

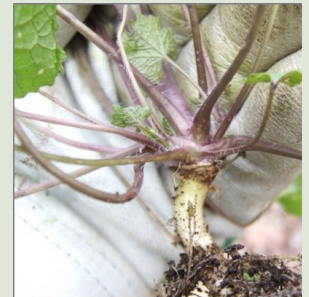
FACT SHEET

Identifying and Managing Invasive Plants

2-16-22

Garlic Mustard *Alliaria petiolata*

- Cool-season biennial – first-year rosettes develop in fall and stay green over winter
- Prefers moist soil in part shade – stream banks, woods
- Rosette has rough, rounded-heart-shaped leaves, dark stems; stem is purple at soil level
- Leaves smell like garlic when crushed
- Flower stalks 1 to 2 ft tall in May; mature leaves become arrow-shaped but still toothed
- Seed heads hold viable seed all summer
- A ruderal species, found in areas of disturbed soil



Native Look-Alike -- Golden Ragwort *Packera aurea*

- Prefers moist soil in full sun to part shade – stream banks, edges of woods, under trees.
- Heart-shaped toothed medium-green leaves often with purplish tinge underneath
- Flower buds tinged with purple before opening
- Freely self-seeds and is easily grown from seed
- Forms large colonies in optimal conditions



Species-Specific Control for Garlic Mustard

- Pull or cut plants in winter while soil is unfrozen.
- Pull or cut rosettes in spring before they flower.
- REMOVE any plants with flowers, as seeds can still develop on cut stems.
- Avoid composting plants due to possible allelopathic compounds and persistent seeds.
- Transplant *Packera aurea* into garlic mustard patch to allow *Packera* to take over.
- Cut or mow garlic mustard when it starts to flower.



Garlic mustard

Packera

Lesser Celandine *Ficaria verna*

- Shiny dark green heart-shaped leaves, bright yellow flowers with 6 to 8 petals in March-April; fleshy white tubers
- Colonizes lawns and edges of woods; prefers moist soil
- Dense, rapid growth forms large, thick mats of foliage
- Flowers have three light green sepals underneath the petals
- Double whammy -- summer dormancy invites warm-season weeds



Native Look-Alike -- Marsh Marigold *Caltha palustris*

- Grows a bit taller than lesser celandine; forms distinct clumps, not mats
- Flowers several weeks later in our area – April to May



Species-Specific Control for Lesser Celandine

- Digging is problematic – it's difficult to dig up the entire root-tuber system, especially in wet spring soil, and digging disturbs the soil further.
- Smothering with thick cardboard can eliminate existing plants if no gaps are left, but new plants will emerge from seeds and bulbils that travel with stormwater.
- Avoid weed-whacking as this could spread the bulbils at the base of the plants.
- Lesser celandine is another ruderal plant that reproduces by seed as well as underground tubers – could planting marsh marigold or another early-blooming aggressive native suppress it?

Bishop Weed *Aegopodium podagraria*

- Leaves are twice-compound with long stalks; some cultivars have variegated foliage
- Roots are a distinctive bright white
- White flowers in umbels, 2 ft tall
- Can form a dense mat in moist, partly shaded woodlands, preventing other plants from establishing
- Spreads by seed and underground runners; plants will regrow from root pieces left in the ground



Native Look-Alike - Golden Alexander *Zizia aptera*

- Also has compound leaves, but the patterns are different
- *Zizia* plants form defined clumps, whereas bishop weed forms a mass or mat
- The roots of bishop weed are WHITE; *Zizia* roots are brown



Species-Specific Control for Bishop Weed

- Weed-whack or cut plants to the ground just after they have fully leafed out, then cover bare soil with mulch and replant with aggressive natives. This will deplete the plant's carbohydrate reserves and prevent it from photosynthesizing additional food.
- Remove new plants as they appear by digging them out with a narrow-bladed tool, to minimize soil disturbance, or cut new plants just below the soil several times during the season to starve the roots.
- Roots can re-sprout in a compost pile; dry them out first.
- For heavy infestations, weed-whack plants to the ground, cover with thick cardboard (leave NO gaps) and a layer of wood chips, and replant with natives.
- Persistence is needed – monitor the locations where you removed bishop weed and keep at them all season.
- Plants encroaching from neighboring property – install an impenetrable barrier (metal or plastic edging) at least 4" underground. Cut, mulch, and replant on your side of the barrier; monitor closely.

