled with combination of herbicide, hand-pulling and scorching. To avoid impacts to native ground layer; apply glyphosate early spring or late fall. In some situations, the broad-leaf selective herbicide triclopyr may be used. Repeat pulling and/or herbicide for up to 5 yrs. as population is reduced over time.

***Centaurea biebersteinii* – Spotted Knapweeds**

Ecosystems Threatened: Great Lakes shorelines of various substrates, roadsides, openings, alvar, savannah, disturbed areas

Manual/Mechanical Control: Small populations less than 14x14 ft. (.004acre) removed by hand-pulling; early spring the easiest time to pull. If plants are flowering when they are cut or pulled, they must be bagged and removed from site. Mowing suggested for roadsides and fields, at the phenological stage just before plants bloom in mid July. If monitoring shows that pulling small populations is ineffective, chemical treatments will be considered.

Chemical Control: Foliar spray/broadleaf selective (ex. clopyralid/Transline). Larger infestations spot treated with clopyralid, a broadleaf weed killer, during bolt or bud stage via backpack sprayer. If damage to surrounding vegetation is not a concern, the area will be spot treated with glyphosate. Knapweed can be chemically treated during all stages of growth from June through Sept. except late when the seed is viable. Mowing just before flowers bud, prior to herbicide treatment, will stress plants, making the herbicide more effective. Ideally treat with one chemical treatment per year per site. Follow up with monitoring in subsequent years with chemical and manual treatment for missed plants and regrowth.

Biological Control: *Urophora affinis*, *U. quadrifasciata*

***Cirsium arvense* - Canada Thistle**

Ecosystems threatened: Roadsides, wetlands, alvar, savannah, openings in cedar swamps, Great Lakes shorelines, etc. Requires minimal disturbance for establishment; relatively recent in UP and HNF.

Manual/ Mechanical Control: For smaller sites, less than .004 acres, the whole plant can be cut or pulled during early bud stage when root reserves are low (usually early to mid July). This will be repeated, if possible, 2 more times during the growing season. On very sparse, small sites the root of this perennial species can be severed below ground using a narrow shovel. These manual methods will require repeat visits for several years to deplete the seed bank.

Chemical Control: Foliar spray/broadleaf selective (ex. clopyralid/Transline). Larger sites spot treated with the broadleaf specific herbicide, clopyralid applied with a wand applicator (preferred) or spot sprayer in order to avoid non target vegetation. Also, using this broadleaf specific chemical will avoid damage to grasses and sedges during treatment (providing soil stabilization). Follow herbicide application with hand pulling 1-2 weeks later. Sites monitored and retreated for 3-5 years. If damage to surrounding vegetation is not a concern, area spot treated with glyphosate.

***Euphorbia esula* - Leafy Spurge**

Ecosystems Threatened: Roadsides, fields, various open habitats. Still minimal occurrences on the HNF.

Manual/Mechanical Control: Small populations (less than 100 plants or about .004 acres) can be hand-pulled. Hand-pulling will require repeat visits for up to 7 years. If monitoring proves this to be ineffective, herbicide use will be considered. On roadsides, larger populations can be mowed or cut June to early July to stress populations and remove flowering heads (may be followed by chemical treatment).

Chemical Control: Foliar/non-selective (ex. imazapic/Plateau). Follow up mowing or cutting larger sites (>.004 acre) or smaller sites where complete eradication is desired, with spot treatment of imazapic or glyphosate. Herbicide can be applied Aug. to mid-Oct. as long as sap flows from cut stems. Most effective time to apply herbicide is mid-September. Single chemical treatment per year per site followed by monitoring in subsequent years and treatment of missed plants and resprouts. Follow up treatment will take several years until seed bank is exhausted.

Biological Control: Leafy spurge flea beetles, *Aphthona flava*, *A. lacertosa*, *A. nigriscutis*

***Lythrum salicaria* - Purple Loosestrife**

Ecosystems Threatened: All types of riparian and wetland areas. Forms monocultures and results in habitat loss.

