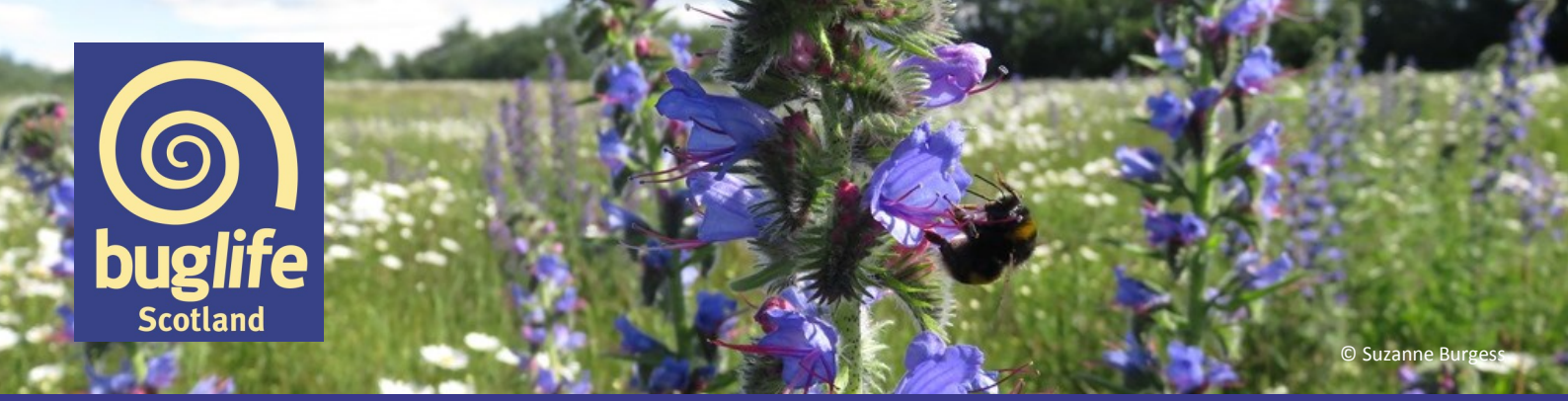


Free Ecosystem Services in Scotland

There are over 24,000 species of invertebrate in Scotland, many of which are incredibly important providing us with a range of free 'ecosystem services' that are worth millions of pounds! Many of these services, such as pollination and the creation of healthy soils, are often overlooked until they are damaged or lost and they are usually impossible to replace. It is important that we all work together to protect Scotland's invertebrates and the free services they provide.

This leaflet has information on some of the ecosystem services that invertebrates in Scotland provide for free.

Pollination

Insects such as bumblebees, solitary bees and hoverflies are not only responsible for the pollination of wildflowers and many trees but also a variety of crops in Scotland. The most significant crop pollinated by insects in Scotland is the soft fruit industry with the strawberry crop worth £84 million, and the raspberry crop £12 million (in s#2016). The soft fruit industry is altogether worth more than £115 million per year.

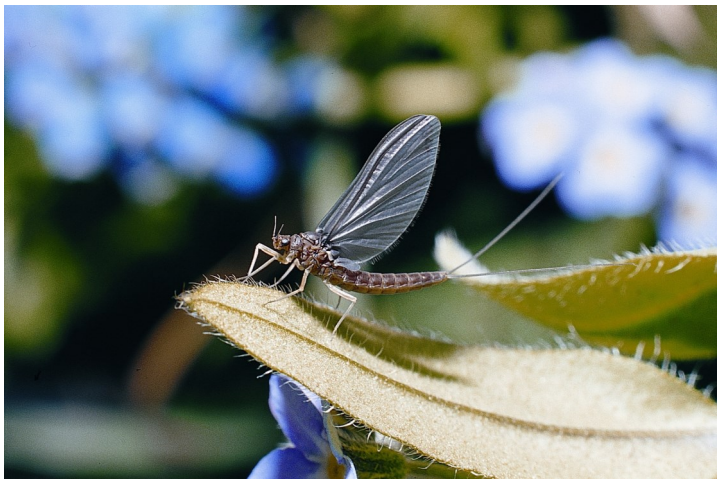
Scottish Fishing Industry

The Scottish fishing industry relies on invertebrates like shrimps, prawns, crabs, lobsters and other shellfish such as mussels and oysters which make an important contribution to the economy of coastal communities.

