

## Management Considerations for Invasive and Non-Native Species in Nontidal Wetland, Stream, and Buffer Mitigation Sites in Maryland

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Mitigation projects should be designed to become self-sustaining natural systems with no non-native or invasive species<sup>1</sup>. As described in the Maryland Performance Standards<sup>2</sup>, the acceptable cover of non-native or invasive species will be no more than 10% of relative plant cover over the entire mitigation site, with no individual colony greater than or equal to 5% of relative plant cover. In addition, no more than 5% of relative plant cover over the entire mitigation site shall be made up of *Phragmites australis*, *Persicaria perfoliata*, *Pueraria montana*, or *Lythrum salicaria*. However, even with proper site selection, construction protocols, and control measures to reduce the risk of encroachment by these undesirable species, mitigation sites can struggle to achieve this goal within certain regions of Maryland. For mitigation sites that do not meet the required performance standards for non-native or invasive species, the U.S. Army Corps of Engineers and Maryland Department of the Environment, in coordination with the Interagency Review Team (for mitigation banks), may consider a focused management approach for handling non-native and invasive species. This focused management approach is designed to consider a holistic strategy, reducing harmful herbicide usage while still accounting for long-term site success.

To the extent practicable, the mitigation plan implementation shall minimize effects that would lead to improved conditions for non-native or invasive species. Monitoring reports must fully identify and evaluate the presence and abundance of non-native and invasive species and develop management recommendations. In addition, the Priority species below, as an ongoing threat to restoration site development, should be monitored more frequently throughout the required monitoring period.

In general, identification of Priority Species listed below will trigger eradication measures and should be controlled aggressively. Invasive plant eradication measures will be conducted at the proper time of year, using appropriate control measures. These species are more of a threat to meeting the desired future conditions for restoring native habitat conditions, high-value ecosystems, and key ecological processes, as well as, long-term success of the site. They may be more persistent, highly prolific, likely to form monocultures, more easily managed, shade tolerant, or likely to inhibit develop of a forested community.

### Priority Species:

Trees and shrubs:

- Tree-of-heaven (*Ailanthus altissima*)
- Japanese barberry (*Berberis thunbergii*)
- Autumn or Russian Olive (*Elaeagnus* spp.)
- Privet (*Ligustrum* spp.)
- Bush honeysuckle species (*Lonicera* spp.)

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<sup>1</sup> Invasive species are identified on the 2010 National Park Service/U.S. Fish and Wildlife Service document *Plant Invaders of Mid Atlantic Natural Areas* <https://www.invasive.org/alien/pubs/midatlantic/midatlantic.pdf> and the Maryland Invasive Species Council Invasive Species of Concern in Maryland <http://mdinvasives.org/species-of-concern/>. Native status will be based on the Natural Resources Conservation Service Plants Database <https://plants.sc.egov.usda.gov/>.

<sup>2</sup> Performance standards are described in “Ecological Performance Standards and Monitoring Protocol for Nontidal Wetland Mitigation Sites in Maryland” for wetlands and wetland buffers and in “Stream Mitigation Performance Standards in Maryland” for stream buffers.

- Callery ('Bradford') pear (*Pyrus calleryana*)
- Multiflora rose (*Rosa multiflora*)

Vines:

- Porcelainberry (*Ampelopsis brevipedunculata*)
- Oriental bittersweet (*Celastrus orbiculatus*)
- Winter creeper (*Euonymus fortunei*)
- English ivy (*Hedera helix*)
- Japanese hops (*Humulus japonicus*)
- Japanese honeysuckle (*Lonicera japonica*)
- Mile-a-minute (*Persicaria perfoliata*)
- Kudzu (*Pueraria* spp.)
- Chinese or Japanese Wisteria (*Wisteria* spp.)

Herbaceous:

- Bamboo (*Bambusa* spp. and *Phyllostachys* spp.)
- Canada thistle (*Cirsium arvense*)
- Giant hogweed (*Heracleum mantegazzianum*)
- Purple loosestrife (*Lythrum salicaria*)
- Reed canarygrass (*Phalaris arundinacea*)
- Common reed (*Phragmites australis*)
- Japanese knotweed (, *Polygonum cuspidatum*)
- Giant knotweed (*Polygonum sachalinense*)

**The regulatory agencies may determine that additional species not on this Priority Species list also need to be actively managed for a particular project.** Species risk should be based on site-specific criteria including but not limited to species percent cover, location within the restoration site, concern that these species will negatively impact the ability of the site to achieve its goals and objectives, and presence of other desirable species. For example, species that are likely to be shaded out in the long run (for sites designed to be forested) may be less of a concern. If the site is designed to be an emergent site, it may be important to also treat less shade tolerant species (e.g., *Lespedeza cuneata*). Some species are invasive but are very difficult to control because they tend to be interspersed with desirable species. For example, it may not be realistic to control *Arthraxon hispidus* when it is interspersed with native species. Some species are also less of a concern when the area has a high tree/shrub density, high tree/shrub canopy cover, and species richness is still high. Species may need to be controlled if they become dominants, or are trending towards dominance, and are precluding native species from establishment (e.g., Cattail monocultures). **Each project must be discussed with the regulatory agencies on a case-by-case basis to determine the non-native/invasive species strategy appropriate for that site.**