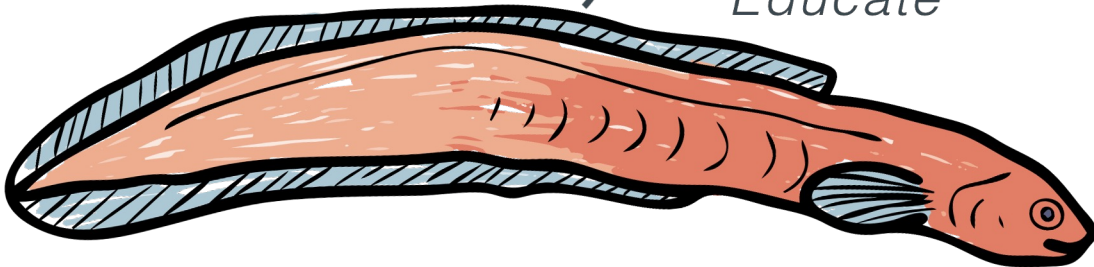




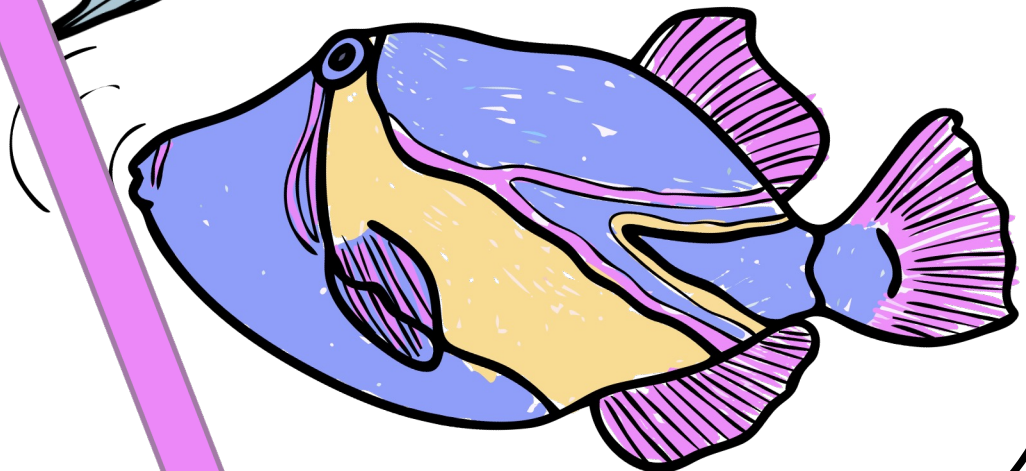
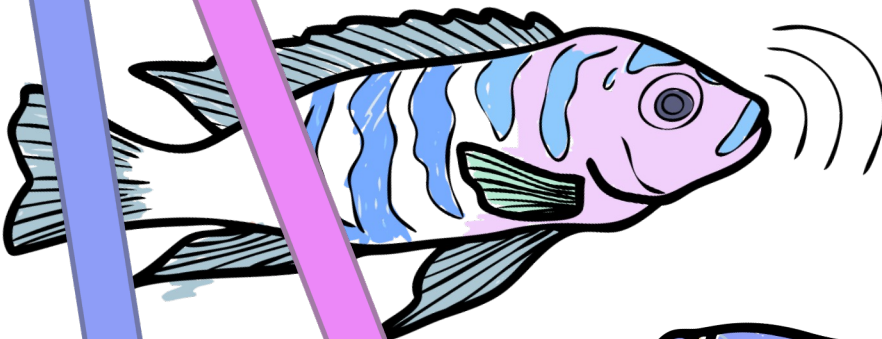
FishSounds
Educate



WHAT SOUND DOES A FISH MAKE!?

A COLOURING BOOK

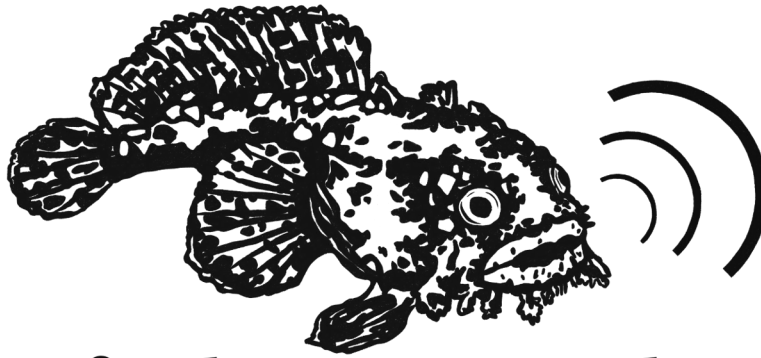
By Hailey Shafer, Hailey Davies, Sarah Jim,
Audrey Looby, and Kieran Cox





The FishSounds team is grateful to learn and teach on the lands and waters of the Lekwungen and W̱SÁNEĆ peoples. As settler-Canadians on unceded territories, we are compelled to create opportunities for Indigenous resurgence and to continue learning how we can help take care of this extraordinary place. While the FishSounds team is not exclusively based in these territories, this is where much of our work takes place.



