British Dragonfly Society

KS3 Science

Southern Damselfly activity

KS3 Science: Biology, Structure and Function of Living Organisms. Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.

Background Information:

The British Dragonfly Society is a small charity, which was set up in 1983 by a group of dedicated volunteers who love dragonflies and damselflies. We have gone from strength to strength since then and now employ 5 staff and have over 1700 members. We work across the whole of England and Scotland to conserve dragonflies, damselflies and the habitats they rely upon. We rely solely on membership fees, donations and charitable grants to carry out our work and we achieve a lot with our limited resources.

Why conserve dragonflies?

Over the last 60 years we have witnessed the extinction of two species of dragonfly in the British Isles. At least a third of the remainder are considered to be rare, localised and have specialised habitat requirements. So we need to act now to conserve what we have left and to stop them from disappearing too. Dragonflies and damselflies are used as 'Indicator' species, meaning that if they are doing well it is an indication that the wider ecosystem is also doing well. And if they are declining then we know there must be wider problems in the ecosystem. They are an important food source for many species and in turn they eat many 'pest' species such as midge and mosquito larvae. We need them around to ensure our own health and well-being too. Also they are amazingly beautiful insects that have been around for millions of years. We have a duty to ensure that future generations have the opportunity to enjoy them too.

HOW DO YOU SAVE SPECIES?

We work with scientists and conduct studies to ensure that we fully understand the requirements of different species of dragonfly and damselfly. From our learnings, we then work with landowners, nature reserve managers and volunteers to put our findings into practice. This includes creating new habitat that dragonflies and damselflies will love, managing existing habitats to make them more suitable and reintroducing species to areas where they once lived, once we have restored the habitat suitably. We also like to keep a close eye on where species turn up each year and at what time of year, we have a network of dedicated volunteer dragonfly recorders who assist with this part of our work. We also rely on the public sending us sightings each year from across the country too!

Southern Damselfly Case Study:

Venn Ottery Common, a Wildlife Trust reserve in Devon, held Southern Damselfly populations until intrusive ditch digging and relaxed grazing caused the species to go extinct in 1989.

As part of efforts to re-establish the Southern Damselfly here, holes were created in the sides of one such artifical ditch, allowing the water to run down the slope. This has naturally recreated a network of braided, shallow runnels which have since been populated by Southern Damselflies following a successful reintroduction programme.

SOUTHERN DAMSELFLY

Species fact file:

Scientific name: Coenagrion mercurial

Damselflies are insects in the sub-order Zygoptera (meaning "paired-wings"). All four wings are near enough equal in size and shape. They are usually small, weakly flying insects that stay close to the water margins or water surface. **When at rest, most species hold their wings along the length of their abdomen.** Unlike dragonflies who when at rest, hold their wings out from the body, often at right angles to it

Length: 29-31mm

Flight period: June to August (occasionally May)

The Southern Damselfly is one of several members of the genus Coenagrion currently to be found in the British Isles and is a member of the family Coenagrionidae.

Males have a distinctive 'mercury' mark on segment 2 of the abdomen (see left - Copyright Environment Agency, 1999). They also have a spur marking on the side of the thorax and a small blue line between the eyespots as additional, but not distinctive, features.

Female Coenagrion species are very similar making them difficult to identify.

The flight is weak and low; they stay close to the breeding site and **do not appear to disperse easily to colonise new areas.** Low shrubs and soft rush plants are used for perching, roosting and feeding forays.

Eggs are laid in submerged tissues of aquatic and emergent vegetation and the plant dwelling **larvae usually take two years to mature**

SOUTHERN DAMSELFLY

Habitat requirements:

The Southern Damselfly is found in **three main habitat types**: **small streams on heathland** (e.g. The Preseli Hills, Pembrokeshire), **old water meadow ditch systems on chalk and chalk streams** (e.g. Itchen Valley Country Park, Hampshire) and **fen habitat** (e.g. Dry Sandford Pit, Oxfordshire). However, within these three broad habitat types are found the same conditions required by the Southern Damselfly: **unpolluted**, base-rich, **shallow streams** with a constant, moderate flow rate and **relatively high water temperatures**. Many sites are also at a low altitude.

Threats:

The main factor thought to be influencing the decline of the species is **habitat loss** due to the removal of grazing animals that maintain the open nature of the species' breeding sites. Other potential threats are abstraction of water, leading to a **lowering of the water table**, drainage due to agricultural and forestry pressures, **pollution** and excessive nutrient enrichment from the runoff of nitrogenous fertilisers from adjacent agricultural land. **Habitat fragmentation** - Isolation and scarcity of habitats is a cause for concern.

