The Migration

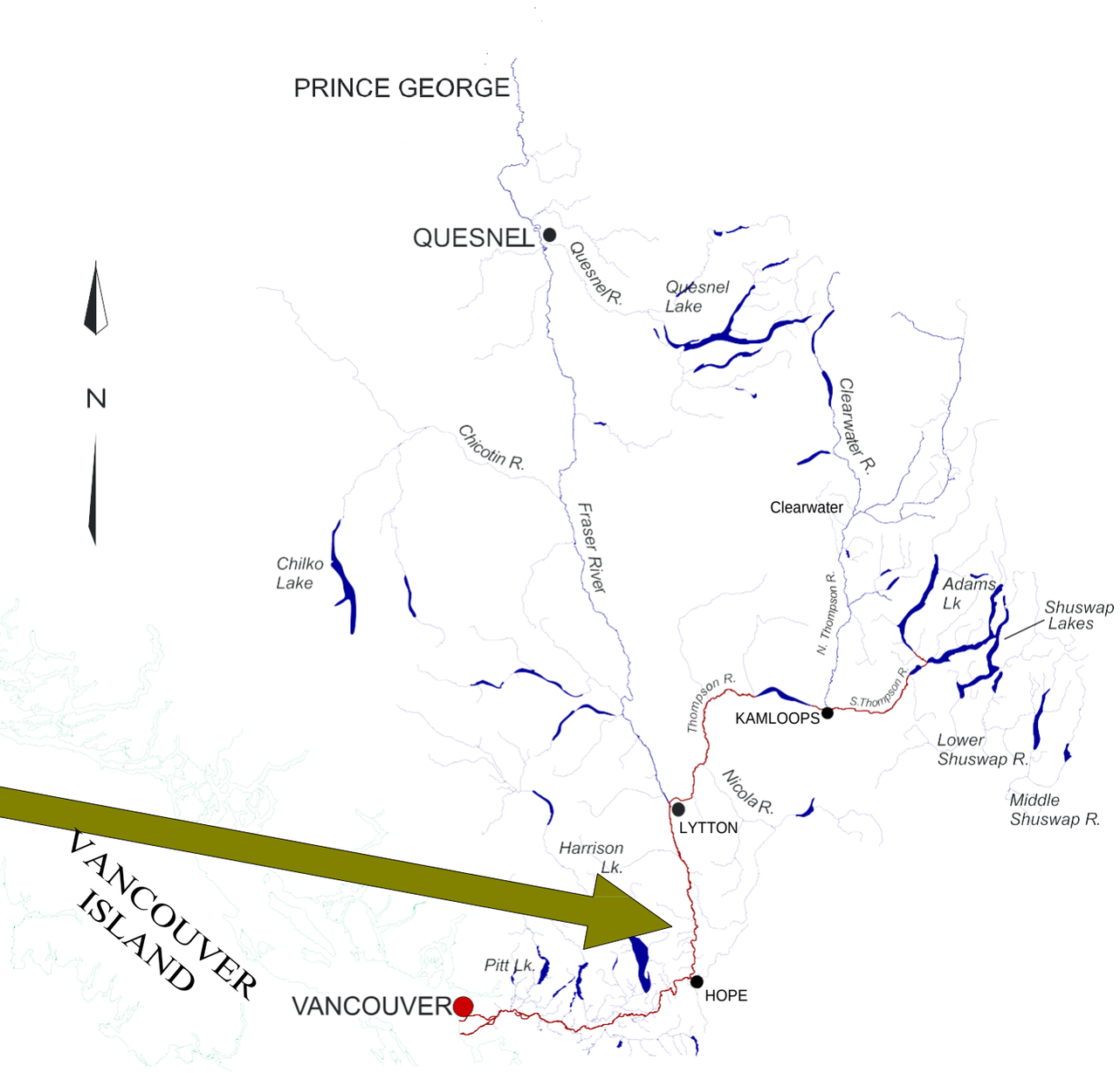
A

Sockeye salmon spawn in the Adams River every year. However, every four years, the ‘dominant run’ of sockeye returns. This run can be several hundred times the size of the small sockeye runs. The eggs are deposited in the gravel in the fall, where they remain until spring freshet (snowmelt runoff). The hatching and early growth stage (egg to alevin and then alevin to fry) usually takes until spring. At this point only 20% of the 4000 eggs have survived (800 fry).

