The use of peat in horticulture destroys wildlife, it is a disgrace and must halt

The UK has about 10 to 15% of the total global area of blanket bog, making it one of the most important international locations for this habitat. In addition, there are also internationally important areas of lowland raised bogs in northern England, Wales, Northern Ireland and Scotland.

There has been a dramatic decline in the area of these peatland habitats in the past 100 years. The area of lowland raised bog in the UK retaining a largely undisturbed surface is estimated to have diminished by around 94% from an original 95,000 to 6,000 hectares. Much of this peat has been extracted for sale as compost for horticulture, however agricultural intensification and afforestation also contribute to the loss of these habitats.

Recent voluntary approaches to move the horticulture industry away to peat alternatives have failed to make the step change that is required to protect this fragile habitat. A change in buying habits of gardeners, horticulturists and local authorities is required. A tax on the production of peat products could lead to producers sourcing their peat from outside the UK, and therefore damaging this fragile habitat in other countries. A levy on the sale of peat products however could lead users to source alternatives to peat and raise funds to ensure continued investment in research on alternatives and the restoration of degraded bogs.

Freshwater invertebrate populations tell us how healthy our environment is and they must be properly monitored and understood

In contrast to many other invertebrate groups, the distribution of freshwater invertebrate species is relatively well known. This is due largely to routine monitoring undertaken by the statutory environment agencies (EA, SEPA, NRW and NIEA). Invertebrates have been used to determine quality of freshwaters for over half a century. Nevertheless there are still gaps in our knowledge. The majority of statutory sampling is concerned with flowing water or larger standing waters meaning that smaller habitats such as ponds, headwaters, springs and ditches are poorly covered. In addition, this sampling is entirely focused on the aquatic life stages of the invertebrates and therefore our understanding of changes to aquatic insect emergence is often lacking. In the past this monitoring has been limited to family level identification of the invertebrates collected. Recently there has been a move toward more species level identification which will lead to this information being useful for a wider range of purposes. It is however important that this information is made more widely available.

Some freshwater species are now so vulnerable that specific, targeted conservation action and legislative changes are required to save them from extinction

Global freshwater biodiversity is reported to have declined by 76% since 1970. Whilst this analysis did not include invertebrates there is no reason to suggest that similar declines have not occurred with invertebrates. Indeed, a survey of trout anglers reported a perceived 66% reduction in the number of freshwater insects emerging from chalk streams in southern England since the 1970s. In a recent assessment of red lists from around the world 15% of dragonflies and damselflies (Odonata) were found to be at threat of extinction. 32% of the world's 590 crayfish species are threatened with extinction and 27.8% of freshwater shrimp species are at risk of extinction.

Recent status reviews in the UK show that 35 water beetle species, six species of dragonflies/damselflies, five species of mayfly and two species of stonefly are threatened with extinction. Five species of water beetle, three species of dragonfly/damselfly, two species of mayfly and one species of stonefly are now considered extinct in the UK.

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Saving the small things that run the planet

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Freshwaters for the Future:

A Strategy for Freshwater Invertebrates

Freshwater teems with wildlife and is vital to life on Earth, including human life. Rivers, streams, ditches, springs, seepages, ponds and lakes are all extremely important wildlife habitats, but with the development of agriculture, human settlements and industry, many freshwater habitats have been lost, damaged or polluted. This loss of freshwater habitats means that there is a great need to preserve what we have, restore what we have lost and create new freshwater habitats wherever possible.

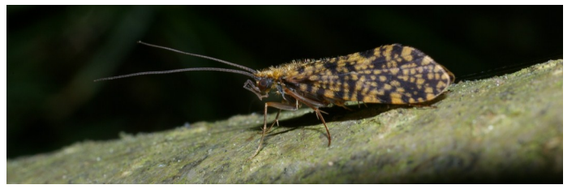
Over 3,800 invertebrate species in the UK spend at least part of their lifecycle in freshwater. These include well known freshwater invertebrates like dragonflies, mayflies, pond skaters and crayfish to lesser known worms and mites. They play a vital role in maintaining clean water; they help to break down and filter organic matter and provide a food source for fish, birds and mammals. Their presence is the standard indicator of the health of the habitat they live in. However, many of our freshwater invertebrates are declining in the face of pollution, invasive species, abstraction and development.

We believe that freshwater invertebrates and their habitats should be understood, respected, conserved and enhanced. This document details the 8 principles that society must choose to aspire to in order to save and sustain freshwater invertebrates and their habitats.

Aquatic invertebrates should be more widely understood, cherished and properly valued for the services they provide

Of all the ecosystems on the planet, freshwater supports the greatest concentration of biodiversity. Whilst freshwater habitats cover less than 1% of the planet's surface, they support up to 10% of all known species. Freshwater life is very diverse and the emergence of insects from water contributes to healthy, functioning terrestrial ecosystems.

The biology and ecology of freshwater bugs is intricate and amazing. Freshwater invertebrates are an important part of our culture and heritage – dragonflies inspire artists, crayfish excite children, and mayflies engage anglers. Freshwater ecosystems provide humans with a multitude of goods and services and most of these are provided directly or indirectly by the species that live there.



