



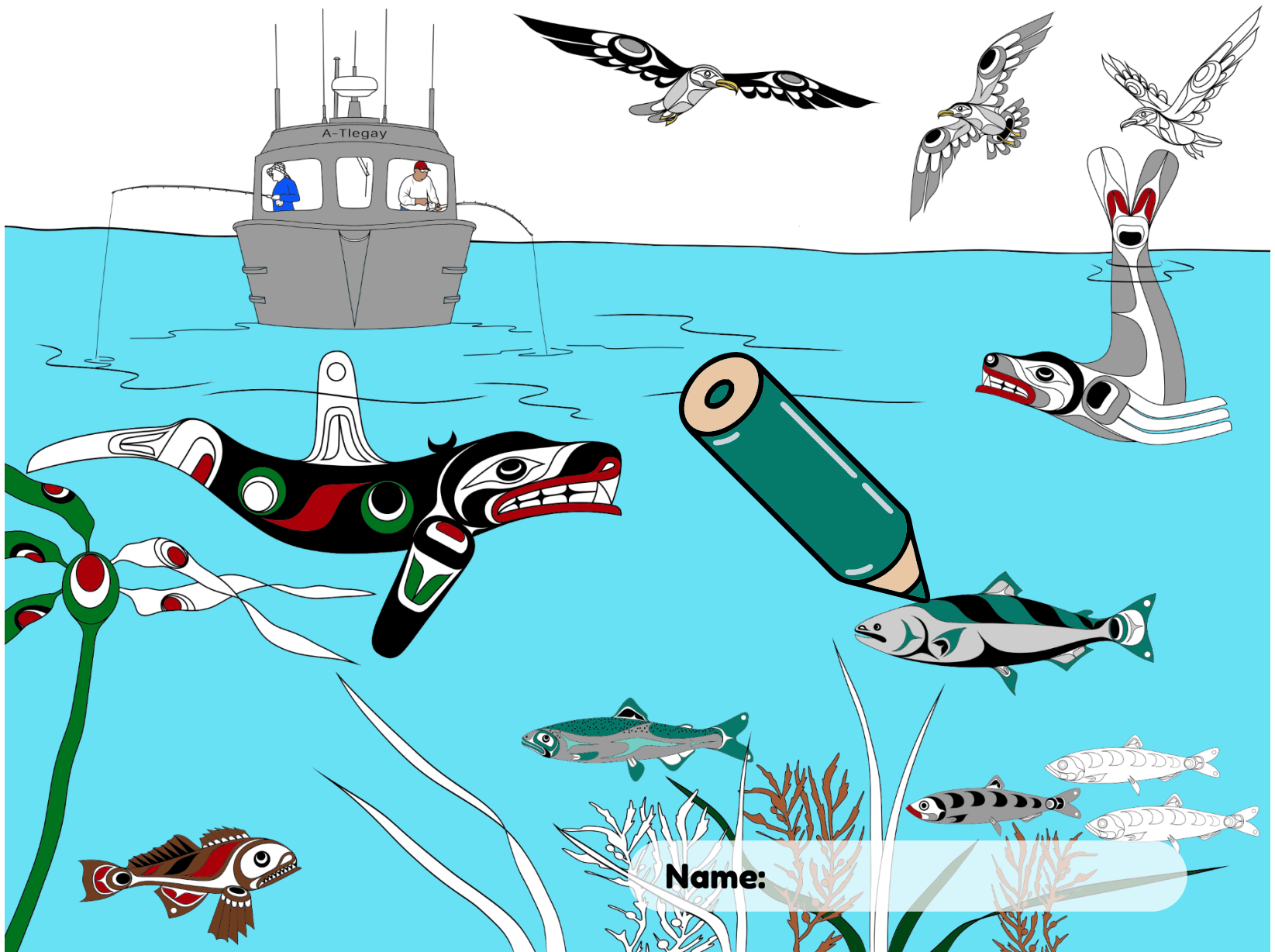
PACIFIC SALMON
FOUNDATION

Artwork by Jessica Chickite
Booklet by Valesca de Groot

Strait of Georgia Salmon—Herring

COLOURING BOOKLET

colour and learn

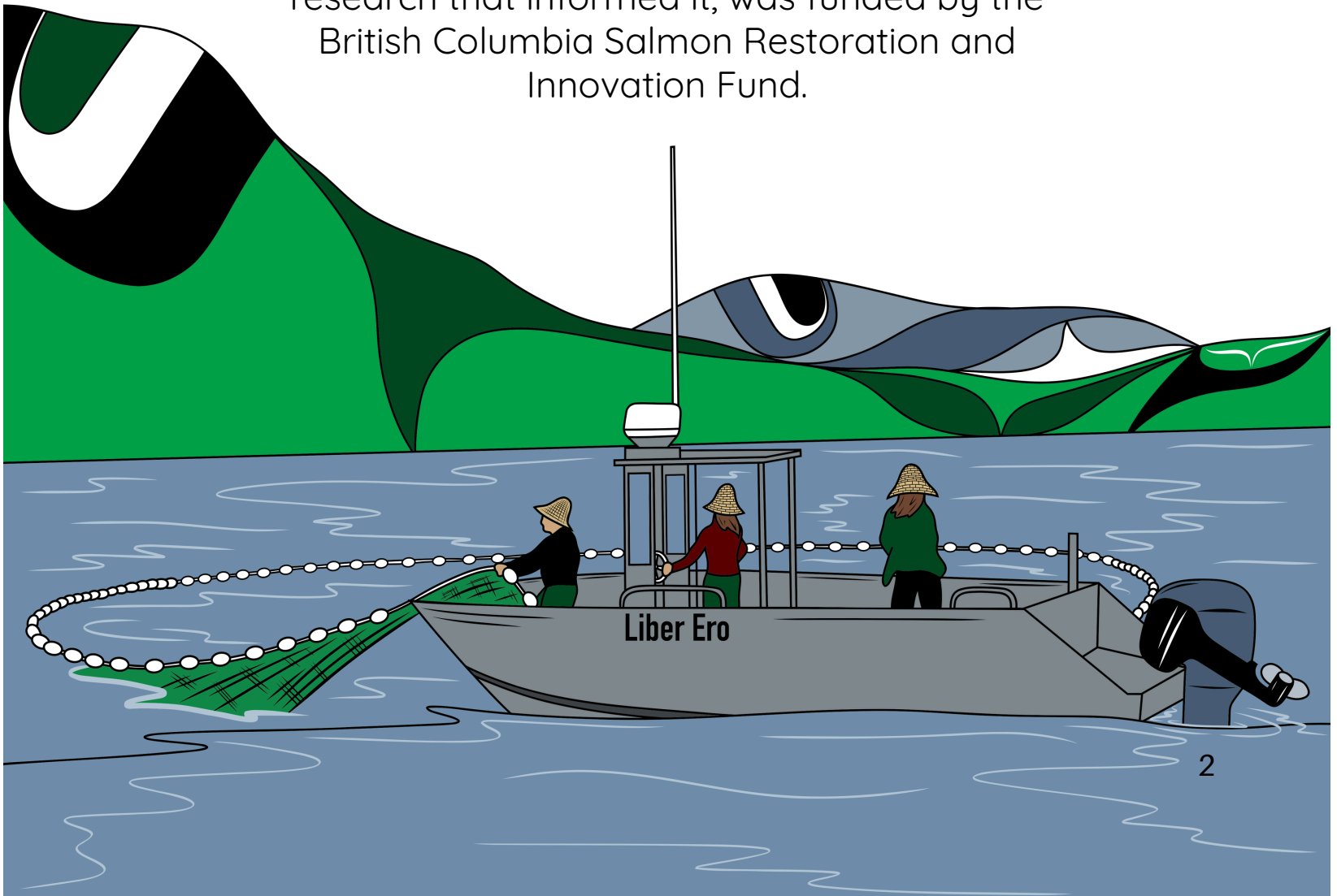


Name: _____



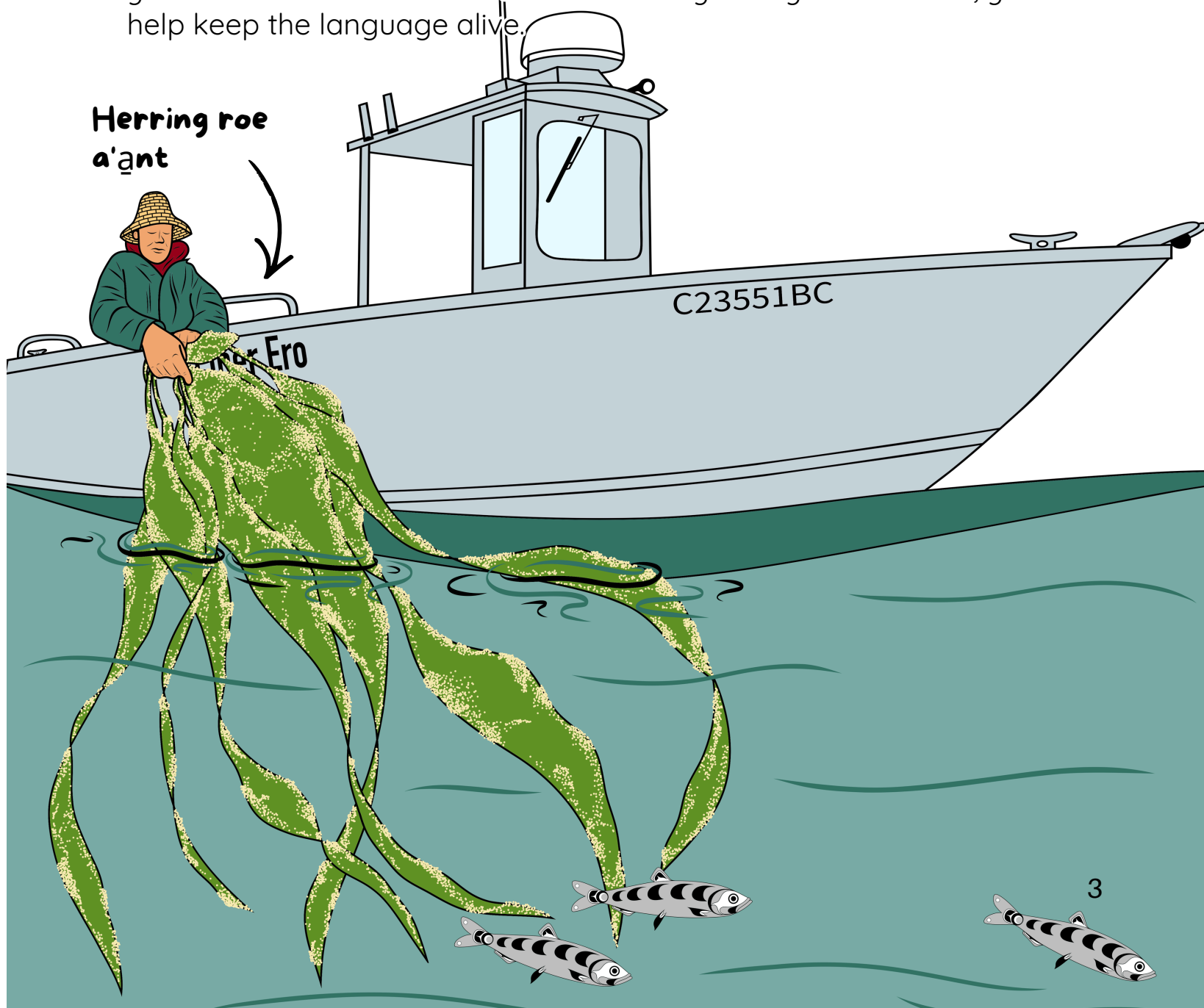
PACIFIC SALMON
FOUNDATION

The Pacific Salmon Foundation Salmon-Herring Interactions project team is grateful to have worked alongside the Cowichan Tribes, Tla'amin First Nation, and the A-Tlegay Fisheries Society to explore and learn about these lands and waters. The Pacific Salmon Foundation aims to work alongside Nation partners to support their marine priorities, provide resources that help traditional stewardship continue into the present, and to fund the creation of materials that document and share important traditional ecological knowledge. This colouring booklet, and the research that informed it, was funded by the British Columbia Salmon Restoration and Innovation Fund.



LANGUAGE PIECES

In this booklet you will see some language pieces in Kwákwala. Kwákwala is the language spoken by many of the Kwákwaka'wakw Nations, including those connected to the A-Tlegay Fisheries Society. For thousands of years, it was shared through stories, songs, and conversation, but not written. During colonization, the language and culture were suppressed, and fewer people spoke Kwákwala. Today, it is considered endangered, but communities are working hard to bring it back. Language programs, cultural centres, apps, and youth camps are helping people learn and speak Kwákwala again. In this booklet, you will see some Kwákwala words - every time you learn one, you help keep the language alive.



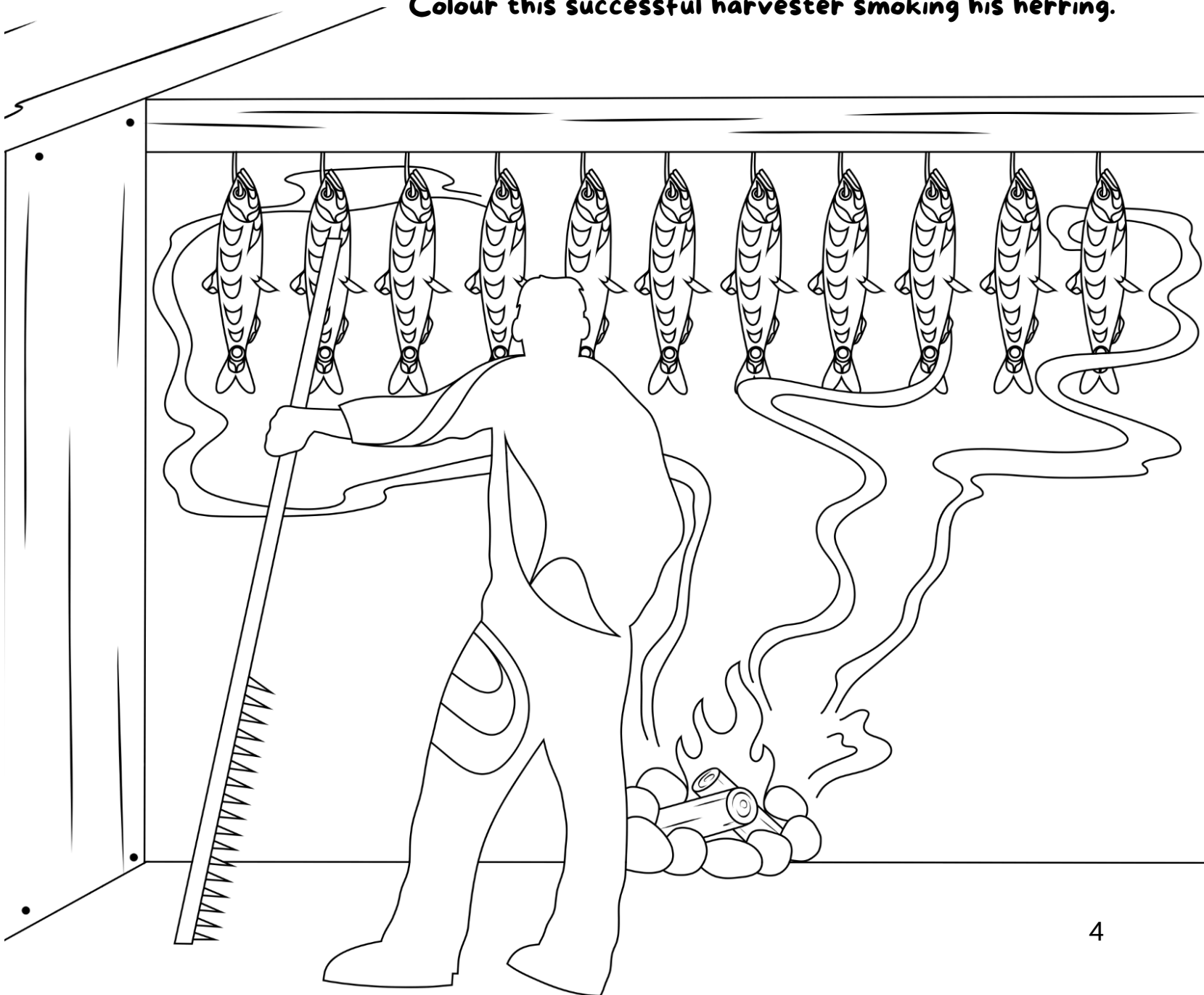
MEET THE HERRING:

Pacific herring are small - but they do a big job! They help feed salmon, birds, sea lions, and even whales. When herring are healthy, the whole ocean is stronger.



People depend on herring too. First Nations have harvested herring and their eggs for thousands of years. The **xalbayu**, or **herring rake**, is a traditional tool that has been used to harvest herring.

Colour this successful harvester smoking his herring.