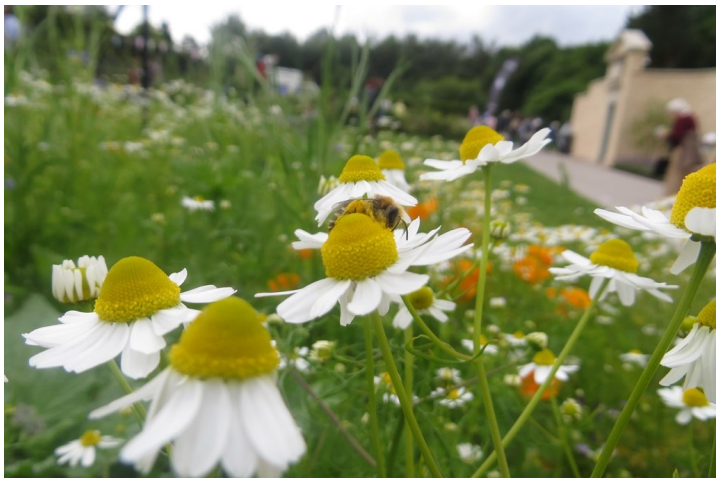
Langoustine (Norway Lobster or Scampi) is the most valuable shellfish species to Scottish fishing industry. Their catch contributes £75million (15%) of the total value of all Scottish landings – two out of every three langoustines are sourced from Scotland! In the pelagic fisheries our important stocks of cod, herring and

Pollinating insects

There are over 4,000 species of pollinating insect in the UK and this includes bees, wasps, butterflies, moths, flies and beetles. Pollination by insects has been shown to increase the yield, quality and marketability of many crop species. Pollinators are in decline due to habitat loss from land use changes due to more intense agricultural practices as well as urbanisation and industrialisation. An increased use of pesticides, especially 'neonicotinoid' pesticides is also a factor in their decline.



Riverflies such as this mayfly form the diet of Trout and Salmon © Stuart Crofts



Solitary bees are our most efficient pollinators © Suzanne Burgess

Worms and soil

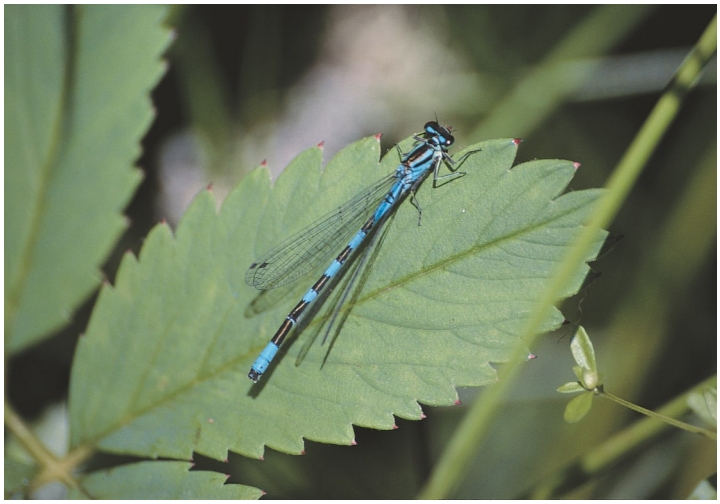
The presence of earthworms generally indicates a healthy soil system. There are 29 species in the UK that are divided into four groups: there are those that live on the surface of the soil in leaf litter (called compost earthworms); those that live in and feed on the soil itself (called epigeic earthworms); those that are found in compost or areas that are rich in rotting vegetation (called endogeic earthworms); and those that live in vertical burrows at the surface of the soil (called aneceic earthworms). There is more information on how to identify earthworms on the UK Earthworm Society website: www.earthwormsoc.org.uk/

haddock depend on invertebrates such as krill and copepods for their food.

Freshwater fisheries for game fish contribute over £112 million annually to the Scottish economy. Aquatic invertebrates like stoneflies and mayflies are an essential source of food for these fish.

Sewage treatment

Invertebrates play an important role in sewage treatment. One of the simplest but most effective treatments for sewage involves passing the effluent over a bed of stones on which a biofilm of bacteria, fungi and algae grow and process the waste. The biofilm attracts, and is ingested by invertebrates including non-biting midges, moth-flies and worms. Altogether these organisms turn the sewage into clean water and an organic sludge that can be used as fertiliser or fuel.



Northern damselflies (*Coenagrion hastulatum*) are only found in Scotland in the UK and help attract visitors © David Pryce

Earthworms help create healthy soils © Roger Key

Healthy soil

Earthworms and other soil invertebrates like springtails benefit our soils, in particular in agricultural areas, by maintaining and improving the structure and aeration of soil by their constant feeding and burrowing. They break down organic matter such as dead leaves and return essential minerals and organic matter to the soil, enabling renewed crop growth. They also help to mix the soils, improve drainage and provide channels for root growth.

Eco-tourism

Tourism – especially 'eco-tourism' constitutes an important and increasing element of economic activity in Scotland. Much of this is about history and landscape but it is also about our varied wildlife. Indirectly, invertebrates are important in underpinning the survival of talismanic animals such as Ospreys and Otters.

But there is also an increasing interest in Scotland's special invertebrate fauna. Certain iconic species such as the Kentish glory moth (*Endromis versicolora*), Chequered skipper (*Carterocephalus palaemon*) and Mountain ringlet (*Erebia epiphron*) butterflies as well as the many striking dragonflies, beetles and flies of Scotland's boreal woodlands increasingly attract visitors, not just from within Scotland but also from other parts of the UK and Europe.

Buglife The Invertebrate Conservation Trust is a registered charity at
Bug House, Ham Lane, Orton Waterville, Peterborough, PE2 5UU
Registered Charity No: 1092293, Scottish Charity No: SC040004, Company No: 4132695