Lesson Plan

Lesson 4

Bradán's Journey Continues

This lesson focuses on a salmon as a par in a river, tracing the development of a salmon from parr to smolt in the middle reaches of a river.

LESSON SUMMERY

Geography
Ages: 10 to 11
Lesson time: 45mins

DOWNLOADS & ADDITIONAL RESOURCES

Images: Conservation and Management
Field Trip: Testing River Pollution
Activity: Aboriginal Fish
Activity Card (Lesson 4)
Whiteboard: Quiz and Questions (Lesson 4)

Downloads and Additional Resources can be found in the Resource page of Somethingfishy.ie

Lesson Objectives

To enable pupils to become more aware of the dangers and hindrances to a parr's growth in this section of a river. This lesson will also foster understanding of the importance of good river management and to demonstrate the interdependence of all species in and around a river.

Teachers Guidelines

Bradán's story continues, this time from parr to smolt (early stages). The need for a safe and suitable habitat with lots of boulders and deep pools to hide in is emphasised.

The following dangers to parr are highlighted:

- From other fish and predators
- Cattle trampling down river banks
- Organic pollution and how it can destroy life in a river.

To help pupils understand these dangers, "before" and "after" pictures of conservation and management work can be shown to the class

SEE:- *Image: Conservation and Managemenet (Download)*

"Before" and "after" pictures enable pupils to use their observational skills to see the changes and improvements carried out by the Fisheries Boards in their conservation and management work.

Pupils should consult a bird-spotting book to identify the dipper. Questions could be asked as to how the dipper got to know Bradán. What does a dipper eat and why does she stand on a boulder in the middle of a river?

The concept of silage and silage run-off is introduced. Hay is dried grass; silage is pickled grass. Both are used as fodder for cattle. Pupils are asked to do some calculations with silage run-off and realise what a toxin it is.

They learn the importance of insects to a parr's growth and why suitable vegetation is necessary for the development and survival of parr. A bug hunt could be carried out here.

Lastly, the pupils may use their knowledge and observational skills by exploring a picture of "Paradise" for a parr. Hopefully as they journeyed downstream with Bradán, they will be more familiar with the dangers and pressures on fish here.

Pupils could be informed that most of the time, Bradán can swim downstream safe in the knowledge that there is clean water and plenty of vegetation to protect her. Sometimes the Fisheries Boards have to repair rivers and their banks if they are damaged by cattle trampling, construction and other types of erosion.

The work of the Fisheries Boards in the management of a river is obvious from this picture and this can be pointed out to the children – the lush vegetation on the river bank, foxgloves to attract insects, boulders in the river bed, the building of a bank on the right.

The dangers of cattle trampling down river banks and the need for good fencing in these cases to create an ecological corridor for fish are also mentioned.

A Field Trip to test water quality is included. Indicator Species Chart will be helpful for this activity.

SEE:- *Field Trip: Testing River Pollution (Download)*

Additional Teaching Material

If food is scarce in a river, parr may stay three years in the river.

Six – eight weeks before migration, a parr changes colour to silver and is now called a smolt. Smolts migrate to sea.

Living organisms consist of organic matter (as do sewage, slurry and decaying plants). When dead or decomposing organic material enters water, bacteria multiply rapidly and may strip water of its entire oxygen content. This can kill many of the fish and other aquatic life forms living in the water.

Slurry, silage run-off, discharge from sewage treatment works and some industrial outfalls are the biggest problems of the middle reaches of a river.

Large numbers of cattle produce a lot of slurry. Slurry is a valuable fertiliser for land but a danger to rivers.

Slurry should not be spread near a river when it is raining, wet or expected to rain. This increases the chance that slurry will run off either directly in the rivers/lake or indirectly through the soil which in turn runs into the river. Rain can also increase the amount of slurry running into a river, further damaging the water quality.

If slurry, silage or sewage get into a river, they also cause a secondary problem by releasing nutrients such as nitrogen and phosphorus when broken down. Clean water already contains small quantities of these elements so extra nutrients speed up the growth of plants in the water. Plants need energy to function and in a process called respiration, they use oxygen to release energy. During the day, plants generate oxygen through the process of photosynthesis but at night they take the valuable oxygen from the water. The extra plants eventually choke the water and begin to die. As they rot, they are eaten by enormous amounts of bacteria, which further use up valuable oxygen that salmon require to grow and survive. This over-enrichment of water with nutrients is called Eutrophication. It comes from the Greek word meaning "to nourish".

Algal Bloom occurs when too much nourishment, e.g. domestic sewage, cattle slurry, pig slurry, silage juice, gets into a lake. It upsets the balance of growth in the water and is damaging to fish. On very calm days, tiny algae float to the surface and produce green paint-like scums (algal bloom) in enriched waters. Some are poisonous.

Follow Up Work

Aboriginal Fish

Fish were a valuable food source for the Aboriginal people of Australia. They were great hunters and trapped fish in a variety of ways, from spears and traps to stunning them with poisonous leaves put into the water. Many of their paintings exist today. Aboriginals always used earthy colours got from natural dyes found in soil, blood, berries and insects. They always painted very simply in lines, spots and repeated pattern.

SEE:- Activity: Aboriginal Fish (Download)

The Trout' by Seán Ó Faoláin

Read the story "The Trout" by Seán Ó Faoláin (Lucky Bag Stories). A great story for language development, creative writing and poetry. Old-fashioned words like "ewer" need to be explained.

At the end of the story

- Discuss with the class, the main points of the story.
- Ask pupils to write a passage on how the trout got into the well.
- Ask the pupils to describee how the trout felt as he swam to freedom.

Revision

Two different types of revision material accompany this lesson; activity cards and whiteboard material. The activity card is a 4 page document that is filled out by the pupils to test their knowledge of the lesson taught. The teacher can decide if the activity card is filled out individually or in teams.

SEE:- Activity Card: Lesson 4 (Download)

The whiteboard resource tests the pupils knowledge of the lesson taught. Pupils are encouraged to actively engage in answering questions relating to dangers to a parr, importance of good river management, and the interdepentance of species in and around the river.

SEE:- Whiteboard: Quiz and Questions, Lesson 4 (Resource)

At the end of the lesson, Pupils should know

1. **How a salmon develops as a parr.**
2. **The ideal habitat for a parr to survive.**
3. **How to examine a river for pollution.**