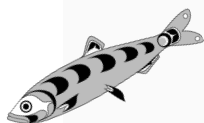
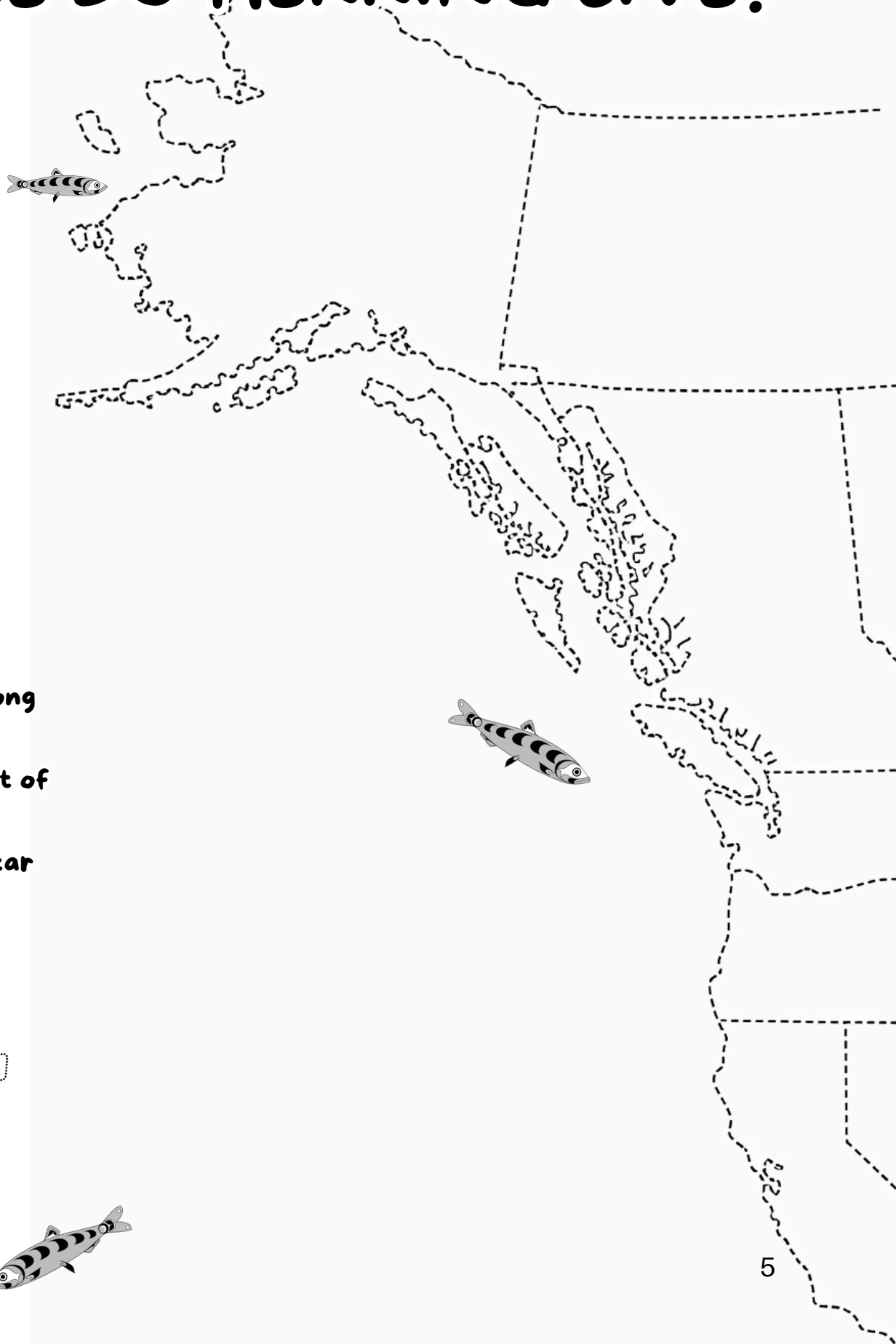
WHERE DO HERRING LIVE?

Pacific herring live along the West coast of North America, from California to Alaska and even across the ocean to Japan. Some herring travel long distances to feed. Others stay close to home in the Strait of Georgia all year.

Draw herring along the coast.

Colour the Strait of Georgia orange.

Can you put a star where you live?

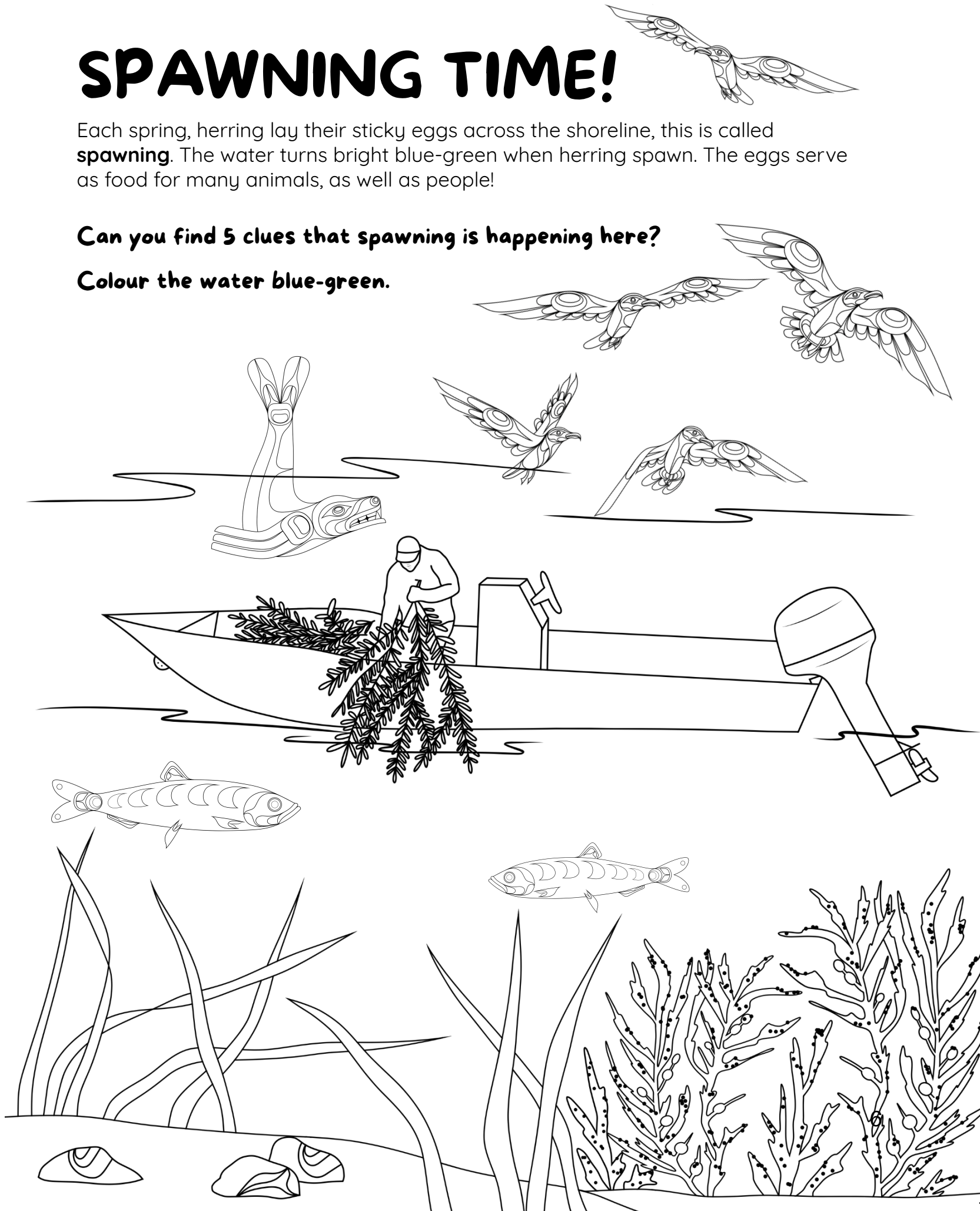


SPAWNING TIME!

Each spring, herring lay their sticky eggs across the shoreline, this is called **spawning**. The water turns bright blue-green when herring spawn. The eggs serve as food for many animals, as well as people!

Can you find 5 clues that spawning is happening here?

Colour the water blue-green.

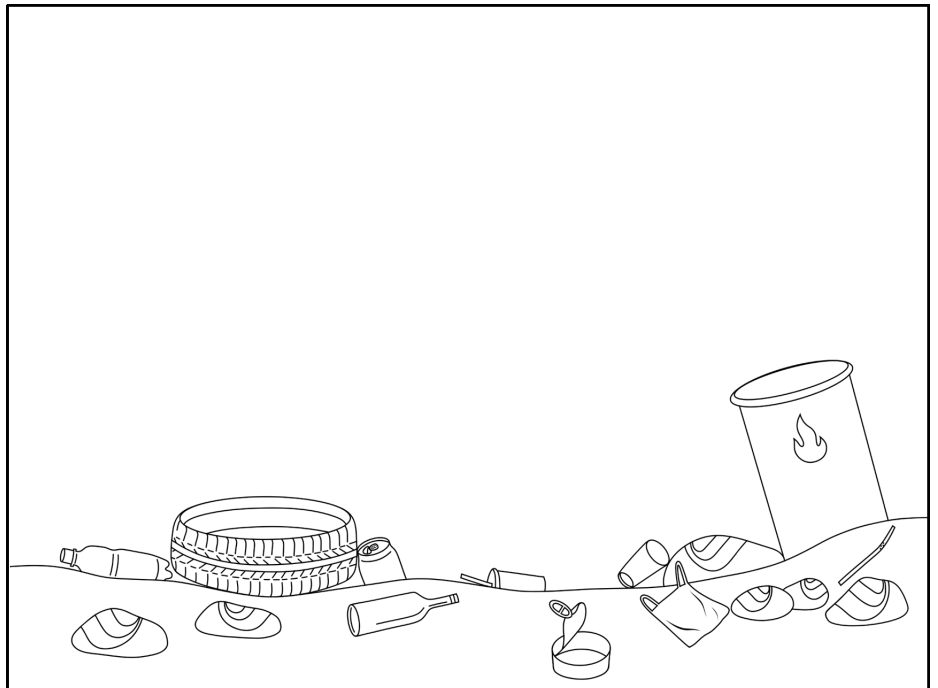


GOOD HABITATS FOR BABY HERRING

When herring **spawn**, their sticky eggs cling to whatever is in the water. If there is lots of kelp and seaweed, the eggs have many places to attach. This helps the eggs spread out instead of piling into big clumps, so they can get the oxygen they need to grow.

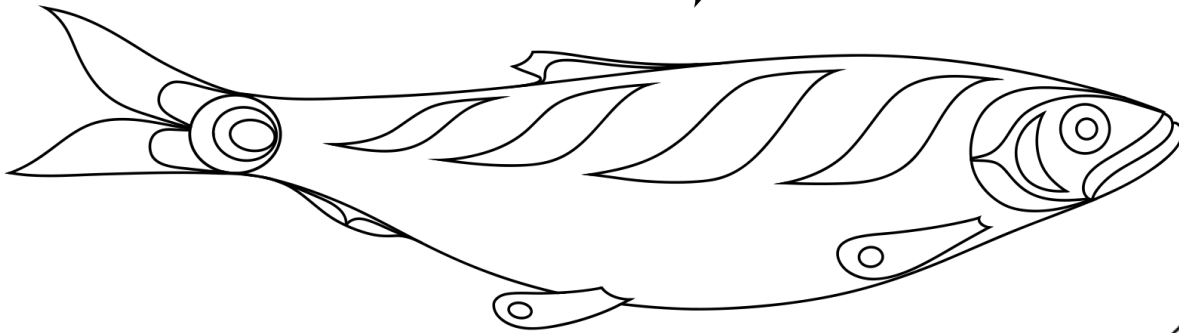
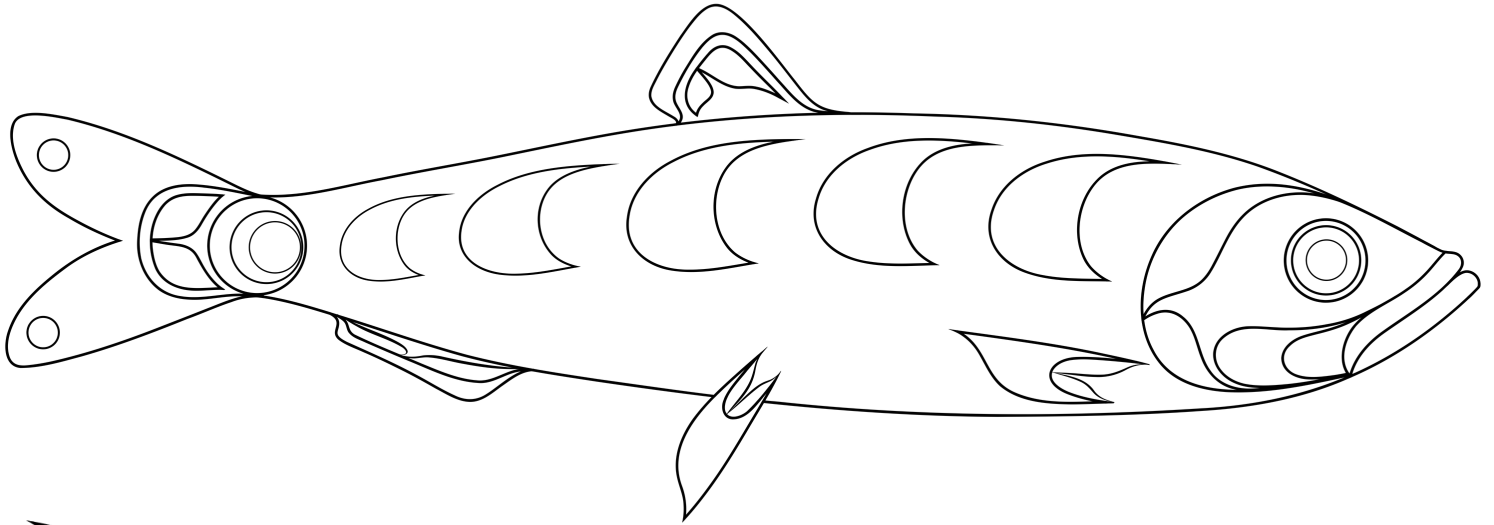
**Draw 20 eggs in
each habitat.**

**Which habitat is
better for herring?**

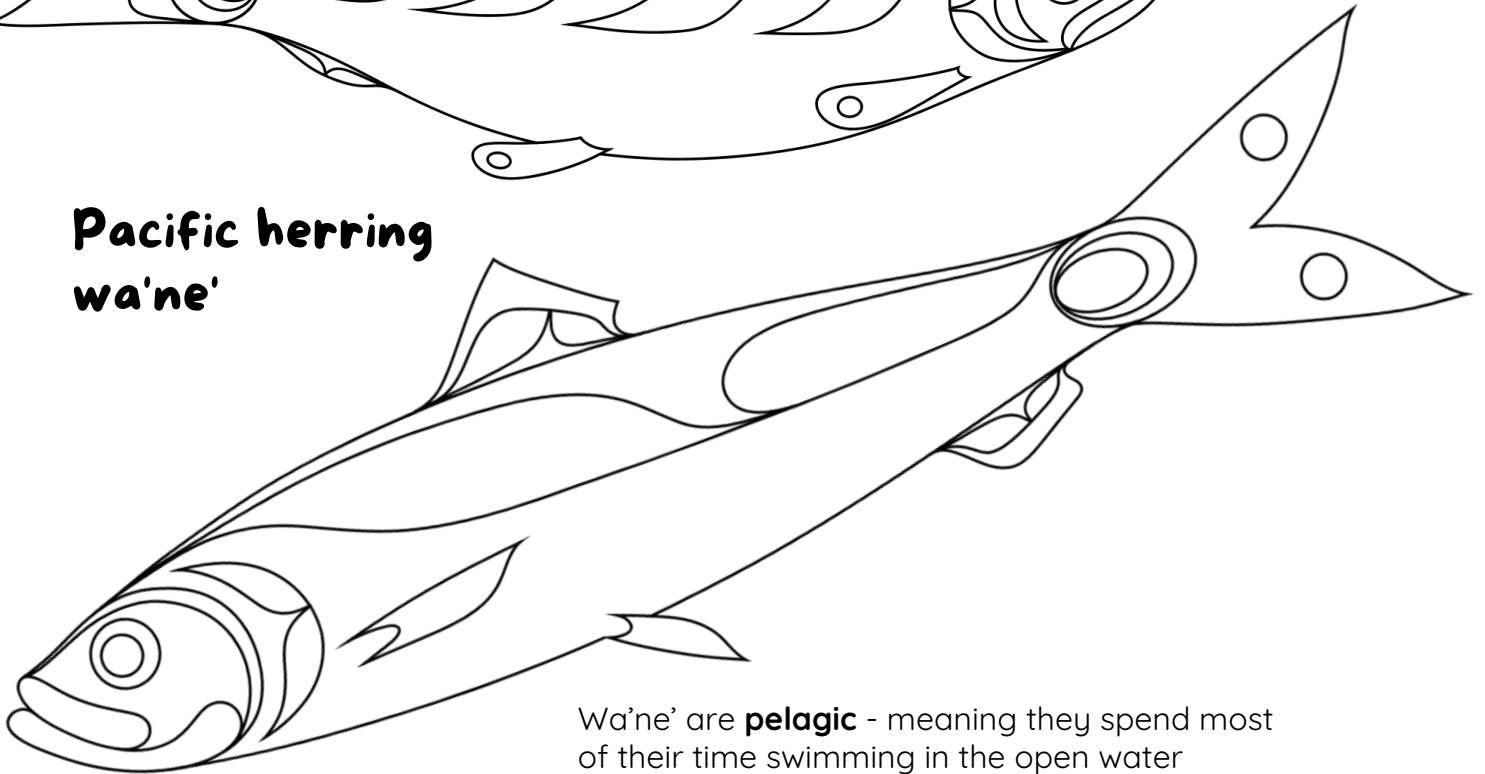


A BUSY NEIGHBOURHOOD

Herring share their home with many other animals - meet and colour those you find on the next few pages!



