

# Aquatic life declines at early stages of urban development

June 3 2010

---

The number of native fish and aquatic insects, especially those that are pollution sensitive, declines in urban and suburban streams at low levels of development — levels often considered protective for stream communities, according to a new study by the U.S. Geological Survey.

"When the area of driveways, parking lots, streets and other impervious cover reaches 10 percent of a watershed area, many types of pollution sensitive aquatic insects decline by as much as one third, compared to streams in undeveloped forested watersheds," said Tom Cuffney, USGS biologist. "We learned that there is no 'safezone,' meaning that even minimal or early stages of development can negatively affect aquatic life in urban streams."

As a watershed becomes developed, the amount of pavement, sidewalks and other types of urban land cover increases. During storms, water is rapidly transported over these urban surfaces to streams. The rapid rise and fall of stream flow and changes in temperature can be detrimental to fish and aquatic insects. Stormwater from urban development can also contain fertilizers and insecticides used along roads and on lawns, parks and golf courses.

"Stream protection and management is a top priority of state and local officials, and these findings remind us of the unintended consequences that development can have on our aquatic resources," said Tom Schueler, Chesapeake Stormwater Network coordinator. "The information has been useful in helping us to predict and manage the future impacts of

urban development on streams and reinforces the importance of having green infrastructure to control stormwater runoff and protect aquatic life."

USGS studies examine the effects of urbanization on algae, aquatic insects, fish, habitat and chemistry in urban streams in nine metropolitan areas across the country: Boston, Mass.; Raleigh, N.C.; Atlanta, Ga.; Birmingham, Ala.; Milwaukee-Green Bay, Wis.; Denver, Colo.; Dallas-Fort Worth, Texas; Salt Lake City, Utah; and Portland, Ore.

These USGS studies also show that land cover prior to urbanization can affect how aquatic insects and fish respond to urbanization. For example, aquatic communities in urban streams in Denver, Dallas-Fort Worth and Milwaukee did not decline in response to urbanization because the aquatic communities were already degraded by previous agricultural land-use activities. In contrast, aquatic communities declined in response to urbanization in metropolitan areas where forested land was converted to urban land, areas such as Boston and Atlanta.

Comparisons among the nine areas show that not all urban streams respond exactly the same. This is mostly because stream quality and aquatic health reflect a complex combination of land and chemical use, land and storm-water management, population density and watershed development, and natural features, such as soils, hydrology, and climate.

**More information:** <http://www.chesapeakestormwater.net/>

Provided by United States Geological Survey

Citation: Aquatic life declines at early stages of urban development (2010, June 3) retrieved 25 April 2024 from <https://phys.org/news/2010-06-aquatic-life-declines-early-stages.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.