### Special Edition



**The Long Journey** Follow the path of the Adams River Sockeye.

Salmon are Sacred What salmon mean to First Nations people.

Healthy Habitat for Salmon See if your local stream provides good habitat for Salmon.

The Big Question How do salmon find their way home?

Salmon Watching Where can you see a salmon?

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### An introduction to the International Year of the Salmon (IYS)

By Brian Riddell, Science Advisor, Pacific Salmon Foundation and a founder of the IYS.

### INTERNATIONAL YEAR SALMON

After the last ice age people started living in British Columbia. Here, for 10,000 years, salmon have nourished the people and the forests they lived in.

Only in the past 150 years did people start to forget the importance of salmon. They put what they wanted ahead of what the salmon needed, and the salmon have suffered.

Now that we realise our mistakes, there are many ways we can help salmon. **The International Year of the Salmon** (IYS) reminds us how important Pacific salmon are to British Columbia and Canada and calls for action to help salmon survive. As the IYS logo shows, caring for salmon is in <u>our</u> hands. Each of us, young and old, must **act** to protect and nurture them.

For more details, see: https://npafc.org/iys/

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### AL Answers Your Salmon Questions

### Can salmon communicate with each other?

Yes. They may not communicate one-to-one as we do (unless they are spawning) but they can send out messages, using colour, body movement or sound. Some fish species, such as carp, send out a special chemical when they are injured which warns other carp of danger and they swim away as fast as they can. Some fish can make audible sounds like clicks or croaks but most salmon communicate with body language.

### How do salmon breather?

While swimming the salmon gulps water into its mouth and sends it out again through the gills. The gills absorb the oxygen and get rid of the carbon dioxide.

### Can salmon hear?

Salmon have no outer ears but they do have sound wave and vibration detection systems like humans. Salmon hear with a special organ called a **lateral line** along their sides that is connected to the inner ear.

### How long can a salmon survive out of water?

Only a few minutes. Once out of the water salmon gills collapse like wet tissue paper so even though there is oxygen in the air the salmon can't breathe it.

### What do salmon eat?

Salmon eat everything from one another to plankton to insects. Juvenile salmon living in fresh water eat zooplankton, and larval and adult insects. In the ocean, salmon eat zooplankton, shrimps and smaller fish, such as herring.

Al Grass has worked as a career park naturalist and ranger throughout B.C. Now he is a well-known nature tour leader and photographer. Al especially likes birds, insects and spiders. Photo of Al. Credit: Robert Alexander, B.C.

Yes, better than humans. Smell is one of senses that help salmon migrate back home.

### Do salmon moult their scales like birds moult feathers?

No, salmon keep their scales for life but the scales develop growth rings like a tree does. Wide rings indicate good seasons (summer) and narrow rings indicate poor seasons (winter). Salmon are born in winter so there is one narrow ring for each salmon birthday.





### The Big Question How DO salmon find their way home?

The Migration of Sockeye Salmon

For hundreds of years, the life of Pacific salmon and their migrations have been a mystery. Salmon hatch from eggs laid in the gravel of freshwater streams, grow into little fish, go down the rivers, out into the ocean and apparently - vanish.

Years later they reappear as full grown adults, and swim back up to the very stream where they first hatched out. The adult salmon spawn and die and the whole mysterious cycle begins again. But the real mystery is how salmon know to return to the exact stream where they were born (their `home' stream).

When the little salmon swim down the river and into the ocean they do not hang around near the river mouth but migrate northward along the British Columbian and Alaskan coast and out into the north Pacific Ocean. Then, for a year or more they swim for thousands of kilometres as they search for food, until they are ready to come back to their home stream to spawn and begin the cycle all over again.

But where do the salmon go when they travel for years through the vast waters of the Pacific Ocean? And just HOW do they find their home again? These are mysteries that scientists have studied for years.