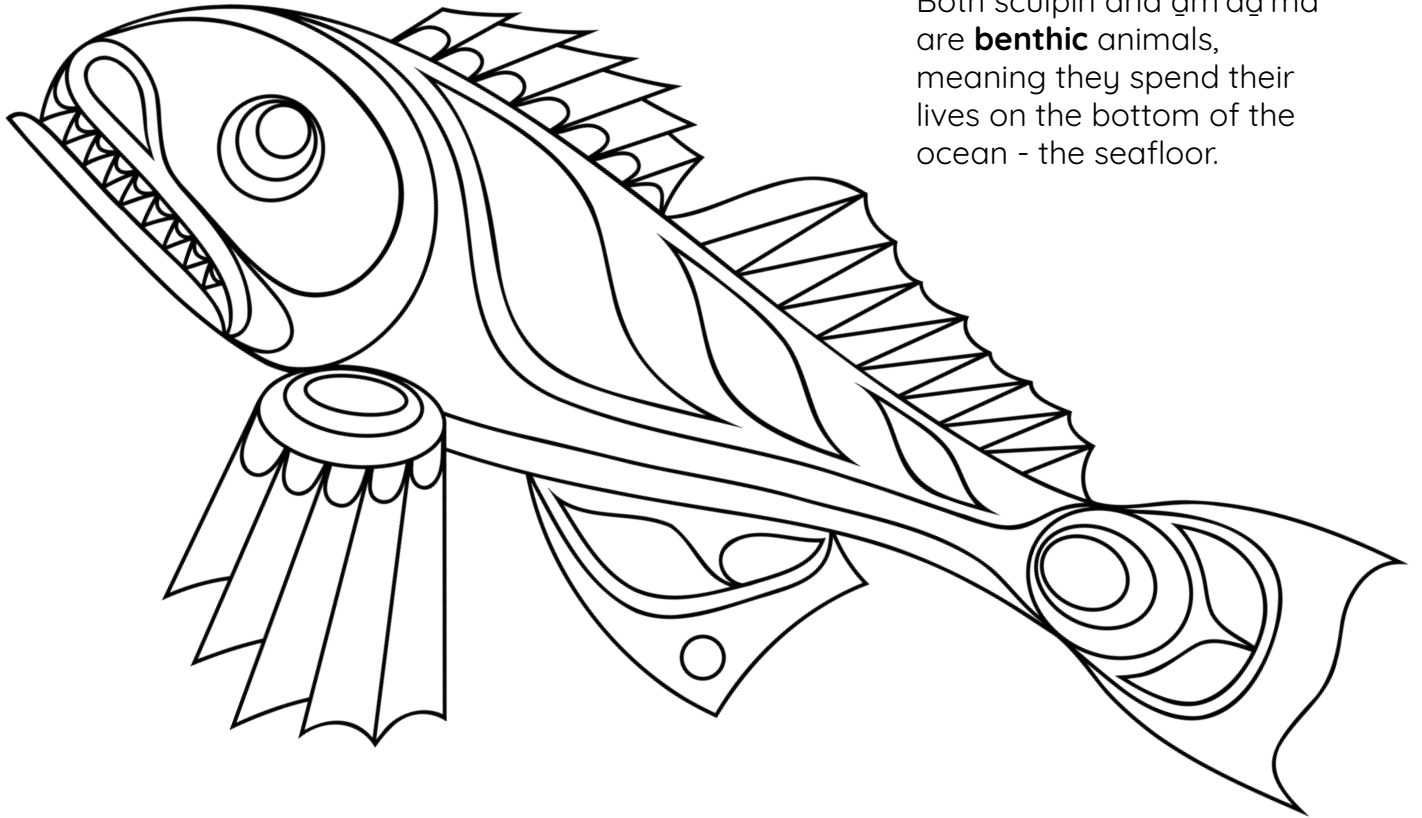
Pacific herring
wa'ne'



Wa'ne' are **pelagic** - meaning they spend most of their time swimming in the open water between the surface and the seafloor. This open space allows herring to travel in big schools, which helps protect them from predators.

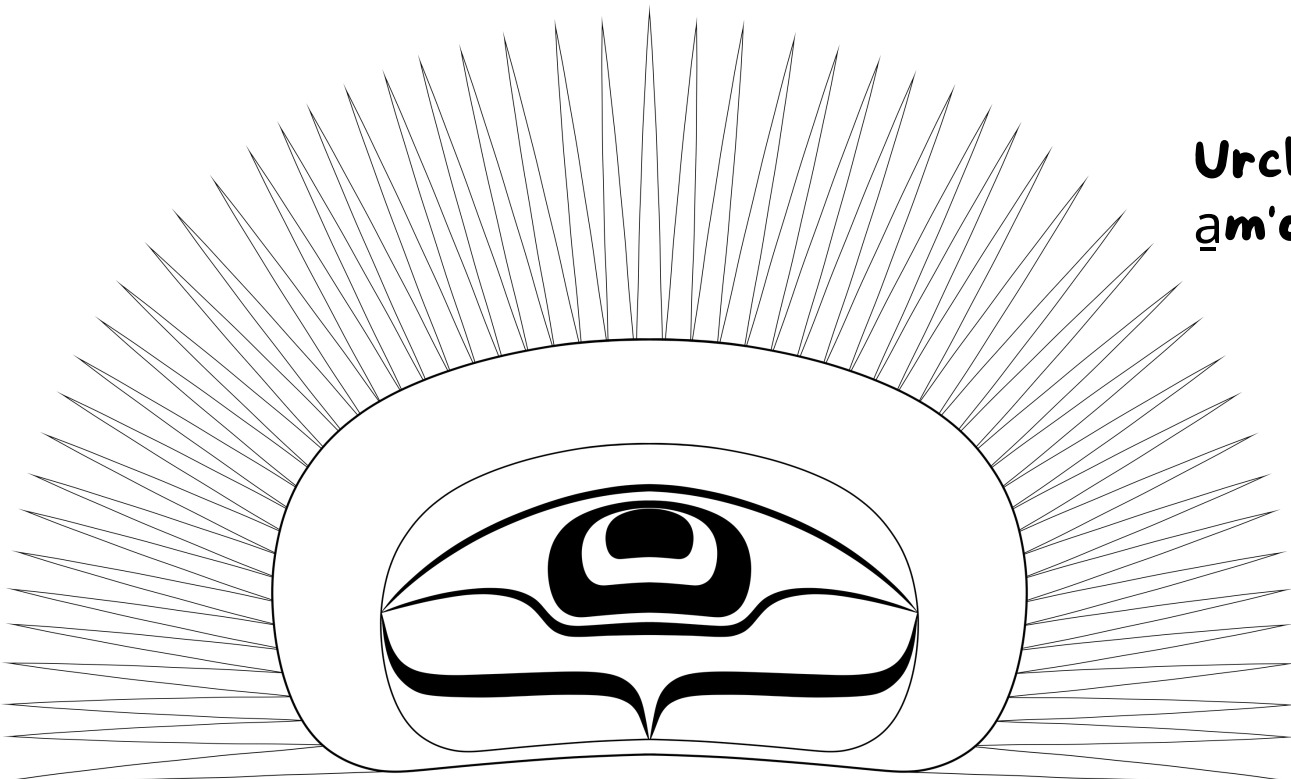
A BUSY NEIGHBOURHOOD

Sculpin



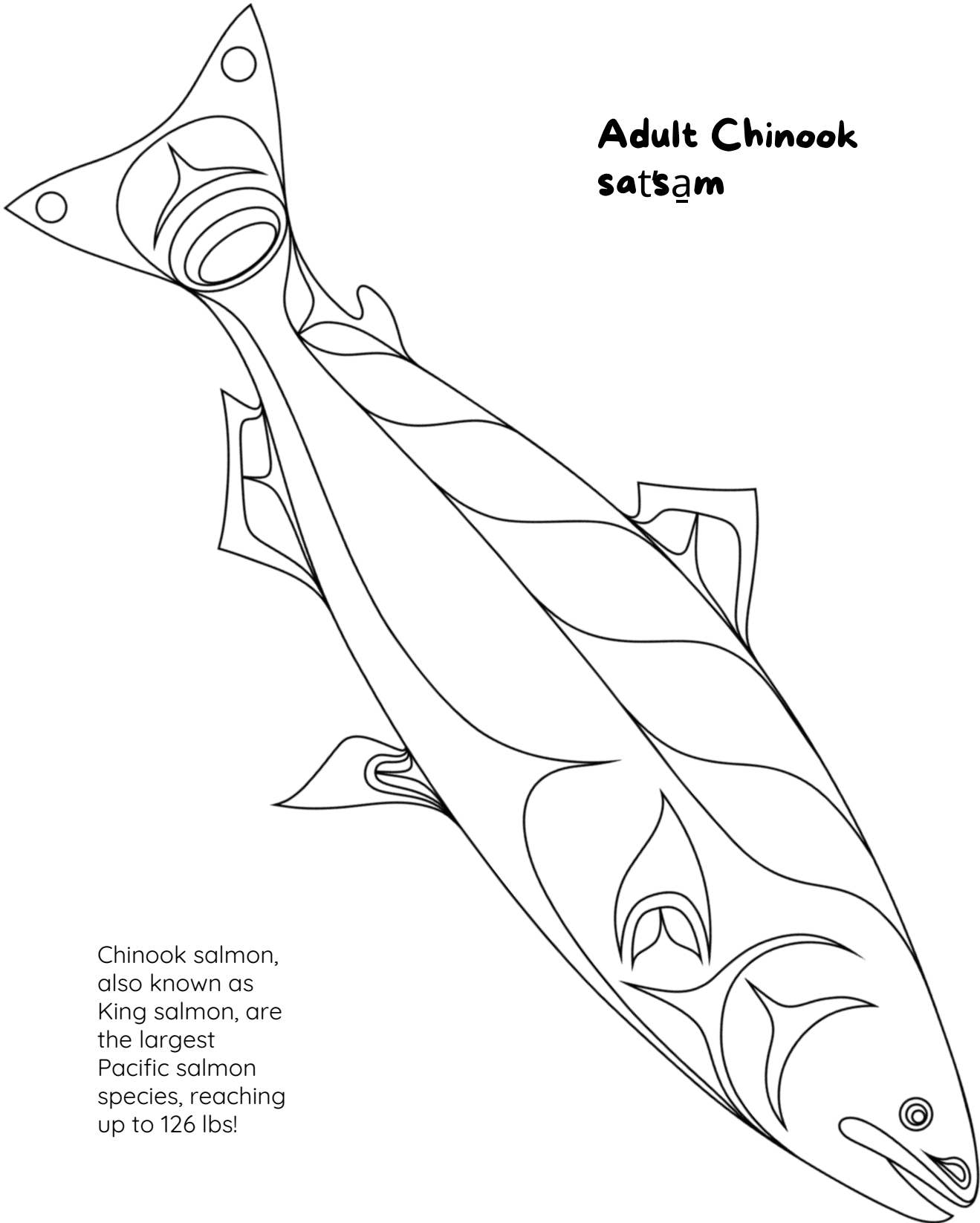
Both sculpin and gm'da'ma are **benthic** animals, meaning they spend their lives on the bottom of the ocean - the seafloor.

Urchin am'da'ma



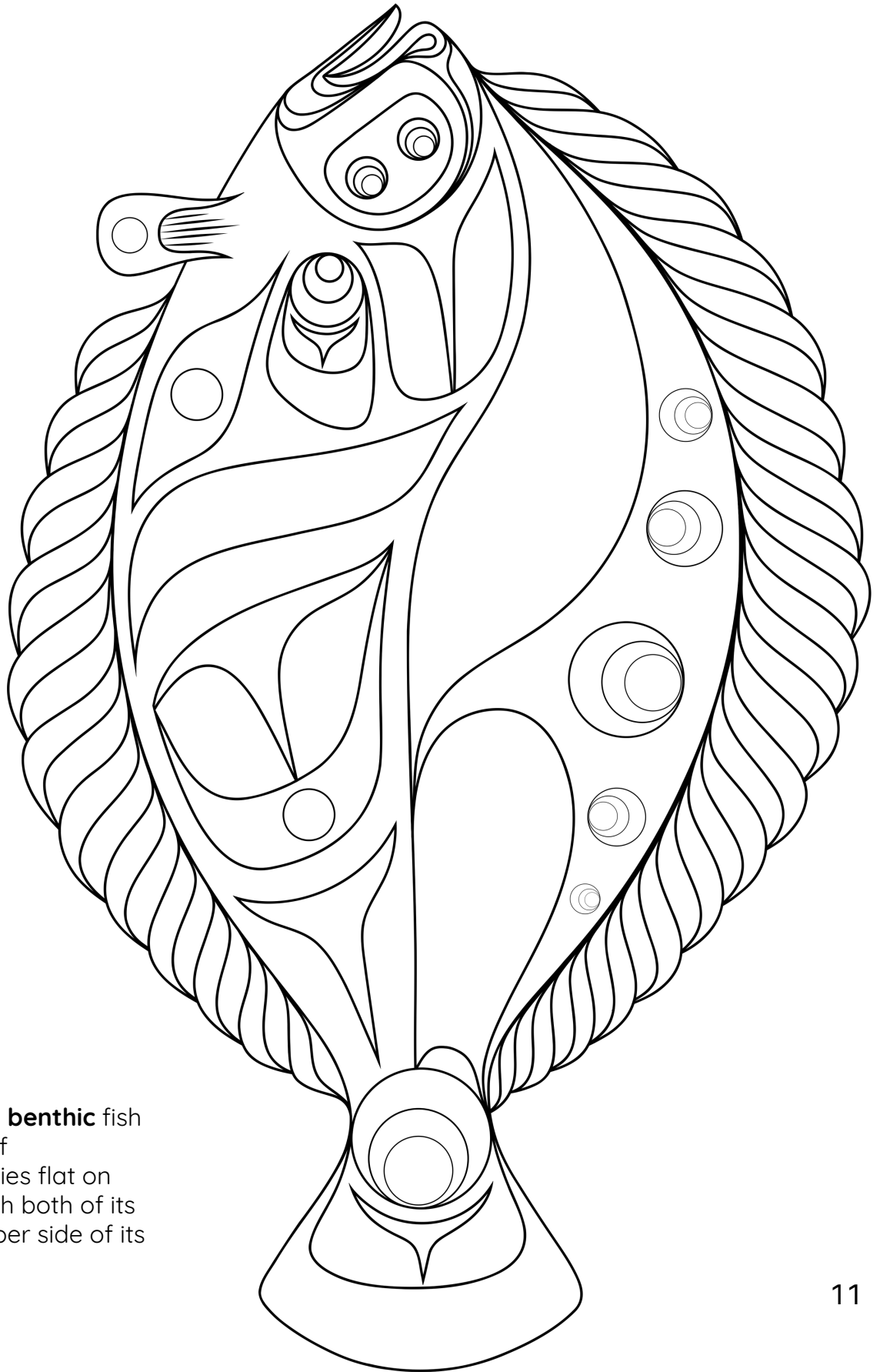
A BUSY NEIGHBOURHOOD

Adult Chinook
satsam



Chinook salmon,
also known as
King salmon, are
the largest
Pacific salmon
species, reaching
up to 126 lbs!

A BUSY NEIGHBOURHOOD



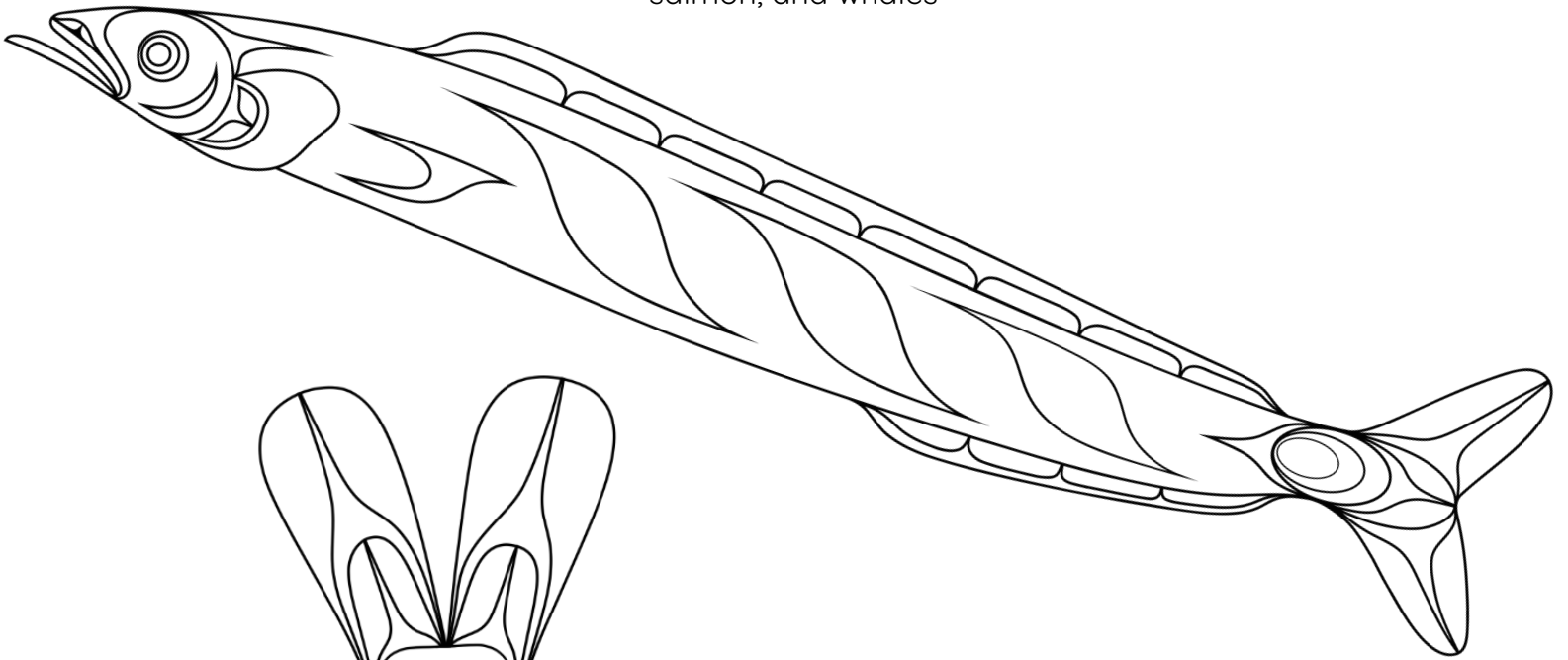
Flounder pa'is

The flounder is a **benthic** fish and a master of camouflage. It lies flat on the seafloor with both of its eyes on the upper side of its body.