Yet freshwater ecosystems are among the most imperilled, with biodiversity losses occurring much faster in freshwater than terrestrial or marine environments. Consequently, there are likely to be adverse effects on the delivery of services. A greater understanding of the relationships between freshwater biota and ecosystem services is particularly timely in achieving local and European legislative aims of restoring water bodies to 'good ecological status'.

Reducing pollution and improving the cleanliness of water is essential to healthy aquatic ecosystems

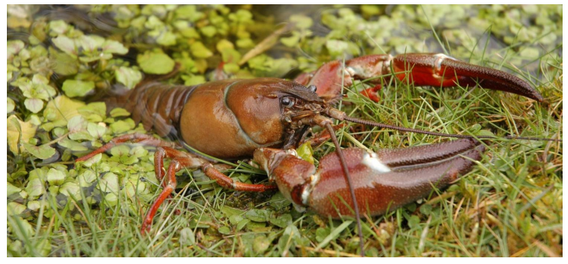
Pollution continues to impact on water quality despite the introduction of legislation such as the Water Framework Directive in Europe. Almost half of sites monitored across Europe continue to suffer from chronic chemical pollution leading to long-term negative impacts on freshwater organisms. One in ten sites suffered acute pollution with potential lethal impacts for freshwater organisms. Sources of pollution include domestic and industrial sewage effluents, and run-off from agriculture and urban areas, with pesticides from farming posing the most immediate risk to freshwater ecosystems.

There are growing concerns that pharmaceutical products are having a deleterious impact on aquatic invertebrates. These concerns relate not only to the toxicity of these substances but also the microscopic pieces of plastic which are included in a range of substance including toothpaste and cosmetic products. These 'microplastics' accumulate in the sediment and have been shown to be consumed by various freshwater invertebrates including worms, shrimps and snails.

Biosecurity, eradication and mitigation measures must be improved because of the extreme vulnerability of freshwater species and habitats to damage from invasive non-native species

Invasive Non-Native Species (INNS) are an increasing threat throughout the World. In Europe, many of these non-native species originate from the Ponto-Caspian region, with over a hundred species known to have spread from this area to date. The introduction of these invasive non-native species to new ecosystems leads to a reduction in species richness and abundance, with mayflies, caddisflies, freshwater shrimps and other crustaceans particularly vulnerable.

A list of 100 of the World's worst invasive species features nine freshwater invertebrates, including the Chinese mitten crab (*Eriocheir sinensis*), the Fish-hook waterflea (*Cercopagis pengoi*) and Golden apple snail (*Pomacaea canaliculata*). In Europe, crayfish species pose a particular threat with Signal crayfish (*Pacifastacus leniusculus*) and Red swamp crayfish (*Procambarus clarkii*) particularly problematic. An estimated annual cost of €454 million is incurred due to damage caused by and/or the control of these two crayfish species.



Climate change is an urgent threat to aquatic ecosystems and actions to make them more resilient must be implemented now

Climate change is one of the major long term threats to biodiversity. Most recent predictions are that temperatures will rise as a result of climate change and there will be changes to precipitation patterns - these will inevitably have an impact on invertebrate populations.

Freshwater invertebrates are particularly at risk, firstly because warmer water holds less of the dissolved oxygen that they need to survive, and secondly because changes to rainfall, evapotranspiration and flow rates will profoundly affect habitat continuity and availability.

Indeed with the majority of species having relatively short life cycles and good powers of mobility they are likely to be one of the first groups to show the impact of a changing climate. Cold-loving species will retreat northwards and uphill, while warm-loving species will increase their range in the UK.

Demands on freshwaters for water supplies are high. These demands are particularly focussed during times of drought. The effect on aquatic habitats is often exacerbated by abstraction for water supply and irrigation of crops. Leakage from the water supply network further adds to demands on freshwater.

Increased severity and intensity of flooding is another anticipated impact of a changing climate. In recent years there have been several instances of widespread flooding in the UK. The immediate response by decision makers is to instigate a programme of dredging in the hope that this will increase the speed with which water drains and thereby reduce flooding. These decisions are often taken contrary to scientific advice and can lead to devastating impacts on the aquatic environment, particularly for fragile habitats such as exposed riverine sediments and ditches.

Efforts to conserve aquatic habitats have focussed on rivers and lakes, but most invertebrate biodiversity lives in small, marginal and dynamic waterbodies, these are much more fragile and require improved protection from damage

Over 50% of wetlands in North America, Europe, Australia and New Zealand have been lost through conversion to other land uses. Whilst this assessment includes some coastal wetlands, it is clear that there has been a significant loss of freshwater habitats over the last 100 years.

Habitats such as exposed riverine sediments, ditches, springs and seepages, headwaters, fishless lakes, ephemeral ponds and pools, bog pools and subterranean and groundwater systems often have important invertebrate assemblages. They are however also often poorly studied and misunderstood. The EU Water Framework Directive focuses on larger waterbodies, and as a result many fragile freshwater habitats are overlooked and undervalued.

Transitional habitats such as saline lagoons and coastal grazing marshes are similarly often overlooked. These habitats are under pressure from climate change and rising sea levels, as well a 'coastal squeeze' where development and agriculture impact upon these sites. It is important to maintain the transition zone between fresh and saline water, which supports a specialised invertebrate fauna.