

SOCKEYE SALMON

the story of sockeye salmon of British Columbia
an illustrated natural history
by Brenda Guiled



through their lifecycle and travels
ODYSSEY

a long series of wanderings and adventures, especially when
filled with notable experiences and hardships

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Hearty thanks for exacting and generous vetting by Don Lawseth, retired from a Fisheries and Oceans Canada career in salmonid enhancement, community stewardship, fisheries management, and species at risk programs, and career salmon biologist Dr. David Levy of Levy Research Services, former Research Director for the *Cohen Commission of Inquiry* into Fraser River sockeye decline.

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SOCKEYE SALMON ODYSSEY

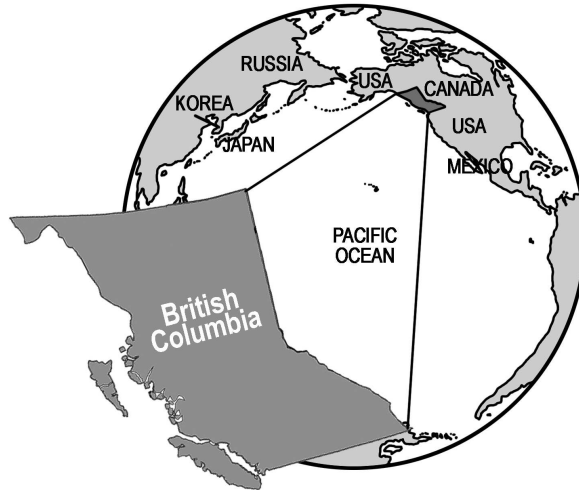
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1. MEET THE SALMON FAMILY

British Columbia, Canada, has a long, wild coastline and many rivers running into the sea. Salmon need this.

Salmon also live in the waters of the United States of America (USA), Mexico, and across the Pacific Ocean in Russia, Korea, and Japan.



Each of these countries cares for its salmon in its own way. This story is about the sockeye salmon that the people of British Columbia know and love.

Sockeye are one of five main kinds of wild salmon found in British Columbia waters. They start their lives in fresh water, where they have colours and markings that fit living there. Then they go to sea, where they grow to full size and have dark backs, silver sides, and white bellies, as shown on the next page. Finally, they return to fresh water, where their bodies and colouring change again.

Sockeye have cousins, called steelhead and cutthroat, that also begin their lives in fresh water, become silvery adults in the salty sea, then return to fresh. This makes a total of seven kinds of fishes (5 + 2) that do this.

Which one is sockeye in this picture? How would you tell it from the others? That's called identification, or ID'ing for short.

Pink or Humpback Salmon

- mature at 2 years old, weight 1.5 - 3 kg
- very small scales, lots of them,
- oval gray spots on back and tail



Sockeye Salmon

- mature at 4 -5 years; 2 - 7 kg, average 3.6 kg
- no spots on tail
- small speckles or no spots on back



Coho Salmon

- 3.6 - 5.4 kg, up to 16 kg
- some spots on back
- sometimes spots on top half of tail
- mouth has white or gray gums

Chum or Dog Salmon

- 3.6 - 6.8 kg, up to 20 kg
- dark speckles on back, none on tail
- narrow "wrist" before tail



Spring or Chinook Salmon

- 4.5 - 22.7 kg, a few over 50 kg
- dark spots on back, top fin, and tail
- mouth has black gums



The name 'sockeye' comes from the Coast Salish people's word 'ȚEKI', said "tsekhi". It means "red fish". "Sockeye" is the way English-speaking people say it.

ȚEKI are a sacred fish to the Coast Salish people. ȚEKI is its everyday name. Its special name is EN ŚWSELÁWE, "the honoured one, the one you are poor without."



*"Spawning Sockeye" by Cowichan
First Nation artist Joe Wilson*

Coast Salish people, like many aboriginal peoples, draw and paint animals in the way that this picture of a sockeye shows. It's called "x-ray art".

'Sacred' means to be cared for, protected, treated with special prayers and thanks.

'Aboriginal' means the first, or original, people living in a place.

'X-rays' are invisible, powerful rays that can see through bodies to what's inside.

Do you think 'x-ray' is a good word for it? Have you seen an x-ray photograph? If you have, what do you remember about it?

