A pressing problem

Recognition of the problem of invasive plants is growing, at the same time as damage to native ecosystems is mounting. Identifying invasive plants and understanding the potential damage they can cause is essential to stopping their spread and protecting native vegetation. Recent publications specifically on invasive plant control and a good field guide can help identify and avoid planting invasive plants. Try to learn as much as possible about this issue. The Internet is an excellent way to access the rapidly growing body of information on this topic.

For more information

Contacts

PA Department of Agriculture.
www.agriculture.state.pa.us/agriculture/cwp/view.asp?a=3&q=127347&agricultureNav=|

Penn State University Cooperative Extension Office Directory. www.extension.psu.edu/extmap.html

Sea Grant Pennsylvania.
www.paseagrant.org/education/community-workshops

Control

PA DCNR - *Invasive Plants*
www.dcnr.state.pa.us/forestry/plants/invasiveplants/index.htm

Maryland Native Plant Society – The Invasive Alien Species Handbook
http://mdflora.org/Resources/Publications/invasiveshandbook_color.pdf

Identification of Invasive and Native Plants

Alliance for the Chesapeake Bay – *Common Invasive Plants in Riparian Areas*.
www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/streamreleaf/Docs/Invasive%20Plants.pdf

Mid-Atlantic Early Detection Network (MAEDN) – Distribution maps, fact sheets and control information.
www.eddmaps.org/midatlantic/

Bowman's Hill Wildflower Preserve – *Fact Sheets*.
www.bhwp.org/native/invasive_plants.htm

Brown, Lauren. 1979. *Grasses, An Identification Guide*. Boston: Houghton Mifflin.

The Pennsylvania Flora Project of Morris Arboretum – Species identification and distribution.
http://paflora.org/original/

National Park Service and U.S. Fish & Wildlife Service, 2010, Plant *Invaders of Mid-Atlantic Natural Area, Fourth Edition.*
www.nps.gov/plants/alien/pubs/midatlantic/

National Wildlife Federation – *Native Gardening and Invasive Plants Guide*.
http://enature.com/native_invasive/invasives.asp

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Block , T. A. and A. F. Rhoads. 2011. *Aquatic Plants of Pennsylvania,* A Complete Reference Guide, University of Pennsylvania Press, Philadelphia.

Rhoads, A. F. and T. A. Block. 2007. *The Plants of Pennsylvania, An Illustrated Manual,* Second Edition. University of Pennsylvania Press, Philadelphia.

Rhoads, A. F. and T. A. Block. 2004. *Trees of Pennsylvania*, A Complete Reference Guide. University of Pennsylvania Press, Philadelphia.

USDA Forest Service – *Invasive Plants Field and Reference Guide: An Ecological Perspective of Plant Invaders of Forests and Woodlands*. www.fs.fed.us/r9/wildlife/nnis/invasive-species-field-guide.pdf

Management

Federal Interagency Committee for the Management of Noxious and Exotic Weeds. www.fws.gov/ficmnew

Invasive Plants

In Pennsylvania

Japanese stiltgrass spreading into the forest

pennsylvania
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
www.dcnr.state.pa.us

What is an invasive plant?

"Invasive plant" is a name for a species that has become a weed pest, a plant which grows aggressively, spreads, and displaces other plants. Invasive plants tend to appear on disturbed ground, and the most aggressive can actually invade existing eco-systems. Invasive plants are generally undesirable because they are difficult to control, can escape from cultivation, and can dominate whole areas. In short, invasive plant infestations can be extremely expensive to control, as well as environmentally destructive.

Most invasive plants arrived from other continents and are often referred to as "exotic," "alien," "introduced" or "non-native" invasives. An aggressive plant freed from its environmental, pest, and disease limits, can become an invader of other ecosystems. This brochure lists the most troublesome invasive plants that occur in Pennsylvania and impact native plant communities.