Once freshet begins, the sockeye fry in this system migrate into Shuswap Lake. They spend the next year growing in the relatively sheltered waters of Shuswap Lake. By the time they begin their migration to the Pacific Ocean only ½ have survived (400 smolts).

During their river migration, another ½ will perish. This leaves only 200 smolts to enter the Pacific Ocean, where they will grow and mature for up to three years. During this time, they will face many uncertainties including predators, changing water conditions, changes in the climate, food supply challenges, open ocean fishing and more.

By the time the sockeye enter the Fraser River, there are approximately ten sockeye remaining to make the journey upstream. They will face a final monumental challenge, navigating the Fraser River and Hell’s Gate. Of these last few sockeye typically only two, from the original 4000 eggs, arrive at the Adams River.



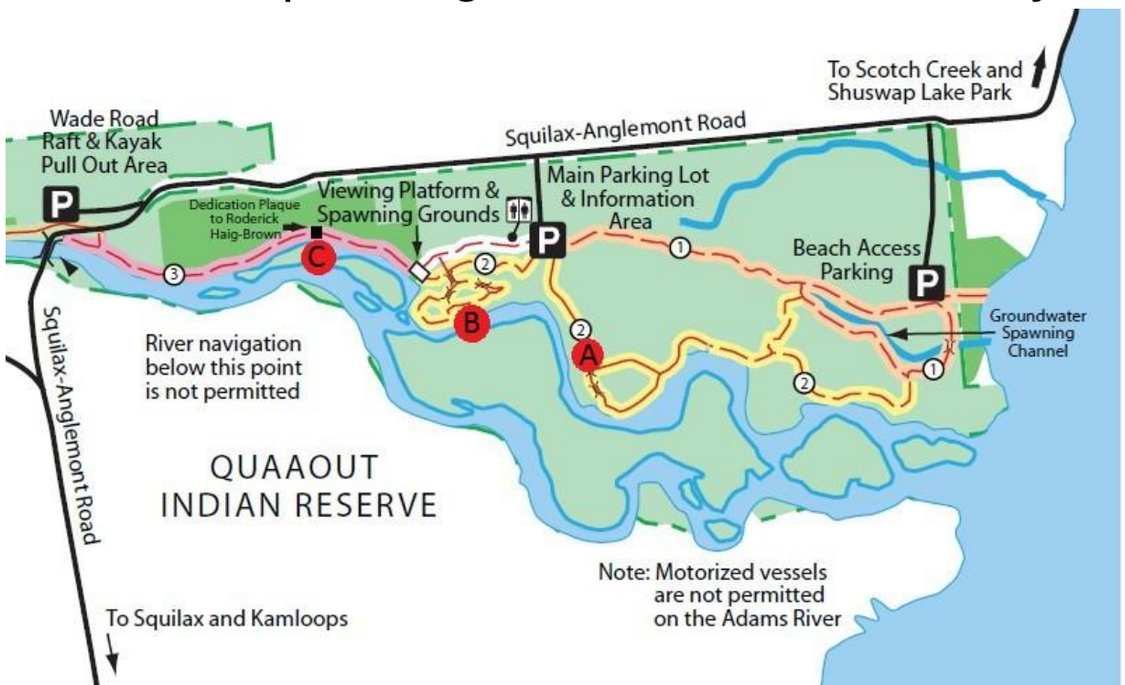
The remaining sockeye arrive at the Adams River approximately two weeks after entering the Fraser River. Their lifetime journey has spanned over ten thousand kilometres in the Pacific Ocean and more than 400 kilometres each direction in fresh water.

What makes this return journey truly incredible is that they have not eaten since they re-entered fresh water. The sockeye are living off the fats and proteins stored in their bodies.

After congregating at the mouth of the Adams River, the sockeye move into the river, females seek out prime spawning habitat to dig their redds (nests) and finally pair up.

Sockeye pictures supplied courtesy of Andrew Holland

To learn more about the spawning behaviour of the sockeye, visit sign **B**.



