

# Urban ponds require attention to ensure biodiversity, shows study

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(a) Activity traps utilized to sample dytiscids in this study; (b – d) A variety of urban ponds with emergent plants in their margins. Credit: *Global Ecology and Conservation* (2022). DOI: 10.1016/j.gecco.2022.e02361

Ponds are important part of urban green-blue infrastructure. They provide city dwellers with many ecosystem services, such as recreation and supporting biodiversity. Recreation, however, may conflict with supporting biodiversity. For example, fish introduced for recreational purposes can reduce the diversity of aquatic invertebrates, which in turn may limit the value of urban ponds for aquatic biodiversity conservation.

A research team at the University of Helsinki investigated how aquatic plants can be utilized as a tool to enhance the co-existence between aquatic invertebrates and their [fish](#) predators in urban [ponds](#).

Emergent plants, such as sedges, can enhance the occurrence of diving beetles in a pond. Diving beetles are an indicator taxon of pond biodiversity, and they have stronger needs for emergent plants as prey refuges when fish is present in a pond. In ponds with fish, diving beetles occur when approximately 40% of pond margins are vegetated by emergent plants, such as sedges and cattails.

For comparison, in ponds with fish, diving beetles already have high chance to occur when approximately 30% of margins are vegetated. This is because diving beetles have lower predation risk in ponds without fish.

"In urban ponds, however, [aquatic plants](#) are sometimes removed to create tidy appearance, but it is not really good for biodiversity, because aquatic invertebrates need plants for various purposes, such as prey refuges to hide from predators," says researcher and corresponding author Wenfei Liao from the Faculty of Biological and Environmental Sciences, University of Helsinki.

## **The more aquatic vegetation, the better? Not always**

Diving beetles have different needs for emergent plants at different scales. At the pond scale, diving beetle presence is positively correlated

with vegetation cover.

However, when the team investigated diving beetle diversity in 1m×1m microhabitats in the ponds, they found different patterns: The results show, at the microhabitat scale, the effects of emergent plant cover on diving beetle diversity are different between ponds with and without fish. In ponds with fish, the more vegetation a microhabitat has, the more diving beetle species and individuals are present.

Yet, in ponds without fish, the diving beetle diversity is not correlated with emergent plant cover; that is to say, one may find a similar number of diving [beetle species](#) in vegetated spots and non-vegetated spots. This is because when fish is absent, diving [beetles](#) have low predation risk and can seek food in both vegetated and non-vegetated spots.

"Vegetated spots in urban ponds are good starting places for city people to observe [aquatic insects](#) and understand urban nature. However, we should remember some insects, such as the larvae of some caddisfly species, may prefer [open water](#); therefore, in aquatic habitat management, it is beneficial to maintain both vegetated and non-vegetated microhabitats to keep habitat heterogeneity. This is to ensure urban ponds meet the needs of different aquatic insects and support high aquatic biodiversity," concludes Liao.

The work is published in the journal *Global Ecology and Conservation*.

**More information:** Wenfei Liao et al, Microhabitats with emergent plants counterbalance the negative effects of fish presence on diving beetle (Coleoptera: Dytiscidae) diversity in urban ponds, *Global Ecology and Conservation* (2022). [DOI: 10.1016/j.gecco.2022.e02361](https://doi.org/10.1016/j.gecco.2022.e02361)

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