# Building Climate Resilience: Stream Restoration

## Background Information on the Fraser River:

The Fraser River starts as a trickle of melted snow at the top of Mount Robson, which is in the Rocky Mountains, sitting on the border of British Columbia and Alberta. The river travels 1,375 kilometres through BC and empties into the Pacific Ocean. There are many tributaries (a river or stream that flows into a larger river or lake) that add water to the Fraser as it travels through BC. The Fraser River is the longest in BC, and one of the largest in all of Canada.

The landscapes of the Fraser River change from the beginning of its journey to its end. As you exit the headwaters on Mount Robson, the water is crystal clear, shallow, and extremely cold. The middle portion of the river is called the Fraser Canyon, where the river is squeezed between mountain ranges, increasing the speed and creating many impressive rapids. The point at which the fresh water of the Fraser River meets the salty water of the Pacific Ocean is called the estuary (also sometimes called “between land” by the First Nations people because, as the tides ebb and flow, the estuary changes from land that is covered with water to dry land). Because estuaries have access to both riparian (river) and marine nutrients, they are home to an incredible diversity of life. The Lower Mainland is located in the estuary portion of the Fraser River.

The Fraser River Estuary is as rich in its biodiversity as it is an ideal habitat for many organisms, such as salmon. Salmon are a keystone species because their life cycle contributes greatly to the health and biodiversity of numerous ecosystems. They transport nutrients found in the ocean to freshwater environments as they migrate inland to spawn. These nutrients can also reach land as their odies wash upon shore, feeding hundreds of other species, from bears and eagles to towering forests and microorganisms. Their populations are an important way for scientists to gauge the health of a watershed, and their decline signals broader ecosystem imbalances.

Indigenous people have been living in what we now call Canada for time immemorial, meaning that Indigenous communities have no stories of arriving here. They have always been here. There are many different First Nations along the River; each group is unique, with its own language or dialect, specific traditions, particular relationships with the landscape, stories, etc. The river has been used by Indigenous communities for thousands of years, and they have specialized technologies, traditions and celebrations related to the river, nature, and biodiversity. Hul’q’umi’num’, Halq’eméylem, and hənqəminəm are Indigenous language dialects spoken in the lower portion of the Fraser River. In Halqeméylem, the language dialect spoken in the upper portion of the lower Fraser, the word for river is Stolo. In hənqəminəm, a language dialect spoken in the lower portion of the lower Fraser, the word for river is stalə w. Indigenous communities throughout BC speak other languages and dialects, and will have other names for the river. The Fraser River Discovery Centre is located on the traditional and unceded territory of the

hənqəmінəm and Halqeméylem speaking peoples. Territory acknowledgement is one small part of Reconciliation. We ask you to take a moment to think of other ways you can participate in Reconciliation with Indigenous communities.

## Program Overview:

In this program, students will learn about what is needed to create a suitable habitat. They will investigate the different aspects of habitats and the different environmental threats that can impact these environments. Specifically, students will look at salmon habitats and see real-life threats to current salmon ecosystems. Students will create their own streams and apply real-world restoration tactics to restore stream health.

## Program Objectives

- Learn what qualifies a habitat and the characteristics that make it suitable.
- Become familiar with stream restorations and how they are used in real-life situations.
- Familiarize yourself with salmon habitats and the current threats they face.

## Helpful Vocabulary

- **Keystone Species:** species with significant influence in their natural environment – so much so that they are critical to maintaining the diversity and stability of an ecosystem
- **Migration**: the cyclical journey salmon make between fresh and saltwater environments to complete their life cycle.
- **River Basin:** the area of land from which all surface water—including precipitation, runoff, and groundwater—drains into a particular river and eventually flows to a single outlet, such as the sea or a large lake.
- **Traditional Knowledge**: a living system of knowledge, know-how, skills, practices, and cultural expressions that are passed down from generation to generation within a community
- **Restoration:** the action of returning something to a former owner, place, or condition.
- **Stream**: a body of running water (such as a river or creek) flowing on the earth

## In- class activities:

Here are some ideas to help prepare your class for the program, and to continue the learning back in the classroom.

Pre-visit:

1. Review what stream restoration is
    a. https://www.youtube.com/watch?v=XXef2y3MYsQ
2. Review the salmon life cycle, and what the journey looks like specifically for the Northwest Pacific Salmon
    a. https://www.youtube.com/watch?v=gFswGt7o_08
    b. Watch this beautiful video that illustrates the life cycle of salmon, told from the salmon's perspective. This video shows how salmon affect all aspects of life both inside and outside the water. It outlines Indigenous' importance as well.
3. Review what a healthy habitat may look like by using this fun art project by BC Invasive Species
    a. https://bcinvasives.ca/for-educators/activity/habitat-hit-what-happened-here/
    b. You can tailor this to reflect salmon habitat specifically or consider other threats to the habitat beyond invasive species.

Post visit:

1. Go over current restoration projects in the Fraser River, and as a group, discuss the benefits and concerns of these projects
    a. https://wwf.ca/restoration-in-the-lower-fraser/
    b. https://www.raincoast.org/habitat/
    c. https://www.dfo-mpo.gc.ca/campaign-campagne/pss-ssp/stories-articles/2025-youth-restoration-restauration-jeunes-eng.html
2. Watch a video that shows the immediate effects of stream restoration in the Fraser River
    a. https://www.youtube.com/watch?v=sKlM5uZYJTY
3. As a class, brainstorm some of the biggest threats to salmon habitats
    a. Show this video illustrating the effects of climate change and wildfires on salmon habitats
        i. https://www.youtube.com/watch?v=J9JWM8jfAlg
4. Create a fun art project by having students draw a healthy salmon habitat in and around the river.