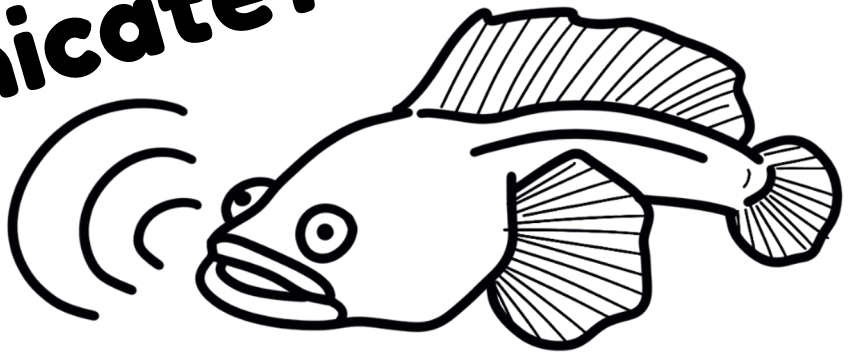


FishSounds

FishSounds is a collaborative project that aims to consolidate information on sound-producing species and make it freely available via FishSounds.net. This work is the product of an international collaboration between researchers and developers from several organizations. We have taken a cross-disciplinary approach, combining expertise in ecology, bioacoustics, and data management to produce a website that we hope will promote underwater research, facilitate conservation, and inspire the next generation of scientists.

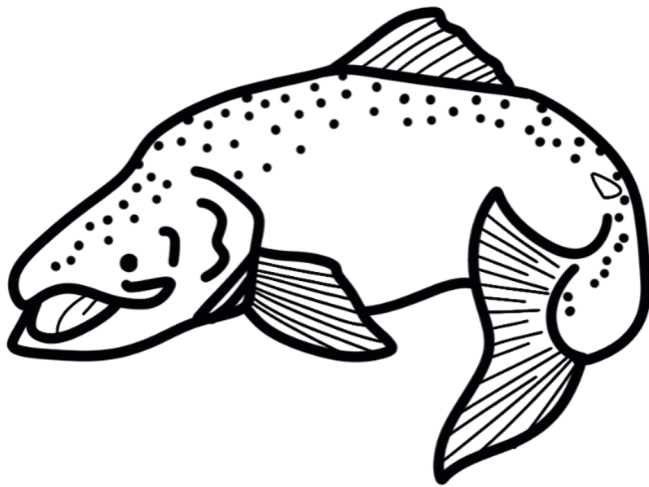


How do fish communicate?



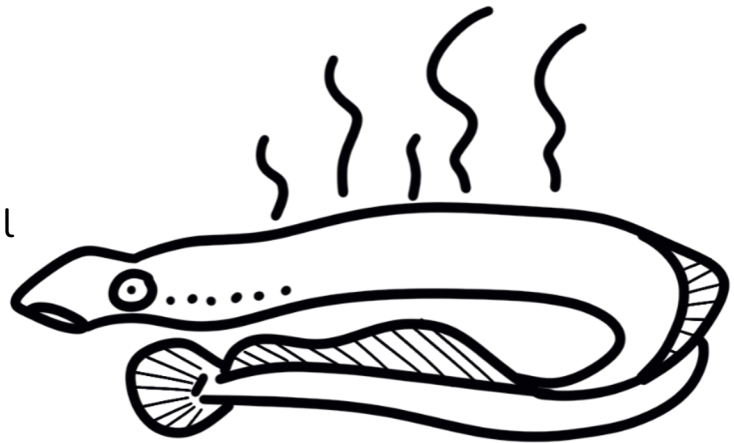
SOUND

Many fishes, like the **Plainfin Midshipman**, use sounds to communicate warnings, attract mates, and signal distress.



SIGHT

Some fishes use their physical appearance to send signals, such as **Sockeye Salmon** turning bright red to attract spawning mates.



SMELL

Some fishes can detect chemical cues, like the **Sea Lamprey**.

WHY DON'T
FISH LOOK LIKE

THIS?!

Because
their ears
are on the
inside!

Otoliths are calcium carbonate structures found in their inner ears. When a sound comes toward a fish, this causes the otoliths to move. The movements are picked up by sensory cells, which then send the **acoustic information** to the brain.