Characteristics of invasive plants

Invasive plants are noted for their ability to grow and spread aggressively. Invasive plants can be trees, shrubs, vines, grasses, or flowers, and they can reproduce rapidly by roots, seeds, shoots, or all three. Invasive plants tend to:

- not be native to North America;
- mature quickly;
- spread, reproducing by roots or shoots;
- if spread by seed, produce numerous seeds that disperse and sprout easily;
- be generalists that can grow in many different conditions; and
- be exploiters and colonizers of disturbed ground.

Impact of Invasive Plants

The primary reason to not landscape with invasives is that they are degrading our native environments. In fact, second only to habitat loss, invasives are a major factor in the decline of native plants. Plants like kudzu, purple loosestrife and garlic mustard are displacing native plants and degrading habitat for native insects, birds and animals. Endangered, rare and threatened native species of plants and animals are especially at risk because they often occur in such small populations that make them particularly vulnerable.

Another reason to avoid invasives is that invasive plants, even when grown in a cultivated yard, can spread, escape, and cause landscape maintenance weeding problems for years to come. In urban and suburban areas there is a good chance that the worst weeds on your property are escaped plants, like Japanese honeysuckle, multiflora rose, Japanese knotweed, and oriental bittersweet. In yards, gardens, fields, and parks these plants are very expensive to control.

What can I do?

The best insurance against future problems is to **avoid the use of known invasive plants** and educate others about the problems of invasives. This brochure lists many of the plants that are invasive in Pennsylvania. Plants on this list should be avoided because they can escape cultivation and aggressively move into surrounding ecosystems. One way to avoid invasives is to choose plants that are native to your area. Natives often are adapted to a specific environmental niche and have natural controls that keep them in balance.

Minimize landscape disturbance. Invasive plants thrive on bare soil and disturbed ground where the native plant community has been displaced. The key to controlling invasives is to **protect healthy native plant communities.**

Use fertilizers wisely. Proper site preparation begins with a soil test before applying fertilizer. High nitrogen levels sometimes give an advantage to invasive species that are better adapted to using plentiful nutrients for explosive growth. For soil fertility, try using organic, slow-decomposing compost and mulches.

Have a land management plan for maintenance over time. Lawns, gardens, meadows and woodlands are maintained using vastly different techniques, but will need to be monitored and invasive plants removed. Land management plans provide guidelines on monitoring, assist in prioritizing removal and prevention goals and help track the progress of control work.

Scout your property annually for invasives or other problems. The best way to control invasive species populations is to prevent their spread. Prevention includes restricting them from spreading vegetatively and limiting soil disturbance/other factors that would promote their growth. Listed in this brochure are further resources to help property owners.

Early detection of invasive plant populations minimizes the cost and effort needed to control them. Effective scouting or monitoring ensures problems are found while they are still small and easily controllable. Remove invasives when their densities are low or they still cover a small area. Invasive plant control works best where there is a functioning native plant community still in place, which can move back into the empty niche. Control options should be taken before invasive plants go to seed. They include mechanical removal by hand pulling, and herbicide control by trained individuals or homeowners carefully following label directions.

Replace invasive plants with native or non-invasive species. Invasives are good at exploiting bare soil and empty niches. When you remove an invasive plant, unless there is another plant substituted, the invasive will tend to come back (either by seed or resprouting). What grows at a site in the future depends largely on what is planted there now. It is important to fill that niche with a desirable plant that will provide seed for the future.

Remove invasives first where their densities are low. This gives the most immediate success because invasive plant control works best where there is a functioning native plant community still in place which can move right into the empty niche.

- Avoid using known invasive plants
- Minimize landscape disturbance
- Protect healthy native plant communities
- Use fertilizers wisely
- Have a land management plan for maintenance over time
- Scout (and keep scouting)
- Remove invasives when they are present in low numbers or when they are confined to a small area before they become a bigger problem
- Dispose of removed invasive plants wisely
- Replace invasive plants with native or non-invasive species
- Clean equipment that has been used in an area having invasive plants

Invasive Plants in Pennsylvania

The species below are serious threats to our native ecosystems. Many have been designated as ""Noxious Weeds" by the PA Department of Agriculture and are also a major concern to our agricultural community.