There are seven species of migratory Pacific salmon (Sockeye, Pink, Chum, Coho, Chinook, Steelhead trout, and Cutthroat trout) living in British Columbia waters. All of them follow similar life cycles but each is a little different. Pink salmon are the smallest and most abundant, and every Pink salmon only lives two years. Chinook salmon are the least abundant but are the largest, sometimes weighing over 50 kilograms (!). But the most important salmon to the people of British Columbia has been the sockeye salmon, especially from our largest river, the **Fraser River.** 

Fraser River sockeye almost always live for 4 years, so let's follow the adventures of a *Fraser River sockeye* that will return this year, 2019.

These sockeye hatched from eggs that were laid in the fall of 2015. After hatching in early spring 2016 the juveniles spent a year in their nursery lakes until the spring of 2017, when they travelled down the Fraser River into the ocean.

Photo credits page 6 & 7: background: Hagerty Ryan USFWS, CC • sockeye: Clive Bryson, B.C. • question mark graphic: opico, istockphotos.com • smolts: Clive Bryson, B.C. Before starting their long trip (migration) each little salmon has to get ready. The little salmon uses water temperature and hours of daylight to trigger when it changes its behaviour, its appearance, how its body works. At last it is ready to stop being a fresh water fish and become a salt water fish. Then, one day the whole sockeye population moves off together, leaving their nursery lakes and travelling down the streams and rivers to their date with the ocean.

After they entered the ocean in 2017, the sockeye swam a thousand kilometres north to their ocean-feeding grounds (map). Salmon prefer to stay in colder waters between 10-14°C in summer and only 8-12°C in winter. As the temperatures changed between seasons, the young salmon migrated through the Pacific Ocean where they feasted on zooplankton, squid and 50 sometimes on small fish. After feeding and swimming through 2017, in 2018 they circled those distances all over again to continue to grow.

In summer 2019, after 2 years at sea, the now adult sockeye will migrate back to the British



Columbia coast and back to their home river. That's approximately 3,000 to 5,000 kilometres of swimming in the ocean! Then they may still have to travel several hundred kilometres upriver to get back home.

Of course, the ocean is a dangerous place for a small salmon – salmon are prey for many other animals such as birds and other fishes, as well as orcas and sea lions that depend upon salmon for a large part of their diet. As they migrate home, many are caught by fishermen. Others perish on the way back up the river because in some places the water is too warm or the channel is blocked by a rockfall. Of all the millions of salmon that go out only about 8% will return (*from each 1,000,000 young salmon,about 80,000 will return*). Years ago the return numbers were higher. It's a tough life being a salmon!

So - how DO the Fraser River sockeye find their way on their long, long journey back home to where they were born? This is what we know so far – or think we know.

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The direction that salmon fry and smolts need to take through their nursery lake to the river outlet and down to the sea is fixed in their genes. No matter which part of the lake they live in, the fish know which way they need to swim to exit the lake.

To find their way out of the lake and down to the sea, the young sockeye can use the position of the sun in the sky or the earth's magnetic field for direction finding. So they have two compasses, a sun-compass and a magnetic-compass, to guide them during their migrations. As they swim out to sea, they learn the places they move through and form some kind





of **'map**' in their brain, so that they can find their home stream again when they return to spawn. This ability of salmon to find home again is called **navigation** and we do not really know how they can do it so well.

To be able to use the sun for orientation, salmon must have a **biological clock** to determine the time of day. This clock helps them to change the angle with the sun as it moves through the sky (15° per hour) so as to maintain a constant migration direction.

Once the sockeye salmon have returned to the river and become freshwater fish again, they can use their super-sensitive sense of smell to track the water of their birth stream and follow it back to where they were born.

As to WHY the salmon return to their natal (birth) streams – maybe only the salmon know for sure. However, a likely reason is that they know it was a good place to grow up themselves, so it will probably be a good place for their babies to grow up as well.

So now you know almost as much about salmon migration as the scientists do – perhaps when you grow up you will discover some more salmon secrets.

The information upon which this article is based was kindly provided by Dr. Kees Groot, fish behaviourist with the Department of Fisheries and Oceans and Dr. Brian Riddell, Chief Science Advisor, Pacific Salmon Foundation.



