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Ecosystems threatened by invasive plant species

New research shows that by replacing native vegetation, aggressive plants such as knotweed seriously affect not just plant diversity but whole ecosystems. The study showed that habitats invaded by knotweed supported a lower abundance and richness of insect life, which in turn affects larger insect-eating animals such as frogs and birds.

Imported in the 19th century from eastern Asia as ornamental plants, knotweed species have rapidly spread, particularly along rivers in the UK and France. River banks are important habitats as they are normally extremely rich in plant and invertebrate life and provide havens for insects and small animals in otherwise intensively used landscapes.

Knotweeds are recognised as among the most aggressive invasive weeds in temperate terrestrial ecosystems. This study compared ten invaded riverbank areas of France, Germany and Switzerland with nearby areas of unaffected native grass and shrub land. It measured the abundance and richness of plants and insect species in the three types of habitat over two years in both spring and summertime and the density levels of the knotweed to find out how far invasive weeds have altered ecosystem patterns and processes.

A greater variety of plant species was found in grassland than in shrub land, but both were more diverse than in knotweed dominated areas. Knotweed invaded habitats had 40 per cent lower insect numbers compared to native grass and shrub land, showing a clear link between replacement of native plant species and the negative impact on insects. However, some native plant species (*Urtica dioica* and *Gallium aparine*) were able to survive inside knotweed areas, and some predatory insects such as spiders were present in equal numbers to native shrubland. However, the authors suggest that predatory insects would have greater difficulty finding food and are thus likely to have lower fitness traits, for example, they may be smaller. At the study sites, there was extremely little evidence of the knotweed being eaten by herbivores, showing that they are probably inedible by European animal species.

The authors point out that large-scale invasions of river banks by knotweed endangers the value of these ecosystems for birds, amphibians, reptiles, mammals and other insect-eating wildlife. However, completely removing knotweed has a high economic cost and is a very difficult operation that needs to be followed up over several years and can also cause undesired effects on native vegetation. The authors suggest low-input management schemes to lower the density of invasive plants may partially reduce the negative impact of the weed.

Source: Gerber, E., Krebs, C., Murrell, *C. et al*. (2008). Exotic knotweeds (*Fallopia spp*) negatively affect native plant and invertebrate assemblages in European riparian habitats. *Biological Conservation.* 141(3): 646-654.

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