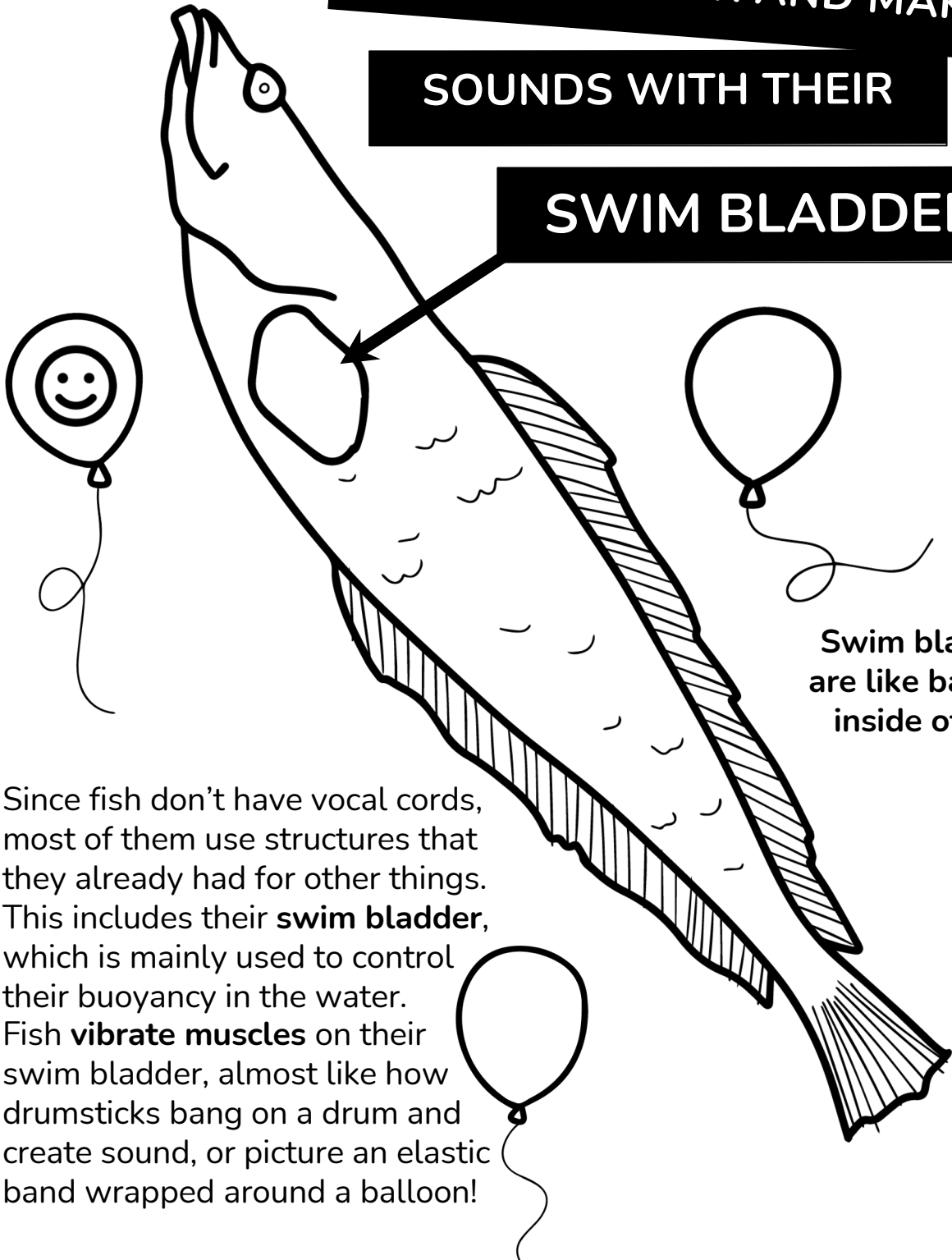




FISH CAN HEAR AND MAKE

SOUNDS WITH THEIR

SWIM BLADDERS!



Swim bladders
are like balloons
inside of fish!

Since fish don't have vocal cords, most of them use structures that they already had for other things. This includes their **swim bladder**, which is mainly used to control their buoyancy in the water. Fish **vibrate muscles** on their swim bladder, almost like how drumsticks bang on a drum and create sound, or picture an elastic band wrapped around a balloon!



What Sound

Does a

FISH MAKE?!



Fishes can make a huge variety of different sounds!

To listen to recordings of many species of sound-producing fishes, check out FishSounds.net.