### Bears and Salmon-

### Hidden Objects Puzzle - Created by Sara Theuerkauf

These bears are happily eating the salmon in the river. Sadly, a couple of months ago some people camped beside the river, leaving a lot of trash behind. Hidden in the picture is all the garbage they left (*shown down the left side of the page.*) Can you find everything? (Look for the solution at https://www.naturekids.bc.ca/)



#### Chip Bags (1)



Plastic Bags (2)



Pop Cans (2)



Coffee Cups (2) & Lids (2)



Bottle Caps (3)



Cigarette Butts (5)





reach their destination. Many won't succeed because of all the animals that catch and eat them on the way - animals like whales, seals, humans and bears. And when it comes to salmon fishing, no one has tricks like a wily old bear.

When the salmon return to the rivers, bears from all over the forest put their hermit ways aside and gather together to fish. It's like a great big, months-long fishing derby because to a bear there's nothing better than the season's first taste of salmon; to them it's like chocolate to a child. As usual, the biggest, strongest bears - usually the biggest, strongest grizzlies - get the best fishing spots. Weaker bears and mothers and cubs have to make do with places where the pickings aren't as rich. But in the fall, if everything goes the way nature intends, there should be so many salmon that no one goes hungry.

millions of salmon have returned from their migration back to their birth and have created the next of salmon, their work is don die. This seems sad but rea gift to many other creatures upon the meat from the salm In the Great Bear Rainfores food for bears, wolves, river of and more than two hund species of rainforest ani



Ike people, have different tastes especially when it comes to eating salmon. Some like the fatty eggs best. Others like the skin and brains. Some aren't nearly as fussy and will eat the h the tail and almost everything in between. What the eat they throw away. After a day of bear fishing, the r riverbanks stink to high heaven. The odour is so strong think you'd walked into a fish-packing plant by mistal for long, because in the end not one fish scale is waste such thing as garbage in the rainforest, especially when it cor it is probably fair to say that the whole rainforest lives in som salmon's shiny backs. Even the trees benefit because when t the salmon carcasses from the water they leave what they do ground. Then, thanks to all the microscopic creatures th those carcasses, they decompose into the soil and fill it with

Think of it as nature's compost. Just like compost that vegetable garden, the good things that come fro salmon help the rainforest trees grow faster and talled any gardener will tell you, it's not unusual to us fish fertilizer to help plants grow. Now you know why.

Photo credits: background: sekarb, 2 salmon: OVasik: istockphotos.com • giant salmonfly: Rob Alexander, B.C. • black bear & Spirit bear: Dave Holli

### Not only bears feed on salmon

r long h stream generation le and they lly it is their that depend on to survive. t salmon is tters, eagles red other mals.

### Wolves

We think of wolves as hunting deer for food, but every autumn, when the salmon come upriver to spawn, many wolves change their diet and feed on salmon. It makes sense for wolves to switch from deer to salmon - salmon provide extra nutrition in fat and energy, plus they are much easier and safer to catch. While hunting deer, wolves are often seriously injured by hooves and antlers; that doesn't happen when catching salmon.

> Other Birds

American Dippers dive into the spawning streams to feed on the left-over eggs. Many gulls -Glaucous-winged, Herring, Bonaparte's and Mew - also like to feed on loose salmon eggs, as do ducks such as Mallards, goldeneyes and mergansers.

### Eccles

Throughout BC, hundreds of Bald Eagles sit on trees beside the river banks, watching and waiting for the Pacific salmon to return. Feeding on salmon carcasses gives eagles a rich food source to see them through the winter and their breeding season which starts in fall. Eagle chicks hatch as early as March, earlier than most other birds.



Decomposing salmon provide rich nutrients for many aquatic insects such as mayflies, stoneflies, caddisflies and crane flies. In turn, the insects are eaten by young salmon and so the **Circle of Life** is completed.

Insects

Excerpted from **Salmon Bears** by Ian McAllister and Nicholas Read, Published 2010 by Orca Books, Victoria, BC. Reprinted with permission.

nd head, ey don't ainforest's you might ike. But not d. There's no nes to salmon. he way off the he bears drag in't eat on the hat feed on in nutrients.

t feeds a om the er. As e



#### harbour seal, American Dipper & ss, B.C. • wolf: Ian McAllister, B.C. • eagle: B Roitberg, B.C

# Salmon dra

Author: Carrielynn Victor - Xwementelot

Salmon are sacred to the First Nations people that live in British Columbia. The First Nations people that live on the South West Coast of BC are called 'Coast Salish'.