Conservation Status and Legal Protection:

In Great Britain this species is classified as **Rare** (category 3) on the **Red Data Book List** (it also features on the red list of other Countries in Europe), and it is a British Dragonfly Society "Key Species".

It is also listed in Appendix II of the Berne Convention and Annex II of the EC Habitats Directive, which is transposed into UK law through the Conservation (Natural Habitats etc.) Regulations (1994), commonly referred to as the **Habitats Regulations**. Under the Regulations sites of significant ecological importance within a European context for their habitats and/or species populations have been proposed as **Special Areas of Conservation (SAC).** In the UK there are more than 10 candidate SACs with one of the **qualifying criteria being the presence of Southern Damselfly.**

SOUTHERN DAMSELFLY

Conservation Status and Legal Protection:

The UK Biodiversity Steering Group published the UK **Biodiversity Action Plan (BAP)** in 1995. This identified the **Southern Damselfly as a priority species** for conservation action and included (Volume 2, page 132) a **Species Action Plan (SAP) for the species.** The UK BAP accords with and implements the UN Convention on Biological Diversity, signed at the Rio Earth Summit in 1992. Its overall goal is to conserve and enhance biological diversity within the UK and to contribute to the conservation of global biodiversity.

To co-ordinate implementation of the UK Southern Damselfly SAP a Steering Group was established in 1997. This partnership of organisations comprises: Environment Agency (EA), The Wildlife Trusts (Lead Partner), Natural England (NE), Countryside Council for Wales and British Dragonfly Society. Subsequently academics from Liverpool University were co-opted onto the Group.

Conservation Action:

Many efforts to conserve the Southern Damselfly pre-date the publication of the Species Action Plan (SAP), and much of that **work has been initiated and carried out by British Dragonfly Society members,** often at their own expense and time. The purpose of the SAP is to provide a framework through which to provide co-ordinated direction to this on-going and future work and to attract and focus resources to achieving the range of actions identified in the Plan.

The species has undoubtedly benefited from the **positive habitat management, surveys and monitoring** by bodies such as RSPB and National Trust, and in recent years the SAP has inspired others such as the Forestry Commission, Dartmoor National Park Authority and many others to carry out their own works on Southern Damselfly sites. **For example, the Ministry of Defence and English China Clay have worked in close partnership with EA, NE and RSPB to manage and monitor the Bovington Ranges in Dorset.** In that respect the SAP is already becoming a great success, the renewed habitat management efforts and new resources building upon the long-standing surveys and monitoring done by BDS volunteers.

Lesson Plan

In this activity, students will split into small groups and discuss which threats will impact upon this already threatened species. Use the species fact file as a source of information. Use the distribution map print out and threats cards as props to help discussion.

Consider:

- What can be done to help save this species?
- Why is it important to not let species go extinct?
- What obstacles might make it difficult to save this species?

Regroup all the students and get them to present their findings to each other and discuss their recommendations. Suggest further reading on our website if anyone would like to know more about how we do go about saving species and our current projects. Hand out 'Dragonflies in your garden leaflets' for students to take home and learn about the species that they may see.

