Have you seen the fish?

Spatial heterogeneity in the Baltic Sea

BONUS INSPIRE 2014-2018

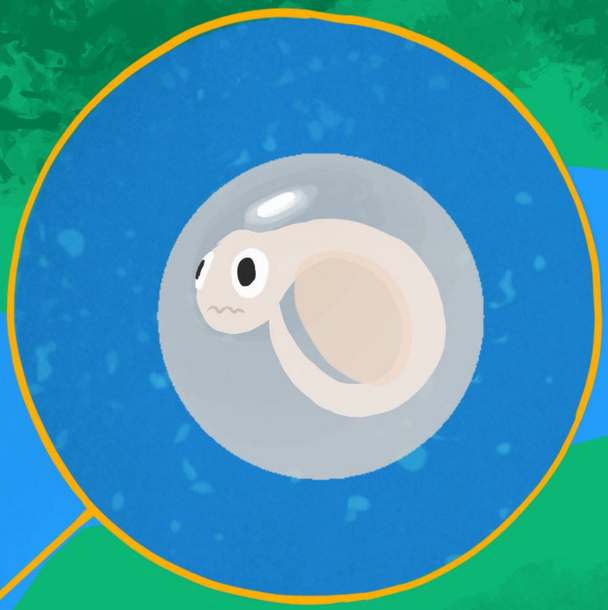
Have you ever wondered why fish are never there when you want to find them? This small story about the life of fishes introduces the primary drivers of fish abundance in the Baltic Sea. These are reproduction, migration, predation, and fisheries. Time and space are crucial for these processes, as some fish species only live in limited areas of the Baltic Sea, while others migrate in and out of the Baltic Sea.

In our BONUS INSPIRE project, we studied the processes that lead to changes in fish distributions in detail. Our goal was to improve ecosystem-based management of the fishery resources. We combined field studies involving fishers and multidisciplinary process studies. Our project increased knowledge of the habitat requirements of different life stages of cod, herring, sprat, and flounder. We also developed methods to account for processes shaping spatial and temporal heterogeneity of habitats and distributions of fish. Our results can improve future fish stock assessment in the Baltic Sea.

Look, a small little egg is growing happily among thousands.