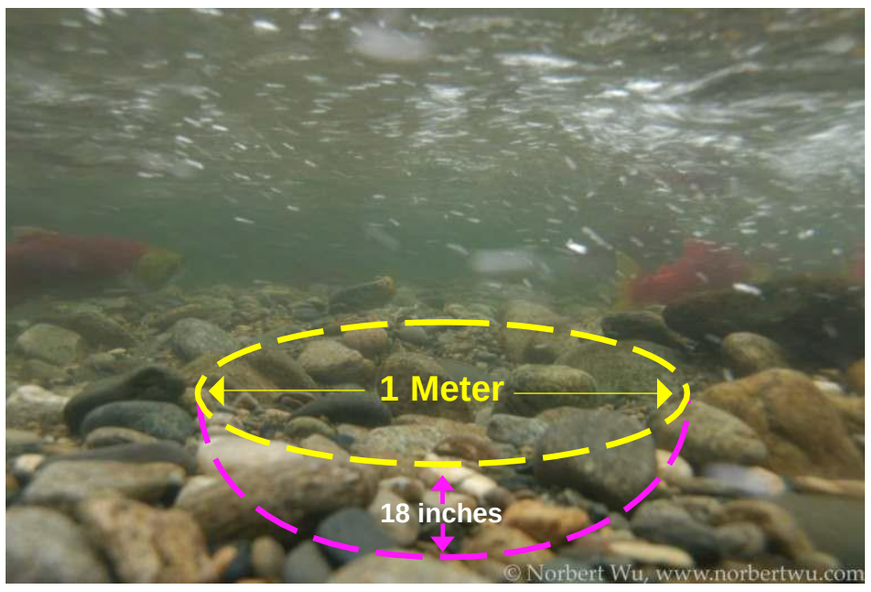
Spawning Behaviours

B

Once sockeye return to the Adams River system, there are some significant physical changes that have occurred, or are about to occur. The first major change is the sockeye have become bright red and green. This change occurs for a number of reasons: to differentiate between types of salmon that come here to spawn (Chinook, pink, sockeye and coho); as a result of their bodies slowly being consumed to fuel their migration (scales are absorbed, leaving only the flesh colour remaining); and, to develop their eggs or sperm.

The second change you will notice is the hooked jaw. This is caused by the same “consuming” of the sockeye’s body. The gums around the teeth recede, the snout elongates and a hooked jaw forms. This is more distinct in males than females. Another trait you will see in the males is the distinctive hump between the head and dorsal (back) fin. This develops as a result of the body breaking down. These secondary sexual characteristics influence the competitive ability of the males to fight off other males and be successful in finding mates.

When the female arrives at her desired spawning area, she uses her tail and the natural force of the water to “dig” a nest in the river gravel. She will dig between three and seven nests (redd) in the gravel.