Manual/Mechanical Control: Most sites are small (<.004 acre). The species will be pulled or dug with a shovel, taking care not to leave any roots. If plants are flowering when they are cut or pulled, they must be bagged and removed from site. It may take 2-3 yearly visits to eliminate a site with a few plants as seed can sprout when ground is disturbed. If monitoring proves this ineffective, the use of herbicide on individual plants will be considered.

Chemical Control: Foliar near water/non-selective (ex. glyphosate/Rodeo). If sites expand to over 100 plants, spot treat with glyphosate (if near open water, a formula suitable for use near water will be used). Where feasible, apply glyphosate to cut stems with wiping technique. Plants can be treated anytime during growing season but before they set seed in August with a single chemical treatment per site per year. This followed by monitoring in subsequent years and treatment of missed plants and resprouts with hand pulling or herbicide.

Biological Control: *Galerucella californiensis*, *G. pusilla*, *Hylobius transversovittatus*

***Myriophyllum spicatum* - Eurasian water milfoil**

Ecosystems Threatened: Aquatic habitats, grows on almost any substrate

Manual/Mechanical Control: Reproduces vegetatively, so a single stem fragment can take root and form a new colony. Hand removal would be ineffective. Mechanical harvesters used after widespread infestation must be done twice during the growing season for 2 or more seasons. Continuous monitoring of waters not yet infested is essential.

Chemical Control:

Biological Control: Milfoil weevil, *Euhrychiopsis lecontei*

***Phragmites australis* - Common Reed/non-native genotype**

Ecosystems Threatened: Wetlands, riparian areas, shorelines. We will map all *Phragmites australis* occurrences but only control/eliminate non-native populations (see electrophoretic studies in literature).

Manual/Mechanical Control: Cut or mow affected area at the end of July and repeat annually. Cut plants with a circular blade weed trimmer below lowest leaf leaving a 6 inch stump.

Chemical Control: Foliar near water/non-selective (ex. glyphosate/Rodeo). Spray plants with glyphosate (formulated for wetlands) in late summer (Aug.) when in full bloom. If plants are too tall to spray, cut back in mid-summer and apply glyphosate when regrowth reaches 2-3 feet tall. Repeat in subsequent years. Cut back dead stalks several weeks after herbicide application to stimulate growth of native plants previously suppressed.

***Rhamnus frangula* - Glossy Buckthorn**

Ecosystems Threatened: Forested wetlands and wet prairies, forested areas, edges of openings, roadsides, etc. Not yet widely dispersed in UP/ HNF.

Manual/ Mechanical Control: Small plants (<5 mm diameter or <0.5m tall) with shallow root systems can be hand pulled and soil shaken off at site. Non-fruiting size plants can be left on site; those with fruit or seeds may be bagged or piled and burned. These methods will require repeat control visits as well as monitoring of the site, perhaps for 4-5 years or longer. If

monitoring shows that pulling leaves behind roots that spout, or is otherwise ineffective, spot sprayed herbicide will be considered on these small plants. Plants may be pulled anytime the ground is not frozen. Scorching sprouts in fall may be used when sprouts emerge thickly following death of parent tree.

Chemical Control: Foliar spot spray/broadleaf selective (ex. triclopyr/Garlon3A). Cut larger shrubs and treat stump with glyphosate or triclopyr, in late summer/fall/early winter. Compatible dye will be added to the herbicide mixture so that the cut stump treatment can be distinguished. Herbicide applied with sponge type applicator to avoid contracting non target plants. Alternative method is to paint triclopyr on the basal bark and leave the shrub. Thick patches of young seedlings may be spot sprayed with glyphosate. Herbicide treatment can be applied almost anytime of the year optimally Sept. - Nov. Will make a single chemical treatment per site per year followed by monitoring in subsequent years for treatment of missed plants and resprouts.

***Polygonum cuspidatum* - Japanese Knotweed**

Ecosystems Threatened: It spreads quickly to form dense thickets that exclude native vegetation and greatly alter natural ecosystems. It poses a significant threat to riparian areas, where it can survive severe floods and is able to rapidly colonize scoured shores and islands. Once established, populations are extremely persistent.

