

SECTION 17: INVASIVE SPECIES IDENTIFICATION, REMOVAL, AND CONTROL

17.1 Invasive Plant Definition, Recognition, and Reproduction

Definition

“Invasive species are alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.” (*Plant Invaders of Mid-Atlantic Natural Areas*, p. 8) Although this definition considers only human impacts, proliferation of invasive plants can affect entire ecosystems in numerous ways:

- reducing biodiversity
- altering soil chemistry and erosion rates
- degrading or changing wildlife habitat, food quality and availability
- displacing native plants through competition for water, nutrients, light, or space
- altering native populations through breeding or hybridization

Source: *Sustainable Landscapes Certification Manual*. Pennsylvania Landscape and Nursery Association.

As previously discussed in Section 14 of this manual, an integrated systems approach to non-native invasive plants would be to find acceptable population levels rather than seek complete eradication. This level will vary for each species and ecosystem, but greater harm is possible when taking extreme measures to eradicate any single invasive species without consideration of the larger ecosystem whole.

Recognition and Reproduction

Learning how the most common invasive plants look at different times in their growth cycle and during different seasons of the year is a process. The books listed below are great places to start. Many “weed ID” phone apps are also available, often at no cost. The most regionally specific reference book is *Plant Invaders of Mid-Atlantic Natural Areas*, available as a free pdf download.

In addition to knowing what invasive plants look like at various stages of development, you will need to know how they reproduce in order to understand how best to time control methods most effective for that species. It’s always good to work with nature so you’re not fighting harder than necessary to achieve your goals.



Over 60 Grounds and landscape services staff enjoying plant identification training at the University of California, Davis.

PHOTO: PROFESSIONAL GROUNDS MANAGEMENT SOCIETY, BALTIMORE, MD

Not surprisingly, given their successful establishment, invasive plants reproduce and spread in many ways. *Plant Invaders of the Mid-Atlantic* says:

Invasive plants can spread by seed and by vegetative means including rhizomes, runners, shoots, tubers and bulbs. Seeds and plant fragments may be dispersed by wind, water, wildlife and people. Some animals spread invasive plants by consuming the fruits and depositing seeds later or by transporting seeds or fruits on their fur and feet. People can spread invasive plants by carrying seeds and other plant parts on their shoes, clothing and equipment, or by using contaminated fill dirt and mulch. A common pathway for dispersal of invasive aquatic plants is through attachment to anchors, propellers, and wheel wells.

Don't try to learn every invasive plant at once. Focus on three that are most common in a particular landscape you care for. Learn as much as you can about them, both from books and in the field. Test recommended control methods and keep detailed notes. After you gain confidence with a few species, learn three more. Slowly you will develop an invasive plant knowledge base with control methods that work for you.

17.2 Public Agency Assistance and Regulation

Your state, county, or city may maintain an invasive plant list with recommended control and disposal measures. Your local extension agency, Master Gardener, riverkeeper, or watershed stewards, native plant society, or "weed warriors" group may offer technical assistance or organize work days for invasive plant control on public lands. Here are state-level invasive plant websites from which to start your research:

- Delaware: www.dnrec.state.de.us/fw/invasive.htm
- District of Columbia: doee.dc.gov/page/invasive-plants-district
- Maryland: dnr2.maryland.gov/invasives
- New York: www.dec.ny.gov/animals/265.html

- Pennsylvania: www.dcnr.state.pa.us/forestry/plants/invasiveplants
- Virginia: www.dcr.virginia.gov/natural-heritage/invspinfo
- West Virginia: www.wvdnr.gov/wildlife/invasivewv.shtm

Be aware that certain states pass legislation against the planting or sale of certain invasive species. Always check online before planning a purchase. For example, Maryland has such a [law to regulate invasive plants](#). This is a dynamic field so check often and register for any email updates you can.