Yellow Archangel *Lamiastrum galeobdolon*

- Variegated, coarsely toothed leaves, hooded yellow flowers, square stems, 1-2' tall
- Highly adaptable; grows in a wide range of conditions, from full shade to full sun, in sandy to heavy clay soils
- Prefers moist soil (growth will be more dense) but also tolerates drought and dry sites
- A member of the mint family; spreads effectively by seed, stem fragments, and root nodes
- Creates dense monocultures that allow little else to grow



Species-Specific Control for Yellow Archangel

- Roots are not deep, so plants can be hand-pulled or dug. However, plants grow densely, so hand-pulling is labor-intensive and not very effective long term due to the plant's ability to sprout from small fragments of root or stem, as well as its tendency to grow into and among desirable vegetation.
- Sift through soil carefully to find all roots and stem fragments. Smother dense infestations with cardboard and a layer of wood chips; replant with natives to out-compete resprouts.
- Monoculture infestations can be controlled by sheet-mulching with cardboard and/or burlap followed by a thick layer of wood chips and replanting with natives. Control any escaping plants and check regularly for gaps in the covering material.
- Weed-whacking is problematic because stems scattered by the machine can re-sprout wherever they land; rake them up and allow to dry out before composting.
- Because yellow archangel spreads by stem and root cuttings, don't dump the refuse in natural areas or dispose of it in the compost pile until it has been completely dried out.

Sweet Autumn Clematis *Clematis terniflora/paniculata*

- Aggressive vine growing up to 30 feet a season
- Small fragrant white flowers on new wood in late summer; fluffy silver seed heads in fall
- Leaves are long and oval shaped with smooth edges



Native Look-Alike *Clematis virginiana*

- Similar vine with small fragrant white flowers and fluffy silver seed heads in fall
- Leaves are distinctly toothed



Species-Specific Control for Sweet Autumn Clematis

- Cut vine to the ground in late summer before seeds develop. Keep cutting resprouts during the next year to starve the roots.
- Juvenile plants can be hand pulled or cut below the soil line. Cut off root sprouts as they appear.
- For climbing vines, cut vines just below ground level and as high as possible. Cut off root sprouts as they appear.
- Allow roots to dry out before composting.

Oriental Bittersweet *Celastrus orbiculatus*

- Deciduous climbing woody vine up to 60 ft long and 4" thick
- Light green alternate elliptical finely toothed leaves; bright orange roots
- Bright red berries occur in leaf axils all along stems; yellow fruit capsules
- Prefers sun but can tolerate shade
- Vines can girdle and kill trees, break branches, and shade out natives
- Spreads by seeds (birds) and root suckers



Native Look-Alike - American Bittersweet *Celastrus scandens*

- Flowers & fruit occur only at ends of branches
- Fruit capsules are orange



Native Look-Alike (Seedlings) - Spicebush *Lindera benzoin*

- Leaves oval with smooth edges
- Leaves smell spicy when crushed



Species-Specific Control for Oriental Bittersweet

- Seedlings - roots are not deep; pull by hand or cut below soil level.
- Larger plants - dig and remove as many roots as possible. Roots on larger plants have many branches; follow and remove as many as possible. To avoid soil disturbance, cut roots below soil level and monitor area for sprouts from root branches.
- Vines - cut below soil level and as high as possible; don't pull vines out of trees as this will damage tree branches. Not necessary to untwine from host tree branches if vine has been cut off at soil level or root has been dug up.
- Seedlings will continue to sprout as long as plants remain in the area; persistence is required but is effective.



Canada Thistle *Cirsium arvense*

- Perennial noxious weed with a clonal root network that can grow deep into the ground
- Lobed oblong waxy green leaves are tipped with spines
- Flowers mostly purple, blooming June to August up to 5 ft tall
- Can spread rapidly via horizontal root network and by reseeding
- Ruderal plant commonly found in agricultural and disturbed sites; shade-intolerant



Native Look-Alikes - Field Thistle, Pasture Thistle

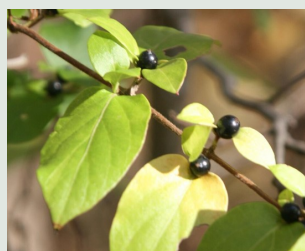
- Field thistle and pasture thistle are biennials that spread by seed, not vegetatively
- Consult a field guide to identify native thistles