Manual/Mechanical Control: It is difficult to control because of its ability to regrow from vegetative pieces and from seed.

- Manual - Hand pull young plants; remove all roots and runners to prevent re-sprouting.
- Chemical - It can be effectively controlled using any of several readily available general use herbicides such as glyphosate or triclopyr. Apply herbicides to freshly cut stems or to foliage. Follow label and state requirements.

***Pinus sylvestris* - Scotch Pine**

Ecosystems Threatened: Savannah, Great Lakes shoreline, various other sites, usually planted or escaped. Scotch pine is the most widely distributed pine in the world. It has been naturalized in northern New York. The associated trees are black cherry (*Prunus serotina*), red maple (*Acer rubrum*), sugar maple (*A. saccharum*), American beech (*Fagus grandifolia*), quaking aspen (*Populus tremuloides*), and eastern white pine (*Pinus strobus*). In many areas the aggressive reproductive habit established a mat of seedlings, and has concerned foresters. Where Scotch pine has been intermixed with red or white pine at planting, the Scotch pine grows so much more aggressively during the first few years that its roots crowd out roots of the other species leaving only Scotch pine.

Manual/ Mechanical Control:

Manual- Hand pull young seedlings; cut larger trees. Chemical - It can be effectively controlled using any of several readily available general use herbicides such as glyphosate or triclopyr. Follow label and state requirements.

Natural Enemies: Some of the natural enemies include: coneworm larvae (*Dioryctria* spp.), tip moths (*Rhyacionia* spp.) and the pine root collar weevil (*Hylobius radicis*) that is a major cause of tree death in young plantations in the Lake States.

Other Invasive Species For Consideration:

***Phalaris arundinacea* - Reed Canary Grass**

Ecosystems Threatened: Wetlands, riparian areas.

Manual/Mechanical Control: Cut or mow affected area mid-June and again in early October. Repeat annually.

Chemical Control: Foliar near water/non-selective (ex. glyphosate/Rodeo). This control is often more effective in combination with other treatment methods, such as cutting. Cut affected areas in early spring, let plants resprout, and then treat with glyphosate in late Aug.-Sept. For heavy infestation, monitor and treat again if necessary. If standing water is present, use foliar application of glyphosate formulated for use near water.

***Pastinaca sativa* - Wild Parsnip**

Ecosystems Threatened: Openings, alvar, fen, roadsides, seasonally wet areas, full to partial sun. Phototoxic

Manual/Mechanical Control: Small sites less than 100 or so plants, root of this biennial will be cut below ground level with sharp, narrow shovel or hand-pulled. Large roadside sites may be mowed just after peak flowering before seeds ripe. Areas may be mowed again if plants re-flower; this will decrease the seed bank. If monitoring shows this ineffective, the use of herbicide will be considered.

Chemical Control: Foliar spot spray/broadleaf selective (ex. triclopyr/Garlon3A); stump treatment and foliar/non-selective (ex. glyphosate/Roundup). Treat basal rosettes of first year parsnip with spot application of glyphosate. Plants can be treated anytime during growing season but best to treat before seed set in August. As an alternative, triclopyr may be used as it is broadleaf specific and will not harm grasses. The ideal treatment time is July when root reserves are low. A single chemical treatment per year per site is ideal, followed by monitoring in subsequent years for treatment of missed plants and re-sprouts via hand-pulling or herbicides.

***Melilotus alba* – White Sweetclover**

Ecosystems Threatened: Great Lakes shorelines, alvar, roadsides, openings, savannahs and various open habitats.

Manual/Mechanical Control: Small populations can be hand pulled or dug up with a shovel before seeds set. If plants are cut or pulled after flowering, they must be bagged and removed from site. Inspect the area frequently for late flowering plants. Mowing at the end of summer results in high rates of winter mortality. Populations can be reduced by prescribed burning 2 years in a row.

Chemical Control: Herbicides such as 2,4-D and dicamba are effective.

Biological Control: Sweetclover weevil, *Sitona cylindricollis*