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Tippecanoe Invasive Cooperative Taskforce Newsletter
August 2021

Climate Change Impacts on Invasive Species

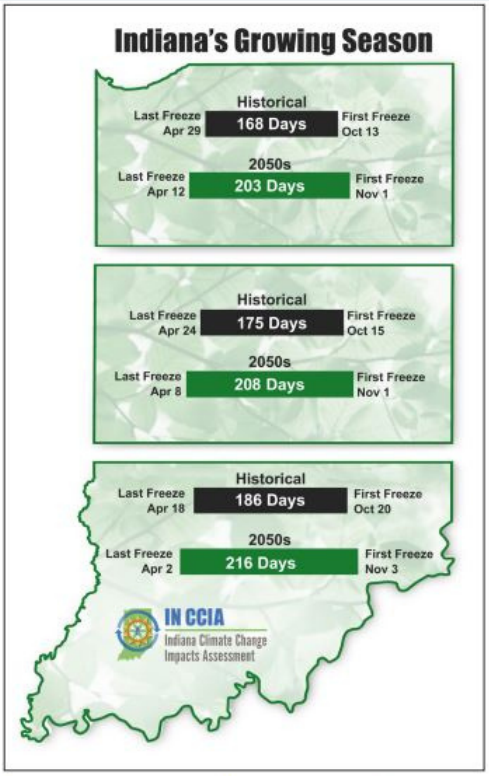
By: Amy Krzton-Presson, Wabash River Enhancement Corporation
with excerpts from Purdue Climate Change Research Center's Indiana Climate Change Impacts Assessment

The effects of climate change are becoming more and more noticeable to the average person every passing season. Immediate impacts on people's homes, livelihoods, and health are often more readily apparent than changes in our local ecosystems. Changes in weather patterns, such as increased rainfall and high temperatures, will have an impact on species composition in our local forests, prairies, and wetlands.

Purdue's Climate Change Research Center has been collaborating with scientists and experts across the state to complete a climate impacts assessment of Indiana. This report goes into detail predicting and explaining how climate change may impact Indiana. The assessment addresses invasive species several times throughout the report. Excerpts from Forest and Aquatic Ecosystem sections are below.

Impacts on Forest Ecosystems: "Seedling survival and growth also depend on competition with other plants that live in the forest understory, including some highly competitive invasive plants. For instance, Japanese stiltgrass invasions in southern Indiana slow the growth of seedlings of many native tree species (Johnson et al. 2015). Similarly, Amur honeysuckle, a widespread invasive shrub, reduces survival rates of native tree seedlings (Owings et al. 2017). As the climate warms, additional invasive plants that are thought to have been kept out of Indiana by cooler temperatures could begin to spread into our state from the south. For instance, Chinese privet, a dense shrub that crowds out native species, is expected to pose increasing risks to Indiana forests."

"A small aphid-like insect, the hemlock woolly adelgid (HWA), has killed populations of hemlock trees along much of the eastern U.S. The insect currently has populations in Ohio and Kentucky and could spread to Indiana's remnant populations of hemlocks as winter temperatures warm (Dukes et al. 2009). However, high summer temperatures reportedly kill HWA and complicate this prediction (Mech et al. 2018). While hemlock is a relatively minor component of Indiana's forests, it tends to occur in very specific places in the landscape (cool, moist groves); as such, it's unclear which species, if any, would replace hemlocks following a HWA infestation."



Above: *Growing season length and average first/last freeze dates for northern, central and southern Indiana. "Historical" is the average for the period 1915 to 2013. For future projections, "2050s" represents the average of the 30-year period from 2041 to 2070 for the-high emissions scenario. Data for other locations and time periods available. Source: Hamlet et al. (in review).*

Continued from Climate Change Impacts on Invasive Species...
"Kudzu, the invasive vine that overgrows and chokes forests in the southern U.S, could start expanding in Indiana within the next few decades as temperatures increase. This species already causes $100 million to $500 million in economic damage to forests and agricultural land in the U.S. each year."

