Invasive Species of Concern in Maryland

Inside is a representative list of species that are, or have potential to be, invasive in Maryland. It is by no means an exhaustive list, but includes species of great concern because they:

- are currently regulated by a state and/or federal law,
- are widely recognized by biologists and resource managers to degrade natural ecosystems, or negatively affect native species,
- are known to have significant economic impacts on agricultural ecosystems, public infrastructure or natural resources, including impact on recreational activities, or
- have, or can have, deleterious effects on human health.

This list is designed as a guidance tool for:

- on-the-ground management of existing invasive species,
- regulatory prevention, quarantine and enforcement activities,
- support of funding requests to the legislature, government agencies and private organizations, and
- education of legislators, regulators, commercial plant and animal producers and the public.

The list does not have regulatory or legal status, and is expected to change over time as the process of invasive species identification and management continues.

Species and Cultivars

Some of the plant species on the list are of commercial importance to the nursery industry and are routinely sold and planted in Maryland. MISC encourages nursery people, landscape architects, designers and installers, and the gardening public to consider alternatives to these species, particularly when plantings are done near parks and other natural areas.

Horticultural selections made from some of these species (e.g., cultivars of daylily, *Hemerocallis* hybrids) may not be invasive. The position of MISC is that cultivars are not presumed to be invasive unless shown to be so.

What can you do?

Invasive species spread in many ways, often helped unintentionally by people. You can slow the spread of invasive species, and prevent new invasions, by being an aware, responsible and vocal steward of your own property.

- *Scout for invasive species.* Learn which plants and animals are problems in Maryland, so you can recognize them if you see them. The MISC website (mdinvasivesp.org) features helpful descriptions and pictures.
- *Remove invasive species before they become a problem.* The best way to control invasives is through early detection and rapid response. Pull, cut, spray or deadhead problem plants before they go to seed. Watch for population explosions of insects or other animals. Report unusual plants, insects or animals to your local Extension agent or Animal Control board, and seek their assistance.
- *Avoid introducing invasive species.* Check with plant sellers before you buy, to make sure that the plant you want, whether native or exotic, is not invasive. Ask about non-invasive alternatives for your garden. Keep wildlife wild – don't approach wildlife with food, or release exotic pets and aquarium fish into the wild.
- *Avoid transporting invasive species.* Seeds of invasive plants and immature stages of insects are easily moved from place to place on hiking boots, car tires, pants cuffs, and camping or recreational gear. Invasive zebra mussels colonize boat hulls. Check that your gear or boat is clean, especially when entering wildlands or other natural areas, or new bodies of water. Don't bring species into Maryland from distant parts of the US, or other regions of the world.
- *Minimize disturbance.* Many invasive species, especially plants, are adapted to disturbance and rapidly take over newly disturbed areas. Keep open areas on your property to a minimum and monitor disturbed areas for species that spread quickly.
- *Spread the word.* Invasive species have environmental, economic and social impacts for all of us. Report your observations to appropriate state government agencies and conservation groups. Share what you know and learn with your friends and neighbors.

For Further Information

Southeast Exotic Pest Plant Council (http://www.se-eppc.org)

Missouri Department of Conservation (http://www.conservation.state.mo.us/nathis/exotic/vegman)

Illinois Department of Conservation (http://www.inhs.uiuc.edu/edu/VMG/VMG.html)

Plant Conservation Alliance, Alien Plant Working Group (http://www.nps.gov/plants/alien/factmain.htm)

The Nature Conservancy, Invasive Species Iniative (http://nature.org/initiatives/invasivespecies/)

National Park Service (http://www.nps.gov/plants/alien)

United States Department of Agriculture-Animal and Plant Health Inspection Service (http://www.invasivespecies.org/)

National Agricultural Pest Information System (http://ceris.purdue.edu/napis/)

National Biological Information Infrastructure [NBII] (http://www.invasivespecies.gov/geog/state/md.shtml)

Forestry Images (http://www.forestryimages.org/)

USDA/APHIS/PPQ Federal Noxious Weed Program (http://www.aphis.usda.gov/ppq/weeds/)

Exotic Forest Pest Information System for North America (http://www.exoticforestpests.org/english/english.htm)

Very Useful Printed Sources

Newcomb, Lawrence. 1977. Newcomb's Wildflower Guide. Little, Brown, and Co., Boston, Massachusetts.