The Coast Salish people call the Fraser River, **"Stó:Iō"**. It is pronounced **"Stah-Low"** and it means `the river'. **Stó:Iō** is also the name for the people who live in the Fraser River Valley. It is everyone's job to make sure the river is clean and cool so the fish swimming home have a safe journey. Nobody is allowed to throw garbage in the river or spit in the river. The river is the home of the salmon; we wouldn't want them making a mess in our home, so we respect their home.

Each year when the salmon start swimming back up the **Stó:Iō**, the people gather for the first salmon ceremony. The first fish is shared with all the people who attend the ceremony, and all the bones are put back in the **Stó:Iō** as a sign of respect. The Coast Salish people believe that by thanking the salmon for coming back every year, and putting the bones back in the river in a special way, that the salmon will continue to return each year.

A lot of **Stó:lo** kids learn to fish when they are really young. Some kids start fishing when they are only two years old. Kids catch salmon, sturgeon, minnows, and many other types of fish. Learning to catch fish is important, because when kids get older, they will help to feed their families.

The **Stó:Io** people still catch fish in the same river today that they did a long time ago. To catch fish, fishers used to use hand-made wooden traps, or nets that were made of stinging nettles or cedar bark on the end of long poles, and long spears to catch salmon. Today, some fishers use big nets and boats with motors to catch salmon. Sometimes traditional ways are still used to fish. **Stó:Io** people wind-dry salmon and can salmon in the summer, and smoke them in the fall. Smoking and wind-drying salmon are old traditions that have been passed on from generation to generation.

Face Of Our Ancestors acrylic on canvas Artist: Carrielynn Victor



Coast Salish people believe that the salmon used to be people. The salmon people would send their young men and women to the humans every summer so they could feed and nourish the humans. The Cedar tree, many types of plants, and even rocks were once human beings, but were transformed into helpers for the rest of the people. When we see all the parts of nature as our relatives, we can respect everything like family.

The Coast Salish people sing special songs just for the salmon. Some people wear masks and blankets that have symbols on them of salmon. Dances are performed by children and adults that show the journey that salmon take in the rivers and oceans. Coast Salish people paint and draw pictures of salmon. Masks and totem poles are carved from cedar to show how important salmon are to the Coast Salish people.

# Sockeye On The Mind - acrylic on canvas Artist: Carrielynn Victor

#### Salmon are sacred.

Salmon are also important to the four legged creatures, like the bear and the cougar. Creatures with wings eat salmon too, like the eagle, and raven. Even the plants and the trees near rivers like salmon. There are lots of different ways that salmon help the environment.

### Kw'as Hoy Kw'as Hoy

Carrielynn Victor - Xwementelot

Community Based Researcher

Sto:lo Tribal Council

Guess what! Kw'as Hoy means Thanks... next time your Mom or Dad makes dinner say Kw'as Hoy!

Artist: Carrielynn Victor

Artist: Carrielynn Victor

Scissors

Googly Eyes

(optional but very fun!)

# Salmon Art: Recycled Salmon (made from recycled Newspapers)

 Newspaper (whole and shredded) What you'll need:

- Wax Crayons or Oil Pastels

- Tempera Paint in green, red, black
- Take one full sheet of large format newspaper (e.g. Globe & Mail, Vancouver Sun) and fold it in half vertically. Now you have the perfect proportions for a good-sized adult salmon. Look at a poster or real salmon or image on the computer and observe closely how many fins a salmon actually has, taking note of the shape. Start at the nose and touch all sides of the folded paper while you draw the outline of your fish in black crayon. Press lightly at first and as you get the proportions that are satisfactory press heavily to define the outline. Use a variety of wax crayons to define the darker markings and have fun pressing hard to show the scales. Using white utility candle stubs to draw the scales will give a very interesting texture. When you are finished take a wash (tempera paint diluted with water so that it is transparent) in red, green

Utility candle stubs

or black and lightly brush over the newspaper fish. Cut it out and make more. You can staple around the cut out fish and stuff them with the newspaper clippings or shredded paper from the office shredder. Display on a bulletin board making sure to overlap the fish as they

swim upstream!

