Invasive Species: Identification & Control

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Introductions

• Jesse Felix
  • Natural areas consultant
  • Previous experience
    • Superintendent of Parks of West Chicago Park District, 28 years
    • Garden Curator, Cantigny Gardens, 15 years
    • Certified Prescribed Burn Manager, Certified Arborist
    • Horticulturist by trade

• Sarah Duple
  • Restoration ecologist & urban forest data technician
  • Previous experience
    • Field Ecologist, V3 Companies
    • Landscape Specialist, Park District of Oak Park
    • International Society of Arboriculture member, GIS Certified, Wetland Delineation Certified
NATIONAL INVASIVE SPECIES AWARENESS WEEK
FEBRUARY 24- 28
PART 1
“Invasive species pose a major risk to the environment, industry and health: invasive species – pests, diseases and weeds – threaten agriculture and forestry, native species, natural regeneration and ecosystem resilience. They already have a massive environmental, social and economic impact, and climate change is likely to enable new invasive species to thrive.”

Cresswell and Murphy 2016
Alien Species vs. Invasive Species

“Alien Species” means, with respect to a particular ecosystem, any species, including its seed, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

“Invasive Species” means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

President’s Executive Order 13112, 1999
United States Department of Agriculture
I'M VIN VASIVE. MY PRETTY FACE IS HEADED YOUR WAY.

I AM INVASIVE SPECIES AND MY HUNGRY PESTS ARE TRAVELING ACROSS THE U.S. TO DEVOUR YOUR CROPS AND TREES. CATCH ME IF YOU CAN.
For too long we have heard about the invasive species issue...

“It’s not in the budget”
“It’s too expensive”
“It’s too difficult”
“There is not enough staff”
“Nobody is complaining about it”

Thinking this way has allowed small issues become large issues.
The distinction of native species and non-native species dates back to the 18th century.

- Over 50,000 plant species have been introduced since European settlement.
- 5,000 species have gone rogue and now compete with some 17,000 native species.
- The term “invasion” was first used in 1958.
- The term invasive or invasion did not reach its peak until the 1990’s and 2000’s.

As of 2019 there are 1,538 invasive species across the United States.
“Why invasive species are like a bad girlfriend or boyfriend.”

-Hannah Bowers

- Invasive species can be attractive
- They are shady about their past
- Invasive species can be found anywhere
- They are clingy
- They are bad neighbors
- They cause stress
- They don’t listen
- Invasive species are kind of our fault
Invasive Plant Characteristics

- Reproduce prolifically
- Spread aggressively
- Seed can remain viable for years
- Tolerates & spreads to disturbed sites
- Tolerates large variation in site conditions (generalist)
- Leaf’s out earlier in Spring and drops leaves later in Fall

This makes invasive species difficult to control
Impacts of Invasive Species

- Biological diversity: The vast array of plants, animals and microbes may decline
- Native plants may be crowded out or shaded out of existence
- Some invasive plants produce chemicals to inhibit the growth of other plant species
- Soil instability and runoff may increase due to the loss of deep-rooted native species
- Water quality may decrease in a given area
- Inhibit forest regeneration
- Slows or halts natural succession
Impacts of Invasive Species

Degrades wildlife habitat
• Poor food producers
• Directly impacts the food web
• Most bird species feed their young with caterpillars
• Insects have coevolved with the plants they feed from

Invasive species have not been here long enough for that to happen
• Face less natural competition
• Have not coevolved with wildlife making them poor at supporting them
Impacts of Invasive Species

Invasive species cost the United States more than $126 billion annually!

Invasive species can reduce property values.
<table>
<thead>
<tr>
<th>Time Period</th>
<th>Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500s</td>
<td>Black Rats, Feral Pigs</td>
</tr>
<tr>
<td>1600s</td>
<td>Rock Doves, Domestic Honeybees, Mulberry, Dames Rocket, Phragmites, Canada Thistle, Purple Loosestrife, Scots Pine, Dandelion</td>
</tr>
<tr>
<td>1700s</td>
<td>Vinca minor, Norway Maple, Rugosa Rose, White Poplar, Tree of Heaven</td>
</tr>
</tbody>
</table>
When did the invasives get here?