Impacts on Aquatic Ecosystems: "Invasive animals and plants that cannot tolerate cold may expand their ranges as air and water temperatures in Indiana warm. Increased flooding could allow others to spread from their current habitats, as happened with several species of Asian carp that are moving north and threatening to reach lakes Michigan and Erie. In the Great Lakes, invasive fish and invertebrates including round goby, sea lamprey, and invasive water fleas may spread with warmer temperatures. Changing temperature and precipitation patterns could lead to the spread of the invasive freshwater clam, *Corbicula fluminea*, that is known to damage water and water intake pipes. Drought conditions may dry riparian areas, the wetland areas along the banks of rivers, and coastal areas, allowing invasive plant species to move in and thrive. Parasites are another concern. Not only can new parasites move into an area with their hosts, but warmer temperatures and longer growing seasons allow both invasive and native parasites to increase their population numbers. With higher numbers of parasites overall, there is a higher likelihood of parasite movement among animals, including transmission to humans. At the same time, the parasites themselves may also be harmed by extreme temperatures and drought."

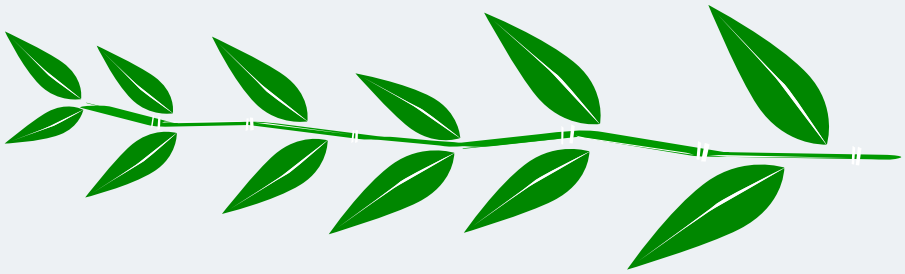
To see the full Indiana Climate Change Impact Assessment report, visit https://ag.purdue.edu/indianaclimate/. To learn about the Greater Lafayette Climate Action Plan and get involved, visit greaterlafayetteclimate.com .

Project Updates: Tippecanoe County Amphitheater

By: Angie Garcia-Miller, Tippecanoe County Soil & Water Conservation District

Two conservation projects are underway at the Tippecanoe County Amphitheater. The first is the establishment of a pollinator habitat planting adjacent to the soccer fields, which has been ongoing for the past three years. Native prairie plants were installed to provide flowers throughout the growing season to benefit native pollinators, such as bees and butterflies. A tour of the project is scheduled for Wednesday, August 18th at 6pm. The planting is still in the early stages of development and will continue to provide new flowers in the coming years.

Invasive plant control is also planned, including a Weed Wrangle scheduled for Saturday, November 20th. This workday is an opportunity for volunteers to help remove invasive shrubs, like Bush Honeysuckle, from the edge of the woods. This event will be part of a series of workdays aimed at reducing invasive plant pressure along the trail. No previous experience is necessary. Volunteers will be shown how to properly identify and control the target invasive plants.



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Replacement Trees Offered
Redbud
Yellowwood
Overcup Oak
Tulip Poplar
Black Oak

CALLERY PEAR REPLACEMENT PROGRAM

We are offering free native trees when you remove your invasive Callery Pear tree. Learn more and apply at http://www.wabashriver.net/callery-pear-replacement/

Do you have an invasive Callery Pear in your landscaping that you've been meaning to get rid of? Several of our partner organizations are teaming up to provide a free replacement tree for removing a Callery Pear! You must fill out the application and be approved prior to removing your pear tree. There are a limited supply of native trees, so it is a first-come-first-serve basis. Right now, this program is only open to residents of Tippecanoe County, Indiana. Please note that applicants are only eligible for one replacement tree or shrub at this time.

