



This document is one of a suite of Factsheets that are part of the support offered to schools and teachers. The Factsheets provide guidance, ideas and link to resources to support your Citizen Science activities. They also contain suggestions for extended learning relating to problem solving, numeracy, geography and social studies. We hope they will provide all the guidance you need to develop lessons to fit with your own curriculum plans. For general enquiries contact – Amanda Malcolm, Citizen Science Coordinator, citizenscience-scotland@tcv.org.uk, 0141 552 5294.

Rivers Factsheet

Introduction

Rivers are corridors of water transporting rain and snowmelt from where it falls, ultimately to the sea. They are also wildlife corridors offering plants and animals a route to spread, live and feed. Rivers are also transport routes for sediments and nutrients that feed into lakes, estuaries and coastal seas.

By the conclusion of the Citizen Science Project it is anticipated that learners will be able to understand:

- some of the pressures placed on rivers by human development
- Some of the natural features of rivers
- Where rivers are affected by humans
- What we can do to reduce the human impact on rivers

Where rivers are left without the influence of humans they flow fast and unhindered from

mountains, tumbling down waterfalls and splashing into pools, winding through hills, cutting cliffs into hillsides, then spilling into flat coastal land, slowing and widening and depositing eroded material. They create meandering loops and broad flood plains before emptying into complex deltas or muddy estuaries where they meet large lakes or the sea.

Activity suggestions: study the **White Cart Water flood prevention scheme**, which has recreated an area of wetlands. A simple but effective device on a dam on the river causes water to build up in the wetlands during heavy rainfall periods. It will then slowly release the water to the river over the next few days. This prevents a large rush of water from flooding downstream parts of Glasgow that have suffered in the past.

<http://www.whitecartwaterproject.org/> and http://www.educationscotland.gov.uk/Images/WhiteCartWaterFloodPreventionScheme2_tcm4-716465.pdf

- The rivers here have been confined behind walls to prevent them flooding, but this can actually make flooding worse.

Activity suggestions: study the Eddleston Water project which is recreating meandering rivers and returning natural flood plains. The project is researching how in time of heavy rainfall, the water can be slowed down and spill into the farm fields and lowering the flood impacts downstream in the town of Peebles.

<http://www.tweedforum.org/projects/current-projects/edleston>

Today most of our rivers and the land along them have been altered to suit our ever growing and changing needs.

- Mountain streams have been dammed to create reservoirs that supply us with drinking water and hydro electricity.
- Farmers have narrowed and straightened many of our rivers to create fields and draw off water to irrigate crops.
- Our cities and towns are mainly built on the flat land near coasts and river estuaries.

- Houses, factories and ports line the rivers allowing ships to deliver goods and for us to pour our wastewater from our factories and sewers into the river.
- In the past we forgot about the rivers original intended use as a place for nature to thrive, grow and move. We have used rivers for our own purposes without thought for the other animals and the plants that need the river to survive. We have altered and poisoned our rivers until some have no life left in them at all. But now we know the damage we have done and many projects are underway to repair this damage. The best way to do this is to look at how a natural river flows and return altered rivers to that condition or to mimic parts of a natural river to control the flow and create a home for wildlife.

Activity suggestions - There is a project that schools should undertake called **Yellowfish** campaign. Yellowfish is an active, enjoyable and effective way of raising awareness of the issues of water waste and pollution, and helping make Scotland's environment a cleaner and healthier place.

<https://www.gov.uk/government/publications/avoiding-pollution-yellow-fish-scheme>

The river near you will have been affected by humans in some way. This will have been a benefit to us but probably not to wildlife. Fertilizer,

chemicals and sewage in rivers makes the water uninhabitable for the creatures that rely on it for life. There may also be unforeseen consequences on the flow of the river further downstream. Straightening of rivers and draining of land speeds river water downstream causing flooding.

Pollution is a problem on many rivers, from farm, factory and road runoff, but rivers can also be polluted from the mistaken belief that what goes down a drain will be taken care of. The reality is that many surface drains lead straight into watercourses leading to river pollution with serious effects on wildlife in and around the river system.

Outcome statement	Curriculum area
I have investigated different water samples from the environment and explored methods that can be used to clean and conserve water and I am aware of the properties and uses of water. SCN 2-18a	Sciences > Materials > Chemical changes
I understand how animal and plant species depend on each other and how living things are adapted for survival. I can predict the impact of population growth and natural hazards on biodiversity. SCN 4-01a	Sciences > Planet Earth > Biodiversity and interdependence
I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally-responsible way. SOC 2-08a	Social studies > People, place and environment
I can develop my understanding of the interaction between humans and the environment by describing and assessing the impact of human activity on an area. SOC 4-10a	Social studies > People, place and environment
Having analysed how lifestyle can impact on the environment and Earth's resources, I can make suggestions about how to live in a more sustainable way. TCH 2-02a	Technologies > Technological developments in society
From my studies of sustainable development, I can reflect on the implications and ethical issues arising from technological developments for individuals and societies. TCH 3-02a	Technologies > Technological developments in society
I can examine a range of materials, processes or designs in my local community to consider and discuss their environmental, social and economic impact, discussing the possible lifetime cost to the environment in Scotland or beyond. TCH 4-02a	Technologies > Technological developments in society