Petrides, G. A. 1988. A Field Guide to Eastern Trees. Peterson Field Guide Series, No. 11. Houghton Mifflin, Boston.

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

Brooklyn Botanic Garden. 1996. Invasive Plants, Weeds of the Global Garden. Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn. NY 11225.

Bright, Chris and Linda Starke. 1998. Life Out of Bounds: Bioinvasion in a Borderless World. W. W. Norton: Worldwatch.

Devine, Robert S. 1998. Alien Invasion: America's Battle with Non-Native Animals and Plants. National Geographic Society, Washington, DC

Luken, James O. and John W. Thieret, eds. 1997. Assessment and Management of Plant Invasions. Springer-Verlag, New York, NY

Mooney, Harold A. and Richard J. Hobbs, eds. 2000. Invasive Species in a Changing World. Island Press, Washington D.C.

Westbrooks, Randall. 1998. Invasive Plants, Changing the Landscape of America: Fact Book. Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW) Washington, DC

McKnight, Bill N., ed. 1993. Biological Pollution: The Control and Impact of Invasive Exotic Species, Indianapolis Academy of Science, Indianapolis, IN

Invasive species are "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health"
(Presidential Executive Order 13112, 2/3/99).

An alien species, also called non-native, non-indigenous, or exotic, is one that is introduced, accidentally or purposefully, into an ecosystem in which it did not evolve. Alien or exotic species can come from other continents, other countries and even other parts of the United States.

Exotic species are not automatically "bad." Most of our important food crops and domesticated animals are exotic. But both exotic and native species (ones that evolved in Maryland) become problems when they are invasive. Invasive species often exhibit certain characteristics: they spread aggressively, reproduce quickly, have short juvenile periods, tolerate a wide range of climatic conditions and habitats, compete efficiently against other species, and thrive in disturbed areas. Unfortunately, the pests and diseases that keep these exotic populations under control in their regions of origin are not present in Maryland. Most of Maryland's invasive species come from somewhere else in the world.

Invasive species cause ecological damage by outcompeting native species, reducing biological diversity, and changing ecosystem functions such as flood and fire regimes or nutrient cycling. The Asian vine, kudzu, quickly climbs over trees and shrubs and can kill them by strangling and shading. Some invasive species, like the aggressive stinging red imported fire ant, can present serious human health risks. Invasive species also have major economic consequences, ranging from the loss of economically valuable species to the costs of controlling or managing infestations on public lands. Populations of the predominant forest tree in Maryland, the American chestnut, were decimated by the chestnut blight, an exotic fungus accidentally introduced in the 1880s. The state of Maryland spent 1.8 million dollars in 2000 on activities related to exotic invasive species.

Cover photos, clockwise from top left: emerald ash borer, purple loosestrife, plum pox, multiflora rose.

About MISC

The Maryland Invasive Species Council (MISC), established in April 2000, is a group of concerned scientists, land managers, business people and citizens acting to reduce the spread of invasive plants, animals and diseases.

Mission Statement
"MISC provides leadership concerning invasive species and encourages efforts that prevent the introduction of, and manage the impact of, invasive species on Maryland ecosystems."

Membership is open to all interested government agencies, organizations, and parties operating or conducting business in Maryland. Present membership includes representatives from:

- Adkins Arboretum
- Maryland Assocation of Pet Industries
- Maryland Department of Agriculture
- Maryland Department of the Environment
- Maryland Department of Natural Resources
- Maryland Department of Transportation
- Maryland-National Capital Park and Planning Commission
- Maryland Native Plant Society
- Mid-Atlantic Exotic Pest Plant Council, Inc.
- Maryland Nursery and Landscape Association
- United States Department of Agriculture
- United States Department of the Interior
- United States Environmental Protection Agency
- University of Maryland

For further information concerning membership, or to attend a meeting, contact:

Maryland Department of Agriculture
Plant Protection and Weed Management Section
(410) 841-5920