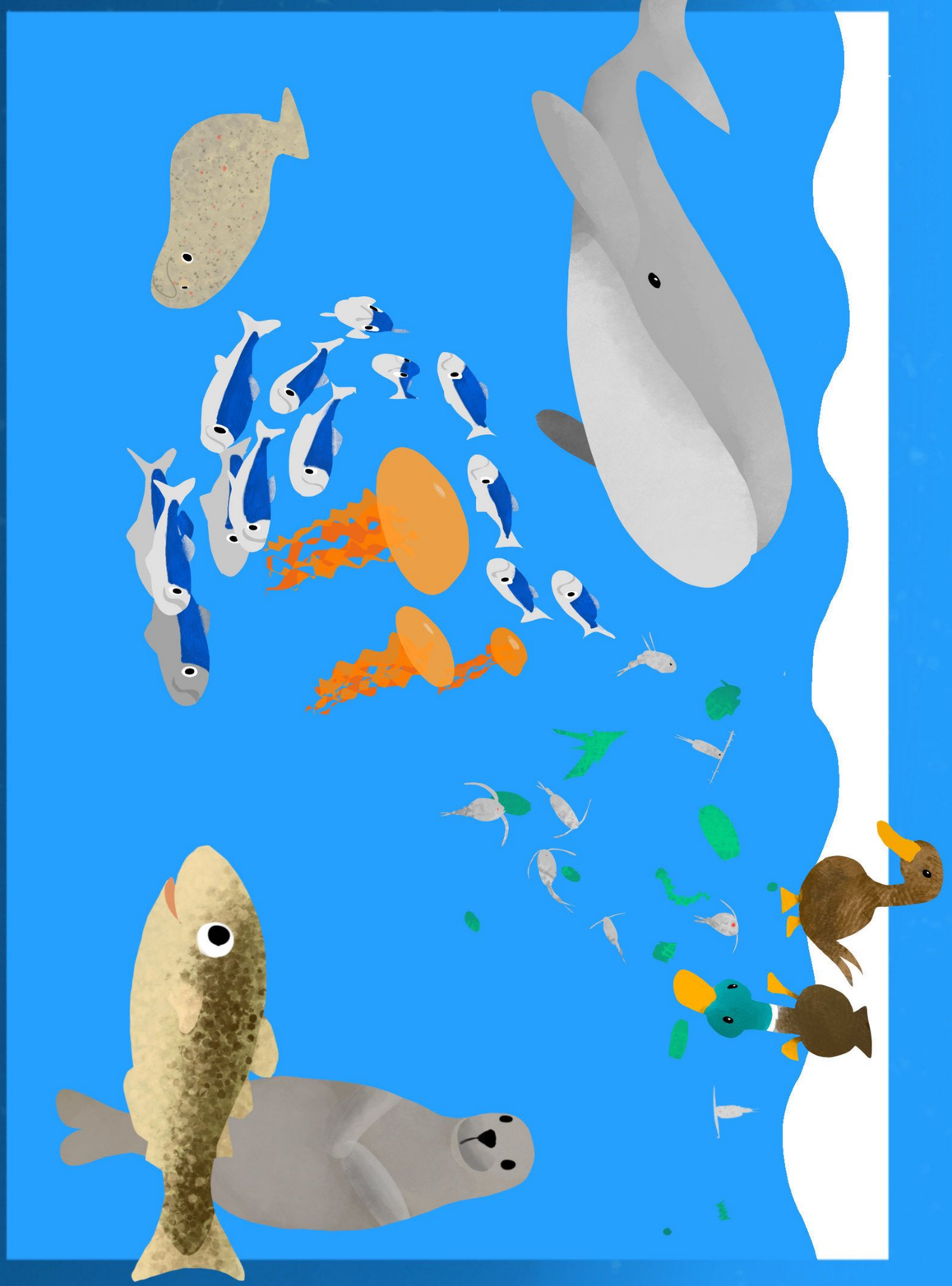
Oh no, a storm brewing on the horizon.
The waves are high and drag one of the egg into open waters.

There it is floating all alone.



After a while, it arrived in the middle of the Baltic Sea.

Once hatched, the baby fish was dreaming of an ocean full of life.



But when she looks around, she cannot see any other animals.

She plays with some drifting algae, but that is not much fun for long.

But suddenly, she sees that she is not alone after all.
Many hungry eyes are staring at her from all directions.

So she escapes as fast as possible into some seagrass meadows.

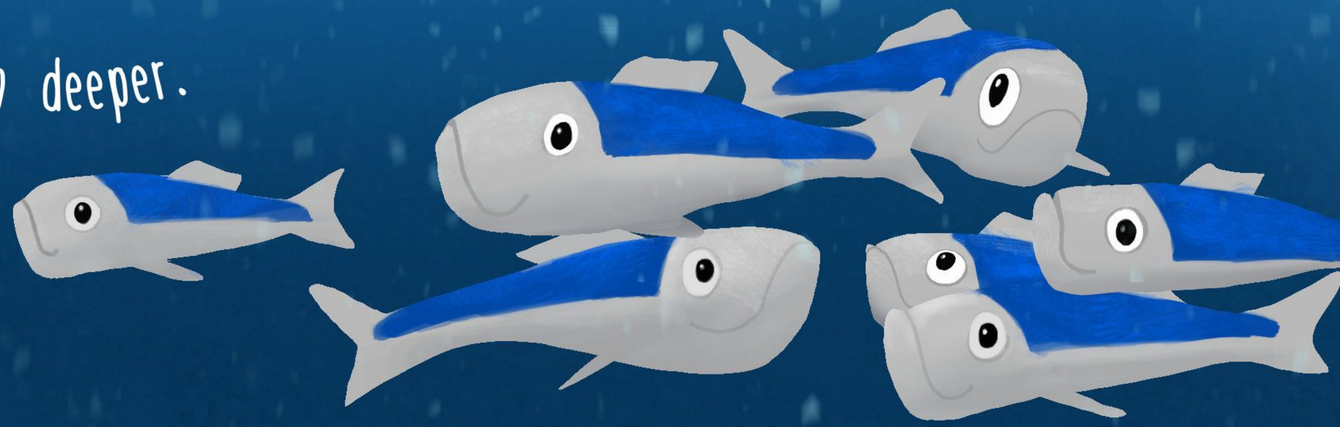
There she can hide from the hungry animals.

