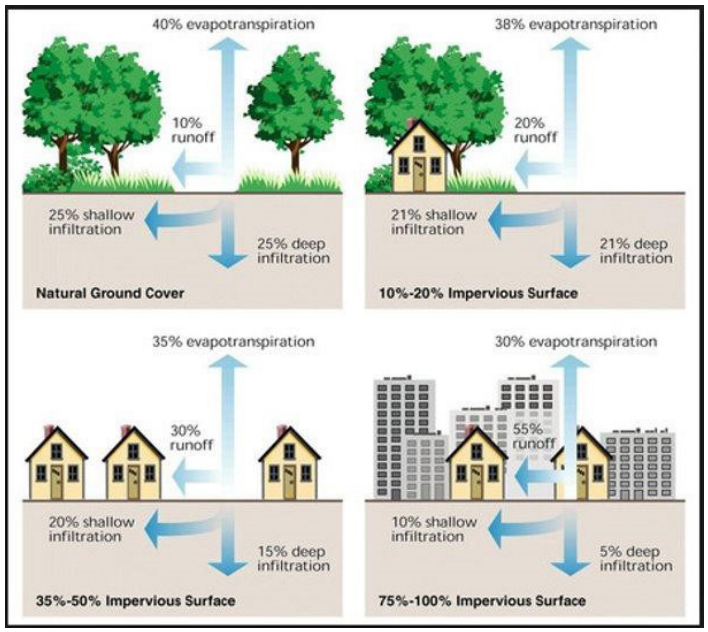
Urbanization and Development

What is urbanization?

Urbanization refers to the concentration of human populations into discrete areas as people move away from rural areas into cities. This concentration leads to the transformation of land for residential, commercial, industrial, and transportation purposes. Urban development has increased dramatically in the recent decades, and this leads to altered streamside areas, increased wastewater inputs, and increased surface runoff. Urbanization increases regional impervious surface area, which generally reduces the ecosystem's ability to quickly respond to rain events and therefore increases flood risk. (EPA)

What is the problem with urbanization?