SCIENTIFIC NAME	COMMON NAME	PLANT FORM	NOTES
Aegopodium podagraria	Goutweed	Flower	Commonly planted & escaped; spreads aggresively by roots
Alliaria petiolata	Garlic mustard	Flower	Invasive in many states; spreads aggressively in woodlands by seed
Anthriscus sylvestris	Wild chervil	Flower	Host for a virus that infects carrots, parsnips and celery; spreads by roots/seed
Cardamine impatiens	Narrowleaf bittercress	Flower	Forms dense stands that out-compete native species; seed-shooting ability
Carduus nutans	Musk thistle	Flower	PA Noxious Weed; each plant can produce 120,000 seeds per year
Centaurea jacea	Brown knapweed	Flower	Spreads rapidly in disturbed habitats; seeds spread by wind, livestock and tires
Centaurea nigra	Black knapweed	Flower	Spreads rapidly in disturbed habitats; seeds spread by wind, livestock and tires
Centaurea stoebe	Spotted knapweed	Flower	Spreads rapidly in disturbed habitats; seeds spread by wind, livestock and tires
Chelidonium majus	Greater celandine	Flower	Seeds have elaisosomes which attract ants to disperse ; poisonous to mammals
Cirsium arvense	Canada thistle	Flower	PA Noxious Weed; seeds spread by wind; remain viable in soil for up to 20 years
Cirsium vulgare	Bull thistle	Flower	PA Noxious Weed; seeds spread by wind; potential to form dense thickets
Conium maculatum	Poison hemlock	Flower	Extremely poisonous to livestock and humans; prolific seed producer
Coronilla varia	Crown-vetch	Flower	Spreads by seeds and rhizomes; main impact is displacement of native species
Datura stramonium	Jimsonweed	Flower	PA Noxious Weed; Sometimes cultivated; spreads by seed
Epilobium hirsutum	Hairy willow-herb	Flower	Spreads primarily by rhizomes; seeds are wind dispersed; can colonize wetlands
Epilobium parviflorum	Smallflower hairy willow-herb	Flower	Spreads primarily by rhizomes; seeds are wind dispersed; can colonize wetlands
Fallopia japonica	Japanese knotweed	Flower	Invasive in many states; difficult to control; spreads by roots and seeds
Fallopia sachalinensis	Giant knotweed	Flower	Invasive in many states; difficult to control; spreads by roots and seeds
Galega officinalis	Goat's-rue	Flower	PA and Federal Noxious Weed
Heracleum mantegazzianum	Giant hogweed	Flower	PA and Federal Noxious Weed; sap can cause burning blisters
Hesperis matronalis	Dames rocket	Flower	Planted in gardens; escaped and naturalized along roads; spreads by seed
Iris pseudacorus	Yellow flag iris	Flower	All parts of the plant are poisonous; spreads by buoyant seed and vegetatively
Lysimachia nummularia	Moneywort	Flower	Threat to swamps & stream banks; spreads vegetatively forming dense mats
Lythrum salicaria	Purple loosetrife	Flower	PA Noxious Weed; garden escape which has become invasive in many states
Ornithogalum nutans	Nodding Star-of-Bethlehem	Flower	Common garden plant which has widely escaped
Ornithogalum umbellatum	Star-of-Bethlehem	Flower	Common garden plant which has widely escaped
Pastinaca sativa	Wild parsnip	Flower	Found commonly along roadsides; widespread and abundant; spread by seed
Perilla frutescens	Beefsteak plant	Flower	Garden escape; widespread mostly along roadsides; spread by seed
Persicaria longiseta	Oriental knotweed	Flower	Occurs mainly in wet areas and disturbed sites
Ranunculus ficaria	Lesser celandine	Flower	Spreads by roots and shoots; can be very aggressive in wetlands
Bromus sterilis	Poverty brome	Grass	Annual; very invasive throughout the west; spreads by seed with barbed awns
Bromus tectorum	Cheatgrass	Grass	Annual; very invasive throughout the west; spreads by seed with barbed awns