Species-Specific Control for Canada Thistle

- For light infestations (there is never just one plant; the root network sends up multiple stems at different times), cut repeatedly just below soil surface; replant with natives to shade out the area.
- Close mowing or cutting of plants twice per growing season just before flowering will usually prevent seed production. Cut at the early bud stage and again when resprouts reach the early bud stage. If plants are cut above the terminal bud before the stems elongate, they likely will regrow. Mowing before the flowers start showing color is important; plants that have developed flowers will produce some viable seed. DO NOT MOW after flowering. Bag or trash seed heads and roots.
- Smother large infestations with cardboard and wood chips, followed by replanting of natives that create quick shade.
- Highly vigorous plants such as wild bergamot (*Monarda fistulosa*), purple prairie clover (*Dalea purpurea*), golden alexander (*Zizia aurea*), Canada wild rye (*Elymus canadensis*), and slender wheatgrass (*Elymus trachycaulus*) can be used to outcompete and suppress Canada thistle.

Japanese Honeysuckle *Lonicera japonica*

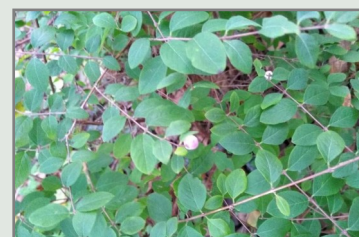
- Fast-growing semi-evergreen climbing vine that twines around stems of shrubs and girdles saplings
- Adapted to a wide variety of habitats from sun to shade
- Prefers sun but can tolerate shade
- Opposite oval leaves; secondary leaves may have additional margins
- Spreads by seeds (birds) and root runners



Native Look-Alike (vines on the ground) - Coralberry

Symphoricarpos orbiculatus

- Opposite oval leaves on long arching branches
- Clusters of small pink berries in fall
- Coralberry is a shrub that sends out runners from its crown

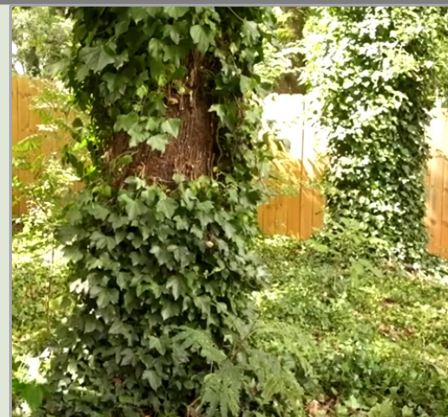


Species-Specific Control for Japanese honeysuckle

- Seedlings and surface runners: Pull out and allow to dry out before composting. Be careful around coralberry plants!
- Young vines choking saplings or shrubs: Unwrap each vine from the host plant, cutting the vine with pruners where necessary. When you get to the base of the shrub or tree, cut the vine below the crown. Allow vines and roots to dry out before composting.
- Mature vines climbing through trees: Cut vines as high as possible. Wait at least one year before pulling mature vines out of trees to minimize damage to host plant. Use pruners or a hand saw to cut vines as close as possible to ground level (beneath the soil level if possible). Allow vines and roots to dry out before composting.

English Ivy *Hedera helix*

- Evergreen perennial vine grows in sun and shade
- Dark green triangular lobed leaves with prominent light veins; mature leaves may not have lobes
- Climbing vines attach to trees via short rootlets.
- Mature vines produce small black fruits eaten by birds
- Spreads from roots that develop along the stem. Stems root easily when in contact with soil.



Species-Specific Control for English Ivy

- Vines on the ground can be pulled by hand; the root system is shallow. To avoid soil disturbance, lift the vine and clip the roots as you pull. Wear gloves; ivy contains sap that can irritate skin.
- Vines on the ground can also be smothered under several inches of biodegradable plant material, such as wood chips. The mulch should stay in place for at least two growing seasons.
- For climbing vines, make two cuts all the way through the vine, several inches apart. Remove the cut vine section. The vine above the cut will die. Repeat for each vine all the way around the tree or other structure. Clip any root sprouts at ground level. Don't pull ivy out of the tree as this will damage branches.
- The ivy above the cut will die; don't pull it out of the tree, as this could damage limbs. Allow ivy clippings to dry out completely before composting, or burn them.
- Keep cutting off new growth that sprouts around the base of the cut vines to starve the root system.
- Stems and root cuttings can resprout; allow all material to dry before composting.
- This video demonstrates how to cut heavy vines on trees: <https://www.youtube.com/watch?v=sQKxiRe1XvI>