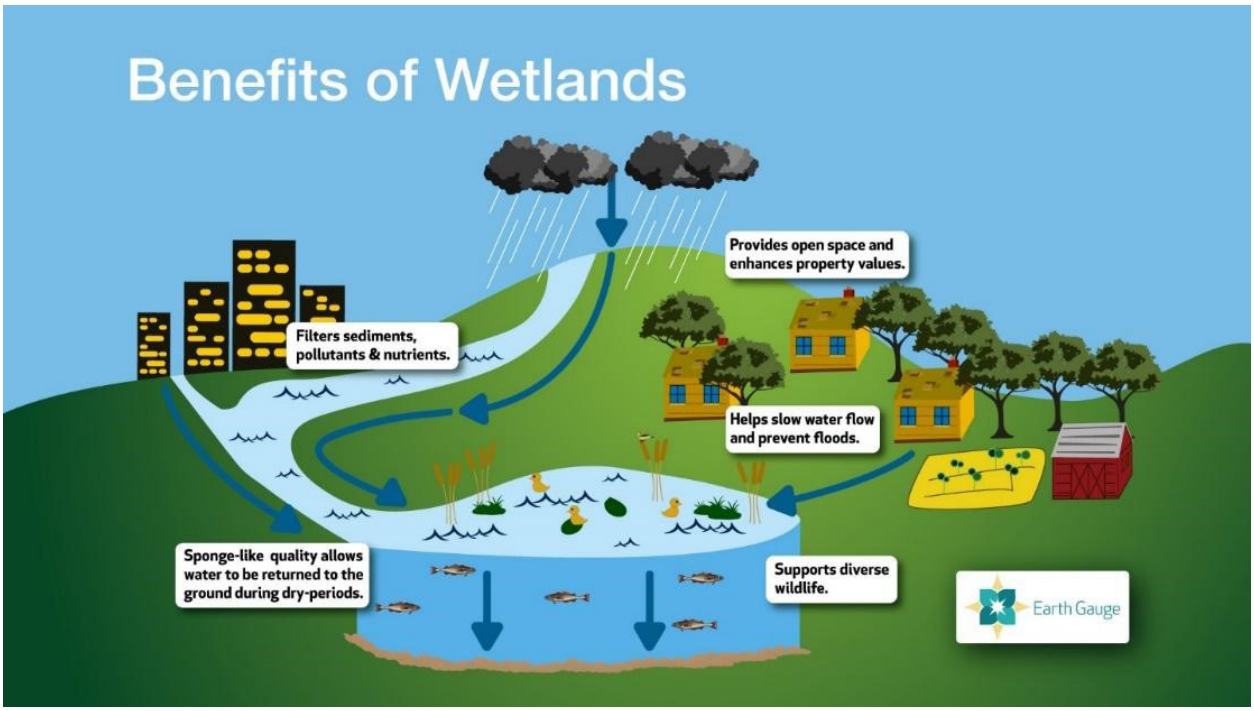


URBAN HEAT ISLANDS occur when cities replace natural land cover with dense concentrations of pavements, buildings, and other surfaces that absorb heat. This in turn causes increased energy costs, higher air pollution levels, and heat related illness and mortality. According to the U.S. Environmental Protection Agency, cities of a million or more people can be 1–3°C (1.8–5.4°F) warmer on average—and as much as 12°C (22°F) warmer in the evening—than the surrounding area.

FLOODING— Land development and increases in impervious surfaces can affect the risk of flooding in several ways. First, development tends to replace soil and vegetation with impervious surfaces such as roof tops and asphalt. This means that rainfall that used to soak into the ground will flow directly into rivers and streams, increasing both the amount of flow and speed. These developments can obstruct the natural course of flood plains. The potential for flood damage is greatly increased when, through lack of awareness or disregard for the potential danger, unsuitable development takes place in areas that are already subject to flooding.

WETLAND LOSS— Wetlands provide critical habitat for many species, but also operate as a buffer for flooding and erosion. Because of their sponge-like ability to absorb water, wetlands can slow the momentum of flood waters. Wetland plants' highly developed root systems hold the soil in place and filter pollutants, naturally improving water quality (including water that is eventually used for drinking). (EPA) Increased flooding, erosion, and pollutants are caused by the increase in development over necessary wetland areas.

According to a state of Michigan 2014 report entitled "Status and Trends of Michigan's Wetlands Pre-European Settlement to 2005," southeast Michigan has had some of the biggest wetland losses with Monroe County leading at 93% loss, Wayne at 90%, and Macomb at 86%. Michigan's 1979 wetland protection law has led to a reduction in loss but the current development bloom is likely to increase the loss.



How does Friends of the Rouge help?

Friends of the Rouge has water quality monitoring programs that give us data to show how development is impacting our local waterways. The Frog & Toad Survey trains volunteers to listen for the presence or absence of frogs & toads throughout the watershed, which lets us know how healthy our wetlands are - or if there isn't enough wetland habitat in an area to support a healthy mix of amphibians. Our "Bug Hunts" send teams of volunteers to the river to search for the bugs that live on the bottom because they are long-term indicators of how healthy our rivers are based on the types and number of bugs we find. Participants in these programs learn the value of these ecosystems first-hand and become advocates for protecting them.