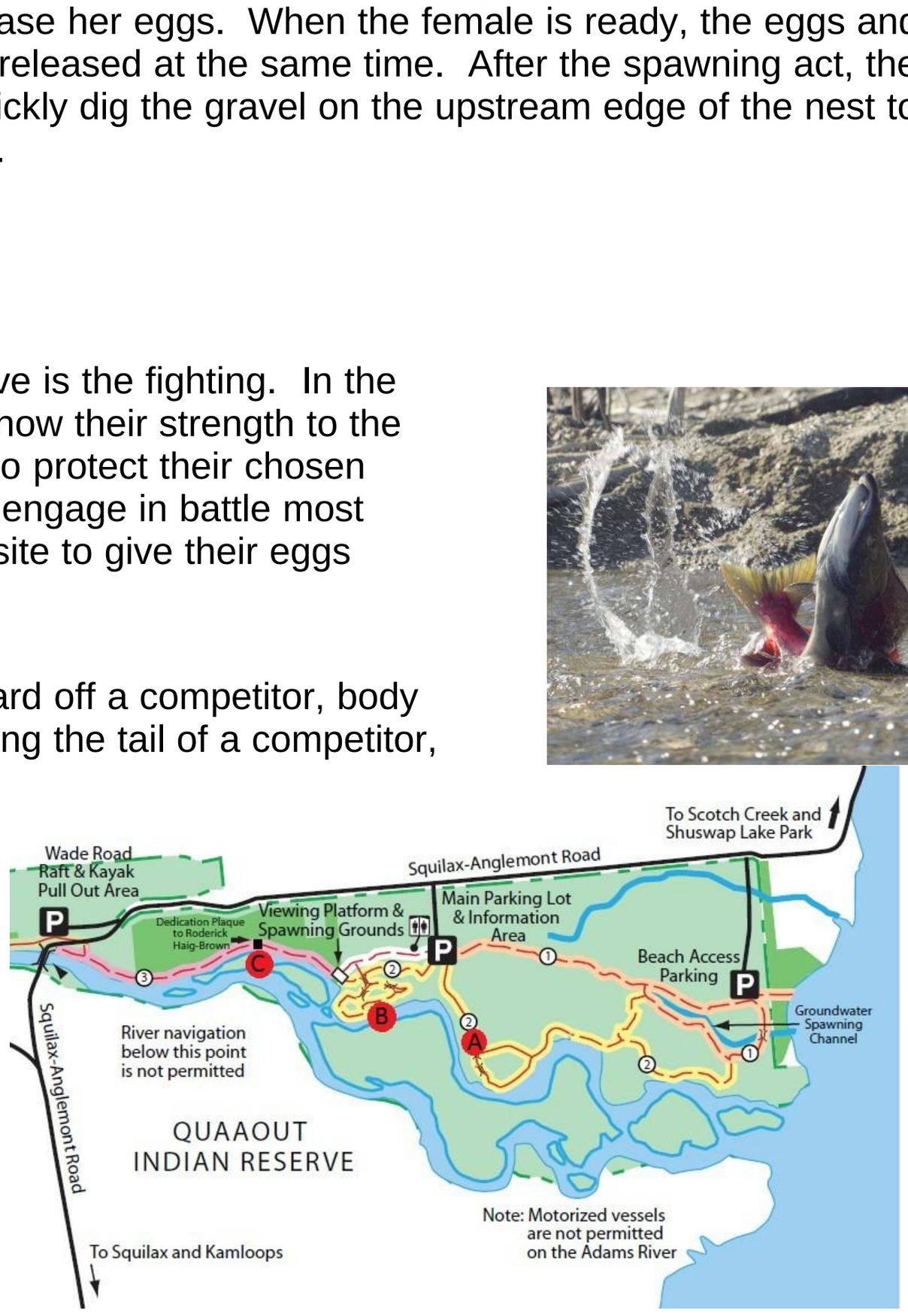
Egg Laying

As the female prepares, her male partner courts her; using his snout to gently touch her side, positioning his body against hers and quivering vigorously for a second or two while side by side. This stimulates the female to release her eggs. When the female is ready, the eggs and sperm will be released at the same time. After the spawning act, the female will quickly dig the gravel on the upstream edge of the nest to bury the eggs.

Fighting

One of the most interesting behaviours you will observe is the fighting. In the natural world, males will often use displays to either show their strength to the females (stronger partners mean stronger babies) or to protect their chosen partner. Here in the Adams, males are the ones who engage in battle most often, although females will fiercely protect their nest site to give their eggs the best chance of survival.

Fighting usually takes one of three forms: biting to ward off a competitor, body slamming to push a predator away, or biting and holding the tail of a competitor, which results in a spinning battle.

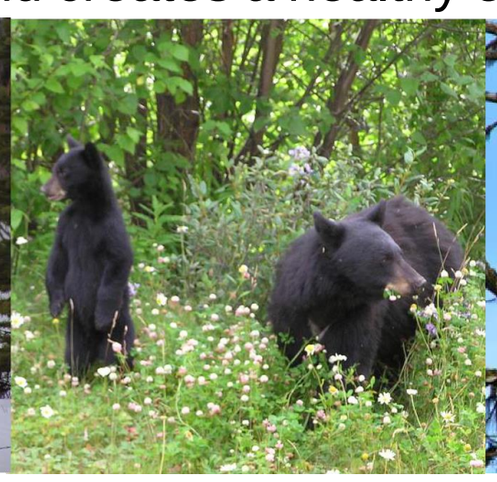


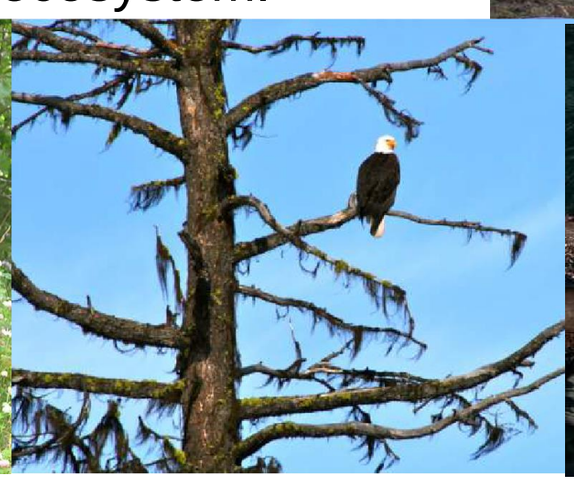
To learn more about the Sockeye Migration visit **Sign A.**
To learn more about the Adams River Ecosystem, visit **Sign C.**

The Eco-System

C

The ecosystem is made up of many elements which contribute to the natural health of this area. Ecosystems include the all living things and the physical environment in which they live: plants, animals, bugs, soil, water, even mountains and glaciers. Together, these elements allow us, and every other living thing in this area to create and maintain life. Animals come together and rely on each other here. The trout and other species of freshwater fish eat sockeye eggs which are washed out of the gravel during the spawning. The sockeye are eaten by bears, eagles, otters, wolves and many other predators. It is a cycle of life and death that gives us incredible diversity and creates a healthy ecosystem.