But she is not alone in the seagrass.
Many other small fish were hiding there.
Can you see them?

It feels a bit safer now, so she swims a little deeper.

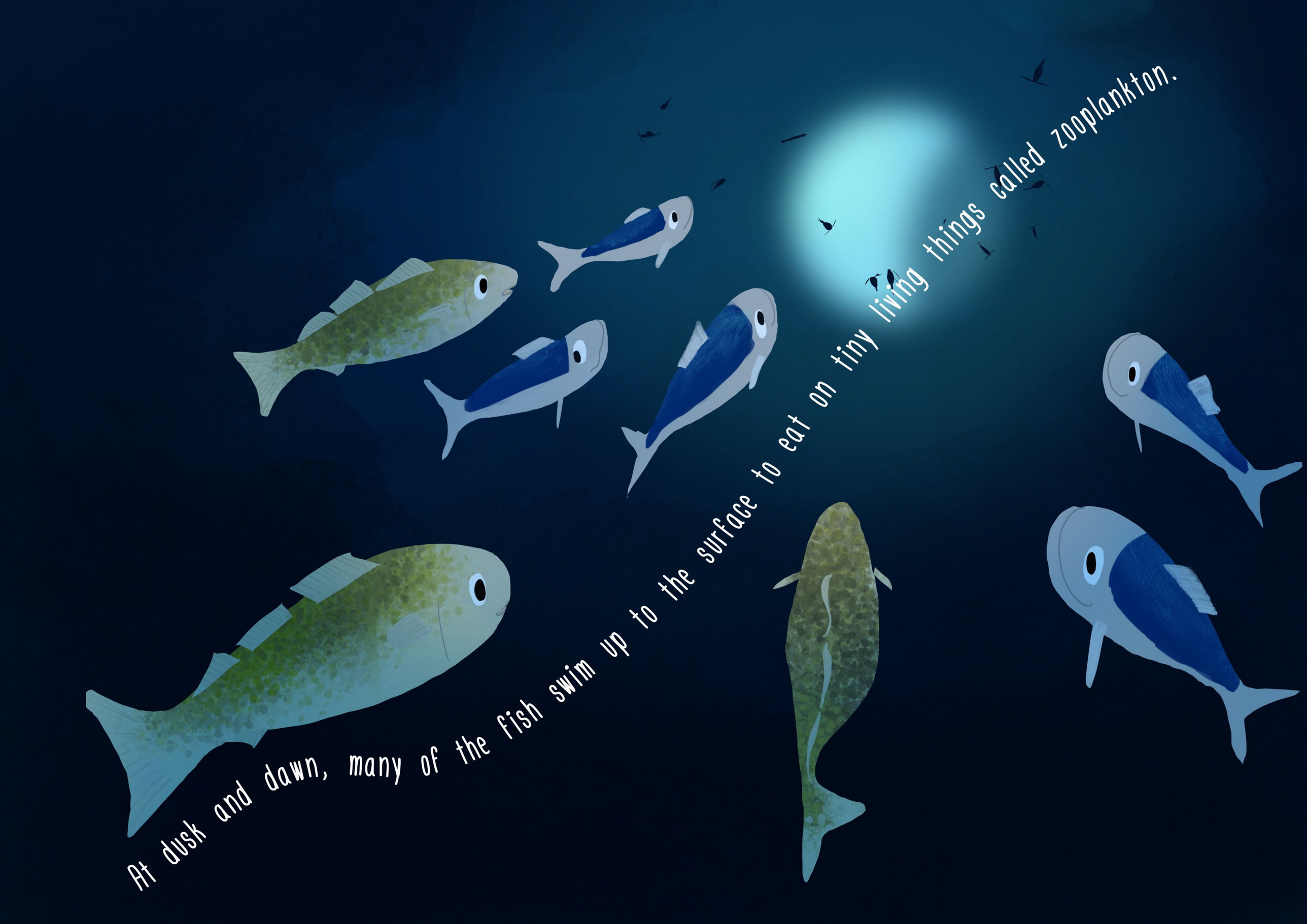
In an open area, she meets some flatfish hiding in the sand.