<table>
<thead>
<tr>
<th>1800s</th>
<th>1900s</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garlic Mustard</td>
<td>Callery Pear</td>
<td>Emerald Ash Borer</td>
</tr>
<tr>
<td>Buckthorn</td>
<td>Elm Bark Beetle 1909</td>
<td>Burmese Python {Florida}</td>
</tr>
<tr>
<td>Shrub Honeysuckle</td>
<td>Dutch Elm Fungus 1930</td>
<td></td>
</tr>
<tr>
<td>Multiflora Rose</td>
<td>Chestnut Blight Fungus</td>
<td></td>
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<tr>
<td>Siberian Elm</td>
<td>Sea Lampreys</td>
<td></td>
</tr>
<tr>
<td>Black Alder</td>
<td>Japanese Beetle</td>
<td></td>
</tr>
<tr>
<td>Starlings</td>
<td>Zebra Mussels</td>
<td></td>
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<tr>
<td>Gypsy Moths</td>
<td>Crown Vetch</td>
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<tr>
<td>Reed Canarygrass</td>
<td>Giant Hogweed</td>
<td></td>
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<tr>
<td>Brown Trout</td>
<td>Asian Carp</td>
<td></td>
</tr>
<tr>
<td>Poison Hemlock</td>
<td>Longhorn Beetle</td>
<td></td>
</tr>
</tbody>
</table>
We do have success stories!

- California, 1700s, Spanish missionaries were cultivating citrus fruit from Southeast China
- The 1849 gold rush brought a demand for citrus fruit to battle scurvy
- Between 1810 and 1942, 600 non-native trees were planted, along with the plants were insect stowaways
- Scales began feeding on native eucalyptus, acacia, orange and lemons (1868)
- Ladybugs from Australia were brought in and saved the citrus industry
The **INVASION**

Curve

- **Prevention**
- **Eradication**
- **Containment**
- Long-term management and protection of resources

Species absent → Species widespread over **Time**

**Cost**
Conquering the Challenge of Invasive Species

Educate ourselves and the public

Prevention: detect and eradicate early

“An ounce of prevention is worth a pound of cure”

-Benjamin Franklin
THE SPREAD OF INVASIVE SPECIES STOPS HERE.
SPREAD THE WORD, NOT THE PROBLEM

European Buckthorn
BE A HERO TRANSPORT ZERO

FIGHT THE SPREAD OF AQUATIC INVADERS

- REMOVE PLANTS, ANIMALS AND MUD FROM ALL EQUIPMENT.
- DRAIN ALL WATER FROM YOUR BOAT AND GEAR.
- DRY EVERYTHING THOROUGHLY WITH A TOWEL.

TRANSPORTZERO.ORG

BE A HERO TRANSPORT ZERO

FIGHT THE SPREAD OF TERRESTRIAL INVADERS

- CLEAN OFF YOUR SHOES, CLOTHES, ANIMALS AND GEAR.
- BURN ONLY LOCAL FIREWOOD.
- LEAVE PLANTS AND OTHER NATURAL MATERIALS IN THEIR PLACE.

TRANSPORTZERO.ORG
Easton Park
West Chicago, IL

2008

2013
Invasive Species Control:
It all comes down to the right time & the right way

- **Timing is everything!**
- Pick your method of control wisely
  - Manual
  - Mechanical
  - Biological
  - Chemical
Invasive Species Control Methods: 

Manual

- Works best for annual species
- Not recommended on species with large tap roots
- Is beneficial for highly sensitive areas
- Time intensive
Invasive Species Control Methods: 
*Mechanical*

- Also works best for annual species
- Not recommended for perennial species, they will only come back
- Objective is to stop the plant from going to seed
- If not done at the right time, efforts are wasted
- Narrow window of success
Invasive Species Control Methods: *Biological*

- Let other organisms do the work for us
  - Goats love to eat tender young growth, particularly undesirable species
  - Insects can be very particular in what they eat
  - Certain bacteria or fungi only infect a single species
- Currently one of the least used methods of control
- Lots of potential!
Invasive Species Control Methods: *Herbicides*

- Many different types that do different things to achieve control
  - Life cycle: pre-emergence & post-emergence
  - Method: growth, water & nutrient uptake
  - Plant type: generalized or specific

- *The earlier in the season you treat, the better the control*

- *The more specific you can be to a target species, the better the control*
Invasive Species Control Methods: Herbicides

• Generalized: glyphosate aka RoundUp
  • Delivery method
  • Timing

• Broadleaf specific: triclopyr, 2-4-D, aminopyralid etc.
  • Soil residual?
  • Water safe?
  • Mode of action?
  • Timing?