Chinese Silver Grass *Miscanthus sinensis*

- Densely bunched grass 5 to 10 feet tall
- Slender blades with silver midrib
- Distinctive silver fans of flowers in late summer
- Prefers full sun but can grow in part shade
- Spreads primarily by underground roots or rhizomes, but multiple varieties grown together have resulted in a “wild type” that can set a significant amount of viable seed



Native Look-Alikes - Indian grass *Sorghastrum nutans*, Bottlebrush grass *Elymus hystrix*

Indiangrass flowers are long plumes with a distinctive golden color



Flowers of bottlebrush grass are spiky rather than feathery with an opposite arrangement



Species-Specific Control for Chinese Silver Grass

- Repeated mowing or weed-whacking as short as possible throughout the growing season usually will kill *Miscanthus* over two seasons. Areas with a seed bank may require several years of mowing. *Miscanthus* cannot tolerate repeated cutback during the growing season. Mowing management similar to that for lawns will provide the best control. *Miscanthus* cannot tolerate repeated mowing or cutting back DURING THE GROWING SEASON.
- Individual plants or small patches can be dug out as long as all of the roots are removed. After removal, monitor the site and cut down any re-sprouts during the growing season.
- Stop mowing once flowers have started to form. **Cutting back in late fall or winter encourages more growth.**
- **Burning will increase this plant's growth, vigor, and seed set. NEVER BURN MISCANTHUS to control it. *Miscanthus* is considered a wildfire hazard due to the large amount of highly flammable dry plant material it can produce.**

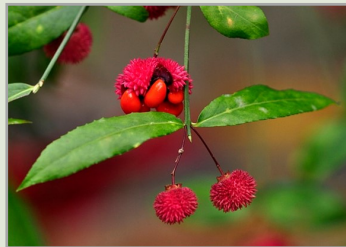
Winged Euonymus/Burning Bush *Euonymus alatus*

- Bright red fall foliage, insignificant greenish flowers
- Tolerates a wide range of exposures and soil conditions
- Responds to being cut back with vigorous new growth; stems will re-sprout from roots.; seeds are spread by birds
- Corky edges on mature stems are a distinctive identifying feature



Native Look-Alikes - Strawberry Bush *Euonymus americanus* Eastern Wahoo *Euonymus atropurpurea*

Strawberry bush has green four-sided twigs but NO corky ridges; bright orange fruit in fall



Eastern wahoo has tiny purple flowers and dark purple fruit

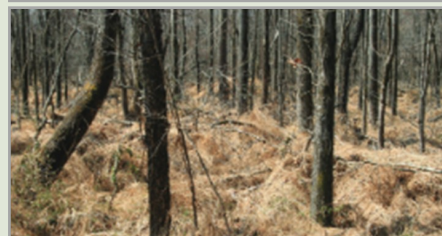


Species-Specific Control for Winged Euonymus

- Pull up small plants.
- Check around the site for sprouts from roots. Roots of older plants are widespread – a 20-ft perimeter is not unusual.
- Mature plants send up root shoots that develop into new plants. All the plants in a colony must be cut or dug out.
- Every time you cut the plant, you force it to re-sprout, which depletes root reserves and weakens the plant.

Japanese Stiltgrass *Microstegium vimineum*

- Annual grass growing 1 to 3 feet tall or sprawling along the ground
- Narrow lance-shaped leaves; thin, weak root system; resembles a small delicate bamboo
- Multiple stems branching near the base; longer stems sprawl and root at nodes; forms thick mats of vegetation
- Tan flower spikes in late summer at tips of stems AND self-pollinating flowers hidden in leaf axils earlier in summer
- Thrives in sun or shade, moist or dry soil, in lawns, in between and on top of other plants
- Seeds are spread by surface water, animals, humans, vehicles; seeds remain viable in soil for up to 5 years
- Forms a dense groundcover that smothers native plants and prevents regeneration of forests and fields
- Releases chemicals that alter soil chemistry and effectively stop other plants from growing, allowing it to spread even more quickly