Learn more and apply: http://www.wabashriver.net/callery-pear-replacement/
Why Callery Pear trees are a problem: https://ag.purdue.edu/reportinvasive/species/bradford-pear/

Invasive Species Spotlight

Information courtesy of the Invasive Plant Advisory Committee (IPAC) and Southern Indiana Cooperative Invasive Management (SICIM)

Name: Japanese stiltgrass (*Microstegium vimineum*)
Range: Densely populated in Southern IN, found in Tippecanoe County and moving north
Description: Japanese stiltgrass has a sprawling growth habit with smooth, alternate, bright green leaves that are 1-3 inches long and relatively broad. The leaf blades have a distinctive off-center mid-vein of silvery hairs on the upper leaf surface. Stiltgrass typically grows 1 to 3 feet tall but can reach heights up to 6 feet with tall plants either sprawling along the ground or layering over other vegetation. Plants produce narrow inconspicuous flower spikes in late summer to early fall, which can either be pollinated or are self-fertile depending on soil moisture and amount of sunlight. Once seed is produced in late August through October, the plants will dieback to leave a layer of tan to orangish thatch. Individual plants produce hundreds of seeds which can remain viable in the seedbank for 3 to 5 years.

Foliage of Japanese Stiltgrass, photo by Mary Welz, Southern Indiana Cooperative Invasives Management.

Why is it a problem:
Japanese stiltgrass is considered to be one of the most harmful invasive plant species in the U.S. It can quickly replace native vegetation in a range of habitats which include forested floodplains, forest edges, waterways, fields, trails, right-of-ways, and ditches. It spreads readily through turf, lawn, and into garden plantings. Monocultures of Japanese stiltgrass negatively impact native species habitat and diversity and interfere with important ecosystem processes. It can alter natural fire regimes by increasing fire intensity and frequency, which further reduces native species diversity and promotes continued invasion (Flory et al. 2012).

Japanese stiltgrass is one of the 44 species regulated under the Indiana DNR Terrestrial Plant Rule, which makes it illegal to sell, gift, barter, exchange, distribute, transport, or introduce these plants in the State of Indiana.


Photo by Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Treatment:
Manual & Mechanical: Since it is an annual, the key to managing existing infestations of Japanese stiltgrass is to prevent it from producing seed. Hand pulling of Japanese stiltgrass before flowering & seed-set can be effective for small populations, since it's shallow rooted and generally easy to pull. Pulled plants without seeds can be left on-site, but if flowers or seeds have formed the plants should be removed and eradicated. Waiting to pull until July through early fall allows time for the seed bank to germinate but does not leave enough growing season for any new plants to produce seed. String-trimming by making sure each plant is cut flush with the ground is an option but will result in soil disturbance. It is essential to avoid string trimming or other mechanical control when flowers and fruits are present to prevent seed spread.

Smothering: The New York State Office of Parks, Recreation, and Historic Preservation has developed some experimental control techniques including smothering. Park biologists have shown that covering stiltgrass with 4 to 6 inches of mulch (chips, leaf litter) will prevent stiltgrass from emerging. However, this treatment is only suitable for trailside infestations and easy to access small to mid-sized patches. (OPRHP Minnewaska State Park Preserve Experiment, 2010, 2011, and Connequot State Park Preserve, 2011).

Chemical: Post-emergent and pre-emergent herbicides have been proven effective. Post-emergent herbicides are applied when the plant is in full leaf and ideally before seed set. Pre-emergent herbicides can be applied at intervals throughout the growing season to prevent germination of Japanese Stiltgrass seeds in the spring as well as when there is soil disturbance. Systemic post-emergent herbicides can be used to gain initial control of larger Japanese stiltgrass infestations. Choosing grass specific herbicides over broad-spectrum herbicides can help prevent mortality of non-target plants. Rotating between post and pre-emergent herbicides can be most effective and helps to reduce the chance of stiltgrass developing herbicide resistance.

It is important to note that since Japanese stiltgrass often occurs in sensitive wetland areas, neither grass-specific nor pre-emergent products are labeled for aquatic use. For treatment in areas with surface water, non-selective post-emergent herbicides and adjuvants that are aquatic label should be selected instead.

Learn more: https://www.invasive.org/weedcd/pdfs/wow/japanese_stiltweed.pdf
https://www.inwoodlands.org/management-of-japanese-stiltgr