17.3 Control Methods

The following seven invasive plant control method categories appear here in a sequential list. However, throughout the landscape different plants will be at different stages of the process simultaneously, most of the time. It is beyond the scope of this manual to do what the excellent books in the References section below have already done: present plant specific growth and reproduction habits and control measures for dozens of local invasive plants. But it is important to know what control measures are available. They are as follows:

1. Prevention

Don't plant invasive non-native plants in the first place. Consult local lists and don't purchase, even if those plants are sold in local nurseries.

2. Regular monitoring

On every routine site visit, have a knowledgeable crew member scout for emerging invasive plants. Make notes, keep records, and notify the client of what you find. Also monitor for re-emergence of previously treated areas.

3. Early intervention

Don't wait until an area is overrun with a particular invasive plant before taking action. You may have one area that is completely covered with English ivy, for example. But keep the big picture in mind and be sure to treat the area with a small emergent invasive population before it gets well established and treatment is more difficult, time consuming, and costly.

4. Manual controls

Thinking on this is evolving. New ideas advanced by professionals like Larry Weaner advise against pulling most weeds out by the roots, which exposes bare soil and brings viable weed seeds to the surface. Cut the plants to the ground leaving the roots in place, and repeat the procedure until the root system becomes so weak the plant eventually fails to re-emerge. There are exceptions however, such as Oriental bittersweet, which should be pulled.

5. Mechanical controls

Mechanical methods include cutting (see above), mowing (timed to when desired plants are shorter than the height of those being mowed), and burning (only as required and with permits).

6. Biological controls

Grazing animals (goats and sheep) or timed release of host-specific insects. Customize biological controls to the plant being managed, the site, and the season. There are companies that will bring a small herd of goats to your site for targeted deployments.

7. Chemical controls

Herbicide use is regulated and should be done with care and by certified individuals. Two of the most common herbicides are glyphosate and triclopyr (sold under a variety of brand names). For a thorough discussion of chemical controls, see *Plant Invaders of Mid-Atlantic Natural Areas*, pp. 75–77. Application of chemicals on woody plants is done in various ways depending on the plant. Three methods are: 1) the basal bark method, 2) the cut stem method, and 3) the foliar spraying method. Herbicide and pesticide certifications and permits may be required depending on the situation. Always check.

Always read directions. Understand that more (of a chemical) is not better. And attempt controls without chemical use whenever possible.

17.4 Common Regional Invasive Plants

The Mid-Atlantic Invasive Plant Council (MAIPC) coordinates regional efforts to gather and share information on the identification, management and prevention of invasive species, provide training and volunteer opportunities and to identify research needs. This website is a tremendous resource for plant ID and training: www.maipc.org.

Table 8 includes a small subset of all regional invasive plants intended to show the different plant categories and some of the most common ones. Note that some of these plants are still sold in plant nurseries.

TABLE 8: SELECTED COMMON CHESAPEAKE BAY WATERSHED NON-NATIVE INVASIVE PLANTS

Aquatics	Grasses	Herbaceous Plants	Shrubs	Trees	Vines
Eurasian watermilfoil <i>Myriophyllum spicatum</i>	Common reed <i>Phragmites australis</i>	Garlic mustard <i>Alliaria petiolata</i>	Autumn olive <i>Elaeagnus umbellata</i>	Bradford pear <i>Pyrus calleryana</i>	Oriental bittersweet <i>Celastrus orbiculatus</i>
Hydrilla <i>Hydrilla verticillata</i>	Japanese stiltgrass <i>Microstegium vimineum</i>	Japanese knotweed <i>Fallopia japonica</i>	Multi-flora rose <i>Rosa multiflora</i>	Norway maple <i>Acer platanoides</i>	English ivy <i>Hedera helix</i>
		Purple loosestrife <i>Lythrum salicaria</i>	Burning bush <i>Euonymus alatus</i>	Princess tree <i>Paulownia tomentosa</i>	Japanese honeysuckle <i>Lonicera japonica</i>
			Japanese barberry <i>Berberis thunbergii</i>	Tree of heaven <i>Ailanthus altissima</i>	Periwinkle <i>Vinca minor</i>