Species-Specific Control for Japanese Stiltgrass

- Hand pulling can work for small infestations. Dispose of stiltgrass in the trash; do not compost.
- Mow or weed-whack while plants are in flower but before seeds set -- usually August. If stiltgrass is mowed in June, flowers low on the stems may still set seed, so repeat mowing will be needed. A late mowing will set the plants back, but mowing too early will result in the plants still being able to flower and set seed.
- Mowing and weed-whacking are problematic when stiltgrass grows in with other plants, or in woodlands that can't be mowed.
- Smothering with cardboard topped with wood chips will prevent stiltgrass from emerging for at least 1 year; replant the area promptly.
- Seeding directly into the decomposing layer of wood chips will reduce future Japanese stiltgrass invasions. Seeding with annual rye can be a temporary restoration practice and is a recommended first stage of complete restoration.
- Certain native plants may be able to out-compete stiltgrass, either as interplantings or after removal:

golden ragwort (*Packera aurea*)

rosy sedge (*Carex rosea*)

May apple (*Podophyllum peltatum*)

Virginia wild rye (*Elymus virginicus*; sun to part shade)

northern sea oats (*Chasmanthium latifolium*)

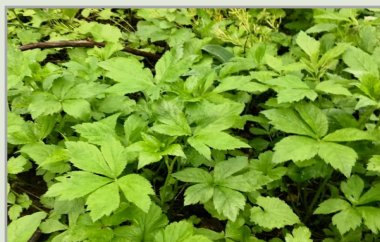
bottlebrush grass (*Elymus hystrix*; dry soil including clay)

- Encourage natives to populate areas overtaken by Japanese stiltgrass:

Canadian black snakeroot
(*Sanicula canadensis*)

white avens (*Geum canadense*)

enchanter's nightshade
(*Circaea lutetiana*)



Follow Up After Removal

Whichever method of removal you use, follow up is critical to prevent invasives from returning, especially if roots were left in the soil or a considerable seedbed remains, and to keep invasives from colonizing the site due to soil disturbance and removal of canopy or groundcover plants.

Cleared areas need immediate cover!

- If you removed invasives that created **canopy** -- climbing vines, trees, tall shrubs -- plant more canopy trees, and fill in the lower layers with shrubs, forbs, grasses, and groundcover plants.
- If you removed plants that **shaded the ground**, plant layers of native forbs and small shrubs.
- If you removed **groundcover** plants, including vines like honeysuckle or ivy, plant native groundcovers. Groundcovers should also be planted under the natives shrubs and forbs you plant.

Natives for Quick Cover

Choose plants that spread quickly to cover the ground, whether by seeds, rhizomes, or both. Check each plant's preference for sun, moisture, and soil type.

Groundcovers: *Salvia lyrata*, *Antennaria plantaginifolia*, *Chrysogonum virginianum*, *Carex*, *Lysimachia lanceolata* var. *purpurea*, *Packera aurea* and *P. obovata*, Robin's plantain (*Erigeron pulchella*), Virginia creeper (*Parthenocissus quinquefolia*), *Phlox stolonifera* and *P. subulata*, dwarf cinquefoil (*Potentilla canadensis*), violet (*Viola sororia*)

Forbs: white wood aster (*Eurybia divercata*), blue wood aster (*Symphotrichum cordifolium*), mountain mints (*Pycnanthemum*), blue mist flower (*Conoclinium coelestinum*), thimbleweed (*Anemone virginiana*), *Rudbeckia*, *Helenium autumnale*, *Monarda*, hay-scented fern (*Dennstaedtia punctilobula*)

Shrubs & small trees: Carolina allspice (*Calycanthus floridus*), grey dogwood (*Cornus racemosa*), elderberry (*Sambucus*; watch for deer), sumac (*Rhus*; deer will browse certain species)

Canopy trees: Sycamore (*Platanus occidentalis*), black cherry (*Prunus serotina*), black willow (*Salix nigra*), sassafras (*Sassafras albidum*), red maple (*Acer rubrum*)

Plan for some of your initial plantings to be replaced by different species as the area matures.

Plan(t) the Solution

According to Professor Douglas Tallamy, 86% of land in the United States east of the Mississippi River is in private ownership.

We need to take ownership of the solution, for restoring balance to our ecosystem, "one yard at a time."