A BUSY NEIGHBOURHOOD

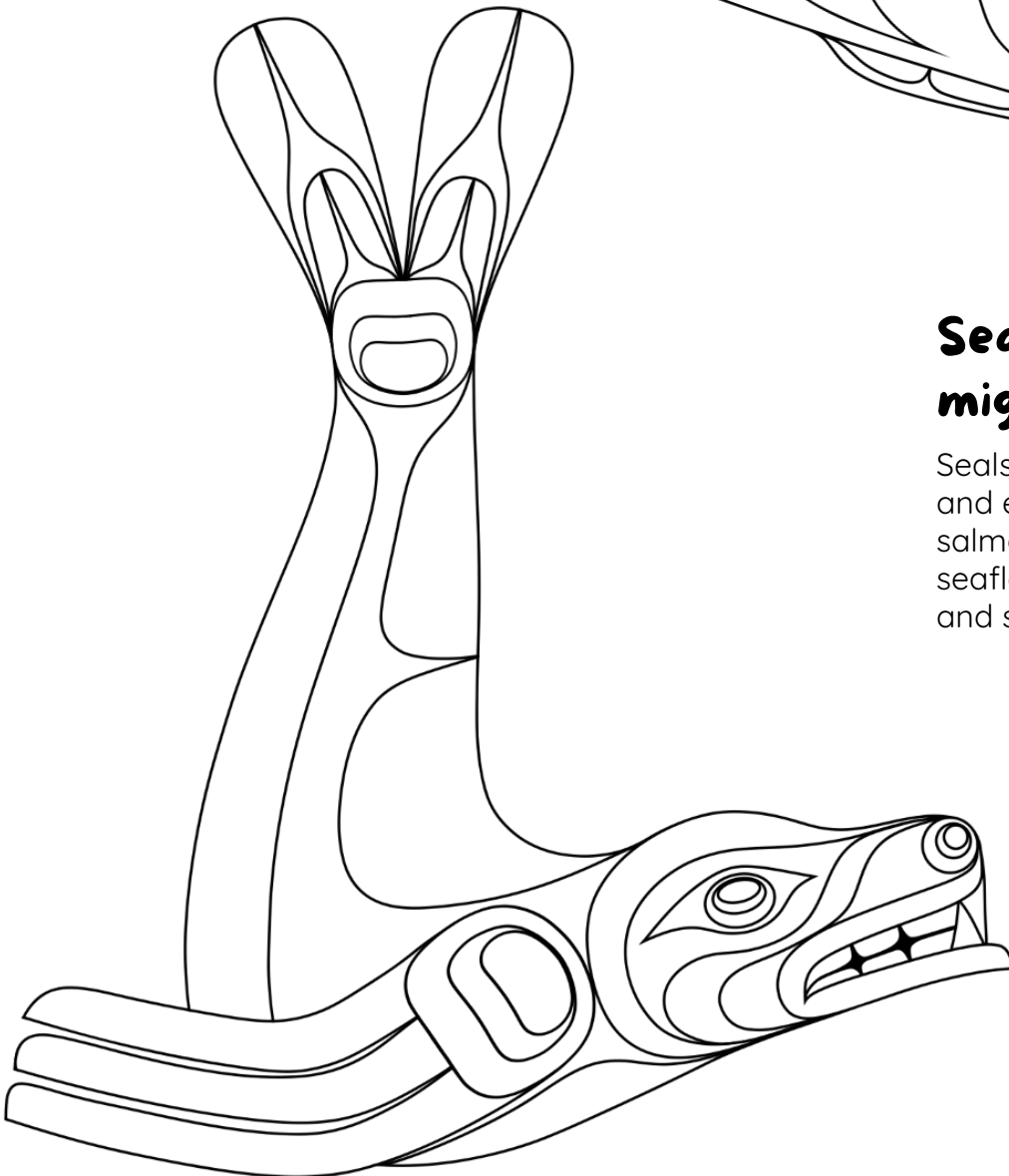
Sand lance

Sand lance, like herring, are forage fish, meaning they are small fish that are an important food source for many bigger animals like seabirds, salmon, and whales



Seal miguat

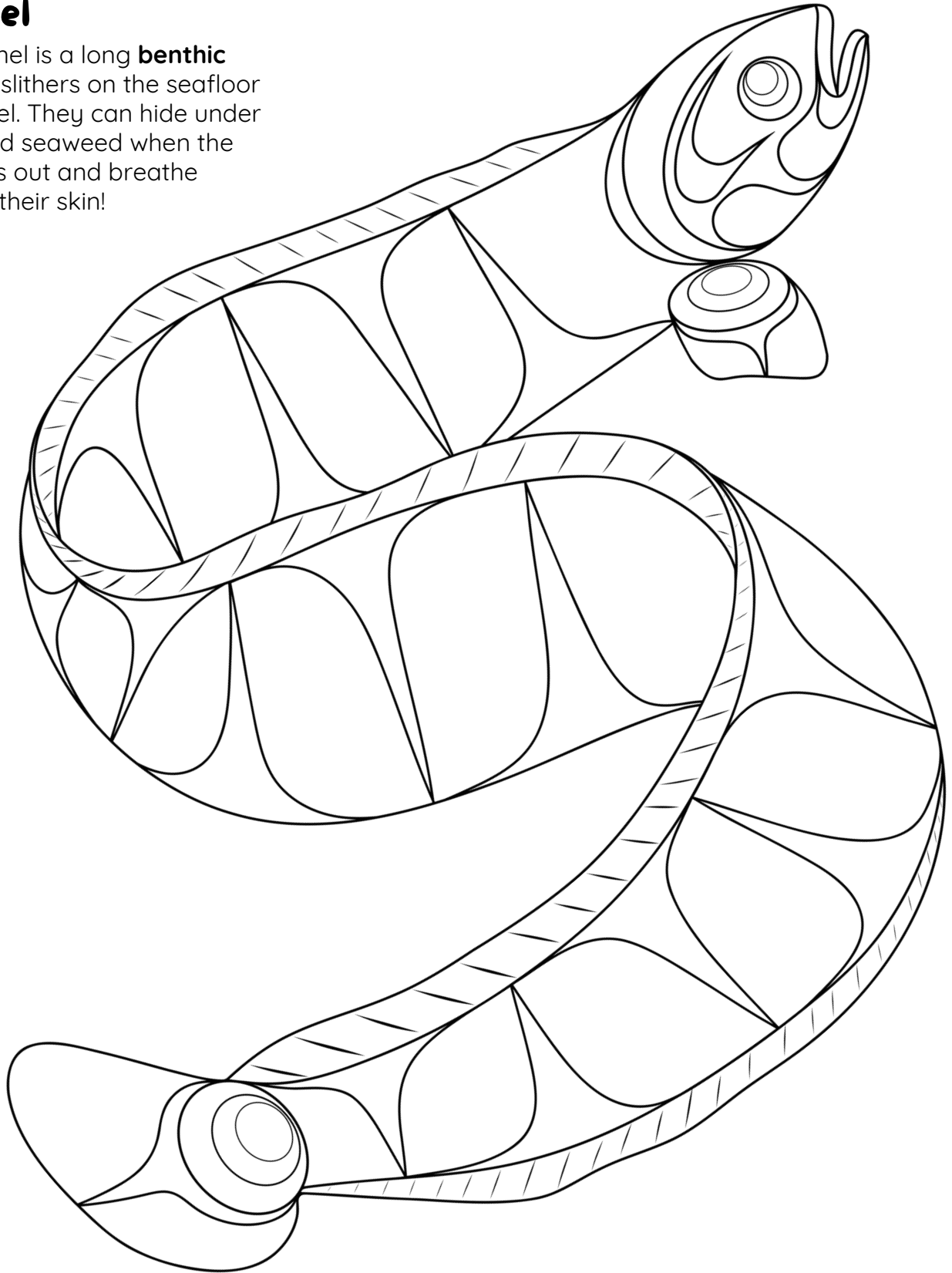
Seals swim in the open ocean and eat fish like herring and salmon, but will also go to the seafloor to hunt sand lance and shrimp.



A BUSY NEIGHBOURHOOD

Gunnel

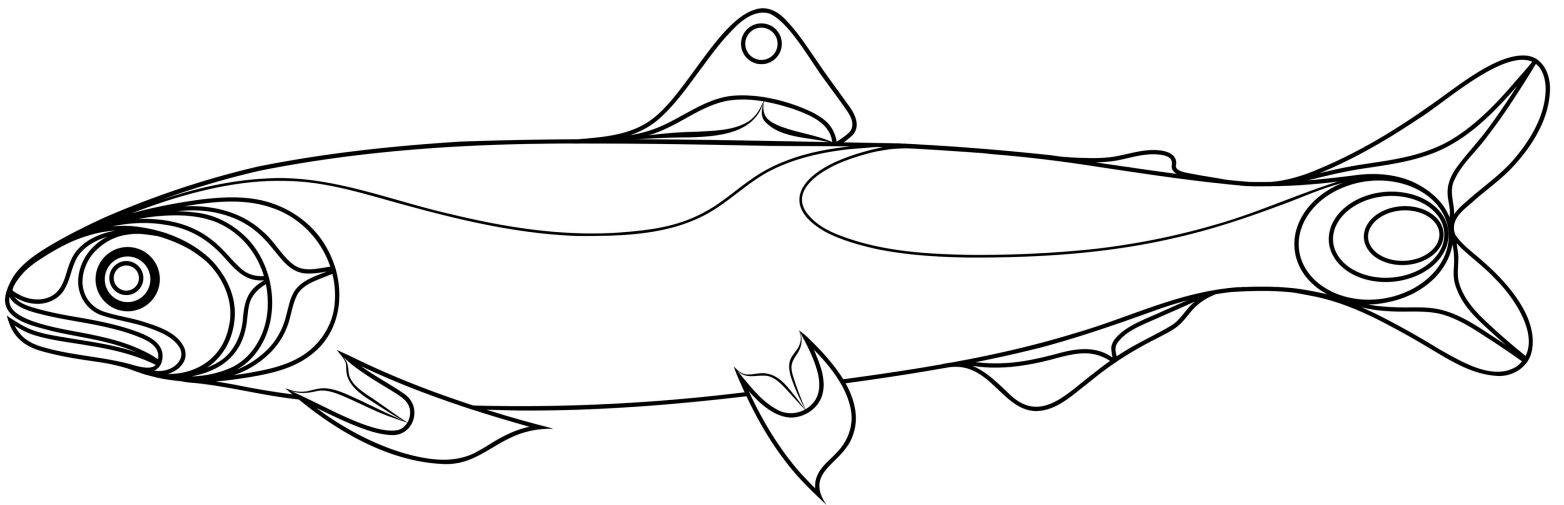
The gunnel is a long **benthic** fish that slithers on the seafloor like an eel. They can hide under rocks and seaweed when the tide goes out and breathe through their skin!



A BUSY NEIGHBOURHOOD

Chum smolt gwax'nis

Unlike other salmon that spend months in rivers, young chum salmon migrate to the sea almost immediately after hatching.



Comb jelly gagisama

Comb jellies are **pelagic** animals that float around in open water. They swim using tiny hair-like combs called cilia, which create a shimmering, rainbow disco-ball effect. Unlike other jellies, their tentacles do not sting!



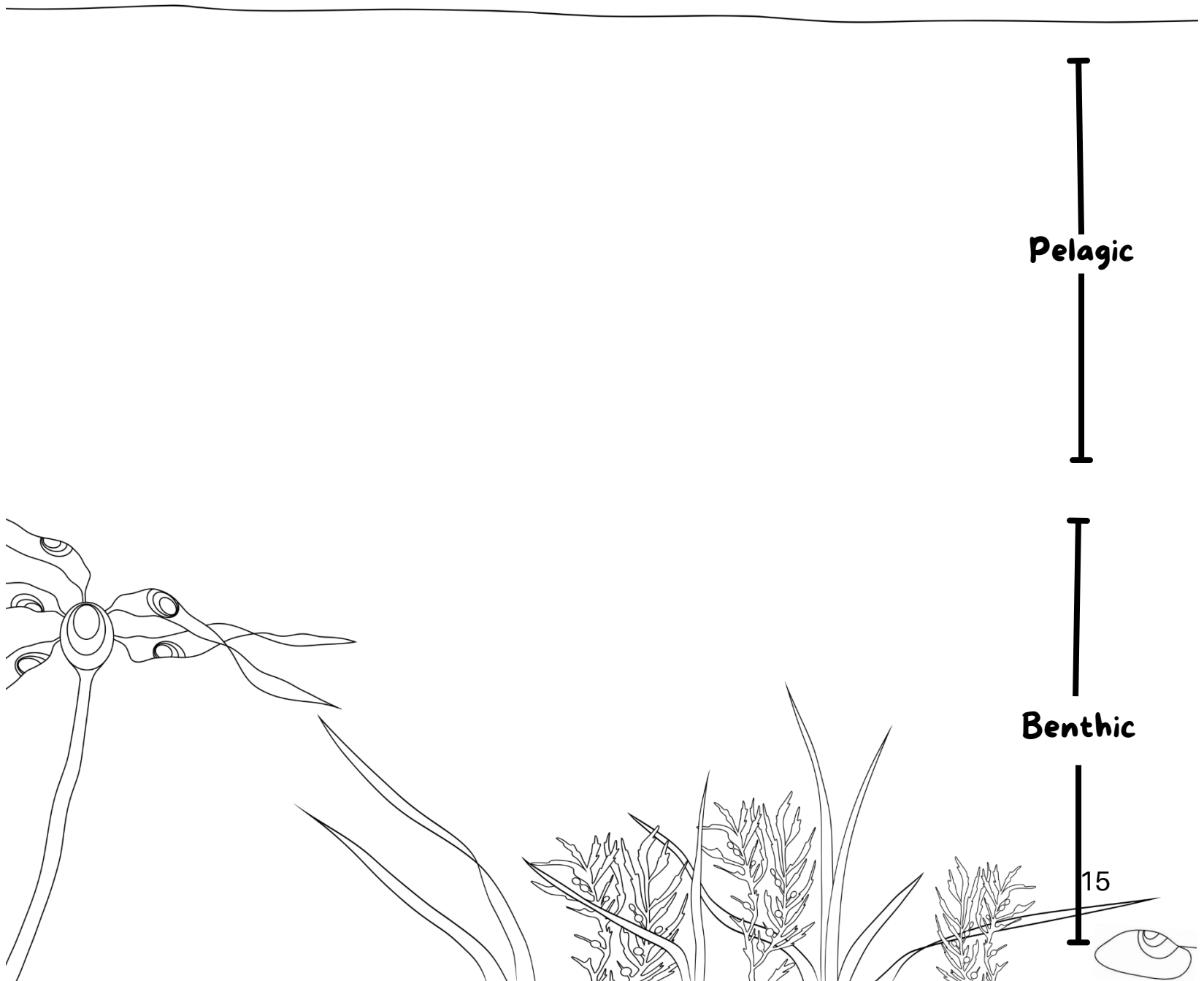
A BUSY NEIGHBOURHOOD

Have you ever heard the word **ecosystem**?

An **ecosystem** is a community where living things (plants, animals, microbes) interact with each other and their environment (sunlight, water, air) to survive.

Think of it as a "neighbourhood" where everyone relies on each other, ranging in size from a small puddle to a vast ocean.

Draw the animals you just met in the pelagic or benthic zone.

