



Modifying urban rivers to increase biodiversity

Urban rivers are typically heavily-engineered and polluted with degraded habitats. They are therefore a priority for biodiversity restoration. Research suggests that relatively simple modifications to river walls may potentially encourage biodiversity by significantly improving habitats for plants and animals.

The EU's Water Framework Directive¹ requires good ecological status in surface waters by 2015, and as such it is important to encourage biodiversity in rivers and waterways. One way of achieving this is to alter the structure of a river. Naturalistic landscape features, such as meanders, are not usually an option in high-density, urban settings, where flow regulating structures are needed for flood protection.

In such confined waterways, river walls may be the most stable and accessible habitats available to plants and invertebrates. Little is known of current river wall ecosystems, which include a mixture of land and river species, but the research suggests that the more complex the surface of the wall is, the more abundant and diverse array of species it can support.

The study examined the River Thames in the UK. Parts of this were once virtually devoid of life, but after 50 years of recovery, is now one of the cleanest urban waterways in Europe. Ecologically-improved areas at the upstream and downstream ends are separated by a heavily-engineered section that runs through central London.

Walls and shoreline along a 2km stretch of this heavily-engineered section of the river were sampled. In general, the walls supported more species than the mud banks, although concrete walls and sheet piling (the most uniform and non-complex surfaces) supported fewer, or no, species. Weathered brick or boulder walls, with rough and complex surfaces that trap water and organic material, were the most biodiverse habitats.

River walls with an urban defence role are frequently maintained and replaced, and the researchers found that the species living in these habitats had adapted to disturbance and none were rare or endangered. Such communities may provide valuable ecological connectivity in sections where habitats are sparse. Once established, communities can build more habitat complexity and biodiversity.

The authors report that adding ledges and timber frames to bare walls encouraged plant growth. They call for a series of similar trial installations of organic material and sediments on walls in urban river sections, to be assessed for habitat development and exploitation. If successful, ecologists and engineers could then collaborate to design materials and structures that are effective and visually-pleasing ecological habitats.

The goodwill of engineers, landowners and river managers is needed for the success of such trial developments. River managers may be unwilling to modify walls, to avoid causing damage or instability and maintain engineering access. Significant structures may also impede river traffic or flow. However, if well designed, modifications can be expected to counter these problems and form a valuable part of wider urban regeneration schemes.

¹ See: http://ec.europa.eu/environment/water/water-framework/index_en.html

Additional information: LIFE has co-funded a number of projects developing best practices for improving the ecological status of rivers. For more information, view the LIFE Focus brochure [LIFE and Europe's rivers](#) or the [Rivers thematic section](#) on the LIFE website.

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