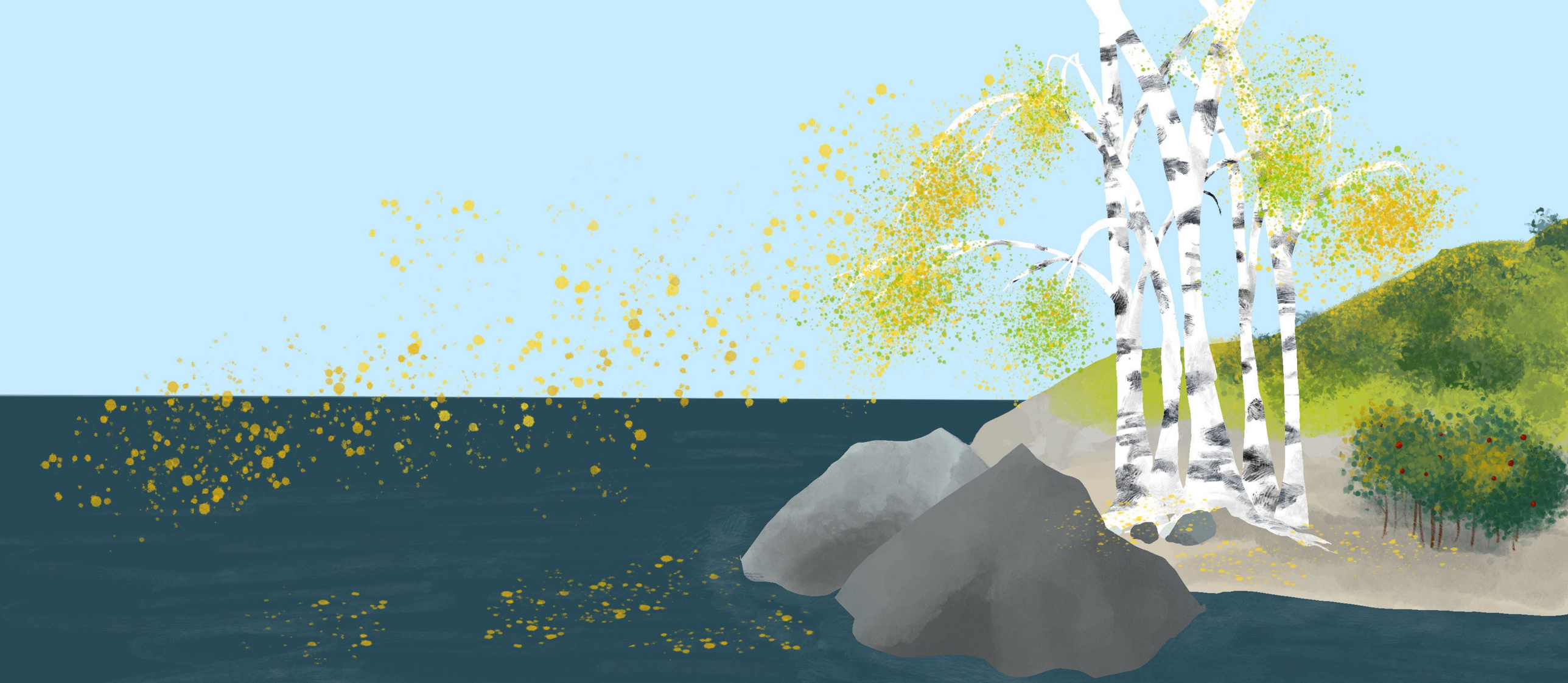
To avoid the hungry birds and seals, she swims even deeper.