Holcus lanatus	Common velvet grass	Grass	Prolific seed producer; forms dense stands that can exclude native species
Microstegium vimineum	Japanese stiltgrass	Grass	Annual grass; invasive in many states; spreading through woodlands by seed
Oplismenus undulatifolius	Wavyleaf basketgrass	Grass	Annual grass; invasive in many states; spreading through woodlands by seed
Phalaris australis	Reed canary grass	Grass	Aggressive wetland grass; native/introduced strains; widespread and abundant
Phragmites australis ssp. *australis*	Common reed	Grass	Wetland plant which can form huge colonies; native/introduced strains
Poa trivialis	Rough bluegrass	Grass	Perrenial; reproduces vegetaively with use of stolons & by seed
Schedonorus arundiaceus	Tall fescue	Grass	Forms dense clumps that crowd out other species; spreads primarily by rhizomes
Sorghum bicolor ssp. *drummondii*	Shattercane	Grass	PA Noxious Weed; annual; only spreads through seeds
Sorghum halepense	Johnsongrass	Grass	PA Noxious Weed; perennial; spreads by roots and seeds
Berberis thunbergii	Japanese barberry	Shrub	Escaped from cultivation and invasive in many states; seeds spread by birds
Berberis vulgaris	European barberry	Shrub	Escaped from cultivation and invasive in many states; seeds spread by birds
Elaeagnus angustifolia	Russian olive	Shrub	Escaped from cultivation and invasive in many states; seeds spread by birds
Elaeagnus umbellata	Autumn olive	Shrub	Escaped from cultivation and invasive in many states; seeds spread by birds
Euonymus alata	Winged Euonymus	Shrub	Escaped from plantings; invasive in moist forests
Frangula alnus	Glossy buckthorn	Shrub	Becoming a problem in PA; allelopathic; particuarly aggressive in wet areas
Lespedeza bicolor	Shrubby bushclover	Shrub	Seeds need mineral soil to germinate; can outcompete native vegetation
Lespedeza cuneata	Chinese bushclover	Shrub	Seeds need mineral soil to germinate; can outcompete native vegetation
Ligustrum japonicum	Japanese privet	Shrub	Escaped from cultivation; seeds spread by birds
Ligustrum obtusifolium	Border privet	Shrub	Escaped from cultivation; seeds spread by birds
Ligustrum sinense	Chinese privet	Shrub	Escaped from cultivation; seeds spread by birds
Ligustrum vulgare	Common privet	Shrub	Planted very commonly in the past and escaped; invasive in many states
Lonicera mackii	Amur honeysuckle	Shrub	Escaped from cultivation; seeds spread by birds
Lonicera morrowii	Morrow's honeysuckle	Shrub	Escaped from cultivation; seeds spread by birds
Lonicera x bella	Bell's honeysuckle	Shrub	Escaped from cultivation; seeds spread by birds
Lonicera standishii	Standish honeysuckle	Shrub	Escaped from cultivation; seeds spread by birds
Lonicera tatarica	Tartarian honeysuckle	Shrub	Escaped from cultivation; seeds spread by birds
Rhamnus cathartica	Common buckthorn	Shrub	Becoming a problem in PA; forms dense thickets which crowd out native species
Rhodotypos scandens	Jetbead	Shrub	Invades forested areas, creating thick layer which can affect native plant species
Rosa multiflora	Multiflora rose	Shrub	PA Noxious Weed; invasive in many states; seeds spread by birds
Spiraea japonica	Japanese spiraea	Shrub	Frequently planted; escaped in some areas
Viburnum opulus var. *opulus*	Guelder rose	Shrub	Resembles native *Viburnumtrilobum* which it replaces; both are cultivated
Acer ginnala	Amur maple	Tree	Spreads primarily through wind-dispersed samaras
Acer platanoides	Norway maple	Tree	Commonly planted/escaped; invasive in many states; wind spreads prolific seed