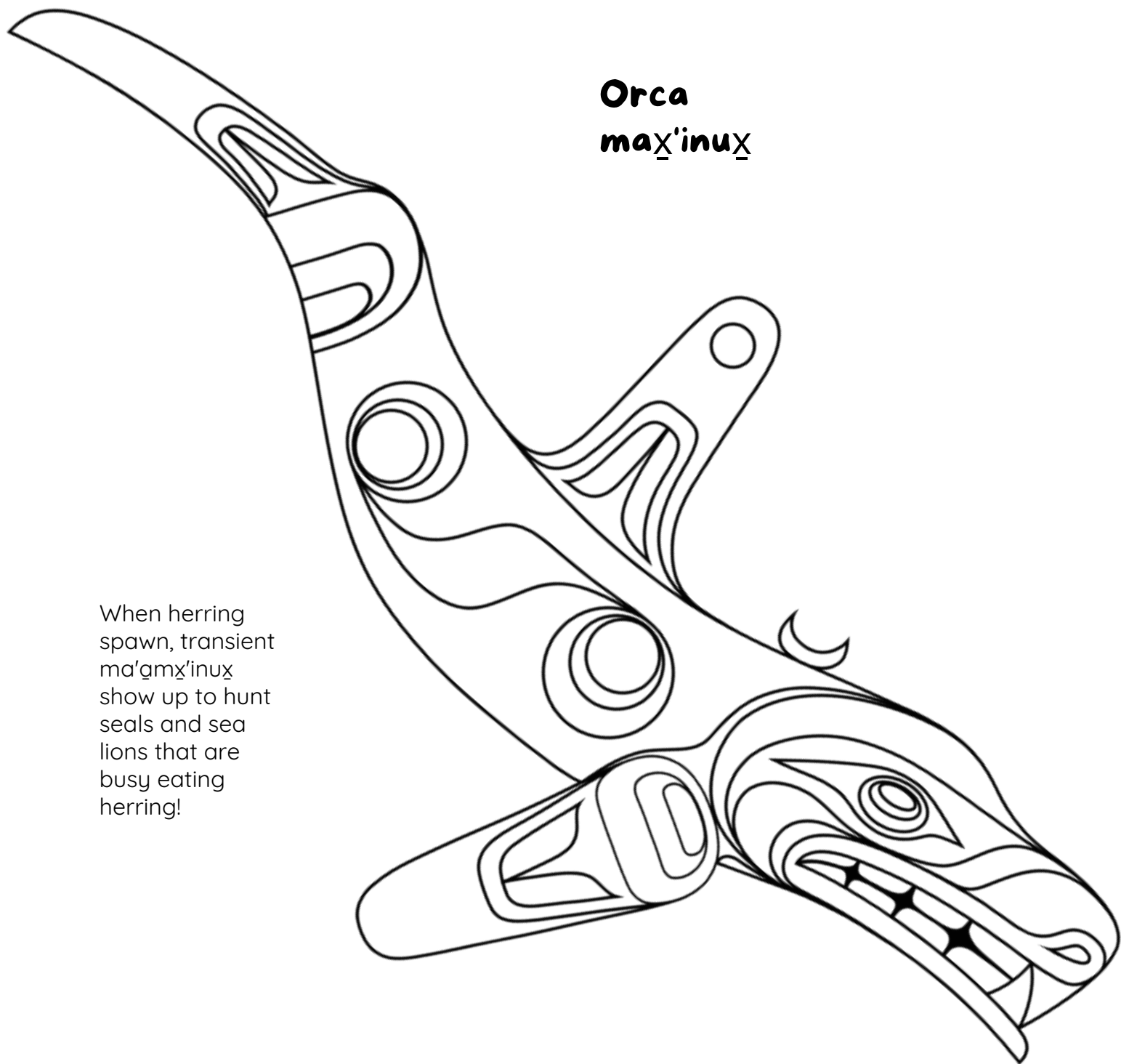


WHAT IS A FOOD WEB?

A **food web** shows who eats who in the **ecosystem**. Meet and colour more of the animals that live alongside the herring over the next few pages.

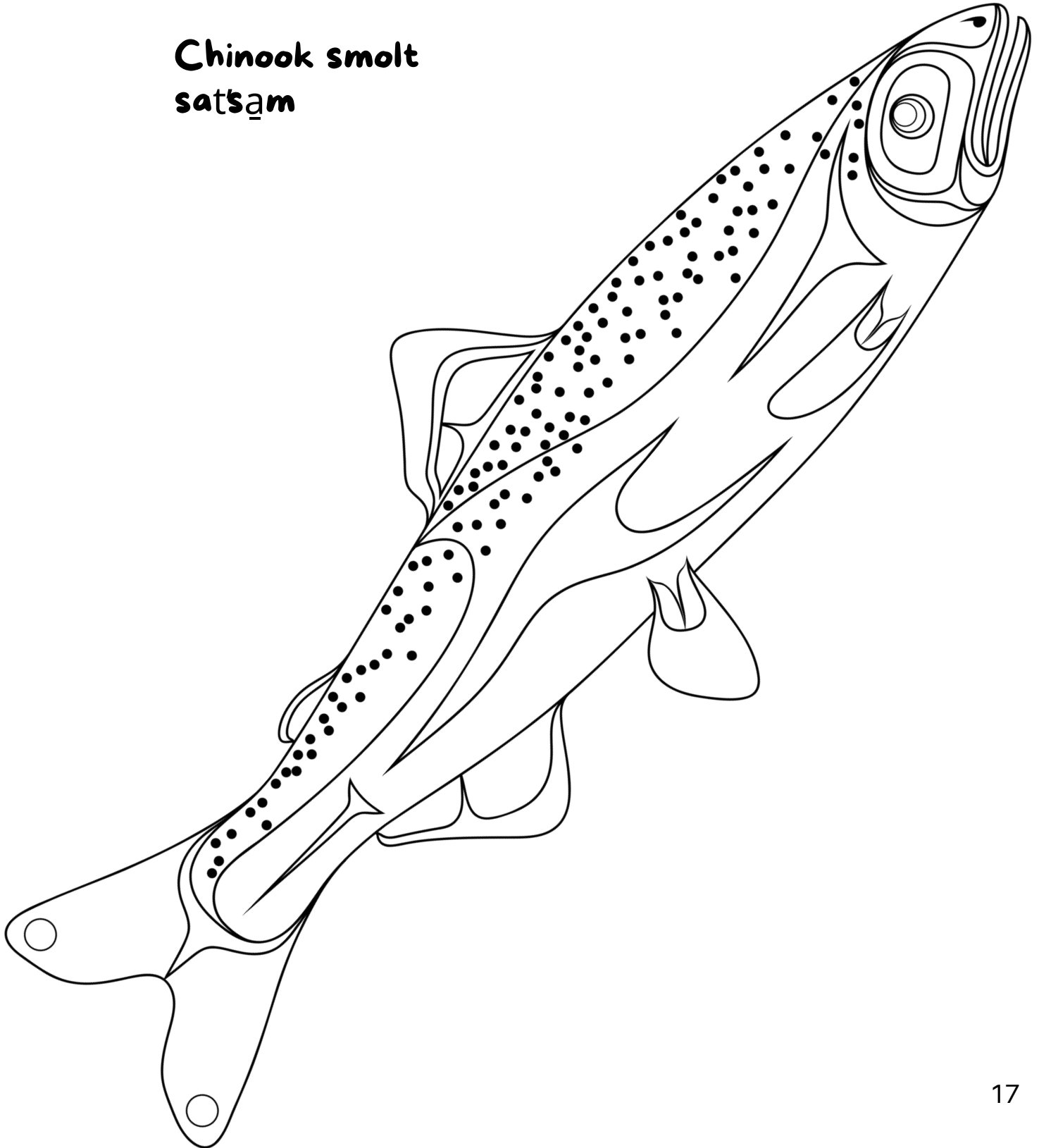
Orca
ma'x'inu_x

When herring spawn, transient ma'gmx'inu_x show up to hunt seals and sea lions that are busy eating herring!

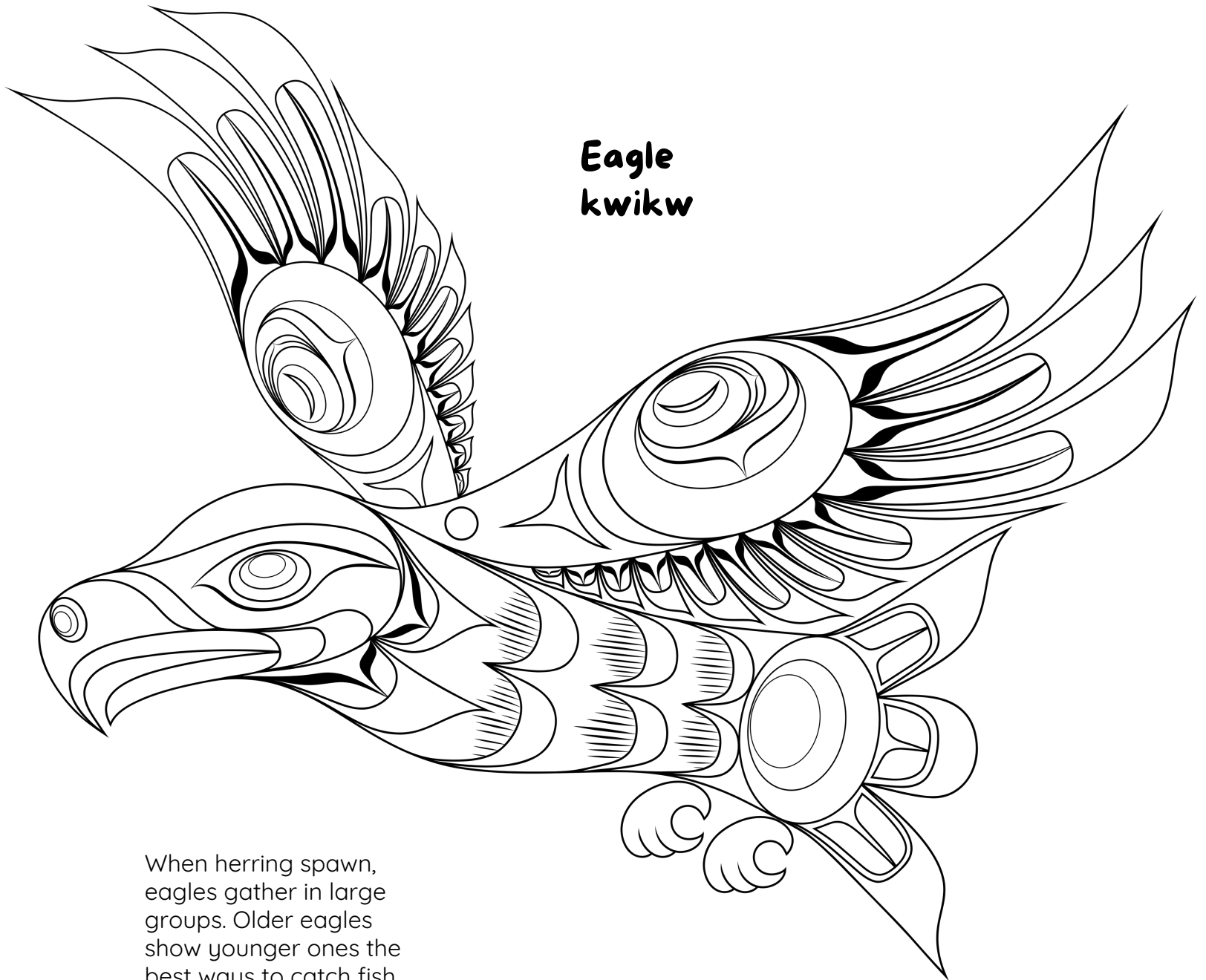


WHAT IS A FOOD WEB?

Chinook smolt
satsam

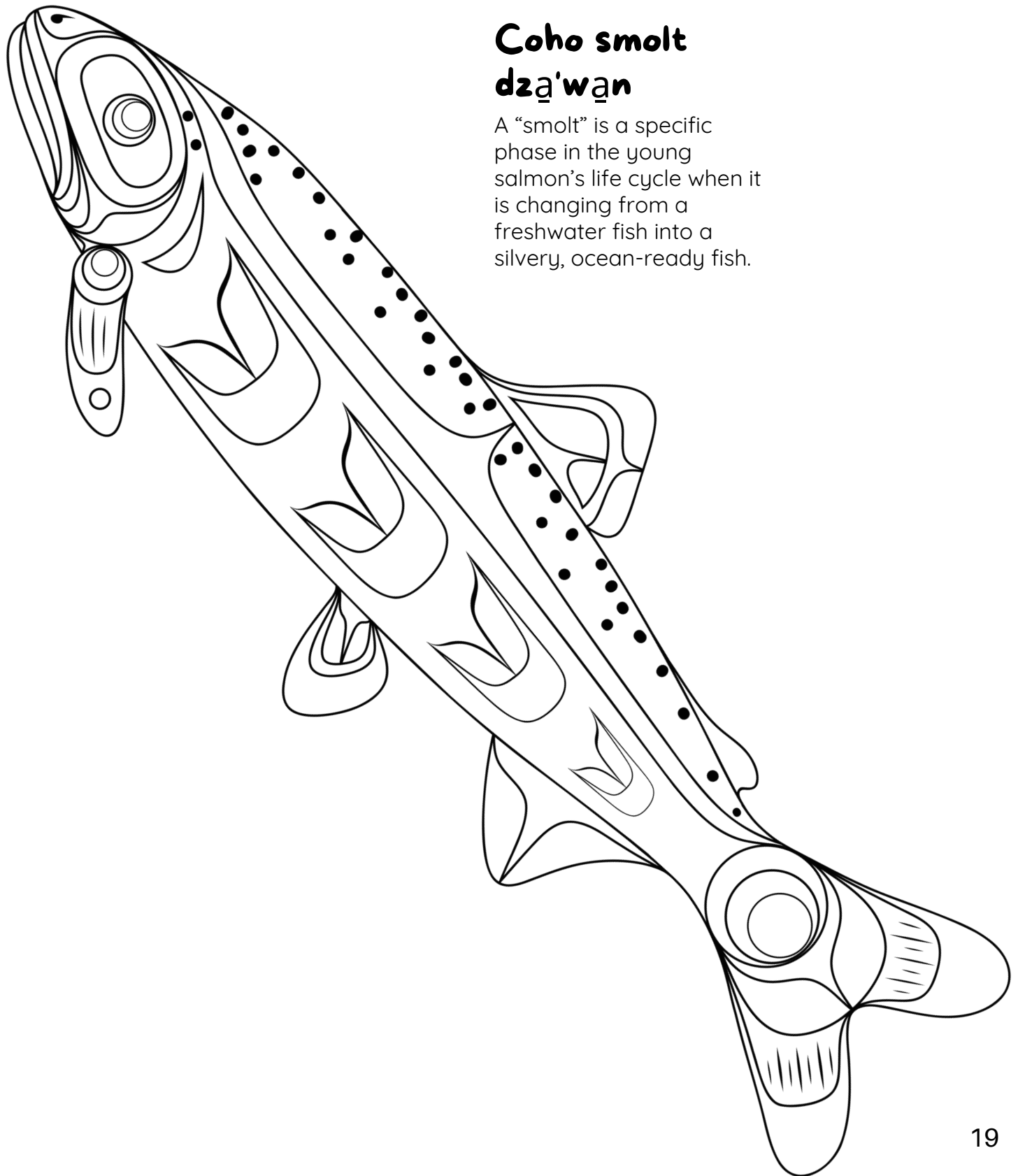


WHAT IS A FOOD WEB?



When herring spawn, eagles gather in large groups. Older eagles show younger ones the best ways to catch fish, helping them learn how to hunt.

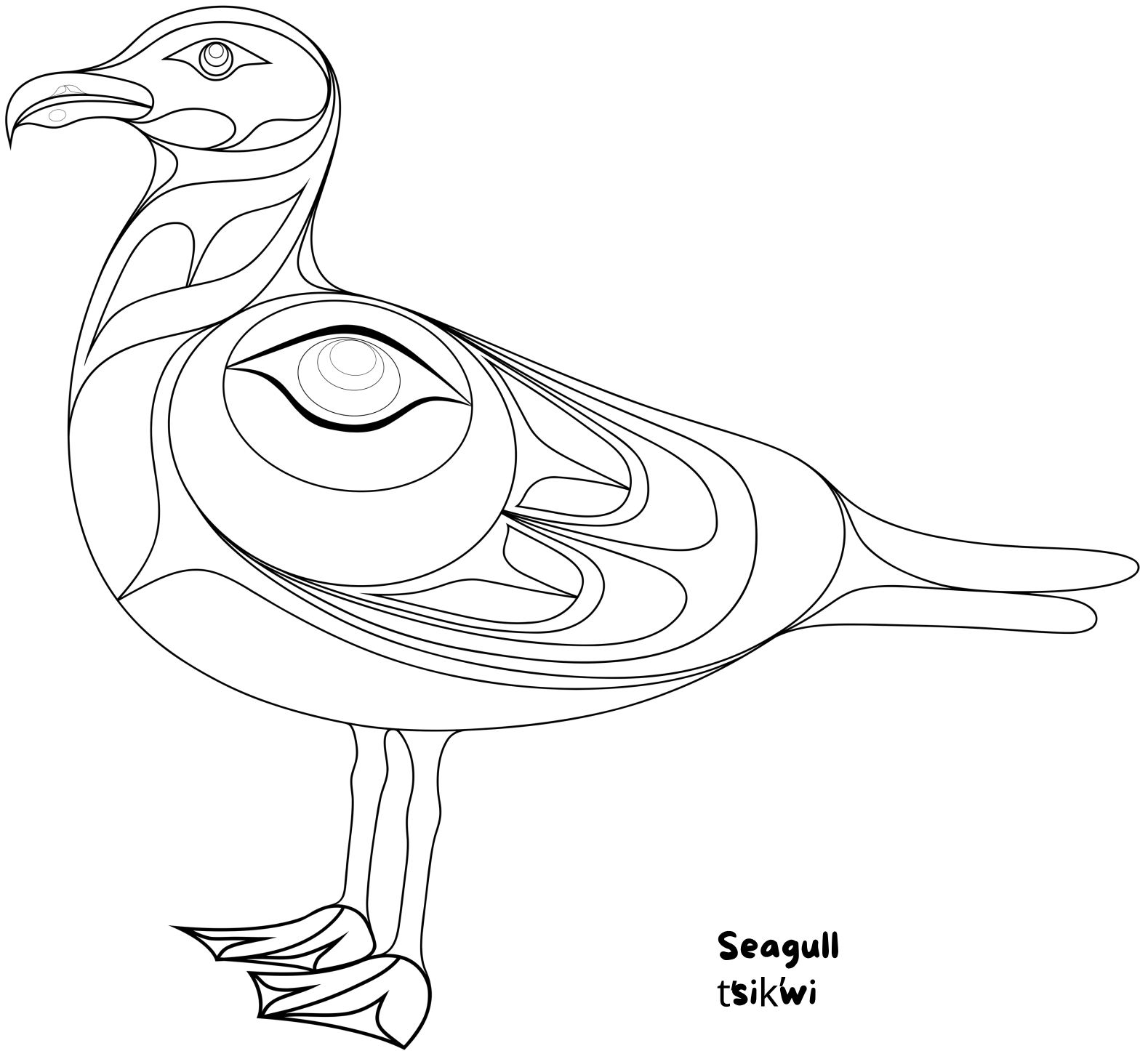
WHAT IS A FOOD WEB?