It is darker there than at the surface.
But she meets fish that look like her.

And also others that are much bigger and look different.


At dusk and dawn, many of the fish swim up to the surface to eat on tiny living things called zooplankton.



Outside the water, autumn is approaching. The trees are losing their leaves, and it is getting colder.

When it is cold our fish and her friends migrate to the warmer waters in the west, while other fish stay in the Baltic Sea.

And they did not only stay, but each group only lives in their preferred area.

And they never talk much with the fish from the other places.

Luckily the winter is over already, and spring is in the air.

With the first rays of the sun, small floating algae get their energy and start to grow.

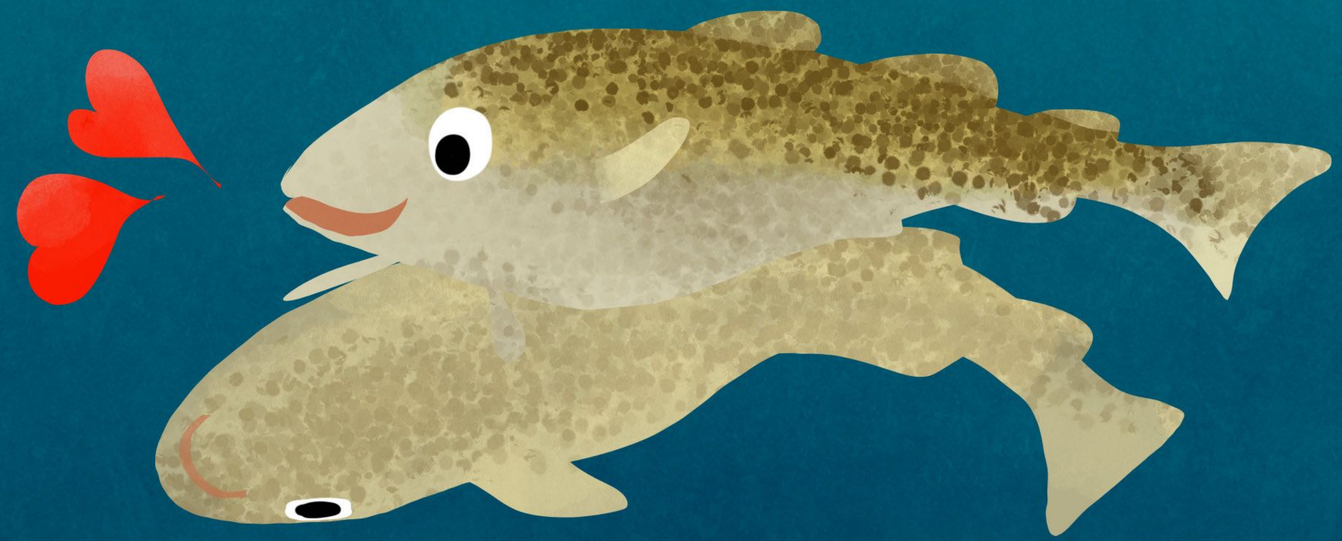
The small zooplankton are crazy about eating these tiny algae.
Zooplankton use all the new energy to make their babies, and soon a lot of them are hopping in the sea.

Also the fish enjoy the food and warmer temperatures. With all the happiness love is in the sea.