This brochure funded by
USDA APHIS PPQ Cooperative Agricultural Pest Survey

INVASIVE SPECIES

of Concern in Maryland

http://www.mdinvasivesp.org

Maryland Invasive Species Council

Invasive Species of Concern in Maryland

Key Code	Taxon	Common Name	Description
	Insects		
1, 2, 3	*Adelges tsugae*	Hemlock Woolly Adelgid	Aphid-like insect native to east Asia, now infesting hemlocks from New England to Georgia
1, 2, 3	* *Agrilus planipennis*	Emerald Ash Borer	Exotic pest of ash trees in the landscape, nurseries and wooded areas; limited North American distribution
1, 2, 3	* *Anoplophora glabripennis*	Asian Longhorned Beetle	Woodboring beetle native to China, infesting trees in NY, Chicago, and Toronto
3	*Exomala orientalis*	Oriental Beetle	Grubs a problem in container nursery production; potentially distributed through nursery trade
1, 2, 3	*Lymantria dispar*	Gypsy Moth	Caterpillars defoliate oak trees throughout much of eastern US
3	*Otiorhynchus sulcatus*	Black Vine Weevil	Adults very prolific, wide host range, grubs root feeders; potentially distributed through nursery trade
1, 3	*Popillia japonica*	Japanese Beetle	Adults feed on over 500 species of plants, grubs major turf pests, regulated by quarantine; potentially distributed through nursery trade
1, 2, 3, 4	* *Solenopsis invicta*	Red Imported Fire Ant	Readily transported in agricultural commodities; human health hazard; regulated by quarantine, ecologically disruptive
1, 3	*Tomicus piniperda*	Pine Shoot Beetle	Bark beetle native to Europe and Asia, now infesting pines in Lake States, New England and parts of MD
	Other Invertebrates		
2, 3	* *Bythotrephes cederstroemi*	Spiny Water Flea	Freshwater invasive that may outcompete small fish for food; currently found in Great Lakes and other inland lakes
1, 2, 3	*Carcinus maenas*	Green Crab	Rapidly reproducing marine animal that feeds on commercially important mollusk species; host for marine worm that kills eider ducks
2, 3	*Corbicula fluminea*	Asian Clam	Fouls power plants, irrigation canals and pipes, drinking water supplies, and competes with native freshwater species for food and space
2	* *Daphnia lumholtzi*	Daphnia	Spiny freshwater organism that is preyed on by young fish but is difficult to consume; may decrease survivorship
1 2, 3	* *Dreissena polymorpha*	Zebra Mussel	Freshwater mussel that fouls water supply pipes, boat engine cooling systems, and interferes with native mussel growth and survival
1 2, 3, 4	* *Eriocheir sinensis*	Chinese Mitten Crab	Secondary host to oriental lung fluke, burrows cause bank erosion in estuaries and rivers; damages fishing nets and eats fish caught in nets
1, 2, 3	* *Cryptomphalus aspersus*	Brown Garden Snail	Causes extensive damage in orchards by feeding on ripe or ripening fruit and young trees, regulated by quarantine federally and statewide
2, 3	*Hemigrapsus sanguineus*	Japanese Shore Crab	Invades saline water; has been collected in Maryland Coastal Bays, may serve as a competitor for many native crabs
1, 3	*Heterodera glycines*	Soybean Cyst Nematode	Major crop pest of soybeans and other pea family members
1, 3	*Heterodera zeae*	Corn Cyst Nematode	Affects corn crops and other grasses, first found in Maryland in 1981
1, 3	*Meloidogyne hapla*	Northern Root Knot Nematode	Destroys roots of many vegetable and fruit crops and ornamentals in northern hemisphere
1, 3	*Meloidogyne incognita*	Southern Root Knot Nematode	Destroys roots of many vegetable and fruit crops and woody plants in warmer climates
2	*Orconectes virilis*	Virile Crayfish	Invader of lakes & streams; displaces native crayfish, reduces the kinds and quantities of aquatic plants and invertebrates
2	*Orconectes rusticus*	Rusty Crayfish	Invader of lakes & streams; displaces native crayfish, reduces the kinds and quantities of aquatic plants and invertebrates
2	* *Rapana venosa*	Rapa Whelk	Released through ballast water; predator of hard clams but will also consume soft clams and oysters
	Vertebrates		
2, 3	*Branta canadensis*	Canada Goose (non-migratory)	Populations have grown rapidly in the last three decades, displays aggressive behavior, eliminates shoreline vegetation
1, 2, 3, 4	* *Channa argus*	Northern Snakehead	A top level predator which can quickly impact local fish populations through predation or displacement