BOOP

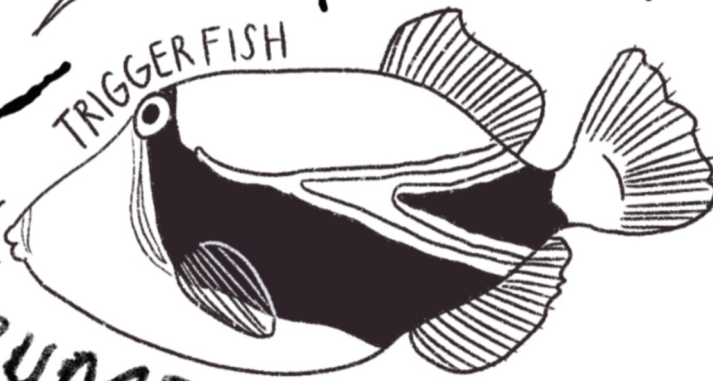


ZEBRAFISH

grunt

KNOCK

GROWL



TRIGGERFISH

CUSK EEL

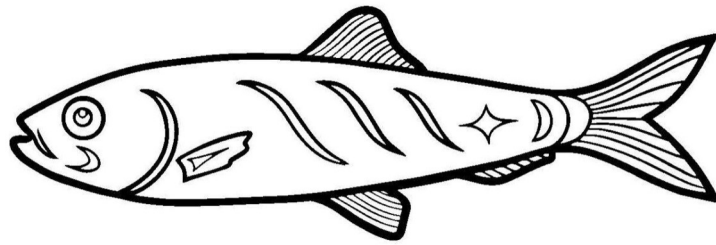
RUMBLE

Croak

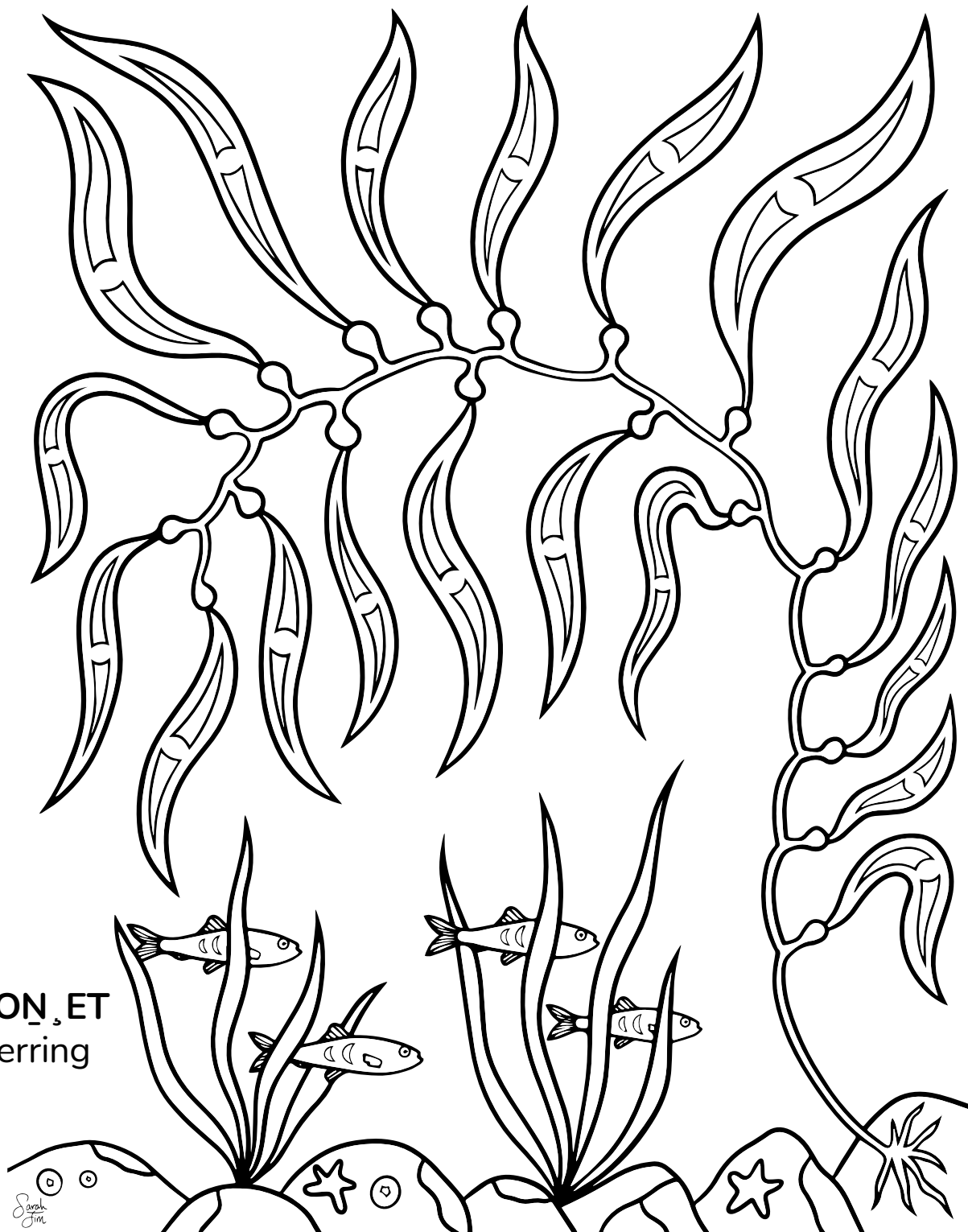
Hummmmm...

GUEST ARTIST

Sarah Jim



The works of Sarah Jim are inspired by the absolute beauty of the lands and waters in which the W̱SÁNEĆ people have stewarded since time immemorial. Sarah is a visual artist from the small village of W̱SÍ, KEM (Tseycum) in W̱SÁNEĆ, along with Mexican, Russian-Jewish, and English ancestry. Although she has received a bachelor's degree of Fine Arts from the University of Victoria, most of her work and teachings are self-taught and community-based. These works are reflections of land-based relationships, ecosystems, human and non-human kin connections, and the power of restorative practices. Creating artwork has been a valuable way of advocating for Indigenous ways of being and ecosystems, along with being a powerful form of medicine.