And after a while, many small babies were swimming along the grown-up fish.

Pipefish carry their eggs in their bellies.

At the coast, sticklebacks build nests to care for their eggs.



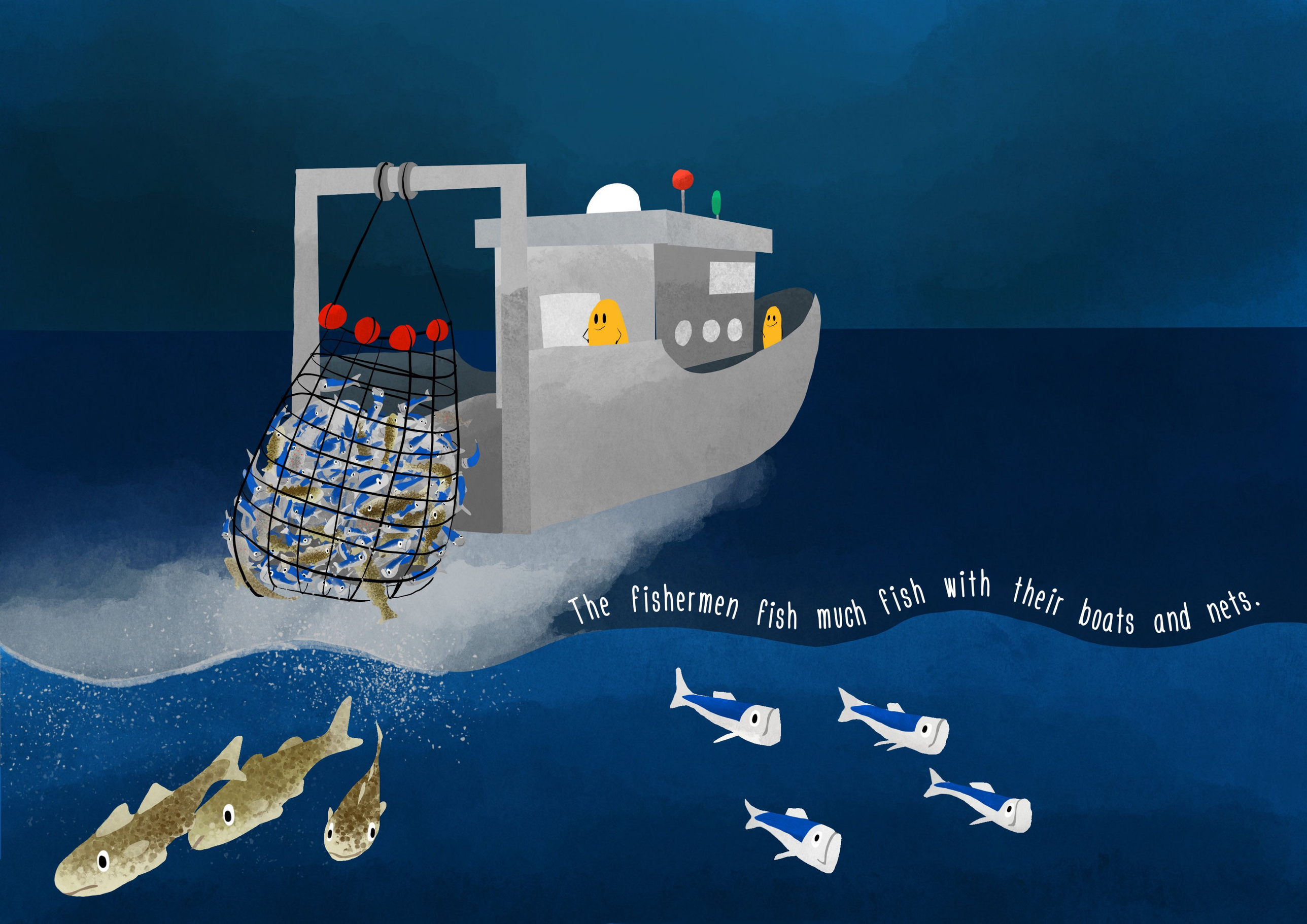
And even the larger fish become adventurous and start to flirt with each other.