1, 2, 3	* *Ctenopharyngodon idella*	Grass Carp	Intentionally introduced in US, may pose a significant threat to submerged aquatic vegetation
2, 3	*Cygnus olor*	Mute Swan	Invader of freshwater and saltwater, diet of submerged aquatic vegetation; poses threat to Chesapeake Bay ecosystem
2	*Gambusia affinis*	Eastern Mosquitofish (non-tidal)	Introduced for control of mosquitoes, aggressive and predatory behavior have negative impact on populations of small fish
1, 2, 3	*Myocastor coypus*	Nutria	Introduced for the fur trade, forages directly on marsh vegetation accelerating the erosion processes associated with tidal currents
	Aquatic Plants		
1 2, 3	* *Caulerpa taxifolia*	Marine Macroalga	Popular in saltwater aquariums and escaped into marine environments. Rapid growth crowds out invertebrates, fish, and native algae
2	* *Elodea densa*	Brazilian Elodea	Found in fresh inland waters, spreads rapidly and outcompetes native plant species; low nutritional value for waterfowl
1, 2, 3	* *Eichhornia azurea*	Water Hyacinth	Floating plant, completely covers lakes, ponds, and slow moving rivers, federally listed noxious weed
1, 2, 3	*Hydrilla verticillata*	Hydrilla	Floating plant, forms dense surface and underwater mats, impassable by motorboats
1, 2	*Myriophyllum brasiliense*	Parrot Feather	Freshwater invasive that spreads rapidly and clogs rivers, water supplies, farm ponds, and irrigation channels
2, 3	*Myriophyllum spicatum*	Eurasian Milfoil	Fresh to brackish water species that forms dense beds, outcompetes native plants; inferior food source for waterfowl
2, 3	*Potamogeton crispus*	Curly Leaved Pondweed	Fresh to brackish water species that forms dense beds, outcompetes native plants; inferior food source for waterfowl
1, 2, 3	* *Salvinia molesta*	Giant Salvinia	Floating plant, covers lakes and ponds, federally listed noxious weed, has been distributed in aquatic nursery trade
1, 2, 3, 4	*Trapa natans*	Water Chestnut	Fills ponds and lakes from top to bottom; seeds viable for a long period of time, spiny seeds harmful to people wading
	Terrestrial Plants		
2	*Acer platanoides*	Norway Maple	Tree that escapes from cultivation, invades open fields, meadows and woods where it forms thickets, very prolific seeder
2, 3	*Ailanthus altissima*	Tree of Heaven	Tree that spreads clonally over large areas, will freely seed, very difficult to control
2	*Alliaria petiolata*	Garlic Mustard	Herbaceous biennial that overtakes floodplain flora and mesic uplands, very adaptable to shady forests
1, 3	*Allium vineale*	Wild Garlic	Perennial bulb that invades lawns, fields, and meadows, subject to state quarantines
2, 3	*Ampelopsis brevipedunculata*	Porcelain Berry	Woody vine, well established in a variety of habitats, introduced as a cultivated plant, berries spread by birds and other wildlife
2, 3	*Artemisia vulgaris*	Mugwort	Herbaceous perennial that escapes from fields, roadsides and waste places into native habitats
2	*Berberis thunbergii*	Japanese Barberry	Shrub, well established in woodlands and forests, introduced as a cultivated plant, seeds spread by birds and other wildlife
1, 2, 3	*Carduus acanthoides*	Plumeless Thistle	Herbaceous biennial that invades roadsides, pastures, and open native habitats, seeds dispersed by wind and wildlife
1, 2, 3	*Carduus nutans*	Musk Thistle	Herbaceous biennial that invades roadsides, pastures and open native habitats, hybridizes with Plumeless Thistle
2	*Celastrus orbiculatus*	Oriental Bittersweet	Woody vine established in woodlands and forests, introduced as a cultivated plant, berries dispersed by birds and other wildlife
2	*Centaurea maculosa*	Spotted Knapweed	Herbaceous perennial that escapes from fields and roadsides into native habitats
1, 2, 3	*Cirsium arvense*	Canada Thistle	Herbaceous perennial that invades fields and pastures, establishes clonal colonies, seeds distributed by wind and wildlife
1, 2, 3	*Cirsium vulgare*	Bull Thistle	Herbaceous biennial that escapes from fields and roadsides into native open habitats, seeds distributed by wildlife
2	*Elaeagnus umbellata*	Autumn Olive	Shrub that invades a variety of native habitats from grassland to forest, introduced as a cultivated plant, berries distributed by wildlife