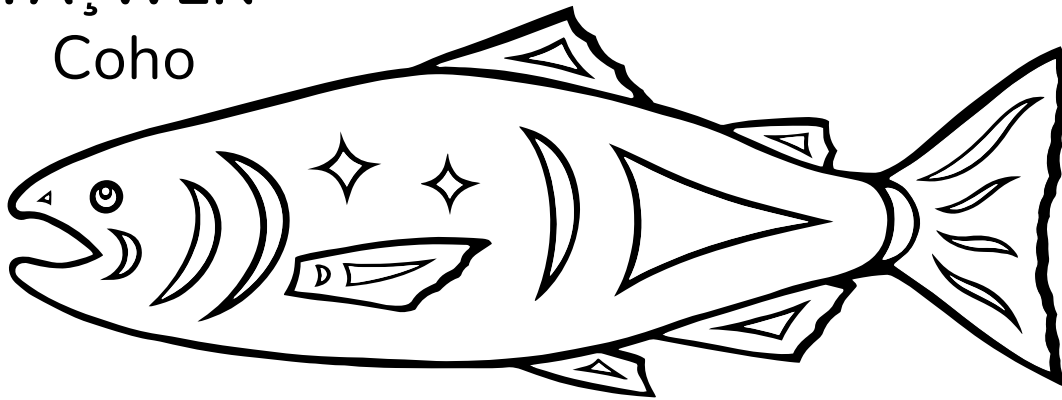


SŁON, ET
Herring

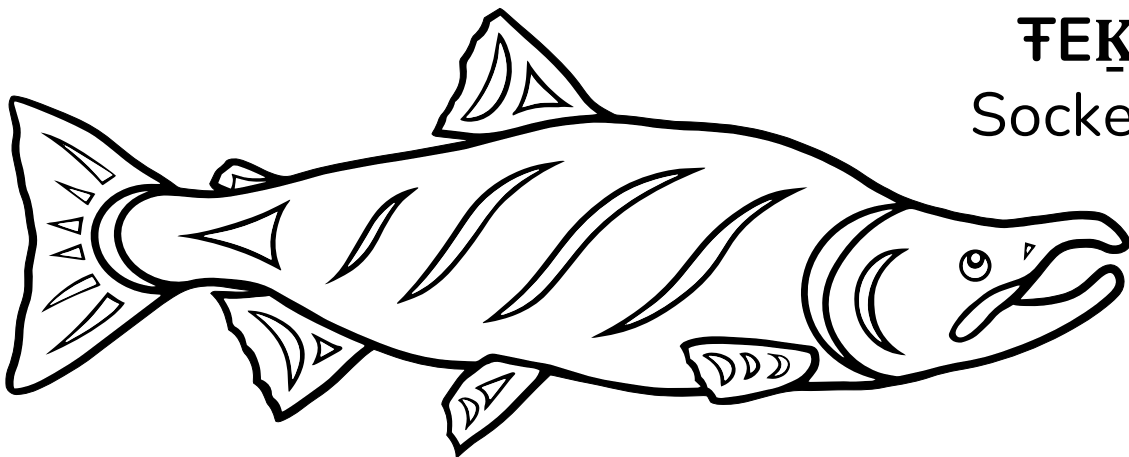
Kelp Forest

Salmon

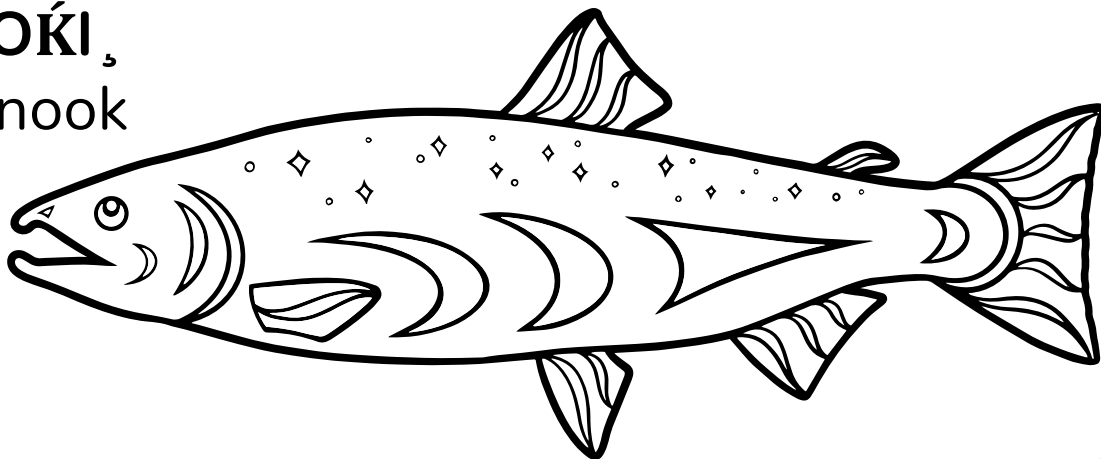
ᑦÁ, WEN
Coho



ᑦEKI
Sockeye

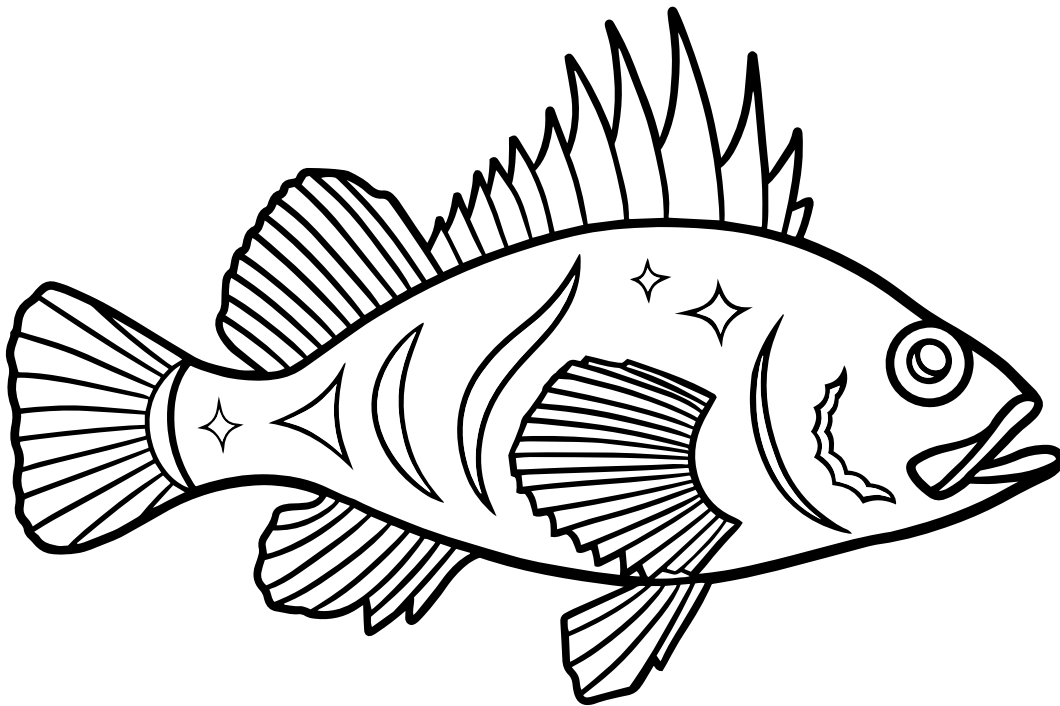
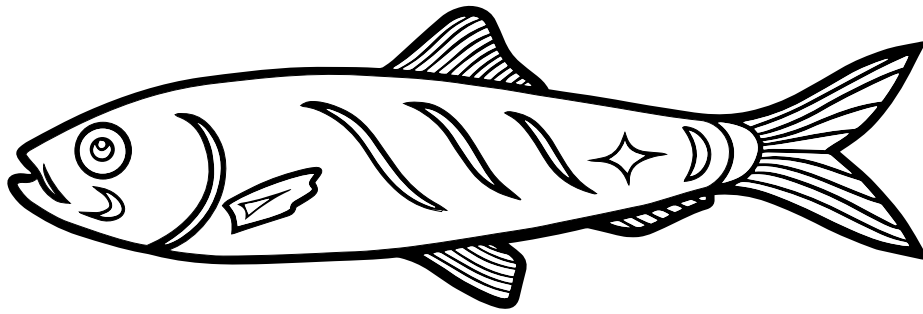


STOKI,
Chinook



*Sarah
Jim*

SŁON, ET (Herring) make a sound called a **Fast Repetitive Tick (FRT)** out of their back end! These sounds help them stay together as a group while swimming.



There are more than 40 species of **Rockfish** off the British Columbia coast! Most Rockfish are thought to make sounds, like **knocks and grunts**, using muscles on their swim bladder!

*Sarah
Jim*

What Sounds Do



A **soundscape** is all the sounds in a particular area, considered as a whole!

As you can see, humans contribute a lot of extra sounds to the marine soundscape, and this can have effects on marine animals and ecosystems in the form of **noise pollution**.

Traffic, planes, construction, waves, and wind make sounds.