Learning outcomes –

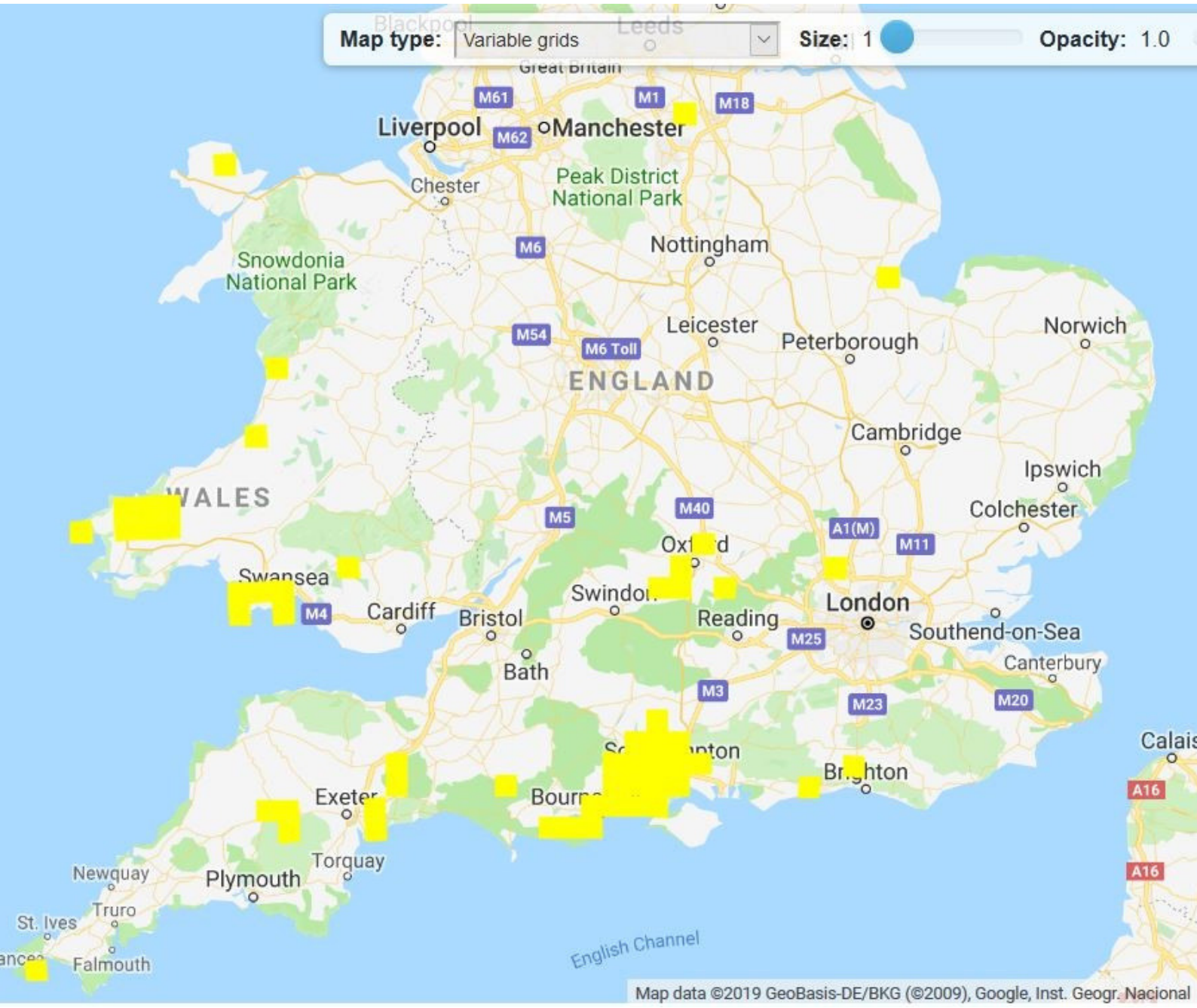
All students will understand the basic difference between damselflies and dragonflies.

Most students will demonstrate knowledge of how species are adapted to suit their environment and that human activity can negatively affect their ability to survive.

Most students will make the link between Climate Change making geographic regions unsuitable for species that have very specific habitat needs and an inability to disperse easily.

Some students will progress further and debate solutions for conserving this species and protecting its habitat from further damage.

Southern Damselfly Distribution Map



This map can be found at:
https://spatial.nbnatlas.org/#

Southern Damselfly Threats Cards

British Dragonfly Society

CLIMATE CHANGE

CHANGES IN LAND USE

UNDER RECORDED/HARD TO IDENTIFY

HOUSING & ROAD DEVELOPMENT

INSENSITIVE LAND MANAGEMENT

POLLUTION

DISEASE

INVASIVE NON NATIVE SPECIES

HABITAT DESTRUCTION

Further Resources

British Dragonfly Society website:

https://british-dragonflies.org.uk/species/southern-damselfly

You will be able to download the Southern Damselfly Management Plan and find habitat restoration project details here too:

https://british-dragonflies.org.uk/content/conservation-projects-wales

Vocabulary:

Habitat Fragmentation - splitting up of habitat into smaller disconnected sections.

Biodiversity - biological diversity.

Runnels - small water channels.

Larvae - aquatic stage of the damselfly lifecycle before transforming into the adult aerial insect form.

Abstraction - water being removed for domestic or agricultural use.

Base-rich streams - base-richness in ecology is the level in water or soil of chemical bases, such as calcium or magnesium ions. Base- rich streams are usually mineral rich.