2	*Hedera helix*	English Ivy	Woody vine that invades forests and woodlands, introduced as a cultivated plant, berries distributed by birds and other wildlife
2	*Hemerocallis fulva*	Daylily	Herbaceous perennial that invades a variety of native habitats, introduced as a cultivated plant
1, 4	*Heracleum mantegazzianum*	Giant Hogweed	Up to 15 ft. tall herbaceous perennial; sap can cause severe skin irritation, blisters and swelling, temporary or permanent blindness
2	*Humulus japonicus*	Japanese Hops	Annual vine, introduced as a cultivated plant
2	*Lonicera japonica*	Japanese Honeysuckle	Woody vine that invades a variety of habitats, introduced as a cultivated plant
2	*Lonicera spp.*	Bush Honeysuckle	Shrub that invade a variety of habitats, introduced as a cultivated plant, fruit is dispersed by birds and other wildlife
1, 2	*Lythrum salicaria*	Purple Loosestrife	Herbaceous perennial that overtakes native wetlands, prolific seeder, biological control organisms available
2	*Microstegium vimineum*	Japanese Stiltgrass	Herbaceous annual rapidly expanding into numerous native habitats, shade-tolerant
2	*Miscanthus sinensis*	Eulalia	Herbaceous perennial grass widely grown in nursery trade, early flowering cultivars have viable seed and are spreading to roadsides
2, 3	*Perilla frutescens*	Perilla	Herbaceous annual that invades a variety of habitats, introduced as a cultivated plant, used medicinally
1, 2, 3	*Phragmites australis*	Phragmites	Herbaceous perennial that overtakes wetland ecosystems, forms large colonies
2	*Polygonum cuspidatum*	Japanese Knotweed	Herbaceous perennial that invades a variety of habitats, forms large colonies, introduced as a cultivated plant
2	*Polygonum perfoliatum*	Mile-a-minute	Annual thorny vine that rapidly overtakes shrubs and trees, seeds dispersed by water
2, 3	*Pueraria montana* var.*lobata*	Kudzu	Woody vine that rapidly overtakes shrubs and trees
2, 3	*Pyrus calleryana* 'Bradford'	Callery Pear	Tree that escapes from cultivation, freely reseeds, most visible when flowering
2, 3	*Ranunculus ficaria*	Lesser Celandine	Herbaceous perennial that overtakes native floodplain flora, difficult to control due to persistent underground tubers
1, 3	*Sorghum bicolor*	Shattercane	Annual grass that invades agricultural and natural ecosystems
1, 2, 3	*Sorghum halepense*	Johnsongrass	Perennial grass that invades agricultural and natural ecosystems
2, 3	*Rosa multiflora*	Multiflora Rose	Shrub that overtakes a variety of open and semi-open habitats, fruits dispersed by birds and other wildlife
	Viruses, Fungi and Other Organisms		
2	*Cryphonectria parasitica*	Chestnut Blight	Persistent organism first detected in 1904; responsible for loss of native chestnut in US
1, 3	* Plum Pox Potyvirus	Sharka	First discovered in the US in Adams County, PA in 1999; this viral disease of stone fruit disfigures fruit and kills the host tree.
2	* Beech Bark Disease Complex		Complex of scale insect and fungal pathogen kills beech trees in Northeast US; detected in Maryland in 2003
1	* *Phytophthora ramorum*	Ramorum Blight	Fungal disease affecting plants from more than 30 genera, established in portions of Pacific northwest, intercepted in nurseries nationwide
1, 3	*Puccinia hemerocallidis*	Daylily Rust	Asian fungal disease of daylily foliage detected in 2000 in US, intercepted in nurseries in Maryland and many other states
3	* *Ralstonia solanacearum* r3b2	Southern Bacterial Wilt	Bacterial disease of certain solanaceous crops, accidentally imported into US from Kenya and Guatamela in 2002 and 2003
1, 3	* *Phakopsora spp.*	Soybean Rust	Fungus that infects more than 90 species of legumes, spread primarily by windborn spores over long distances

KEY

* Red Alert species: Species not yet established in Maryland but considered to be of high risk.

1: Currently Regulated by state and/or federal law
2: Widely recognized by biologists and natural resource managers to degrade natural resources and/or negatively impact native species
3: Known to have a negative economic impact on agricultural or natural resources
4: Known or potential negative impacts on human (or animal) health

rev. December, 2005