And soon the ocean is full of life.

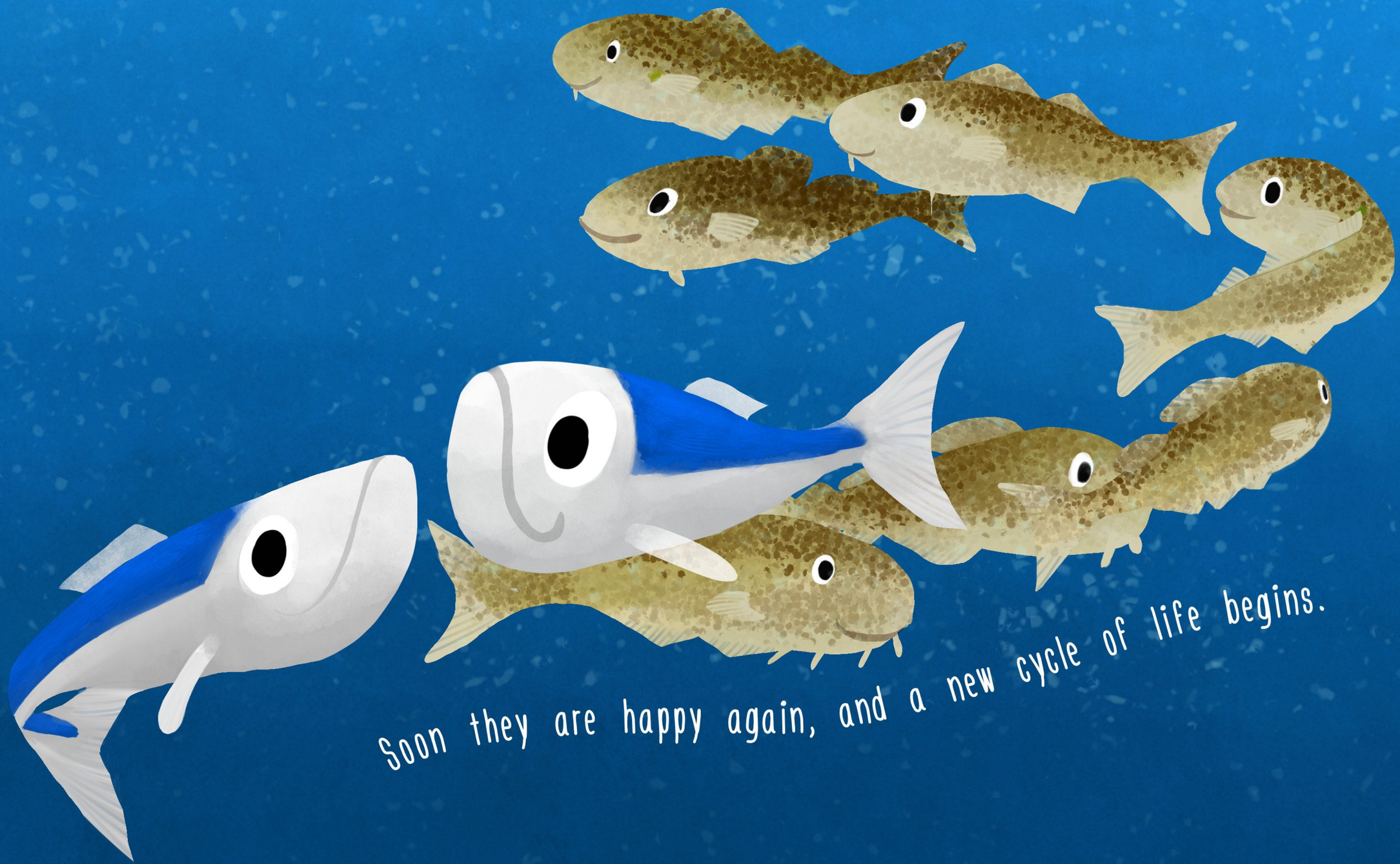
All the small fish attract big hungry animals.