# Spawner Come Home

How does a spawning salmon find its way back home after 3 to 5 years? It smells its way back. Try this fun activity to see whether you can make it to your home creek. Time: 10 minutes

Introduce the activity by asking the group how they think salmon find their way back to their home river to spawn - road maps? Landmarks? Gyroscopes? Salmon rely on water temperature and the earth's magnetic field to find their way to the right part of the coast, but they use smell to find the right river. Designate four players to be home rivers - they do not move. The rest are spawners who must find their home creek by moving (swimming) from river to river to find their home by smell. Give each 'river' a film canister with a different scent extract (e.g. cherry, lemon, peppermint or coconut

extract). Give the rest of the players a film canister at random. This represents the smell they remember from when they were fry in the river. Everyone should use their sense of smell to determine their home river by taking the lid off their canister and sniffing and comparing it to the canisters of the different 'rivers' to find the right one. As soon as they find it, have them stay together until all the salmon find their home river. Finish by asking the participants what might affect the salmon's ability to recognize their home stream. Discuss how environmental pollution might affect these animals. Thanks to Metro Vancouver Regional Parks for this activity

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### Salmon Watching

#### This year try to see one of the most amazing sights in nature ....

Millions of salmon returning from the ocean back to the place they were born so they can lay eggs for new generation in exactly the same place!!

Improve your chances of seeing fish and other aquatic life by following these tips.

### Tip #1

Get as high as possible above the water. The best view of the bottom of a stream or river is from high above like a bridge, tree or large rock. You will see much more from this height than you will on shore.

### Tip #2

Walk softly and quietly as you approach the water. The sound of heavy footsteps will be carried through rock and soil and travel to the water, scaring fish. Talking is OK as sound waves in the air do not transfer easily to the water.

### Tip #3

Walk with the sun at your back and watch your shadow. If the sun is behind you it will light up the water, giving you a clear view and reducing the glare. But be careful your shadow doesn't move across the water telling a fish that it has company!

### Tip #4.

Keep low when walking along water. When a fish looks up it sees what looks like a hole in the water. By looking through this hole, it is able to see what is above and on both sides like a lens or periscope that has a wide field of view, so stay low!

Where the salmon are spawning look for white flashes under water. This is the female turning on her side and using her tail to dig her nest **(redd)** in the gravel. Her mate stays beside her fighting off other males. (Redds are visible through the water as patches of clean white gravel.)

Down by the river mouths and estuaries, look for adult salmon leaping in shallow water – these are salmon returning from the salty ocean and getting used to the taste/smell of the birth stream's fresh water so that they can follow it back home.

#### Where and When to See Salmon in BC.

http://www.pac.dfo-mpo.gc.ca/sep-pmvs/see-observer-smon-eng.html

### By Tom Saare

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Look at your home and what do you see? - a clean place that shelters you from wind and bad weather, where you are safe from enemies. You have rooms, furniture, a bed to sleep in and cupboards with food. Then look at a stream - what do you see?

See the clean, cool water flowing over and around rocks and logs, the lush leafy shrubs and trees that shadow the stream? These are what provide the salmon with shelter from rough water, safety from enemies, resting places and hiding places for food – in its home a salmon needs just the same things that you do.

**Water** is obviously the most important part of this home. Cold, clear unpolluted water contains lots of **oxygen** which salmon take in through their gills. As the water turns and rumbles on its way downstream it collects more life-giving oxygen, rather like you opening **windows** to let in fresh air.

For furniture salmon need all different sized rocks - little marble size rocks (gravel), baseball size rocks (cobble) and large boulders. The gravel is the nursery area. When adult salmon return to their natal (birth) streams to spawn, they dig redds (nests) in the gravel where they lay thousands of eggs. These eggs remain safe under the gravel until they hatch into alevin (little fish). The alevin hide in the spaces between the gravel while they grow bigger. When they are big enough to come out from the gravel the young salmon are called fry.