Homegrown National Park™ is a grassroots call to action to regenerate biodiversity and ecosystem function by planting native plants and creating new ecological networks. Our National Parks, no matter how grand in scale, are too small and separated from one another to preserve species to the levels needed. Thus was born the concept for Homegrown National Park, a bottom-up call to action to restore habitat where we live and work, by planting native plants and removing most invasive plants.

The initial goal is 20 million acres of native plantings in the U.S., representing approximately one-half of the green lawns of privately owned properties.

This is the largest cooperative conservation project ever conceived or attempted.

Learn more, and add your property to the map: <https://homegrownnationalpark.org/about>

Native Alternatives to Common Invasive Ornamentals

Invasive ornamentals	Plant these natives instead:
Lesser celandine (<i>Ficaria verna</i>)	Marsh marigold (<i>Caltha palustris</i>), green and gold (<i>Chrysogonum virginianum</i>), golden ragwort (<i>Packera aurea</i>)
Bishop weed (<i>Aegopodium podagraria</i>)	Golden alexander (<i>Zizia aurea</i> for wet soil, <i>Z. aptera</i> for drier soil), <i>Tiarella cordifolia</i> var. <i>cordifolia</i> ; plantain-leaved pussytoes (<i>Antennaria plantaginifolia</i>), Robin's plantain (<i>Erigeron pulchella</i> var. <i>pulchella</i>)
Yellow archangel (<i>Lamiaeum galeobdolon</i>)	Green and gold (<i>Chrysogonum virginianum</i>), <i>Lysimachia lanceolata</i> var. <i>purpurea</i>
Oriental bittersweet (<i>Celastrus orbiculatus</i>)	American bittersweet (<i>Celastrus scandens</i> ; not deer resistant); cross vine (<i>Bignonia capreolata</i>), woodbine (<i>Clematis virginiana</i>)
Japanese honeysuckle (<i>Lonicera japonica</i>)	Coral honeysuckle (<i>Lonicera sempervirens</i>), woodbine (<i>Clematis virginiana</i>), yellow jessamine (<i>Gelsemium sempervirens</i> ; northern limit of its range), cross vine (<i>Bignonia capreolata</i>), Virginia creeper (<i>Parthenocissus quinquefolia</i> ; groundcover)
Sweet autumn clematis (<i>Clematis terniflora/paniculata</i>)	Woodbine (<i>Clematis virginiana</i>)
Chinese silver grass (<i>Miscanthus sinensis</i>)	Big bluestem (<i>Andropogon gerardii</i>), Indiangrass (<i>Sorghastrum nutans</i>), sea oats (<i>Chasmanthium latifolium</i> ; tolerates shade); bottlebrush grass (<i>Elymus hystrix</i>)
English ivy (<i>Hedera helix</i>)	Virginia creeper (<i>Parthenocissus quinquefolia</i> ; climber & groundcover), wild ginger (<i>Asarum canadense</i> ; groundcover)
<i>Vinca minor</i>	<i>Phlox stolonifera</i> , <i>Iris cristata</i> , blue-eyed grass (<i>Sisyrinchium angustifolia</i>), lyre-leaf sage (<i>Salvia lyrata</i>)
Burning bush (<i>Euonymus alatus</i>)	Black chokeberry (<i>Aronia melanocarpa</i>), red chokeberry (<i>Aronia arbutifolia</i>), ninebark (<i>Physocarpus opulifolius</i>), Virginia sweetspire (<i>Itea virginica</i>)
Japanese barberry (<i>Berberis thunbergii</i>)	Virginia sweetspire (<i>Itea virginica</i>), aromatic sumac (<i>Rhus aromatica</i>)

RESOURCES

Pennsylvania Department of Conservation and Natural Resources [Invasive Plant Fact Sheets](#)

[Blue Ridge PRISM Fact Sheets](#)

[iMapInvasives](#)

- iMapInvasives is an on-line GIS-based data management system used to assist citizen scientists and natural resource professionals working to protect our natural resources from the threat of invasive species.
- Participating jurisdictions are Arizona, Maine, New York, Oregon, Pennsylvania, and Saskatchewan.
- Pennsylvania currently tracks 412 species of invasive plants (including aquatics), insects, and animals.
- If you find an invasive species in one of these areas, you can submit a report on line to iMap.

[Homegrown National Park](#)