Scientists urge policymakers to plant more trees to save Britain's rivers from climate change

October 23 2015

New research has prompted scientists to call on policymakers to plant more trees alongside upland rivers and streams, in an effort to save their habitats from the future harm of climate change.

Published today in the leading international journal *Global Change Biology*, experts from Cardiff University describe having discovered a previously unknown benefit of trees to the resilience of river ecosystems.

Britain's 242,334 miles of running waters are among the most sensitive of all habitats to climate change, with cool water species at greatest risk.

Previous studies by the Cardiff team on warming effects in the Rivers Wye and Tywi reveal significant reductions in insect numbers and even an instance of local species extinction due to climate change. A growing body of evidence shows that deciduous trees can protect river species from damagingly high temperatures owing to the cooling effect of the shade they give.

Yet in this latest study of Welsh streams, scientists demonstrate for the first time that trees offer much more than just a cooling influence. The researchers show that river ecosystems also benefit from large inputs of energy each autumn in the form of falling leaves.

Some insects use this leaf litter as food. Their numbers are greatest in upland rivers where bankside broadleaf trees have been retained, and so their food source is in abundance. Insects are in turn a vital food source for fish, river birds and bats, so where there are healthy insect populations these other species also benefit.

Each autumn, around 5-8 kg of dry, dead leaves fall into every metre of woodland streams. The Cardiff researchers think that this annual gulp of biomass keeps insect populations high and might be crucial in making stream ecosystems more able to withstand climate change effects.

To reach their findings the researchers counted river insects and measured brown trout in over 20 Welsh mountain streams running through moorland, conifer forests or deciduous woodland. They also measured special 'stable isotopes' of carbon and nitrogen in river organisms to trace how much of the energy in their bodies came originally from leaf litter.

"We were surprised that, no matter where we looked, roughly half of the carbon in river insects had originated from vegetation in the surrounding landscape rather than the river itself - in other words leaves falling or being blown into the river," said lead author Dr Stephen Thomas, from Cardiff University's School of Biosciences.

"But, because there was so much more leaf litter at deciduous woodland sites, the numbers of insects supported by these streams was at least double that in any other stream type," he added.

River biodiversity and climate change expert, Professor Steve Ormerod, also from the School of Biosciences, who supervised the study, said:

"This important evidence gives hope to the fact we can protect some of the world's ecosystems against climate change. Further global warming is

looking increasingly inevitable in the years ahead, and we need to plan for conditions that could be outside anything that we've ever experienced and adapt to them as far as we can".

"In rivers, reducing pollution or restoring bankside broadleaves appear to be very effective ways to increase resilience, but these actions take decades. We want to impress on decision makers the urgency of taking action now to protect against climate change effects in future."

Climate change adaptation is expected to be a key feature of the forthcoming "COP21" Global Climate Change conference this November in Paris, making these results particularly timely.

Provided by Cardiff University

Citation: Scientists urge policymakers to plant more trees to save Britain's rivers from climate change (2015, October 23) retrieved 26 April 2024 from https://phys.org/news/2015-10-scientists-urge-policymakers-trees-britain.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.