The Impacts of Non-native, Invasive Species on Wildlife

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The Impact of Invasive Species

- National Impacts
  - At least $200 million annual losses to the Great Lakes Region.
  - Leafy spurge costs more than $144 million a year.
  - Efforts to control purple loosestrife cost $45 million per year.
  - The estimated damage from invasive species worldwide totals more than $1.4 trillion--five percent of the global economy.
  - The annual US cost from invasives is $120 billion, with over 100 million acres being affected.
  - Ohio alone - Forest products industry add $22 billion to the economy.
The Threat of Invasive Species on Wildlife

- Invasive species are one of the leading threats to native wildlife
- *Loss and degradation of habitat continues to be the primary threat to Ohio's wildlife*

Outcompete Native Species

- Oak species regeneration is low in our forests
  - Require disturbance to let some light in and decrease competition
  - *Competition from invasives*
    - Seeds from buckthorn germinate 2 weeks faster
- What is on the forest floor is the future forest…
Do we want this to be our future forests?

Invasive Species Cause Loss of Habitat

- In terms of wildlife, this means:
  - Reducing native food and cover resources
    - In quantity and diversity
    - Impacts up through the food webs?
Disrupting Food Webs

- Lepidoptera
  - Butterflies, skippers, and moths

- Pollinator diversity decreased in honeysuckle invaded areas
  - Spring caterpillar and summer butterfly diversity down (Doyle, thesis, 2006)
  - Removing privet increased diversity and abundance of butterflies and native bees (Hanula and Horn, 2011)

Invasive Species Impacts on Wildlife

Arthropod community response to non-native invasive plants -

"Total abundance of arthropods decreased in 62% of studies
 taxonomic richness decreased in 48% of studies."

(Litt et al. 2014)
Hemlock Woolly Adelgid & Bird Communities

Hemlock Woolly Adelgid (HWA)
- Puts significant threat to the health and sustainability of hemlocks
- Primarily transported by wind, infested nursery stock, and...birds.

Hemlock Bird Specialists
- Blue-headed Vireo
  - Rick and Nora Bowers/VIREO
- Black-throated Green Warbler
  - Rob Curtis/VIREO
- Blackburnian Warbler
  - Glenn Bartley/VIREO
HWA is Changing Bird Communities

- Hemlock bird specialists **declined** across HWA infested stands (Toenies et al. 2018)
- Other species increased...

Birds and Forest Structure

- The physical structure of a forest plays an important role in bird habitat

**Bird species associated with:**
- the shrub layer,
- forest edge
- mature deciduous habitat showed the strongest increases.
Similar studies have found changed or declined bird communities in EAB infested stands and honeysuckle invaded stands. Unfortunately, this is a very common ecological response when non-native species are introduced into new areas.
In the relatively short period that I monitored their activities, the birds probably ate hundreds of berries.” ~Jim McCormac

Invasives can be Ecological Traps

- Wood thrush and robin higher nest predation in honeysuckle and buckthorn (Schmidt and Whelan 1999)
- Cardinals nesting in honeysuckle fledged 20% fewer young (Rodewald, 2010)
- Early leaf-out appealing for nesting
Impacts on Reproductive Strategies

- Carotenoids pigments
- **Urban birds** eat honeysuckle berries
- Brightly feathered birds not as healthy

**Bright feathers ≠ quality mate**

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Honeysuckle in **rural forests**
- Brightest males producing fewer young

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Songbird Nesting Success

Reported the 3rd most diverse community of nest predators in the world (21 species).

Songbird Nesting Success

- Nest predation did NOT increase in urban areas
- Survival of fledglings was not impacted by urban areas
  - In rural areas, nest survival did go down with increasing predators.

>4600 nests in 11 years
Please explain...

Most nest predators are generalist.

Urban Ecosystems

These ecosystems have their own unique challenges that can lead to unique behaviors and activity patterns by wildlife.
White-tailed Deer and Invasive Species

Overabundant populations can cause damage to forest understory.

White-tailed Deer Herbivory Impacts

Over-browsing by high deer populations → less palatable species left & disturbance to understory and forest floor →
Outside the fence, deer consumed seedlings and saplings and reinforced the dominance of Japanese stiltgrass.

Inside the fence, multiflora rose increased.

White-tailed Deer Herbivory Impacts

After 17 years of controlled deer hunts, plant species richness, diversity, and the herbaceous layers increased AND exotic species cover decreased in Indiana State Parks (Jenkins et al. 2014).

Moderate levels of deer browsing promote herbaceous layer diversity when combined with other disturbances. (Royo et al. 2010)
Invasive Species Traverse Many Taxa

- Plants
  - Honeysuckle, tree of heaven, garlic mustard, lesser celandine, kudzu, Hydrilla, purple loosestrife, stilt grass
- Insects
  - Hemlock woolly adelgid, viburnum leaf beetle, Asian long-horned beetle, emerald ash borer
- Wildlife and Fish species
  - Feral swine, earthworms, rusty crayfish, Asian carps, round goby
- Pathogens
  - White-nose syndrome in bats, bur oak blight, sudden oak death

Webinar on Ohio Bats and WNS

woodlandstewards.osu.edu/resources/wildlife
What Can Be Done?

- Invasive species management needs to take priority
- Ohio’s forest land
  - 87% of forests are privately owned
- Cities, townships, villages
  - Majority of people in world living in urban areas
“Raising the awareness of the public and channeling their energies into constructive action may be the single most effective tool available.”
~ Shroufe and Riley, Arizona Game and Fish Department

Help us track non-native, invasive species!

Great Lakes Early Detection Network

- Droid & iPhone version available

woodlandstewards.osu.edu/resources/webinars
Questions?

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