



Blue Owl Hollow

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Plant Marauders of Field and Forest: Invasive Species to Know and Control

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Description:

What is a weed and what makes a weed an INVASIVE weed? Learn to identify and understand several of Ohio's most common plant invasives and then join me in exploring alternative -- and sometimes unexpected -- ways to combat them without the use of toxic herbicides.

Definitions:

Weed: any plant growing where you don't want it to be growing

Invasive plant: any plant that is growing where you don't want it.... to the extent that it's crowding out other plants and disrupting the proper functioning of the overall ecosystem around it

Background and Disclaimers:

I am a forest farmer and herb farmer using sustainable, permaculture principles to foster biodiversity, conservation, and native habitat. I feel it's more useful to provide an overview of tools and techniques and a different mindset in approaching this problem rather than lots of plant specifics. Towards that end, I will use individual plant species that I have experience with as examples, but will try to generalize to broader plant classes.

Most of the work I've done combating invasives has not taken place in cultivated areas; the truly frightening invasives are the plants that have moved into our forests and field edges and made themselves at home, crowding out native plants and reducing appropriate habitat for our native pollinators, birds, animals, amphibians, and reptiles. They are a threat to our entire ecosystem, not just our livelihood as farmers. Some actually pose threats to human health. So I won't spend much, if any, time on common weeds of cultivated areas, but I would hope that many of the techniques described below are applicable in that arena as well.

A lot of what I say will sound like common sense.... and a lot of work. Both statements are true. There is no magic bullet, even if you ultimately choose to use herbicides.

Themes:

How many of you have ever stood looking over a part of your farm and wanted to just sit down and cry because of the weeds? Yeah, me, too. I've found that the best remedy for that is.... REVENGE. The more creative and lucrative, the better!

Controlling plant invasives on your property is not a battle, it's a war. Requires time and resources, a long-term commitment with a clear goal, an intimate knowledge of the enemy AND the battlefield, development of effective offensive and defensive strategies, and acquiring appropriate weaponry and skill to use it.

Strategies:

Knowledge is power; become intimate with your land

- know your soils
- know your native plant communities
- know your invasives
 - how many of you have a forest management plan?
 - controlling invasives should be a significant portion of your forest management plan

Know your enemy, particularly strengths and weaknesses

- know it in all seasons
 - dormant
 - budding out
 - full leaf
 - flowering
 - seeding
- how did it get here?
- why is it thriving to the detriment of other plants?
 - Check soil, pH, light levels, competitors
- how does it propagate?
 - Seeds, stump sprouts, suckers
- what is its life cycle? can life cycle be interrupted?
- is it shade tolerant/intolerant?
- are there natural predators or plants that can compete with it?
- are there native plants that
 - can be confused with it?
 - can be fostered or planted in its place?

Choose your target wisely; prioritize

- does it dominate the landscape?
- is it fertile & fruiting?
- does it have a significant adverse impact on the surrounding environment?
 - does it cause changes in soil pH,
 - crowd out or strangle of desirable natives,
 - harbor nasties like ticks,
 - attract or provide food for other invasives, e.g., spotted lantern fly

Offense and Defense; use both alternately

- Defense: best defensive strategy is containment
 - identify an area infested with invasives and clear a perimeter around it by removing all invasives you can see
- Offense: follow up with a reduction strategy
 - shrink the perimeter, bit by bit
- Defense: another defensive strategy is culling
 - focus on strays that are outside your main containment areas
 - quick and dirty weeding while you are hiking or working or walking the dog

- Offense: target a particularly egregious area for invasive removal when you need firewood, mushroom logs, stress relief, or have access to some overly enthusiastic volunteers
- Defense: any action to combat the invasive, even a defensive action, is better than inaction
 - e.g., grabbing garlic mustard seed heads as you hike the woods and throwing them down in the path. Why? They will stay in the path, not spread beyond into the open woods, they will be concentrated in a high traffic area to be trod on, run over, etc., and they will compete in close quarters with each other for nutrients and resources, so will be weaker as a result.
- wash, rinse, repeat....