The curvy black stripes on the belly of this sockeye image are to show its muscles. **What else can you see inside this fish? What other things could it have inside it that aren't shown?**

2 pages skipped

2. SOCKEYE LIFE BEGINS

In late summer or fall, sockeye babies begin their lives as eggs in fast-flowing streams and rivers.

Each egg has 2,200 to 4,300 sister and brother eggs. They look like orange-red marbles, with no markings.

They're about the same size and colour as huckleberries, shown here in a child's hand,



an edible fruit that grows in northwest-coast woods. They're as soft and squishy, too.

Some people like to eat salmon eggs. Each one pops open when bitten and is full of salty juice.

Many other animals like to eat salmon eggs right from the stream. Birds, bears, weasels, and other fishes need this food to fatten up for the winter, when food will be scarce.



Birds like crows, ravens, and gulls will eat salmon eggs until their tummies are too full to hold another one, and they're almost too heavy to fly.

lunch at the salmon-egg bar

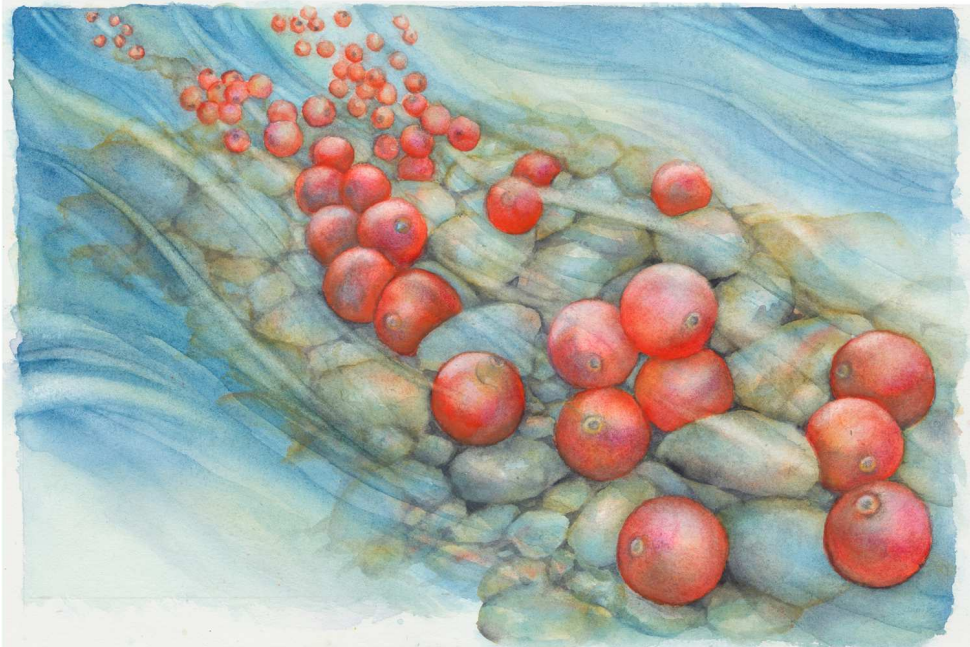
Inside each new egg is a tiny speck of new life. It floats in a 'soup' of all the nutrients needed to grow into a baby sockeye.

The eggs need a good home in the stream. Cold, rushing water helps them breathe properly, and it keeps them clean. This current can also move them around. If it carries them to muddy places or quiet backwaters, they can suffocate and die.

Throughout the winter, streams can run dry or freeze, then the eggs dry up or freeze, which kills them.

From each big bunch of eggs, thousands don't survive. But the lucky baby sockeye who begin life in safe, healthy places in the stream start to grow—and fast.

After a month to six weeks inside their eggs, they grow a body, tail, and look! ... golden eyes, as this painting shows.



1 page skipped

3. BREAKING FREE

Through the fall into winter, baby sockeye grow inside their little homes until they're big and developed enough to break out and swim free. They're about the size shown here.

Newly hatched fishes are called 'alevins', said "ay-lev-ins". This word comes from Latin, *levāre*, "to raise up, or rear".

People raise children and rear animals.