Between the large boulders the salmon fry can find spaces to hide from **predators** (creatures that want to eat them). These boulders also help form deep pools which are important for fish feeding and resting areas - the salmon's **dining rooms** and **bedrooms**.

Other hidden spaces in the cobble and gravel are the **food cupboards** where insects and their larvae can be found, providing meals for salmon.

Logs and the tangled root system of trees that fall into streams (known as **large woody debris**) are also important parts of a salmon's home. They too provide cover and protection from predators. As the woody debris decays in the stream, it supplies needed food for insects which in turn are food for both young and adult salmon.

Photo credits: background: Valery Bocman, istockphotos.com • salmon close up: Clive Bryson, B.C.
mayfly: David Shackleton, B.C. • woody debris & rocky bed: Clive Bryson, B.C.

# Home

Another important feature of the salmon's home is the **riparian area** - the trees, shrubs and other vegetation found along the banks of streams. These are almost like **gardens** for salmon.

During warmer weather the overhanging vegetation helps shade the stream and keeps water temperatures cool. (This is very important for salmon as they cannot live in water where the temperature is over 18 degrees Celsius.) Insects fall from the trees and shrubs into the water and provide yet more food.

In some places there are eroded (washed away) areas underneath the stream bank. These **"undercut banks"** are fine areas for fish to hide from predators and to rest safely. So - just as we enjoy certain necessities and comforts in our homes, salmon do too.

The next time you happen to be near a stream, take a look - could this be a salmon home? What habitat characteristics of the stream can you identify as being the important parts of a salmon home? If you look very carefully, you might even see some of the salmon at home.



As a young boy, Tom Saare was fascinated to discover that the small stream in his neighbourhood contained cutthroat trout and other aquatic life. His passion for nature stayed with him throughout his life. Tom now teaches at the Rivers Institute (BCIT), an organization that promotes public awareness about the importance of healthy rivers, supports stream restoration initiatives and mentors future generations of environmental stewards.



Home Tips for Healthy Streams Information on human caused urban runoff and helpful tips for: lawn and garden care, hot tub and pool use, car and driveway maintenance, and things you can do if you live near a stream. https://www.pac.dfo-mpo.gc.ca/publications/pdfs/hometips\_2000\_e.pdf

## Healthy Habitat for Salmon

Young salmon live in streams and lakes. Some species can spend up to a year or more there after they hatch. Young salmon, like human babies, are very sensitive to their environment. They need cold, clean, fresh water (ideally between 5°C and 9°C), lots of tasty insects to eat, and safe places to hide as they prepare for the challenging trip downstream.

A healthy salmon stream has a clean gravel and rock bottom with some shallow areas for spawning, and calm pools for resting. Overhanging bushes and trees along the banks of the stream keep the water shady and cool. They also provide habitat for insects that the salmon like to eat.

Sometimes people and pets cause trouble for salmon. Biking, running or playing in a stream makes the water muddy and hard to breathe for fish. Soap, oil and chemicals that get washed down the drain can poison the water, or the food salmon eat. You can help by reminding others to keep streams clean and safe for salmon. Adapted from Salmonids in the Classroom, Department of Fisheries and Oceans Canada.



#### Want more information on healthy habitat for salmon? Go to:

- Department of Fisheries and Oceans
   www.pac.dfo-mpo.gc.ca/education (for Salmonids in the Classroom, Storm drain marking and other activities)
- Pacific Streamkeepers at www.pskf.ca
- SeaDoc Society at https://www.seadocsociety.org/junior-seadoctors
- **Books:**
- The Sockeye Mother by Brett D. Huson
- S is for Salmon by Hannah Viano
- The Salmon Twins by Carol Simpson
- Salmon Bears by Ian McAllister and Nicholas Read