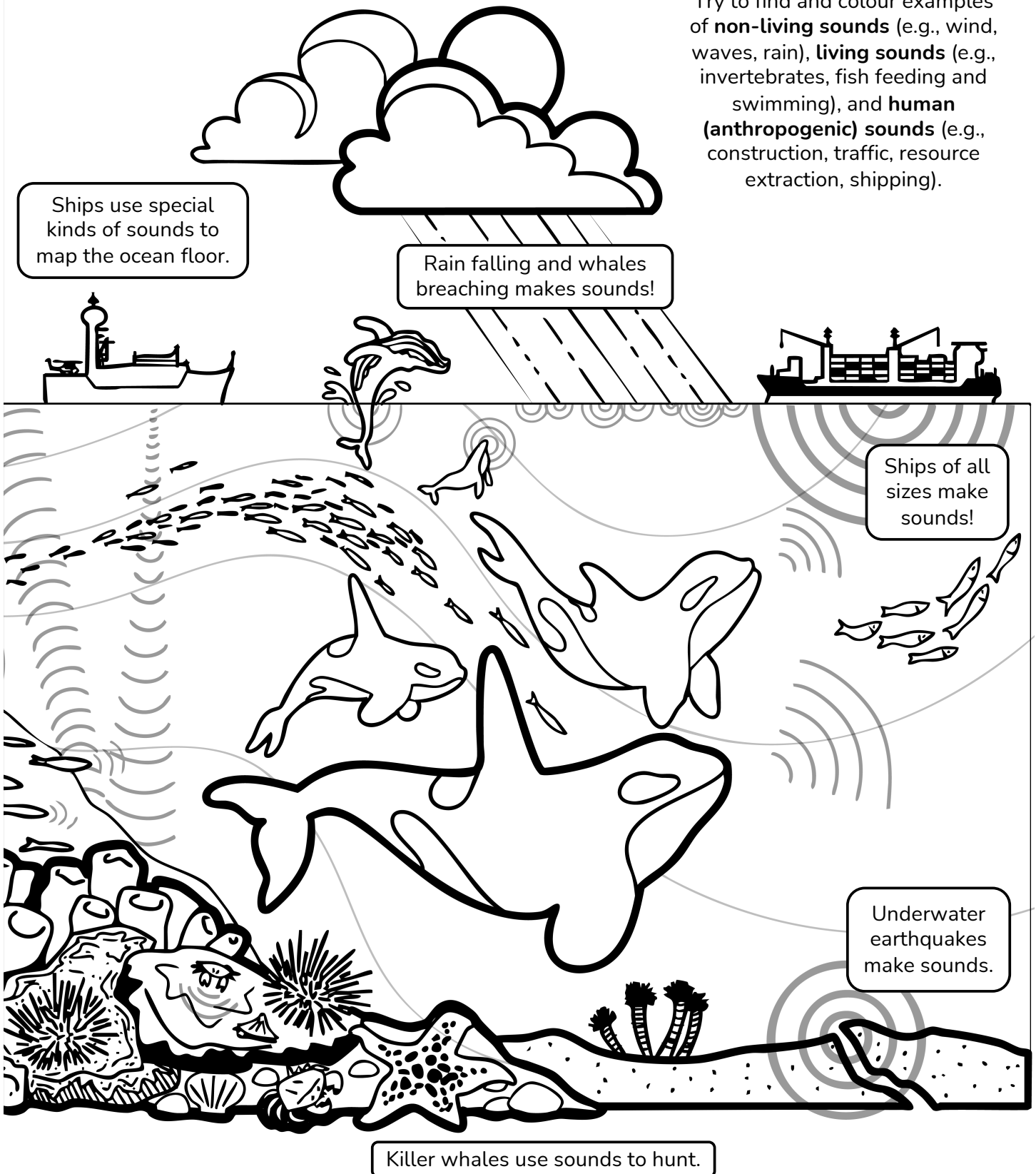
Fishes can use sounds to communicate!

Fishes make sounds when they swim!

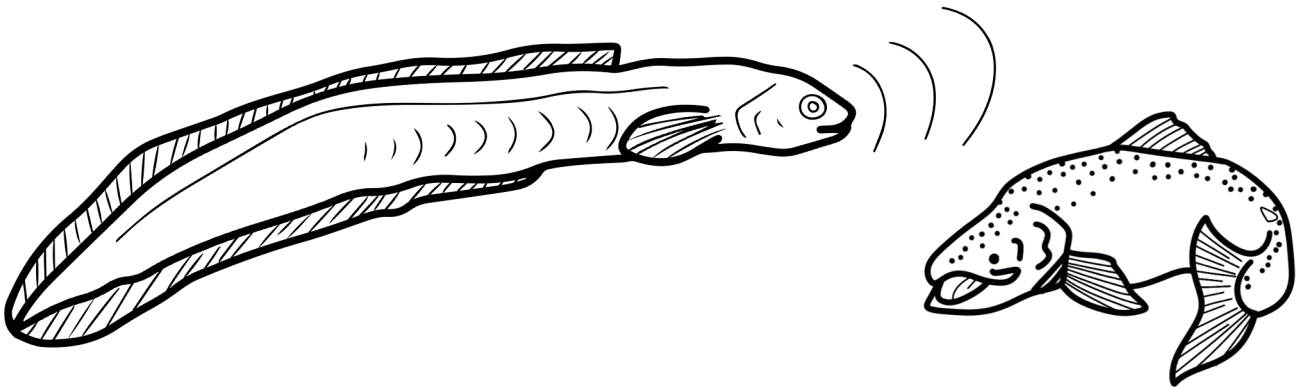
Animals make sounds when they eat, like this Wolf Eel munching on a sea urchin.

Fish Hear?

