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Urban waterways provide important home for wildlife

Urbanisation plays an important role in changes to biodiversity, so it is important that towns and cities are well managed to protect wildlife. New Dutch research concludes that urban drainage systems, such as ditches and canals, can help maintain the same level of biodiversity as rural waterways. Recommendations are offered to ensure their full potential is met.

Urbanisation is increasing, but it leads to ecosystem destruction, habitat fragmentation and species extinction. The protection and enhancement of biodiversity in urban areas are becoming more and more important. However, urbanisation also creates some new spaces for wildlife. With the prospect of climate change, carefully managed towns and cities could in fact play a valuable role in providing important stepping stones to connect fragmented landscapes and offer alternative habitats. However, there is little data to assess the conservation value of urban areas and very few studies focus on urban water systems.

This research compared the biodiversity value of urban water systems in lowland areas, such as ditches and canals, with drainage systems in rural areas (both natural and manmade), such as small streams and rivulets. Water systems in two towns in the Netherlands were studied, specifically looking at macroinvertebrate species, which included snails, mites, flies and exotic crustaceans.

Four types of water were classified, based on the different groups of macroinvertebrates that inhabited them. These water types differed in their level of nutrients and amount of vegetation. Urban water with low levels of nutrients, such as nitrogen and phosphorus, had the highest diversity of macroinvertebrates as well the highest number of endangered species. Waters with high levels of nutrients and poorly developed vegetation had low macroinvertebrate diversity, as did cloudy waters.

Vegetation provides habitat, food and shelter for macroinvertebrates. Water with sandy sediment is strongly influenced by seepage from rivers and canals and is high in nutrients. The number of exotic crustaceans was high in nutrient-rich waters, probably because they are able to cope with harsher conditions, such as low oxygen levels, than native species.

The research demonstrated that the key factors for the conservation of macroinvertebrates in urban water systems are levels of nitrates, sediment composition, transparency and submerged vegetation. On the basis of this the authors offer a number of recommendations for the management of urban drainage systems to optimise biodiversity. For example:

- Nutrient levels can be lowered by regular dredging, avoiding inlet of nutrient-rich water, such as sewage, and preventing over-feeding of water birds and fish.
- Aquatic vegetation can be encouraged by optimising mowing regimes and developing natural banks. This can also increase transparency of waters.
- However, although transparency encourages greater biodiversity, some areas of water with mineral sediment should be maintained as these support more rare species such as the mayfly (*Caenis luctuosa*) and the lesser water boatman (*Micronecta minutissima*).

The study demonstrated that urban drainage systems can be home to a comparable biodiversity as man-made drainage systems in rural areas and natural watercourses. It can also provide habitats for several endangered species.

Source: Vermonden, K., Leuven, R.S.E.W., van der Velde, G. *et al.* (2009). Urban drainage systems: An undervalued habitat for aquatic macroinvertebrates. *Biological Conservation*. 142: 1105-1115.

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Additional information: For more information on how to promote biodiversity through the renaturation of an urban water system, please see the LIFE funded River Liesing project: http://ec.europa.eu/environment/life/project/Projects/files/laymanReport/LIFE02_ENV_A_000282_LAYMAN.pdf