

# Citizen Science for Rivers

## *How citizen science can support river management and restoration*



### What is Citizen Science?

Citizen science is defined as the participation of volunteers (i.e. people not involved as part of their employment) in environmental research and monitoring. This has the dual benefit of allowing individuals to contribute to scientific research while also engaging with and educating people. Citizen science projects are often set up by professionals (e.g. project managers working at wildlife NGO's or conservation organisations), who define the projects aims and objectives. Volunteers then contribute data to the project. This approach, referred to as contributory citizen science, is widely used in the UK. But there are many different forms of citizen science that you may wish to consider.

Individuals and local communities play a critical role in all phases of river management and restoration; **citizen science** is one aspect of this.

Citizen scientists carry out environmental research, river monitoring, restoration work, lead on projects, and more. The work carried out by citizen scientists helps support river management decisions.

Involving citizens in river projects often has multiple impacts, not only for those involved, but also on society, the environment, and science itself.

### Why Use Citizen Science to Support River Management and Restoration?

Increased urbanisation and climate change mean that our rivers are under increasing pressure, and we face difficult decisions regarding how to best manage them long-term. Citizen science can help us to address these challenges by:

- **Project Design:** Engaging local communities in the design phase of projects ensures local knowledge is taken into account at the earliest possible stage. This will improve the quality and resilience of restoration projects.
- **Data Collection:** By gathering scientific data (through monitoring activities) citizen scientists help to determine the current state of river systems and allow us to make informed management decisions.
- **Cost-Effective and Sustainable:** Community involvement can help increase the scope and ambition of river restoration projects; citizen science is a cost-effective way to carry out long-term monitoring.
- **Engagement and Education:** Citizen science projects provides a means of engaging with a diverse range of people and increase their knowledge, awareness, and involvement.
- **Reconnecting People with Nature:** Citizen involvement helps reconnect local communities with nature and engender a feeling of stewardship towards rivers.
- **Vision and Leadership:** Citizen scientists can take responsibility for leading on projects and offer insights that help drive future improvements.

### Contributory, Collaborative, or Co-Created?

There are three primary approaches to citizen science. These include:

**Contributory:** Citizens are only involved in data collection. The project design, aims and objectives, and activities, are decided by scientists/project managers.

**Collaborative:** Citizens contribute data and may help in project design, but the aims and objectives and activities are decided upon by scientists/project managers.

**Co-created:** Citizens are actively engaged in all stages of the project, working alongside project managers to identify the aims and objectives and agree upon activities, in addition to being involved in data collection.

Selecting which of these approaches to use will depend on the nature of the research project. For projects involving environmental monitoring that have a clear end-use for the data, the contributory model will likely be the most applicable format. However, collaborative and co-created projects help to:

- **Greater Commitment:** Community-led projects benefit from individuals feeling that they have a 'stake' in the project.
- **Increased Longevity:** Where repeat monitoring is necessary communities will likely be more willing to commit to this.
- **Better Informed:** Having the community involved in project planning at an early stage means local knowledge can be taken into account at an early stage, and a more robust set of aims and objectives formulated.
- **Increased Scope:** Local involvement may help in the identification of additional issues or monitoring opportunities not foreseen by other stakeholders.



### Case Study – **Anglers Riverfly Monitoring Initiative (ARMI)**

Pollution is a key problem affecting our rivers and can enter from a variety of different pathways. The Riverfly Partnerships ARMI citizen science initiative is a simple, standardized methodology that enables volunteers to monitor river water quality and detect pollution events by scoring the occurrence and relative abundance of different insect groups known as ‘riverflies’. The project has been successful in gaining support from local interest groups, such as anglers, and is now carried out on hundreds of river sites throughout the UK.

#### Key benefits:

- The initiative has developed the participants skills in co-ordinating the planning, initiation and implementation of their own restoration schemes;
- Cost-effective collection of long-term datasets;
- Better alignment between the monitoring efforts of citizens and regulatory bodies;
- Increased detection and reporting of pollution events;
- Increased feeling of stewardship amongst citizens;
- Inspired scientific interest in a new audience.

In some ARMI groups citizen scientists have taken a more active role in project decision making and have worked with project managers to define additional aims and objectives. This transition from *contributory* to *collaborative* citizen science has resulted in the creation of new monitoring initiatives – such as the Extended Riverfly – which aim to further challenge and expand interest in the project.

More information about how to establish successful citizen science projects for river management and restoration can be found on [the Catchment Based Approach \(CaBA\) Website](#).

An important step in developing successful citizen science initiatives is to monitor the projects impacts to promote further growth and development. To get best-practice advice on how to monitor the impact of your citizen science initiative visit the [Measuring the Impact of Citizen Science \(MICS\) project Website](#).