Coho smolt **dza'wan**

A “smolt” is a specific phase in the young salmon’s life cycle when it is changing from a freshwater fish into a silvery, ocean-ready fish.

WHAT IS A FOOD WEB?

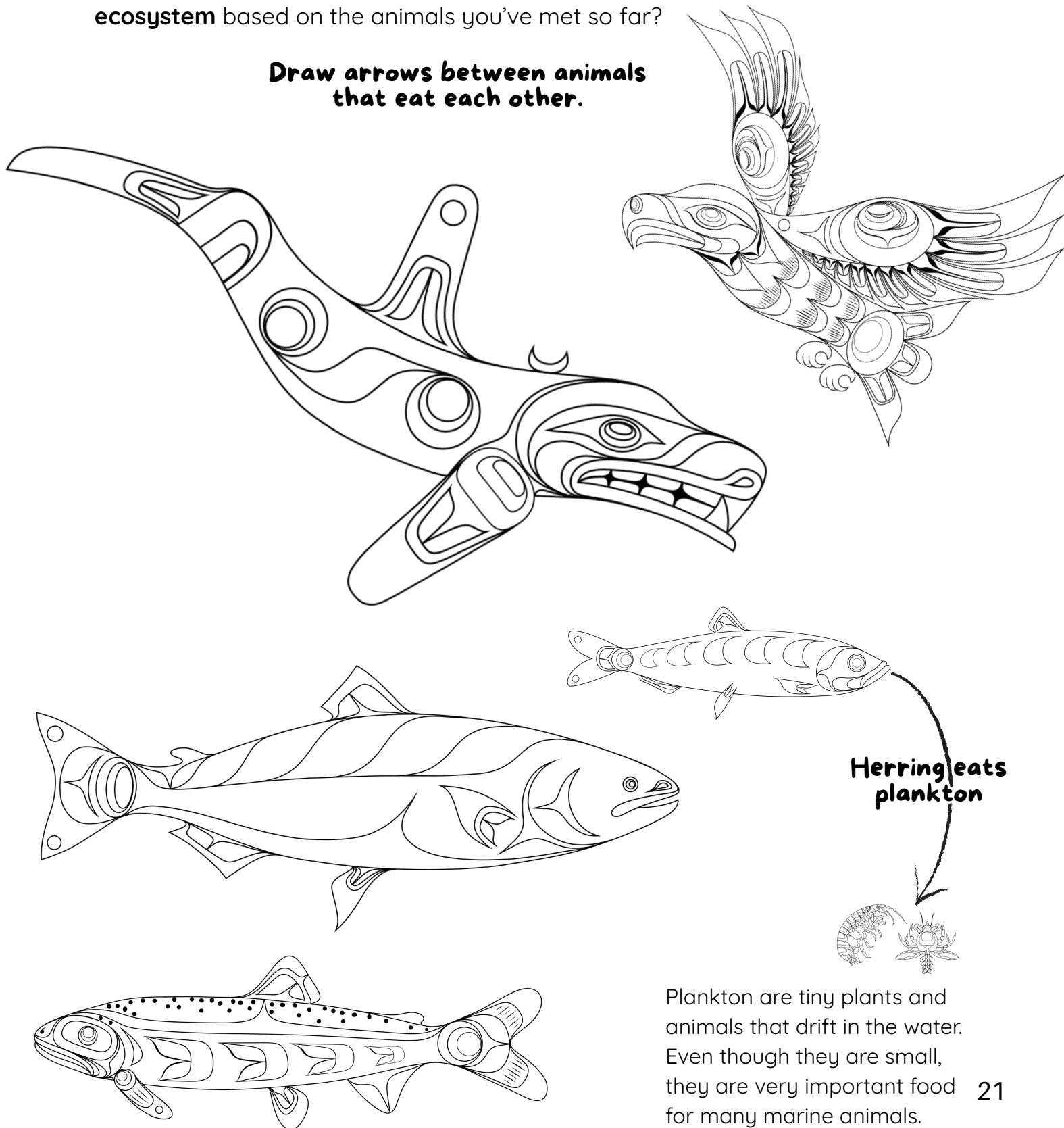


Seagull
tsik'wi

WHAT IS A FOOD WEB?

Who is part of the marine **food web**? Who do you think eats who in the **ecosystem** based on the animals you've met so far?

Draw arrows between animals that eat each other.



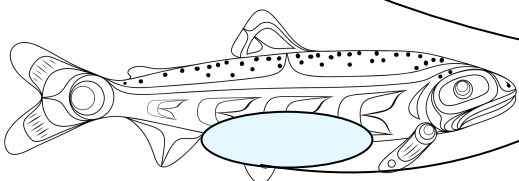
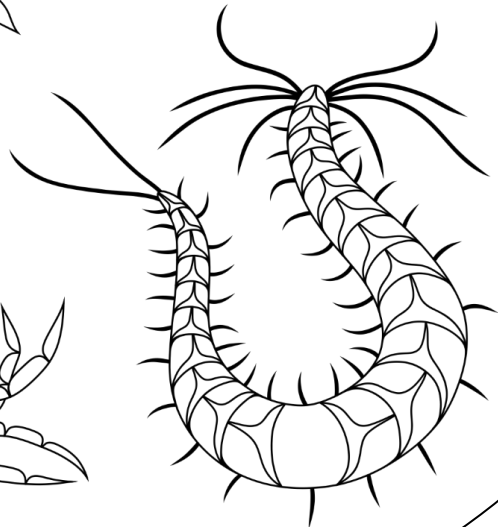
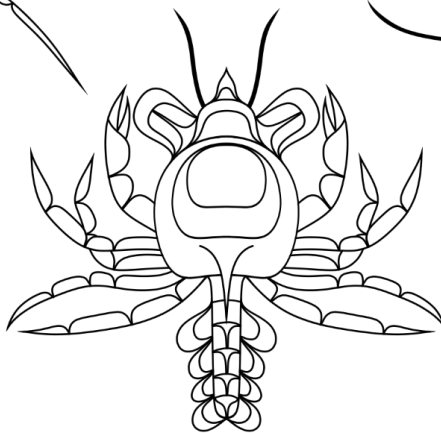
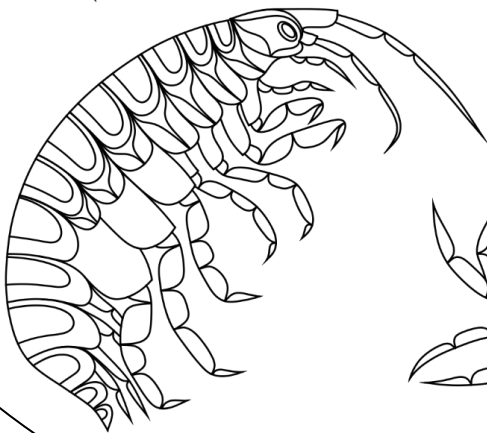
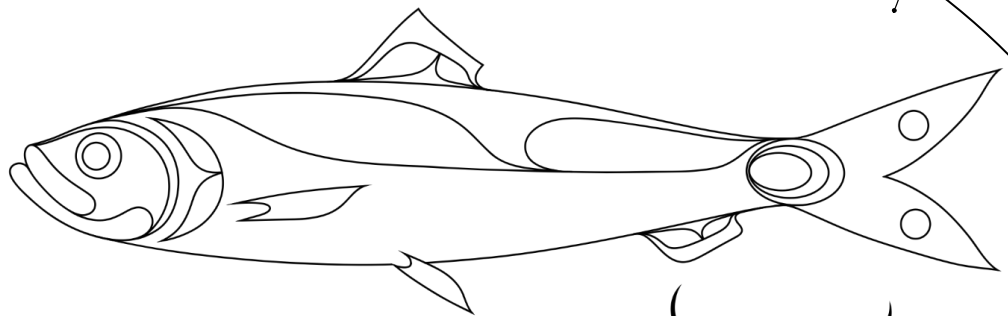
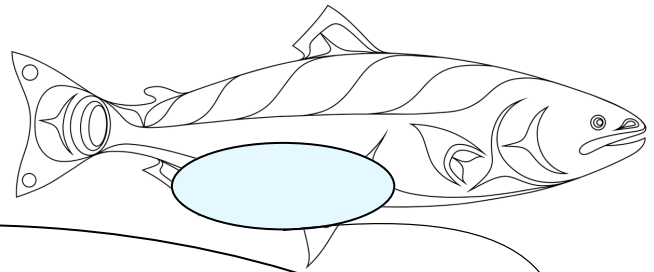
Herring eats plankton

Plankton are tiny plants and animals that drift in the water. Even though they are small, they are very important food for many marine animals.

WHAT DO SALMON EAT?

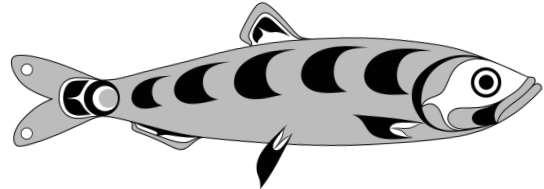
The salmon is an important animal in the **ecosystem** - and yes, they eat herring! Your Nation marine teams and biologists at the Pacific Salmon Foundation and University of Victoria are studying salmon diets to learn more about the **food web**. Herring are one of the most important foods for both young and adult Chinook and coho salmon. They also eat young squid, larval crabs, and other invertebrates!

Colour this healthy salmon meal.



CHECK IN: WHY DO HERRING MATTER?

Fill out the blanks below, and then check your answers on page 33.

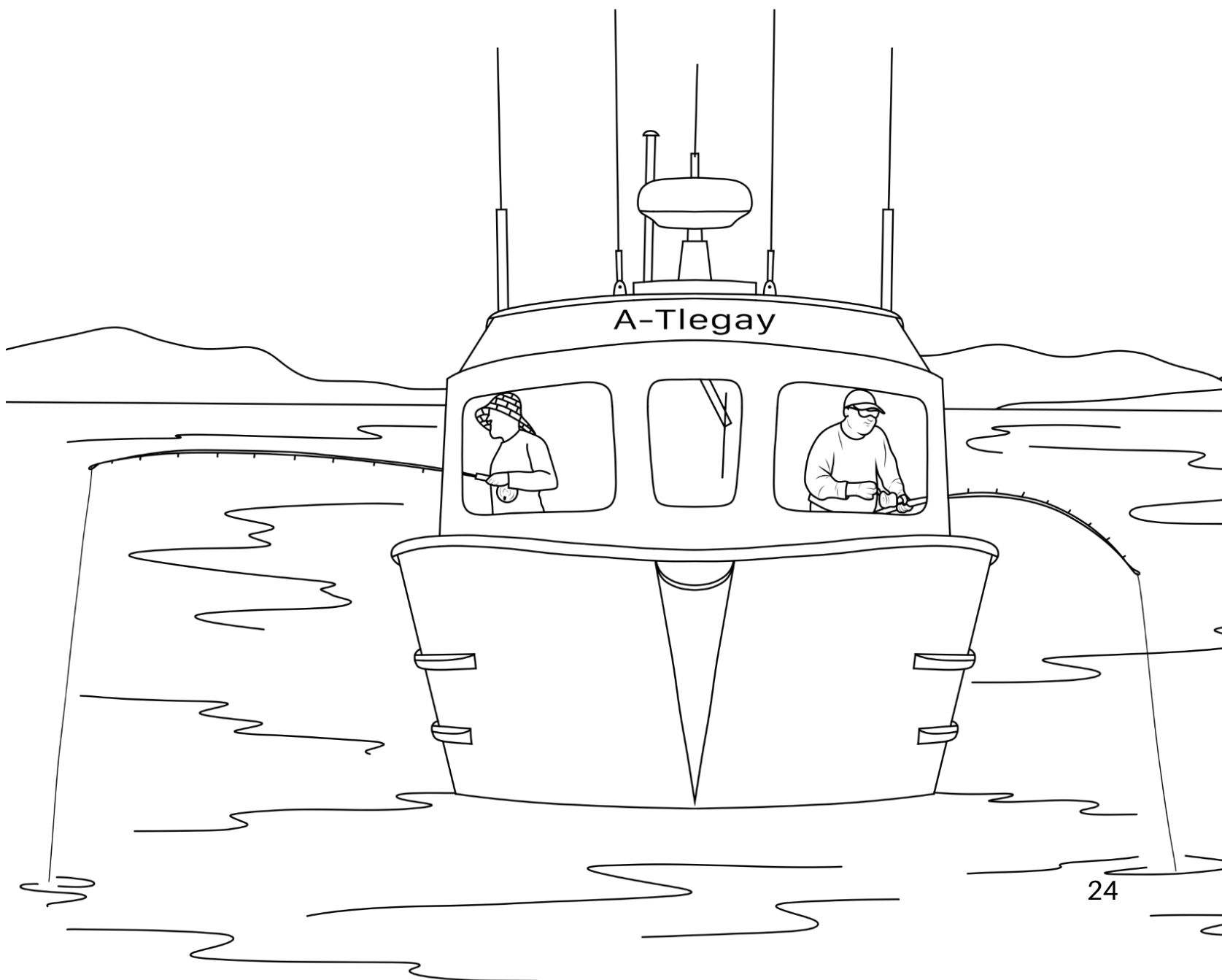


- 1** Herring are important because they act as _____ for animals like salmon, eagles, and orcas.
- 2** In the marine _____ herring eat _____.
- 3** Another word for a neighbourhood where living things interact is an _____.
- 4** Animals that live at the bottom of the ocean are _____.
- 5** The Kwákwala name for herring is _____.

WORKING TOGETHER ON THE WATER

First Nations have observed and shared knowledge about herring for generations. The A-Tlegay Fisheries Society is working together with biologists and community members to care for herring, salmon, and their **ecosystem**.

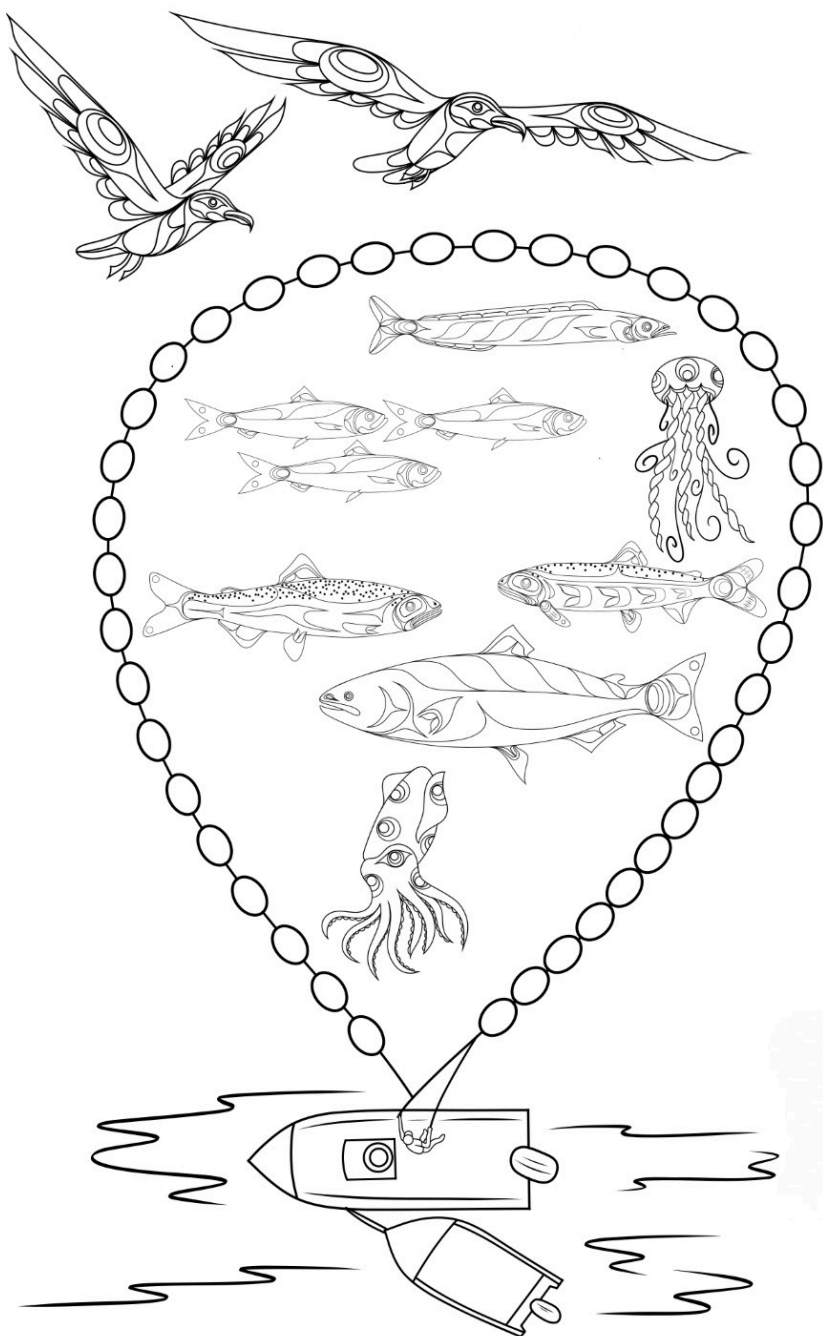
Draw yourself helping the A-Tlegay Fisheries Society Marine Team.