Timing

- revenge is a dish best served cold: winter is a great time to battle invasives
- attack when it's vulnerable
- get it before it fruits
- scout them out when they're most visible
 - invasives frequently leaf out earlier than natives and keep their leaves longer
 - many are extremely cold hardy and stay green all winter, e.g. garlic mustard, chickweed
 - most have distinctive dormant season profile (Ailanthus), easy to spot in winter woods
- work with mother nature, when conditions are right
 - ground is moist after rain, good time to pull up smaller woody shrubs
 - ditto in winter during a thaw
- focus on the long view: are there fewer this year than last? Will there be fewer next year than this if I continue?

Make life difficult

- do all the things that you've learned NEVER to do to members of the plant world
- feel free to: suffocate, strangle, scratch, bite, kick, trample, rip, stomp, strip, pull, slash, whack... in other words, savage whenever possible
- DO fold, spindle and mutilate!
- think about all the damage animals -- deer, rabbits, bobcats, groundhogs, etc. -- can wreak on vulnerable plantings... then channel your own inner animal and go have some fun.
- foster competition
 - seed (or transplant) robust natives

Fight fire with fire

- plant natives, lots of natives
- strategy: collect seed from healthy, prolific natives in summer/fall, then in winter when you are pulling up or otherwise decimating non-natives, drop a handful of mixed native seeds in the disturbed ground
- clear an area of woody invasives, plant bare-root tree & shrub seedlings or seeds (acorns, walnuts, hickories, dogwoods, pawpaws, hazelnuts, cucumber trees, sumac) while the soil is disturbed

Enlist help

- external funding is available, e.g., NRCS conservation programs such as EQIP and CSP
- neighbors
- family members

- hunters
- consulting foresters and other natural resource professionals

Make it pay -- literally;

- get creative, can this otherwise seemingly useless biomass make money for the farm?
- or can it save money for the farmer?
- apply the principle of highest value use, even for invasives
 - turn it into something, even if it's just compost
- if you can't beat it, eat it
- check back to why it's here.... was it brought along with settlers because it was useful?
- how is it used in its native environment? Can it be useful while it's being eliminated?

Toolbox:

Toys and protective gear:

- long sleeves, long pants (trust me on this!)
- leather gloves
- stout boots
- kevlar arm bands
- chainsaw
- weed wrench
- root digger
- drawknife
- loppers
- silky saw
- hand pruner
- hatchet
- trowel

Techniques:

Strangle...

- by de-barking trees that have a tendency to stump sprout
- Ailanthus
- Amur cork

Girdle....

- trees that are too large or complex to handle in other ways and that are less likely to sprout
- Amur cork

Fell....

- anything that isn't likely to stump sprout aggressively
- cut to length for mushroom logs

Pull up....

- anything that you can, just like regular garden weeds; works well for smaller woody shrubs, tree seedlings, and herbaceous plants

- Japanese barberry,
- young Ailanthus or Amur Cork seedlings,
- oriental bittersweet (*Celastrus orbiculata*)
- garlic mustard

Cut off from support.....

- vines that thrive by climbing into trees to reach more sunlight;
- cut at head height and again at ground level so you can see what's been treated and to make it harder for them to re-connect with their "trellises"
- Oriental bittersweet (*Celastrus orbiculata*)
- Japanese honeysuckle (*Lonicera japonica*)
- winterberry

Over-harvest....

- for use or sale;
- cut for use as mushroom logs or firewood,
- forage for food
- use for traditional or non-traditional crafts such as basketry, natural dyes, woodworking,
- make medicine
- start a cottage industry for invasive "artisan" foodstuffs,

Invasive introductions:

- Tree-of-heaven AKA Ailanthus (*Ailanthus altissimus*)
- Amur Cork (*Phellodendron amurense*)
- Flowering Crabapple (*Malus sp.*)
- Bush Honeysuckles:
 - Morrow's Honeysuckle (*Lonicera morrowii*)
 - Tartarian Honeysuckle (*Lonicera tartarica*)
 - Amur Honeysuckle (*Lonicera maackii*)
- Multiflora Rose (*Rosa multiflora*)
- Japanese Barberry (*Berberis thunbergii*)
- Oriental Bittersweet (*Celastrus orbiculatus*)
- Garlic Mustard (*Alliaria petiolata*)
- a blank template is included in the Resources handout for your own use