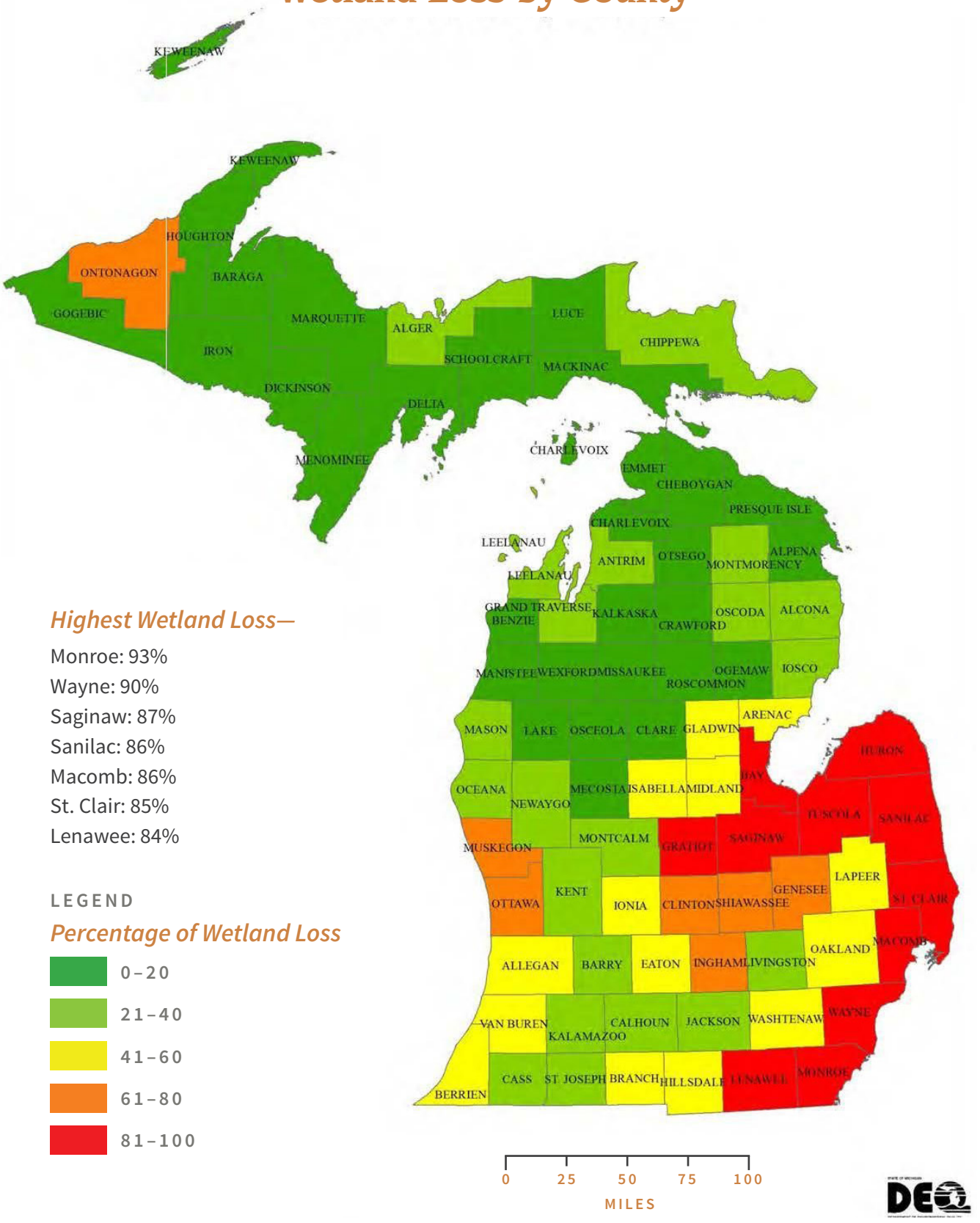
Ways to minimize the impact of urbanization include promoting "green infrastructure": measures such as rain gardens or bioswales along roadways to take runoff and allow it to slowly filter back into the ground instead of being directed immediately to storm drains. Green infrastructure also includes planting trees and native vegetation, incorporating green roofs, and encouraging residents to have rain barrels to capture rainwater for use on their property. These alternatives are a relatively low-cost way to have a major impact on the health of our streams. We have several opportunities through our Restoration programming to learn more about rain gardens, and offer sales of native plants and rain barrels.

What can you do to reduce and mitigate the effects of urbanization?

Ensuring that wetland protection laws are up-to-date and enforced, promoting the value of greenspace to quality-of-life as well as property values, and prioritizing conservation would improve the health of our ecosystem. Laws that promote low-impact development, and rezoning floodplains to prevent development altogether, will go a long way in mitigating rainwater to avoid future flooding disasters that have become common in southeast Michigan. One southeast community is even purchasing and demolishing homes in the floodplain.

Development is attractive to local municipalities because it helps to fuel tax increases, but the hidden costs of new sewer lines, streets, power, etc. are not often considered. Setting aside and protecting green space improves the quality of a community. Local land conservancies like Six Rivers Land Conservancy and the Southeast Michigan Land Conservancy can broker conservation easements and purchase of land for protection.

Wetland Trends in Michigan from 1800-2005
Wetland Loss by County



Highest Wetland Loss—

Monroe: 93%
Wayne: 90%
Saginaw: 87%
Sanilac: 86%
Macomb: 86%
St. Clair: 85%
Lenawee: 84%

LEGEND

Percentage of Wetland Loss

- 0–20
- 21–40
- 41–60
- 61–80
- 81–100

0 25 50 75 100

MILES