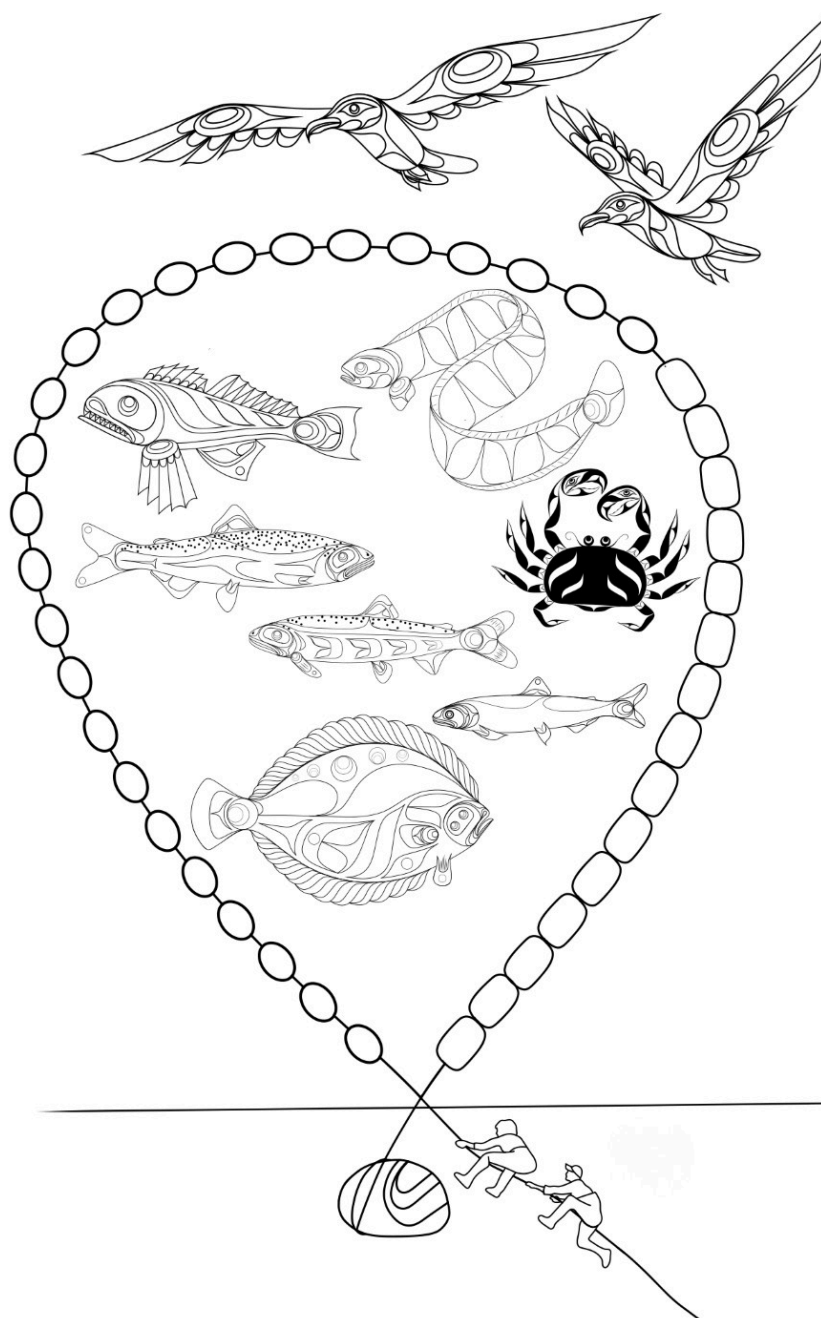
CATCHING SALMON

Below are two types of nets that your Nation marine teams have used to catch salmon – the beach seine net catches younger salmon coming out of the rivers, and the purse seine net catches larger salmon as they go into deeper waters.

Can you circle the 7 differences in the image on the right? Check your answers on page 33.



Purse Seine Net



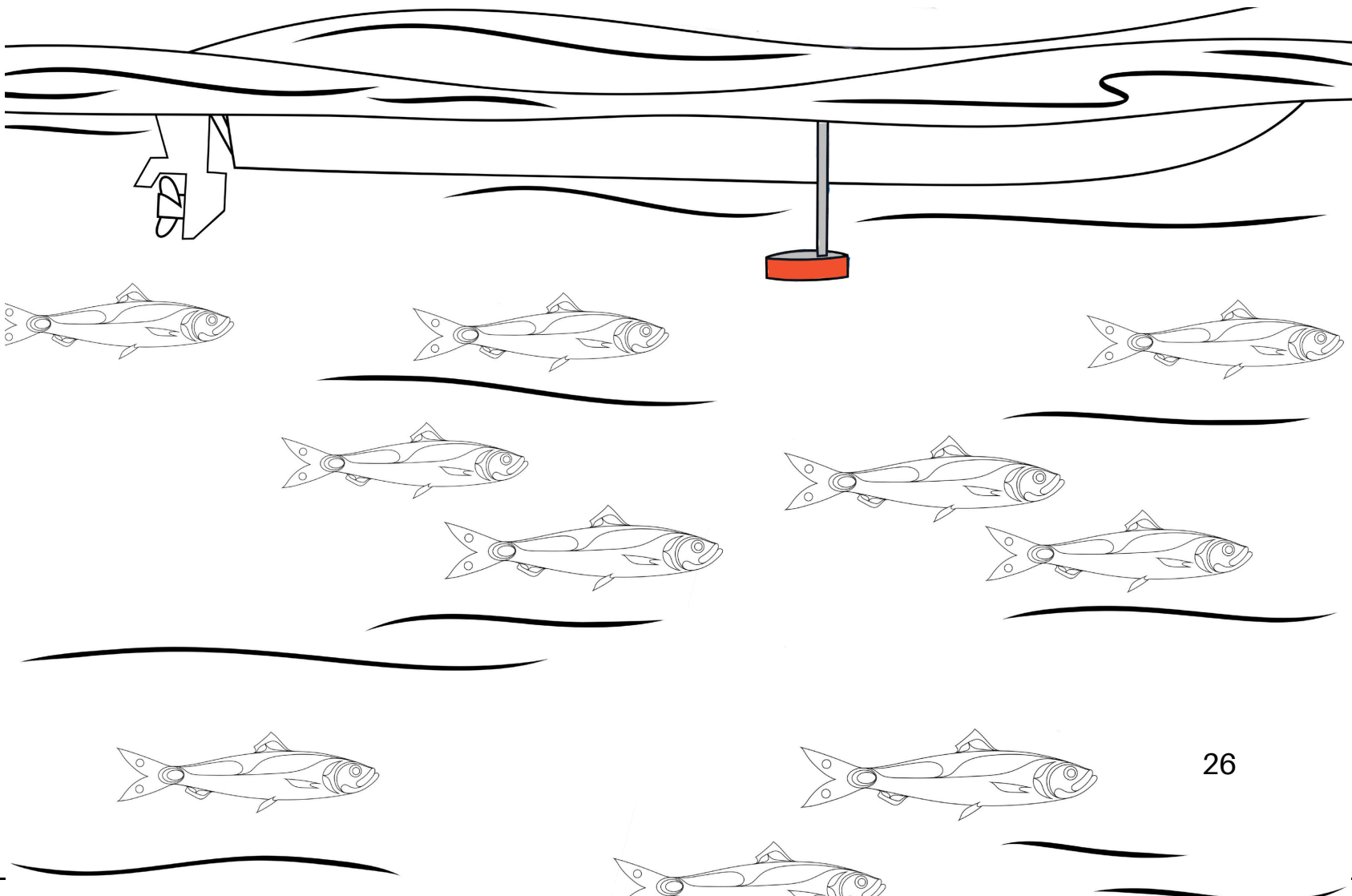
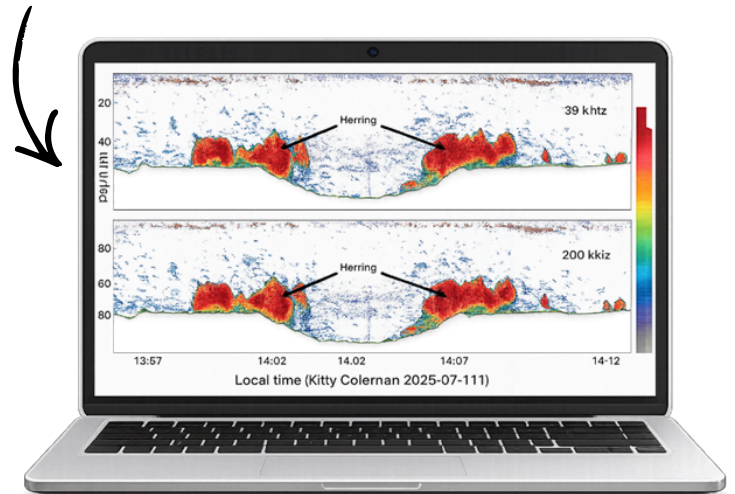
Beach Seine Net

LISTENING UNDERWATER

Sound helps biologists find fish underwater. **Hydroacoustic** equipment (hydro – meaning water, and acoustic – meaning sound), sends sound waves into the water, which bounce off fish. When sound waves bounce off fish, we can detect how many fish are gathered in an area by looking at the laptop that is connected to the equipment.

Do you see the hydroacoustic equipment poking into the water from the boat?

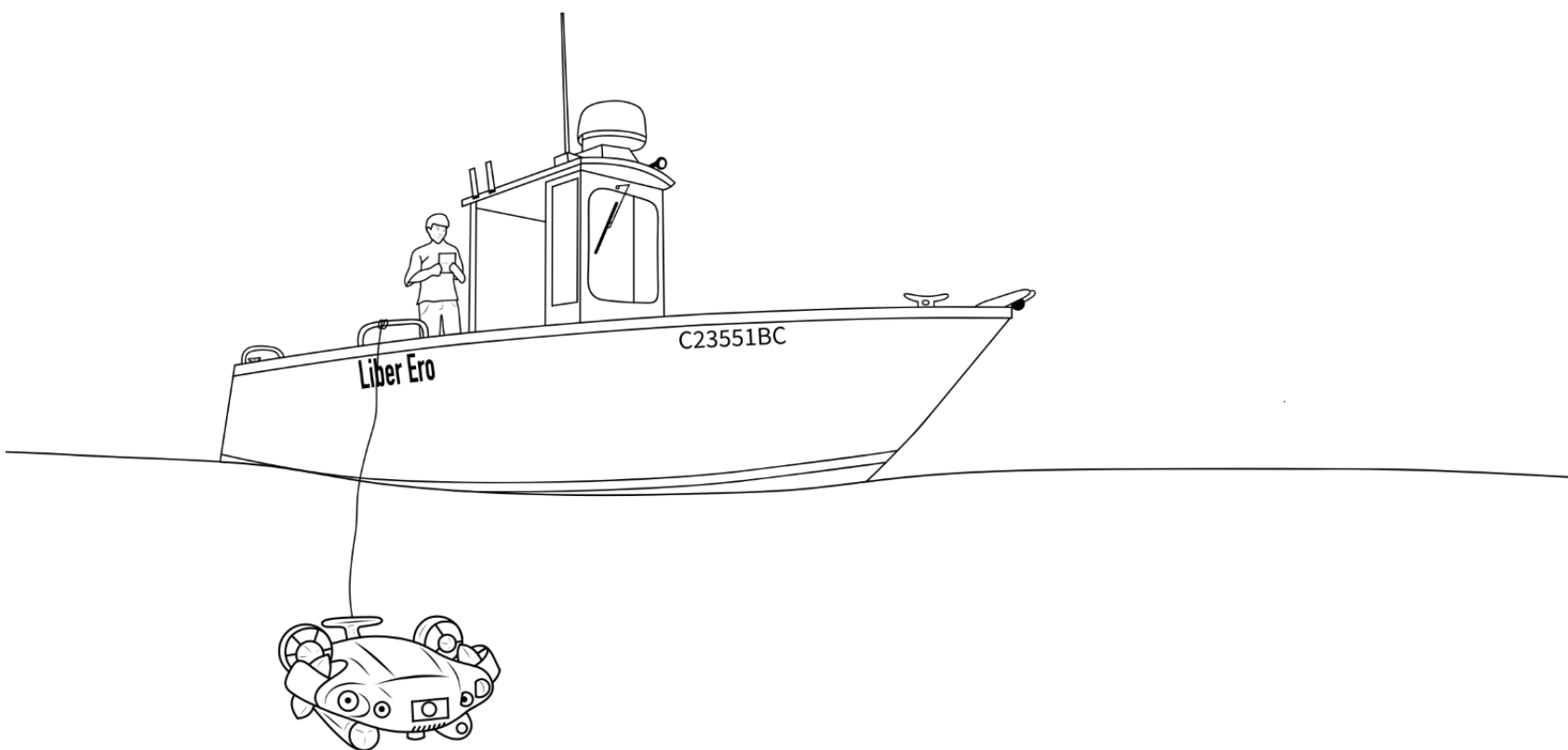
Draw sound waves down towards the herring so that we can locate them.



LOOKING UNDERWATER

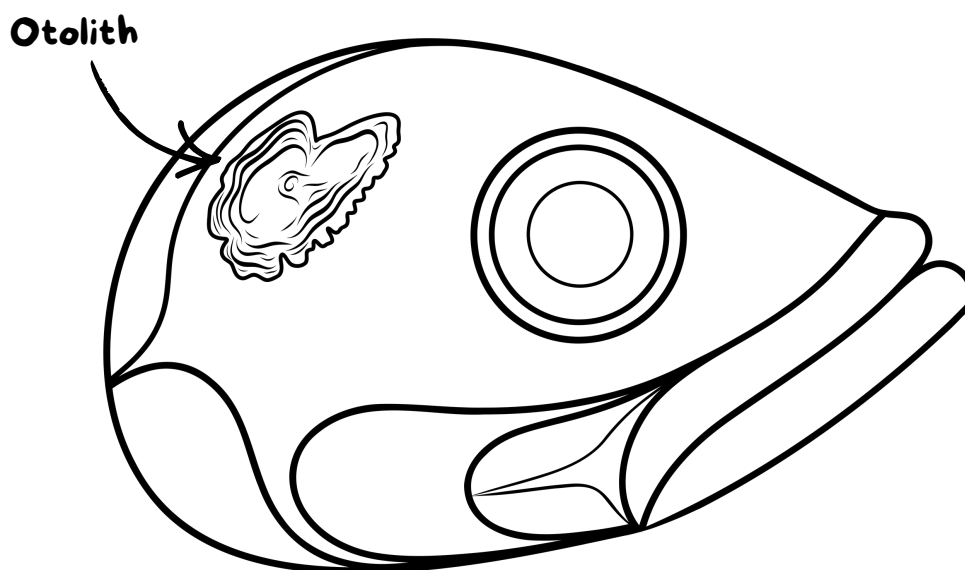
We mentioned healthy and not-so-healthy habitats for baby herring earlier - how do we know what it looks like for herring under the water? Biologists use a small underwater robot called a Remotely Operated Vehicle, or "ROV", to see where herring eggs land underwater.

Can you circle all of the eggs you see and draw the herring that are spawning.

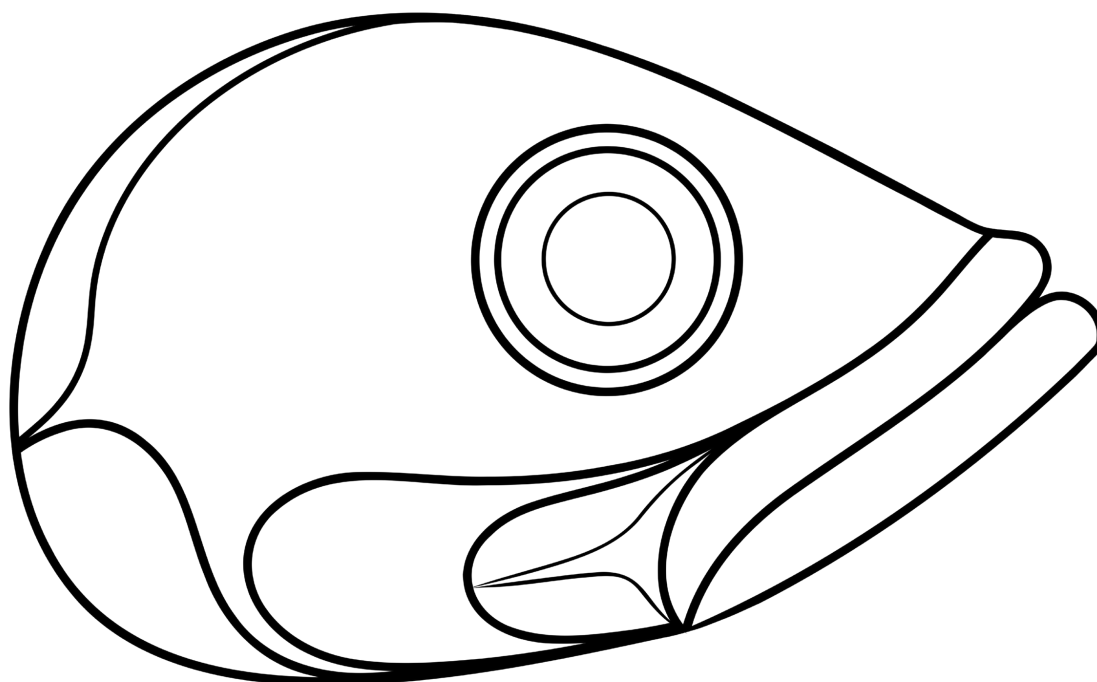


WHERE DO THEY GO?