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Tree-of-Heaven (*Ailanthus altissima*)

Plant type:

- large deciduous tree

Characteristics:

- dioecious: has male and female reproductive parts on separate plants,
- possibly hermaphroditic: may change genders (usually male to female) in response to environmental conditions;
- stump sprouts prolifically;
- long-lived seedbank in soil, i.e., for decades

Key ID Features:

- opposite compound leaves
 - NOTE: use the acronym MADBUCK to remember native Ohio trees with opposite leaves
 - MapleAshDogwoodBUCKeye
- prolific growth habit,
- gnomish fingers profile;
- smell when cut
- prominent flower clusters in summer

History:

- native of China
- oldest known description and use of a medicinal tree, in an ancient TCM text
- used to treat male baldness
- eponymous tree in the classic novel [A Tree Grows in Brooklyn](#) by Betty Smith (1943)

Threat:

- allelopathic: releases one or more toxic chemicals that suppress the growth of other plants in area
- fast-growing, crowds out natives
- wind-dispersed seeds
- weak wood, susceptible to wind damage
- preferred host for spotted lantern fly

Treatment:

- de-barking, i.e., strangulation and starvation

Possible uses:

- mushroom substrate
- balsa wood alternative
- compost

Native look-alikes:

- ash,
- sumac,
- black walnut

Other invasives that may be treated similarly

- Amur cork (*Phellodendron amurense*)
- Princess tree (*Paulownia* spp.)
- Norway maple (*Acer platanoides*)
- Siberian elm (*Ulmus pumila*)

Amur Cork (*Phellodendron amurense*)

Plant type:

- medium deciduous tree

Characteristics:

- dioecious,
- allelopathic
- stump sprouts prolifically;
- shade tolerant

Key ID Features:

- opposite, compound leaves
- growth habit is similar to *Ailanthus*
- distinctive gray corky outer bark, bright yellow color inner bark
- fruit clusters of blue berries (actually drupes)

History:

- native of northern China, Korea, and Japan
- introduced into US as a landscape tree around 1850
- drought tolerant as well as resistant to effects of pollution
- remains a popular landscape tree in urban settings due to its robustness
- research is underway as treatment for various cancers

Threat:

- aggressive spreader through seed dispersal aided by birds
- reduces acorn and nut production in nearby native trees
- crowds out natives, both woody and herbaceous

Treatment:

- de-barking (young trees before bark gets too thick)
- girdling (of very large trees, will sprout aggressively)
- cutting (will sprout aggressively)

Possible uses:

- 1 of the 50 fundamental herbs in TCM medicine
 - bark contains berberine among other medicinal alkaloids
- source for yellow paper pulp and natural plant dye (inner bark)
- compounds in fruit is insecticidal similar to pyrethrum
- cork substitute (outer bark)
- lumber is strong and rot-resistant
- woodworking
- firewood
- mushroom substrate?
- pollarding or coppicing for basketry or other uses

Native look-alikes:

- ash
- walnut
- tulip poplar

Other invasives that may be treated similarly

- Tree-of-heaven (*Ailanthus altissima*)
- Princess Tree (*Paulownia spp.*)

Flowering Crabapples (*Malus spp.*)

Plant type:

- small understory deciduous tree

Characteristics:

- hybridizes readily with domestic apple varieties and ornamental flowering crabapples as well as native crabapples to form an inferior "weedy" understory tree
- may stump sprout after cutting
- tolerates compacted soils, disturbed areas
- shade tolerant

Key ID Features:

- looks "thorny" although the thorns are really spurs and not sharp
- small clusters of yellow-orange-red fruits that persist into winter
- leafs out very early in spring, easy to spot
- covered in white to pink flowers in spring

History:

- ornamental flowering crabapples from Asia have been planted widely

Threat:

- spreads widely by birds eating the persistent yellow-red fruits

Treatment:

- de-barking
- girdling
- cutting
- plant native alternatives

Possible uses:

- mushroom logs
- natural dye (pink, from the bark)
- grilling planks (aromatic)
- firewood
- basketry: potential candidate for pollarding or coppicing
- woodworking (hard, close-grained wood)

Native look-alikes:

- native crabapples (*Malus coronaria*)
- hawthorns (*Crategeus spp.*)
- young black or honey locust (*Robinia pseudoacacia*, *Gleditsia triacanthos*)

Other invasives that may be treated similarly

- single-stem woody shrubs/small trees
- Callery pear (*Pyrus calleryana*)
- autumn olive, Russian olive, (*Eleagnus spp.*)
- European buckthorn (*Rhamnus carthartica*)

Bush Honeysuckles

- **Morrow's Honeysuckle** (*Lonicera morrowii*)
- **Tartarian Honeysuckle** (*Lonicera tartarica*)
- **Amur Honeysuckle** (*Lonicera maackii*)

Plant type:

- hardy deciduous woody shrub

Characteristics:

- allelopathic
- rapid growing, leafs out earlier than most natives
- shade tolerant, widely adapted
- tenacious, resprouting again and again
- prolific production of fruits attractive to birds (and deer?!)

Key ID Features:

- leaves are opposite
- flowers and fruits are tightly paired
- twigs are hollow; native species have solid, white pith

History:

- native to various parts of Asia, mostly eastern Asia
- introduced early into US as ornamentals and landscape plants
- in early 20th century was planted as windbreaks and living hedges to combat soil erosion and provide wildlife cover

Threat:

- crowds out of native species
- tends to dominate fields and forest edges (which are most biodiverse and productive habitats for wildlife), reducing biodiversity and natural forest regeneration as well as changing dynamic for native birds and animals
- forms dense, impenetrable thickets that make farm management challenging
- high dense thickets provide prime habitat for ticks and tick-bearing mammals (both deer and deer mice)
 - incidents of tick-born diseases decrease with the removal of honeysuckle thickets
 - NIH study shows correlation with honeysuckle removal and decrease in lone star tick populations

Treatment:

- cutting, cutting, cutting, and..... cutting
- flaming and burning may be effective alternatives
- regular mowing
- uprooting (by hand when small or by mechanical means when larger e.g., weed wrench, UTV)
- plant native alternatives

Possible uses:

- woodworking, esp. things like canes
- flowers are edible and some species have a long medicinal tradition (esp. Japanese honeysuckle)
- cat-attracting plants, i.e., catnip alternative (Tartarian honeysuckle)

Native look-alikes:

- Bush honeysuckle (*Diervilla lonicera*)
- Canada fly honeysuckle (*Lonicera canadensis*)

Other invasives that may be treated similarly

- Burning bush (*Euonymous spp.*)
- Multiflora rose (*Rosa multiflora*)

Multiflora Rose (*Rosa multiflora*)

Plant type:

- hardy deciduous woody shrub

Characteristics:

- prolific production of fruits attractive to birds
- can get very large, occasionally uses trees as trellises to garner more sunlight with spreading tentacles
- roots at tips
- resprouts aggressively after cutting
- relatively shade intolerant, so if removed from (or better yet kept out of) forest openings as new succession growth begins, can be kept under control

Key ID Features:

- leaf out very early in spring, much earlier than native species
- leaf petioles are fringed, most natives are smooth or toothed
- white-flowered, small red fruits

History:

- **SORDID**
- Louis Bromfield and the misguided conservation miracle
- on my farm, first conservation plan was for planting..... multiflora rose, at government's expense
- 50 years later, government pays me to remove..... multiflora rose

Threat:

- plants in *Rosa* genus are natural sources for tetanus infections
 - get vaccinated before tackling large stands
 - treat wounds immediately and thoroughly
- sturdy curved thorns can cause serious puncture wounds
- tends to dominate fields and forest edges (which are most biodiverse and productive habitats for wildlife), reducing biodiversity and natural forest regeneration as well as changing dynamic for native birds and animals
- forms dense, impenetrable thickets that make farm management challenging

Treatment:

- Cutting, cutting, cutting, and.... more cutting
 - particularly effective if forest canopy has increased since plant was established
- Uprooting
- Plant native alternatives

Possible uses:

- fruits are high in vitamin C (but small)

Native look-alikes:

- native roses (*Rosa palustris*, *R. setigera*, *R. carolina*, *R. blanda*)

Other invasives that may be treated similarly

-

Japanese Barberry (*Berberis thunbergii*)