The stream or lake bed habitat checklist:         clean gravel       vegetation on its banks         clean flowing water       signs of aquatic life (e.g. insects, fish, birds, animals         does not dry up       not damaged by people         not blocked by waterfalls       cared for by people         Water temperature:      CC         Clarity of water:      CC         Clarity of water:      CC         Clarity of water:      CC         Stream or lake flow:	Find out if your local stream is healthy and provides good habitat for salmon	Name of stream or lake
<ul> <li>clean gravel</li> <li>clean flowing water</li> <li>does not dry up</li> <li>not blocked by waterfalls</li> <li>Water temperature:°C</li> <li>Clarity of water:</li> <li>Clear Cloudy Slity Muddy Brown</li> <li>Stream or lake flow:</li> <li>Flat and calm Moving quickly Mix of calm and moving water</li> <li>Stream or lake bottom:</li> <li>Boulders (30 cm across or larger) Cobble (rock pieces 10 to 30 cm across)</li> <li>Gravel (rock pieces 1 to 10 cm across) Sand Mud</li> <li>Describe the stream bank (e.g. steep, eroding):</li></ul>	The stream or lake bed habitat check	dist:
Water temperature:      °C         Clarity of water:          Clear       Cloudy       Silty       Muddy       Brown         Stream or lake flow:        Flat and calm       Moving quickly       Mix of calm and moving water         Stream depth (measure or guess visually):	<ul> <li>clean gravel</li> <li>clean flowing water</li> <li>does not dry up</li> <li>not blocked by waterfalls</li> </ul>	<ul> <li>vegetation on its banks</li> <li>signs of aquatic life (e.g. insects, fish, birds, animals)</li> <li>not damaged by people</li> <li>cared for by people</li> </ul>
Clarity of water: Clear Cloudy Silty Muddy Brown Stream or lake flow: Flat and calm Moving quickly Mix of calm and moving water Stream depth (measure or guess visually):	Water temperature:°C	
Stream or lake flow:   Flat and calm   Moving quickly   Mix of calm and moving water   Stream depth (measure or guess visually):	Clarity of water: Clear 🔲 Cloudy 🔲 Silty 🔲 Mu	ddy 🗖 Brown
Stream depth (measure or guess visually):         Stream or lake bottom:         Boulders (30 cm across or larger)         Cobble (rock pieces 10 to 30 cm across)         Gravel (rock pieces 1 to 10 cm across)         Sand         Mud         Describe the stream bank (e.g. steep, eroding):         Plant Life along the Bank:         Tall trees         Low Bushes         Overhanging Bushes         Ferns         Ground level         On plants         Airborne         In water or on surface	Stream or lake flow: Flat and calm  Moving quickly	Mix of calm and moving water
Stream or lake bottom:   Boulders (30 cm across or larger)   Cobble (rock pieces 10 to 30 cm across)   Gravel (rock pieces 1 to 10 cm across)   Sand   Mud   Describe the stream bank (e.g. steep, eroding): Plant Life along the Bank: Tall trees Low Bushes Overhanging Bushes Ferns Grass None Insects you can see: Ground level On plants Airborne In water or on surface Numbers:	Stream depth (measure or guess visually	/):
Describe the stream bank (e.g. steep, eroding): Plant Life along the Bank: Tall trees Low Bushes Overhanging Bushes Ferns Grass None Insects you can see: Ground level On plants Airborne In water or on surface Numbers:Types:	Stream or lake bottom: Boulders (30 cm across or larger) Gravel (rock pieces 1 to 10 cm acro	Cobble (rock pieces 10 to 30 cm across)
Plant Life along the Bank:   Tall trees   Low Bushes   Overhanging Bushes   Ferns   Grass   None   Insects you can see:  Ground level    On plants Airborne In water or on surface    Numbers:	Describe the stream bank (e.g. steep, e	roding):
Insects you can see: Ground level On plants Airborne In water or on surface Numbers:	Plant Life along the Bank: Tall trees Low Bushes Ove	rhanging Bushes 🗖 Ferns 🗖 Grass 🗖 None
Numbers:Types:	nsects you can see: Ground level D On plants Ai	rborne 🗖 In water or on surface
	Numbers:Ty	pes:
Garbage 🔲 No Garbage - Describe any evidence of harmful human activity:	🗖 Garbage 🔲 No Garbage - Descrit	be any evidence of harmful human activity:
What could be done to make the stream or lake a better babitat for salmon?	What could be done to make the stream	m or lake a better babitat for salmon?

Adapted from Salmonids in the Classroom, Department of Fisheries and Oceans Canada



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