Fish have tiny ear stones (called “otoliths”) that help them hear. As the fish grows, the otolith grows in rings like a tree, and keeps a record of where the fish has been. These structures have shown biologists that some herring leave to find food in the summer, while others stay in the Strait of Georgia all year.



Can you draw an otolith in this fish's head?

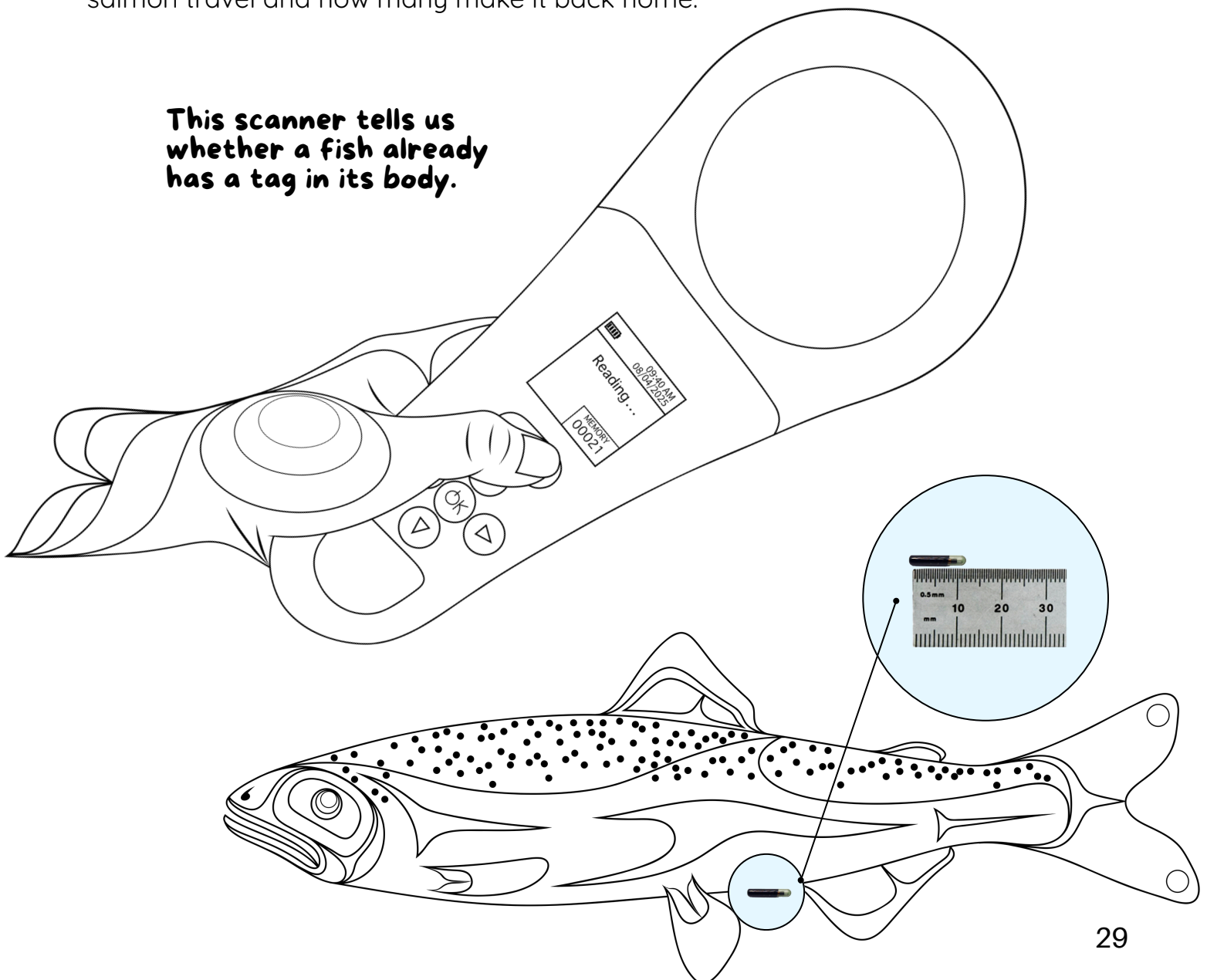


WHERE DO THEY GO?

Salmon travel great distances during their lifetimes - hatching in the river, heading out to the ocean, and then returning to the river as adults to **spawn**. To see where salmon go, biologist and your Nation Marine Teams tag some of the salmon they catch with a tiny microchip called a Passive Integrated Transponder tag, or “PIT” tag.

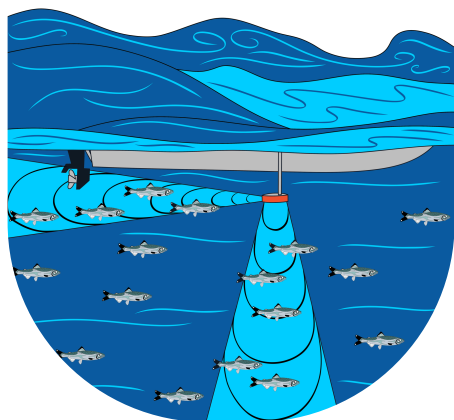
The tag is about the size of a grain of rice and is gently placed inside the salmon’s body. When the salmon swims past special scanners in the river, the tag sends a signal that tells biologists which fish it is. This helps us learn where salmon travel and how many make it back home.

This scanner tells us whether a fish already has a tag in its body.

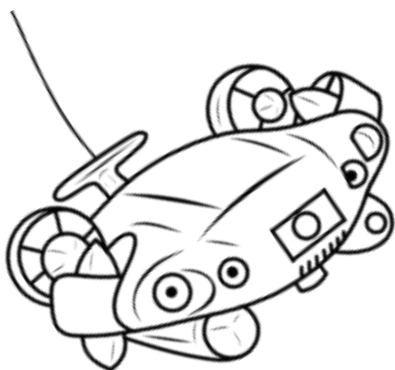


TEST YOUR KNOWLEDGE

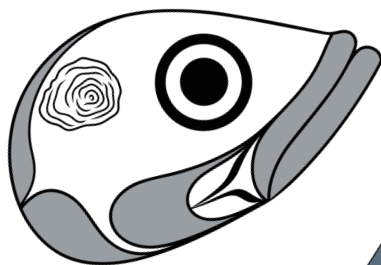
How do we study salmon and herring on this project? Connect the below questions to the tool that would help you answer it. Find the answers at page 33.



Where do the herring go?



Does the habitat look healthy?



Where do the salmon go?



How many fish are gathered in an area?

SHARING FOOD AND KNOWLEDGE

Food fills our stomachs and brings us together. Food from the land and waters connects us not only to each other, but to our surroundings. Smoking salmon and herring is one way that people like to prepare food, and is deeply rooted in tradition.



DO WHAT YOU CAN!

Like all beings in the **ecosystem**, we depend on each other. Even small actions - like keeping beaches clean, learning about marine life, and sharing what you know - can help protect salmon, herring, and their homes. When herring are healthy, the whole ocean thrives!



CHECK YOUR ANSWERS:

Fill in the blanks Page 23

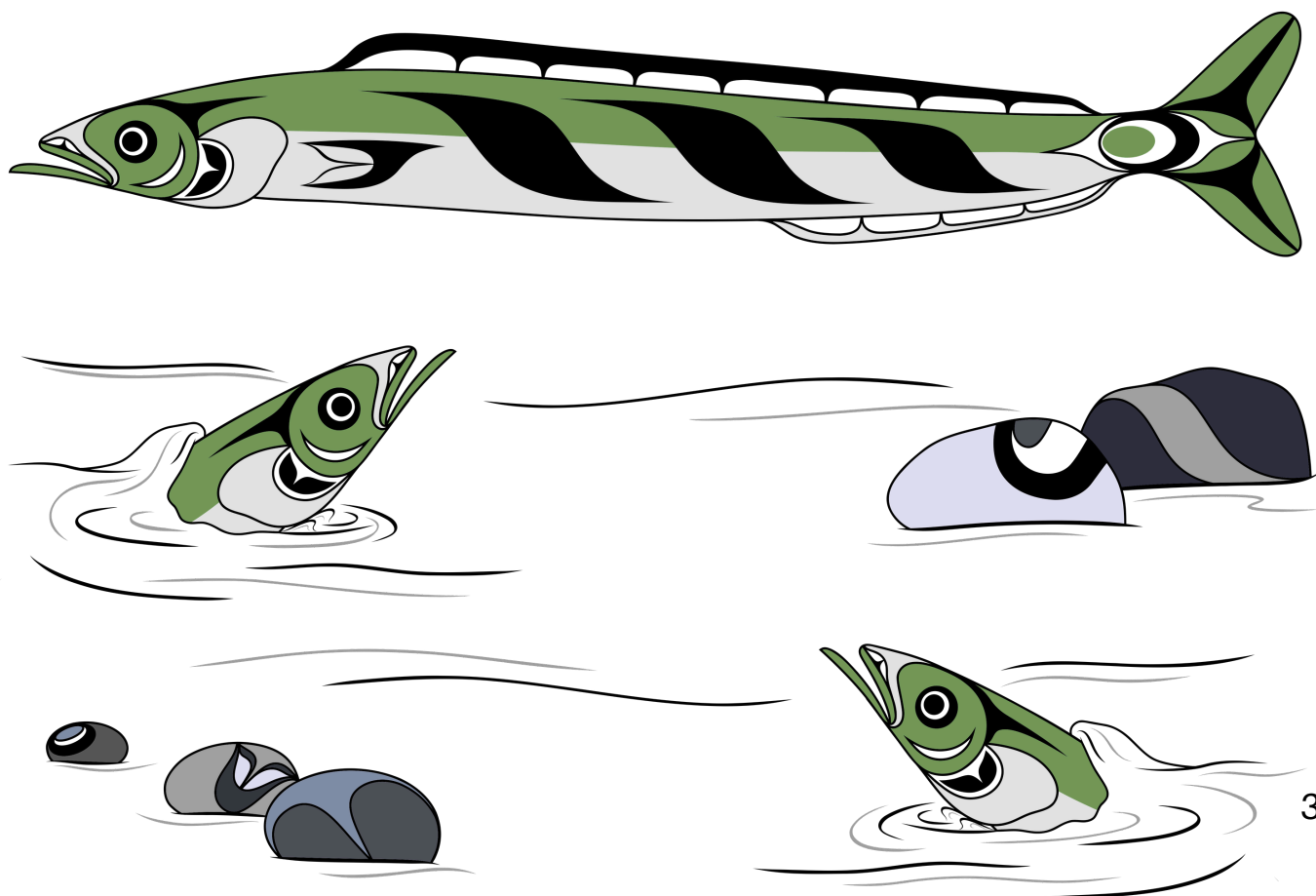
- 1) food
- 2) food web, plankton
- 3) ecosystem
- 4) benthic
- 5) wa'ne'

Connect the questions Page 30

- 1) Where do the herring go - otolith
- 2) Does the habitat look healthy - ROV
- 3) Where do the salmon go - PIT tag scanner
- 4) How many fish are gathered in an area - Hydroacoustic equipment on vessel

Find the differences Page 25

- 1) gunnel in the beach seine
- 2) sculpin in the beach seine
- 3) crab in the beach seine
- 4) flounder in the beach seine
- 5) chum smolt in the beach seine
- 6) net pulled from the beach
- 7) different floats on net



ABOUT THE ARTIST

Jessica is a Lekwiltok native artist born in 1982 from the Cape Mudge Band (We Wai Kai). Jessica is the great granddaughter of the late hereditary chief Johnny Chickite, daughter of Max and Barbara Chickite. Jessica currently lives in Campbell River with her husband and two children. She has been known to follow in her father's footsteps since the age of 9, when she won her first native art contest. Jessica utilizes many of the techniques taught by her father but has grown to develop a unique style of her own. She uses paper, wood, canvas and deer hide drums as mediums for her art. She does a lot of mural work throughout the community, schools, and had the honour of being chosen to design and paint the front of house design on the mini big house at our local college.

Jessica recently has started doing art full time, this has been her dream to be able to create art full time as a living. Last year Jessica started working on digital art and designing logos for local businesses. She also gets asked to work within the school district quite often, sharing her art and exposing the children to the First Nations culture. She feels this is very important to do, to keep the culture going for the next generations to come.

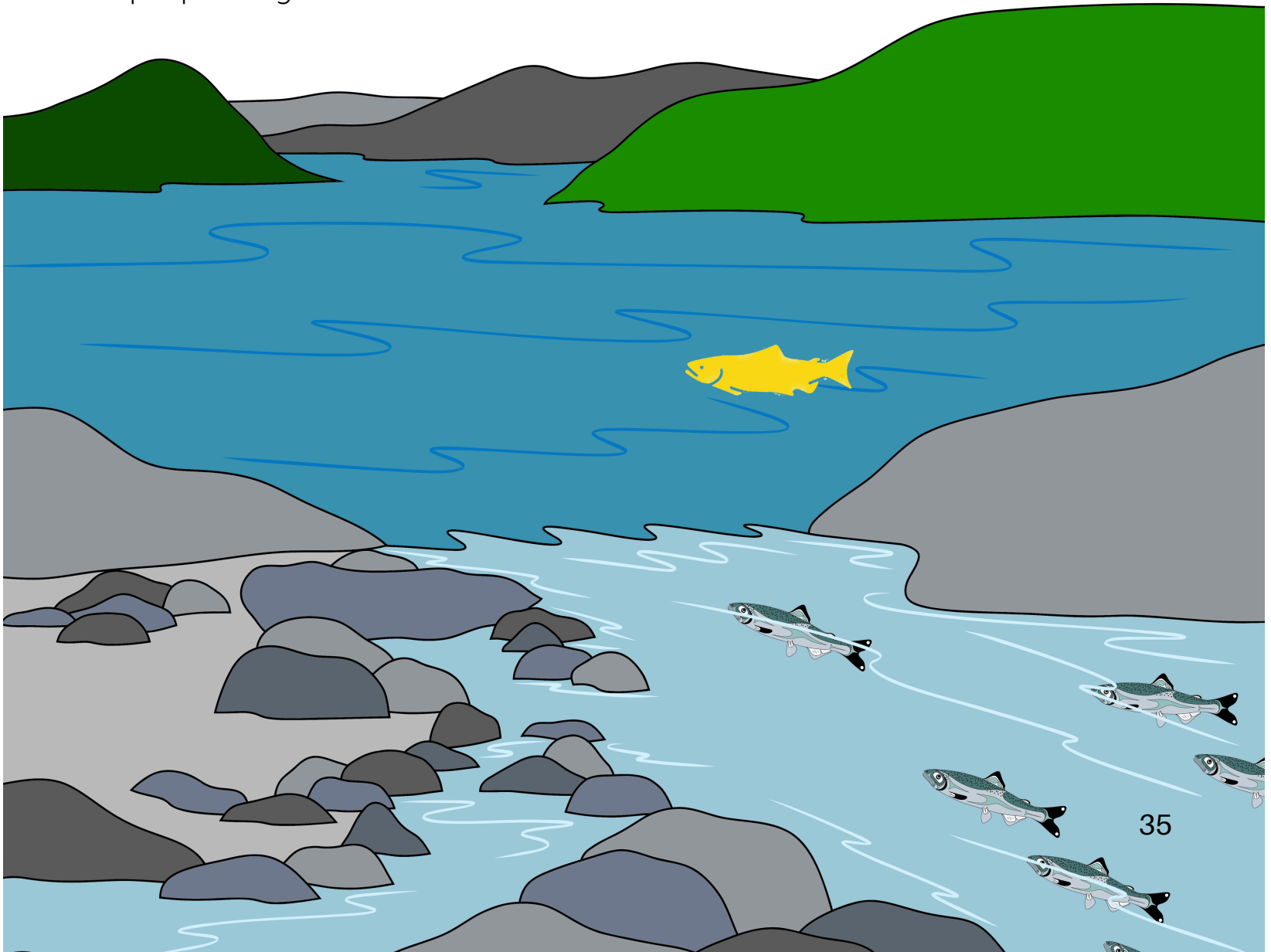


EMAIL: JESSICACHICKITE@HOTMAIL.COM

THANK YOU FROM THE PACIFIC SALMON FOUNDATION

The Pacific Salmon Foundation, founded in 1987, is a non-profit environmental organization dedicated to making transformational change for the benefit of Pacific salmon at every scale – from the smallest streams to the open ocean.

For us, it's salmon first, salmon always and we never go it alone. We work with First Nations, Government, ENGO partners, industry, and all salmon supporters to achieve our vision of healthy, sustainable, and naturally diverse populations of Pacific salmon for the benefit of ecosystems and people for generations to come.



THANK YOU TO OUR PARTNERS, FUNDERS, AND COLLEAGUES



M. C. Wright and Associates Ltd.
Biological Consultants

NCampas
Software Development



Fisheries and Oceans
Canada

Pêches et Océans
Canada

