Riverside Nature Walk
Science 9: Spheres

Introduction

The Coquitlam River is an urban watershed and is part of the greater ecosystem of the lower Fraser River. This region is a major stopover for migrating birds on the Pacific Flyway and the Fraser River supports the world's largest salmon run. Tributaries to the Coquitlam River include Or, Maple, Hoy, and Scott Creeks. Below the dam at Coquitlam Lake, the Coquitlam River and many of its tributaries are home to Coho and Chinook salmon.

In 2001, the Outdoor Recreation Council of BC identified the Coquitlam River as the third most endangered river in the province. This rating is due to gravel mining along pipeline road: the major point source of sediment in the river. Many improvements have been made and it is no longer on the endangered river list. In 2016, the Fraser River was named the most endangered river in BC and this river is tied directly to the Coquitlam River salmon run.

Urban growth in the Coquitlam River Watershed is another major concern to the health of this region. Coquitlam's population is growing rapidly and shows no signs of slowing. Major developments have reduced large areas of habitat and have caused the quality of water in the remaining tributaries to the Coquitlam River to deteriorate. The Coquitlam River Watershed is a valuable natural resource and its health has significant impacts on local biodiversity. **(Clear Water Initiative, Douglas College, 2008)**

Bring your phone and a plant ID book! You'll need them as references as you walk through nature.

1. What biome are you walking through?_____
2. List 5 biotic and 5 abiotic components you witness.

Biotic:	*Abiotic:*
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

3. Record two animal species you see. Through either an online search or your own knowledge, what does this animal eat and what eats the animal?_____

_____

_____

_____

4. Name one invasive species you see on our walk. What is the problem with invasive species?

5. As we explore the natural world around us, continue searching for interactions and interconnectedness between spheres. Take photo evidence, but list the interactions here:

6. List the scientific and common names of 5 plants you see using the guide provided.
   1.
   2.
   3.
   4.
   5.

7. What evidence of human interference do you observe on the land or the river. Which ones seem the most harmful and why.

8. Describe the niche that the salmon fill (niche: the special role an organism plays in an ecosystem, including the way in which it contributes to and fits into its environment)

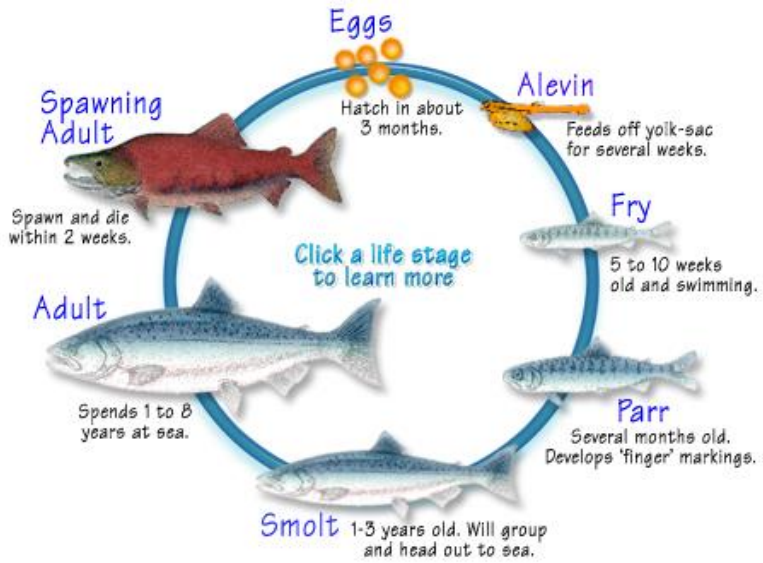
9. Read the passage below. Use it to answer the following questions about the salmon.
    a.) At what stage are the salmon today?_____
    b.) ***What*** human interferences affect the salmon and ***how*** are they affected?_____

_____

_____

_____

_____



The precise method salmon use to navigate has not been entirely established, though their keen sense of smell is involved. In all species of Pacific salmon, the mature individuals die within a few days or weeks of spawning.

In order to lay her roe, the female salmon uses her dorsal fin to excavate a shallow depression, called a *redd*. The redd may sometimes contain 5,000 eggs covering 2.8 m^2. The eggs usually range from orange to red in color. One or more males will approach the female in her redd, depositing his sperm, or milt, over the roe. The female then covers the eggs by disturbing the gravel at the upstream edge of the depression before moving on to make another redd. The female will make as many as 7 redds before her supply of eggs is exhausted. The salmon then die within a few days of spawning.

The eggs will hatch into *alevin* or *sac fry*. The fry quickly develop into *parr* with camouflaging vertical stripes. The parr stay for one to three years in their birth stream before becoming *smolts* which are distinguished by their bright silvery colour with scales that are easily rubbed off. It is estimated that only 10% of all salmon eggs survive long enough to reach this stage. The smolt body chemistry changes, allowing them to live in salt water.

The salmon spend about five years in the open ocean where they will become sexually mature. The adult salmon returns primarily to its birth stream to spawn. Salmon can make amazing journeys, sometimes moving hundreds of kilometers upstream against strong currents and rapids to reproduce.

Freshwater streams and estuaries provide important habitat for many salmon species. They feed on terrestrial and aquatic insects, amphipods, and other crustaceans while young, and primarily on other fish when older. Eggs are laid in deeper water with larger gravel, and need cool water and good water flow (to supply oxygen) to the developing embryos. Mortality of salmon in the early life stages is usually high due to natural predation and human induced changes in habitat, such as siltation (murky water), high water temperatures, low oxygen conditions, loss of stream cover, and reductions in river flow.