• Grass specific: clethodim
  • Surfactant?
  • NOT WATER SAFE
Invasive Species Control Methods:

*Herbicides*

- Backpack sprayer
- Boom sprayer
- Hand wicking
- Bar wicking
- Stump treatment
- Basal bark treatment
Backpack Sprayer
Boom Sprayer
Hand Wicking

• 33% concentration glyphosate solution
Bar Wicking
Cut stump treatment

- 50% water-based glyphosate solution
- 33% oil-based triclopyr solution
Basal bark treatment
Invasive Species vs. “Weeds”

➢ Weeds are any plant growing where we do not want them

➢ Invasive species are those that do harm to the overall ecosystem
  • They can be pretty, they can be useful
  • But they ALWAYS DO MORE HARM THAN GOOD

If there is one thing to take away from all of this...

INVASIVE SPECIES ARE ALWAYS WEEDS
Invasive Ornamentals

Harmful yet we regularly use them in the landscape

These are the easiest species to deal with..

*Just don’t plant them!!*
Callery Pear

Pyrus calleryana
Callery Pear
Pyrus calleryana
Japanese Barberry
*Berberis thunbergii*
Burning Bush

*Euonymous alatus*
European/Black Alder
*Alnus glutinosa*
Being that they are all woody species

• Cut them down to a stump during the winter
• Treat the stump immediately after cutting with:
  • Water based glyphosate solution at 50% concentration
  • Water based triclopyr solution at 15% concentration
  • Oil based triclopyr solution at 12.5% concentration (diesel, Garlon 4)
• Always mix a dye into the solution to mark where you have been and to ensure there is not overapplication to surrounding vegetation
• Basal bark treatments are less than desirable: while cost-effective, overapplication is unavoidable
Common Invasives: you might have heard of them

And maybe you are trying to do something about them
Phragmites

*Phragmites australis*
Phragmites

*Phragmites australis*
Narrow-leaf cattails
Typha angustifolia / Typha hybrid
Buckthorn
*Rhamnus spp*
Canada thistle
*Cirsium arvense*
Teasel

*Dipsacus spp.*
Teasel
*Dipsacus spp.*
Burdock

*Arctium spp.*
Burdock

*Arctium spp.*
Garlic Mustard

*Alliaria petiolata*
Aquatic/Wetland Species

- Disrupt water patterns
- Reduce diversity
- Cause recreational havoc
Reed Canary Grass (RCG)
*Phalaris arundinacea*
Purple loosestrife
*Lythrum salicaria*
Dames rocket

*Hesperis matronalis*
Eurasian watermilfoil
Myriophyllum spicatum
Woodland Species

Shades out understory
Makes enjoying the woods nearly impossible
Looks untidy
Honeysuckle
*Lonicera spp.*
Honeysuckle
*Lonicera* spp.
Autumn Olive
Elaeagnus umbellata
Oriental Bittersweet
*Celastrus orbiculatis*
Multiflora rose
*Rosa multiflora*
Japanese knotweed
*Fallopia japonica*

**Zig-zag stems**

**Lush green colour**
Black locust
*Robinia pseudoacacia*
Tree of Heaven looks very similar to other species
Spotted Lanternfly loves Tree of Heaven
Generalists

Where there is disruption you will find them
Colonizes an area quickly
Does not play nicely with others
Sweet Clover

Melilotus spp.
Crown Vetch
*Securigera veria*
Giant Hogweed

Heracleum mantegazzianum
Wild Parsnip

*Pastinaca sativa*
Kudzu

Pueraria montana