Nutrient Transfers

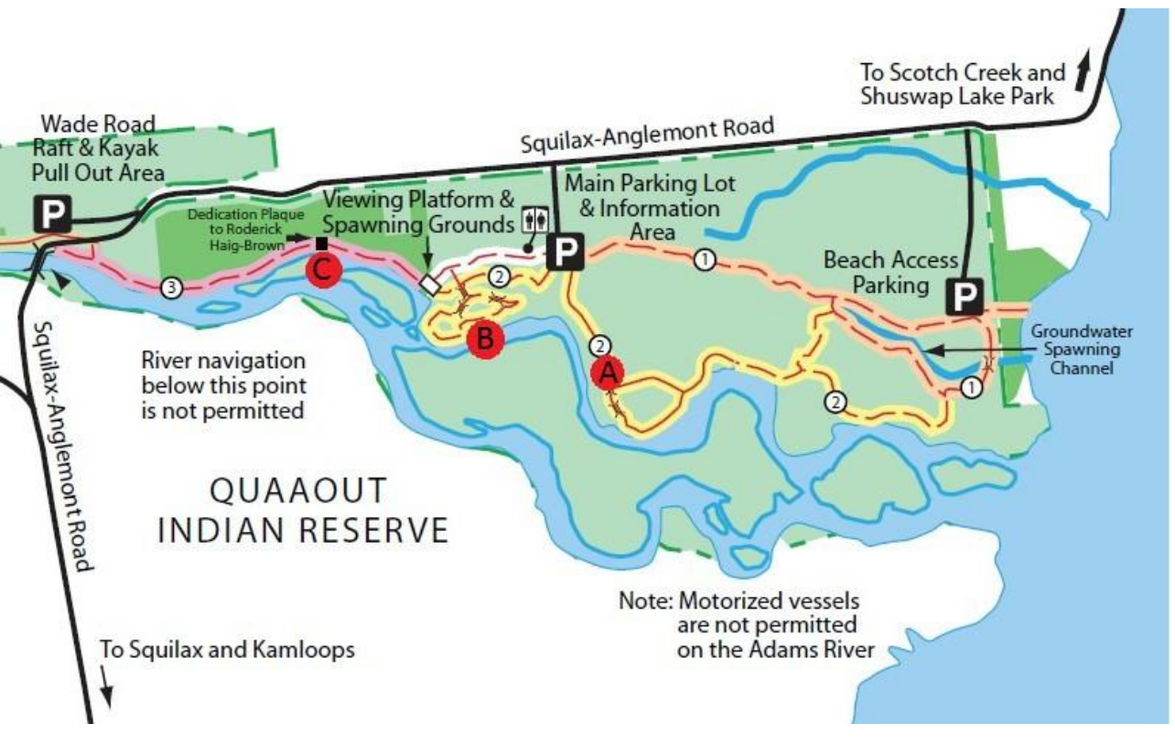
For almost three years, the sockeye inhabit the northern Pacific Ocean. During their ocean based growing phase, the sockeye are eating constantly, filling their bodies with nutrients from their daily meals. When the sockeye arrive back in the Adams River, they bring these nutrients with them, transferring vital minerals and proteins from the ocean to the forest of the Adams.

People often say the smell gets strong later in the run, yet that smell is the transfer of vital food for the entire ecosystem as it passes from the sockeye to the forest floor. These same nutrients fuel a biological system that feeds the fry when they emerge in the spring. In essence the dying adults are feeding their own young.

Ecosystem Challenges

This diverse and dynamic ecosystem is not without its challenges. Development pressures add strain to the ecosystem. BC Parks and the Ministry of Environment work hard to maintain the balance between the environment and invasive elements such as noxious weeds that threaten it. Recently the Adams River Salmon Society held a tree planting event and replanted a thousand saplings in the old homestead site, just upstream of here.

Maintaining this ecosystem is what allows these sockeye to return here and is what supports this system for you to enjoy.



To learn more about the Sockeye Migration visit **Sign A.**
To learn more Salmon Spawning, visit **Sign B.**