

Evidence

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Threats and controls on the distribution of exposed riverine sediments and their associated Coleopteran fauna in England and Wales

Project summary SC060038/S

Exposed riverine sediments (ERS) are those areas of sediments (gravels, sands and silts) within river channels that lack continuous vegetation cover and have a vertical distribution between the levels of bank full and typical base flow.

The physical pressures applied to this habitat such as temperature extremes, frequent inundation and erosion mean that ERS support a highly specialised invertebrate fauna, including beetles, flies and spiders, many of which are rare or uncommon.

The habitat is highly vulnerable to the impact of human activities such as physical or hydrological modification. ERS habitat is much less common than it once was and there has been a parallel decline in associated species.

A three-year study has investigated the controls on the distribution of ERS habitat, their invertebrate fauna and the impact of river management. This study provides useful information that should be considered when planning changes in existing management and restoration strategies, particularly for sandy or gravelly rivers.

English and Welsh ERS have been mapped and the resource catalogued in a Microsoft® Access database, available in an appendix to the main report. The main concentrations of sand/gravel ERS are in Wales and in the north and south-west of England. Slope and frequency of very high flows are shown to be the most important factors for predicting ERS distribution and density.

The study looked at the factors affecting the distribution of different groups of beetles and assessed the impacts of change. It also analysed the different responses to human intervention along the course of rivers. Rarer species with poor dispersal ability are found more often in upstream areas, where modification occurs less frequently but where one ERS patch may be a key location for a particular species. Downstream, where ERS is less frequent, damage or loss may affect dispersal and ecological processes.

Investigation of the prey of ERS specialist beetles shows that, while the ERS habitat is very important, they also use adjacent terrestrial habitat, especially during the wetter months when ERS are more often under water. This reinforces the importance of suitable habitat outside the river channel.

A novel technique using DNA microsatellite markers to investigate the genetic variation between populations from different rivers produced encouraging results that justify further development of the technique.

The report's recommendations include the need to identify key locations and to protect the ERS resource, avoiding changes to natural processes. It is clear that the ecology of ERS and its associated species is complex and that any proposals affecting ERS must be carefully considered to minimise their impact.

This summary relates to information from project:

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