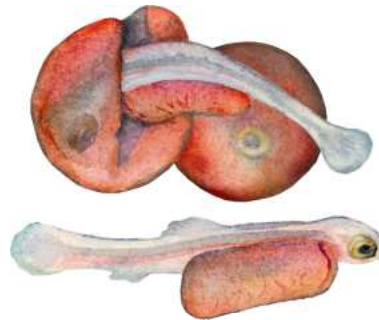
Every kind of fish puts into their eggs everything needed for their babies to rear themselves, to become alevins.

Sockeye reach this stage in about three months, if the water is the right temperature for them—very chilly to us. If the water is icy cold, they can take up to six months to hatch.

Whether they hatch in three months or six, they swim free in the coldest time of year into a trickling stream or maybe rushing creek.

Fast-running water can carry them away. They can still dry out or freeze to death. But now they can do something about these dangers, because they can swim.

They know, somehow, to wiggle down into the gravel, into safe little holes and caves. There, the water won't likely sweep them downstream, and it's also less likely to turn to ice or evaporate.





What will they eat? They won't find any tiny plants and insects to gobble up in their cold, wintery streams. Those yummy foods will only grow again when the weather gets warmer.

But not to worry. Alevins have their lunch bag hooked right to their tummies, as you can see. It's called a yolk sac. It will feed them and keep them growing until spring comes.

4. SPRINGING FORTH

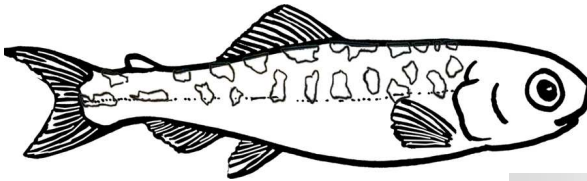
In the northern hemisphere, or the top half of the Earth, spring begins in the month of March. Days grow longer and warmer. The sun melts ice and snow. It's a good time for sockeye babies to come out of their gravel homes and "march forth", or venture into the world. They're no longer called alevins, but "fry".

From each bunch of eggs in the stream, about 900 make it to

The word 'fry' meant "seed", long ago in England and northern Europe. It also meant "to spawn", or "to rub". Sockeye fry are little 'seed' fish that came from spawning, when the parents rubbed each other and the stream bottom to lay their eggs.

this stage. **If we start with 3,500 eggs, what percentage live to become fry?** $(900 / 3500) \times 100 = \text{_____}\%^1$, or about 1 in 4).

They're now 6 - 8 cm long, and they're a bit silvery in colour.



They have darker patches on their sides and backs called "parr marks".

What do you think parr marks are for? Do you know what camouflage is?

What are sockeye fry trying to hide from? Where would they hide? How would these marks help them stay hidden?

A word similar to 'camouflage' was first used as slang in France and Italy to mean "to disguise" or "to deceive".

About 100 years ago, the English used it to describe war clothing and equipment painted and covered in ways to hide from enemy eyes.

¹ 25.71%

final pages

Now you know the whole story. And you know bits of the much bigger story, about how sockeye fit into other lives.

In the picture on page 47, the top left shows trees reflected from the water's surface. Trees by salmon streams are very important to the salmon, and salmon are very important to the trees.

Trees protect the stream and the baby salmon in it. They give shade and are home to insects that the little fish eat. Their roots hold together the edges of the stream, so the running water doesn't stir up the soil and turn it to mud, or wash the eggs and babies away.

The salmon and trees are, in turn, very important to many other living things. Animals that eat salmon leave the left-over parts in



the river. They carry some of the bodies onto the shore and into the forest. The remains of those help to feed the trees.

And when the salmon-eating animals die, their bodies become meals for new life, too.

It's all a great cycle of life, and every part of it matters to every other part. Because sockeye and other salmon connect the sea to rivers and lakes, they are especially important to all the living things in both places.

And that includes us. If we keep salmon healthy and strong in their ocean and freshwater homes, then many things in the world that we love and need will stay healthy and strong.





Brenda Guiled has a B.Sc. in Zoology and an M.Sc. in Education. She worked for 10 years in environmental education, published prize-winning curriculum materials, illustrates fishes, shellfishes, and species at risk, writes non-fiction and stories for all ages, advocates for active transportation, studies the traditional karate way, and teaches the dance inside it.

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