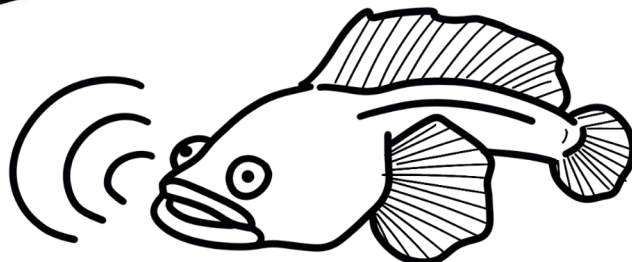
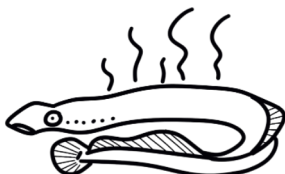
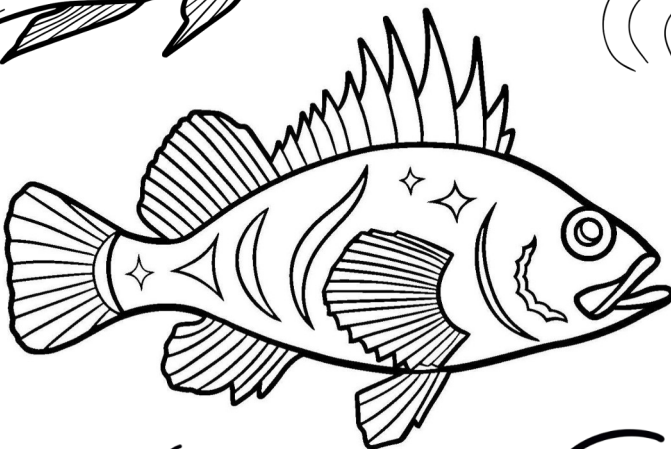
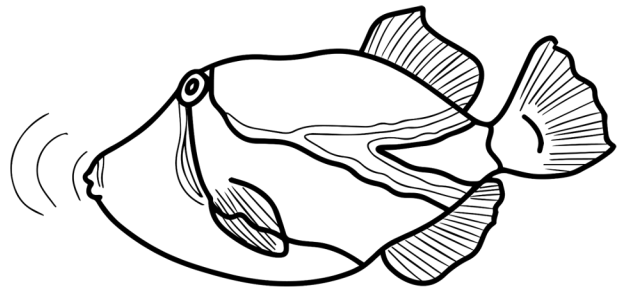
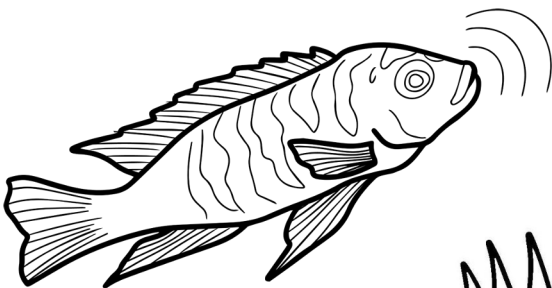
Try to find and colour examples of **non-living sounds** (e.g., wind, waves, rain), **living sounds** (e.g., invertebrates, fish feeding and swimming), and **human (anthropogenic) sounds** (e.g., construction, traffic, resource extraction, shipping).



How can we help fish?

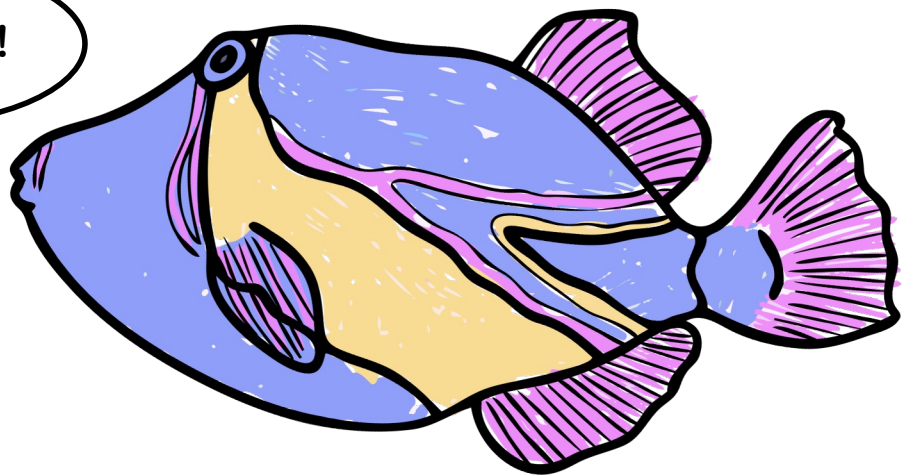


What is one thing you can do to help reduce your impact on fishes in our sea?



Acknowledgements

We are grateful to everyone who made this project possible. Funding was provided by Fisheries and Oceans Canada and the Liber Ero Foundation. Francis Juanes, Sarah Vela, Brittne Spriel, Kelsie Murchy, and other members of the FishSounds team provided substantial support to the FishSounds Educate project. The Ocean Networks Canada K-12 Education Team were instrumental in facilitating our outreach program and expanding our audiences. Most importantly, we are grateful to all the educators who invited us into their classrooms.



Learn More About ...



Fish sounds at **FishSounds.net**

SENĆOTEN words at **Saanich.Montler.net**

Sarah Jim's art at **SarahJimStudio.com**

Ocean science at **OceanNetworks.ca**

Sounds in the sea at **DOSITS.org**