Acer pseudoplatanus	Sycamore maple	Tree	Escaped from cultivation; wind spreads prolific seed
Albizia julibrissin	Mimosa	Tree	Potential to create dense stands that shade-out native plant species
Alnus glutinosa	European black alder	Tree	Seed spread by wind/water; ability to colonize wetland soils; ability to fix nitrogen
Ailanthus altissima	Tree-of-heaven	Tree	Invasive in many states; wind spreads prolific seed
Aralia elata	Japanese angelica-tree	Tree	Forms large competitive thickets; seeds spread by birds
Paulownia tomentosa	Empress tree	Tree	Produces prolific seeds to start new seedlings
Pyrus calleryana	Callery pear	Tree	Commonly planted street tree; becoming a problem as an escape
Ulmus pumila	Siberian elm	Tree	Escaped from cultivation; produces abundant wind dispersed seeds
Akebia quinata	Chocolate vine	Vine	Escaped from cultivation and becoming major problem in the Philadelphia area
Ampelopsis brevipedunculata	Porcelain berry	Vine	Escaped from cultivation; seeds spread by birds
Celastrus orbiculatus	Oriental bittersweet	Vine	Escaped from cultivation and invasive in many states; seeds spread by birds
Humulus japonicus	Japanese hops	Vine	Prefers disturbed sites; forms dense patches that outcompete native vegetation
Lonicera japonica	Japanese honeysuckle	Vine	Invasive in many states; found in a variety of habitats; spreads by seed & runners
Persicaria perfoliata	Mile-a-minute	Vine	PA Noxious Weed; range expanding rapidly
Pueraria lobata	Kudzu	Vine	PA Noxious Weed; Spreads vegetatively by rhizomes/roots
Vincetoxicum nigrum	Black swallow-wort	Vine	Toxic to livestock and monarch butterfly larvae; seeds are wind dispersed
Vincetoxicum rossicum	Pale Swallow-wort	Vine	Toxic to livestock and monarch butterfly larvae; seeds are wind dispersed
Cabomba caroliniana	Carolina fanwort	Aquatic	Reproduces vegetatively when stems break & seed dispersal; aquarium plant
Didymosphenia geminata	Didymo	Aquatic	Didymo is a microscopic algae known as a diatom; easily spread after contact
Egeria densa	Brazilian water-weed	Aquatic	Grows vigorously in ponds & lakes forming dense mats that limit biodiversity
Hydrilla verticillata	Hydrilla	Aquatic	Grows vigorously in ponds & lakes forming dense mats that limit biodiversity
Ludwigia peploides	Floating seedbox	Aquatic	Grows vigorously in ponds & lakes forming dense mats that limit biodiversity
Myriophyllum aquaticum	Parrot feather watermilfoil	Aquatic	Grows vigorously in ponds & lakes forming dense mats that limit biodiversity
Myriophyllum spicatum	Eurasian water-milfoil	Aquatic	Invasive in many states; forms dense mats that limit biodiversity
Potamogeton crispus	Curly pondweed	Aquatic	Plant buds called turions can be spread by waterfowl and boaters to new areas
Trapa natans	European water chestnut	Aquatic	Wetland plant; should not be introduced as it will escape, spread and naturalize
Typha angustifolia	Narrow-leaved cattail	Aquatic	Seeds are viable for 100 years & wind dispersed; rhizomatous spread in wetlands
Typha x glauca	Hybrid cattail	Aquatic	can produce up to 700,000 seeds per year; rhizomatous spread in wetlands

This list of invasive species is not meant to be definitive, but rather a guideline to some of the most troublesome species that degrade native plant communities in Pennsylvania. These species were chosen from a more extensive list compiled from adjacent state or regional lists of invasive plant species; please visit our website at **www.dcnr.state.pa.us/forestry/plants/invasiveplants/index.htm**