Plant type:

- hardy deciduous sub-shrub

Characteristics:

- shade tolerant
- shallow root system
- spread by berries, root clones, and branch tip suckering
 - berries are not particularly attractive to birds, end of winter "poverty rations"
- forms large patches of dense growth
- not browsed by deer or cattle

Key ID Features:

- leafs out in very early spring, so easy to spot in dormant woods or pastures
- leaves and bright red fruits persist well into early winter, also highly visible
- has only 1 spine while common barberry and our native barberry have 3 spines
- smooth edges on the leaves
- bright yellow roots and inner bark

History:

- native to Japan
- introduced as an ornamental plant in late 19th century
- used as living fences for cattle
- promoted for soil erosion stabilization as a replacement after common barberry (*Berberis vulgaris*) was discovered to host black stem grain rust

Threat:

- low, dense high-humidity thickets provide prime habitat for ticks and tick-bearing mammals (deer mice)
 - incidents of Lyme disease decrease with the removal of Japanese barberry
- cause changes to soil pH (more alkaline) making environment less attractive to natives, esp. spring ephemerals
- crowds out native species, both herbaceous and shrubby
- has a mutually beneficial relationship with non-native earthworms, which also causes adverse changes in soil chemistry and structure (mostly nitrogen)
- spines are very sharp and high in silica, when embedded in skin can cause long-lasting irritation and infection
 - wear serious protective gear

Treatment:

- pulling
- plant native alternatives

Possible uses:

- major source of berberine, a medicinal alkaloid
- historically used as medicine, modern studies show potential for cholesterol, anti-tumor, and heart disease treatments
- fruits are edible and have traditionally be made into jams and jellies, or dried
 - common ingredient in Persian cooking
 - source of vitamin C

Native look-alikes:

- Allegheny barberry (*Berberis canadensis*)

Other invasives that may be treated similarly

- Common Barberry (*Berberis vulgaris*)

Oriental Bittersweet (*Celastrus orbicularis*)

Plant type:

- woody deciduous vine

Characteristics:

- dioecious
- prolific seeder, spread by birds
- extensive but shallow root system
- can create vast canopies that shade out understory vegetation
- capable of entirely encompassing a tree, even causing tree to collapse under weight

Key ID Features:

- fruits appear along the stems, fruits of native bittersweet only appear at ends
- color of fruit is orange with yellow bracts, native bittersweet is red and orange
- as name suggests, leaves are more round than oblong or pointed

History:

- Native to east Asia
- used medicinally in TCM
- introduced to US around 1860 as an ornamental

Threat:

- it is extremely aggressive and can strangle mature trees
- out-competes natives by shading out sunlight and resources
- thrives in disturbed areas
- causes collateral damage to surrounding trees when host tree falls
- popular for fall decorations, which spreads it even further when these are discarded

Treatment:

- pulling
- cutting

Possible uses:

- basketry (remove berries)
- DO NOT use for making wreaths unless you remove berries first!

Native look-alikes:

- American bittersweet

Other invasives that may be treated similarly

- Japanese honeysuckle

Garlic Mustard (*Alliaria petiolata*)

Plant type:

- hardy herbaceous biennial

Characteristics:

- allelopathic
- shade tolerant
- winter-hardy, can frequently be "harvested" throughout mild winters
- tap root breaks easily, broken off pieces left in ground can resprout

Key ID Features:

- smells of garlic and mustard (yes, it's true)
- forms a rosette the first year, sends up a flower spike the second

History:

- Brought to US in 19th century for food use

Threat:

- spreads aggressively if unchecked
- robust and tolerant of a wide variety of soils
- shade tolerant
- prolific seeder; seed capsules "pop", sending seeds some distance from mother plant

Treatment:

- pull or dig it up, taproot and all
 - use a trowel or root digger to get whole root
- plant native alternatives

Possible uses:

- edible pot herb
 - garlic mustard pesto is EXCELLENT
 - garlic mustard spaetzle (or gnocchi)
 - root has similar compounds to horseradish, can be used as a substitute

Native look-alikes:

- Golden ragwort
- Phlox (*Phlox spp.*)

Other invasives that may be treated similarly

- Japanese knotweed (*Fallopia japonica*)