Birds, seals and big fish all start to munch away on the smaller fish.

Besides animals, fishers are fishing fish for us to eat.


The fishermen fish much fish with their boats and nets.

Luckily, enough fish survive and continue living.



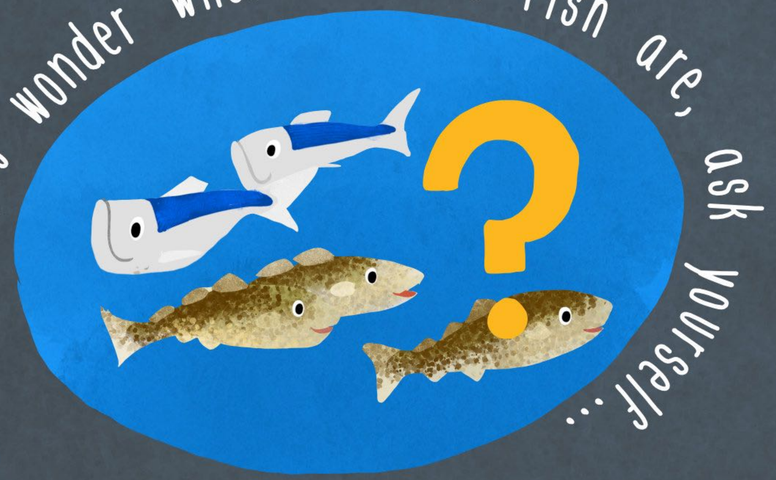
Soon they are happy again, and a new cycle of life begins.

And so the story starts again.

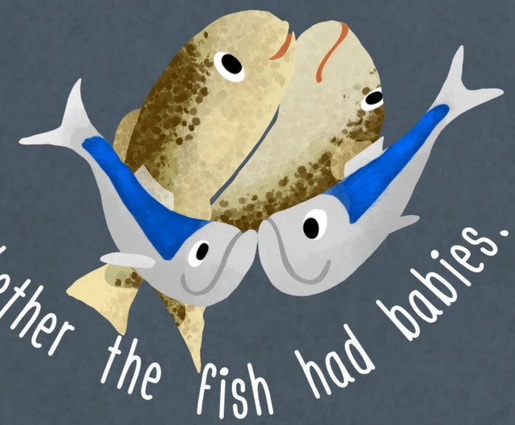
...what time it is.

...whether there is food.

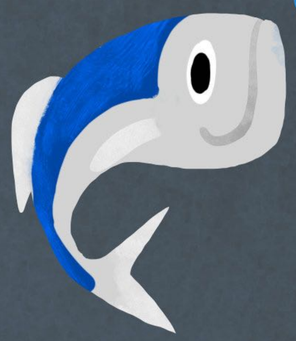
...whether the fish have been fished.



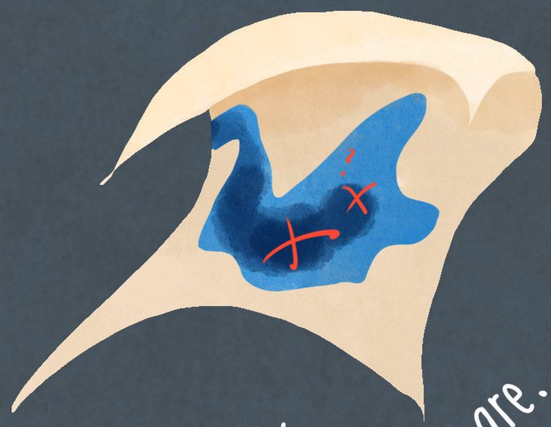
If you wonder where all the fish are, ask yourself...



...whether the fish had babies.

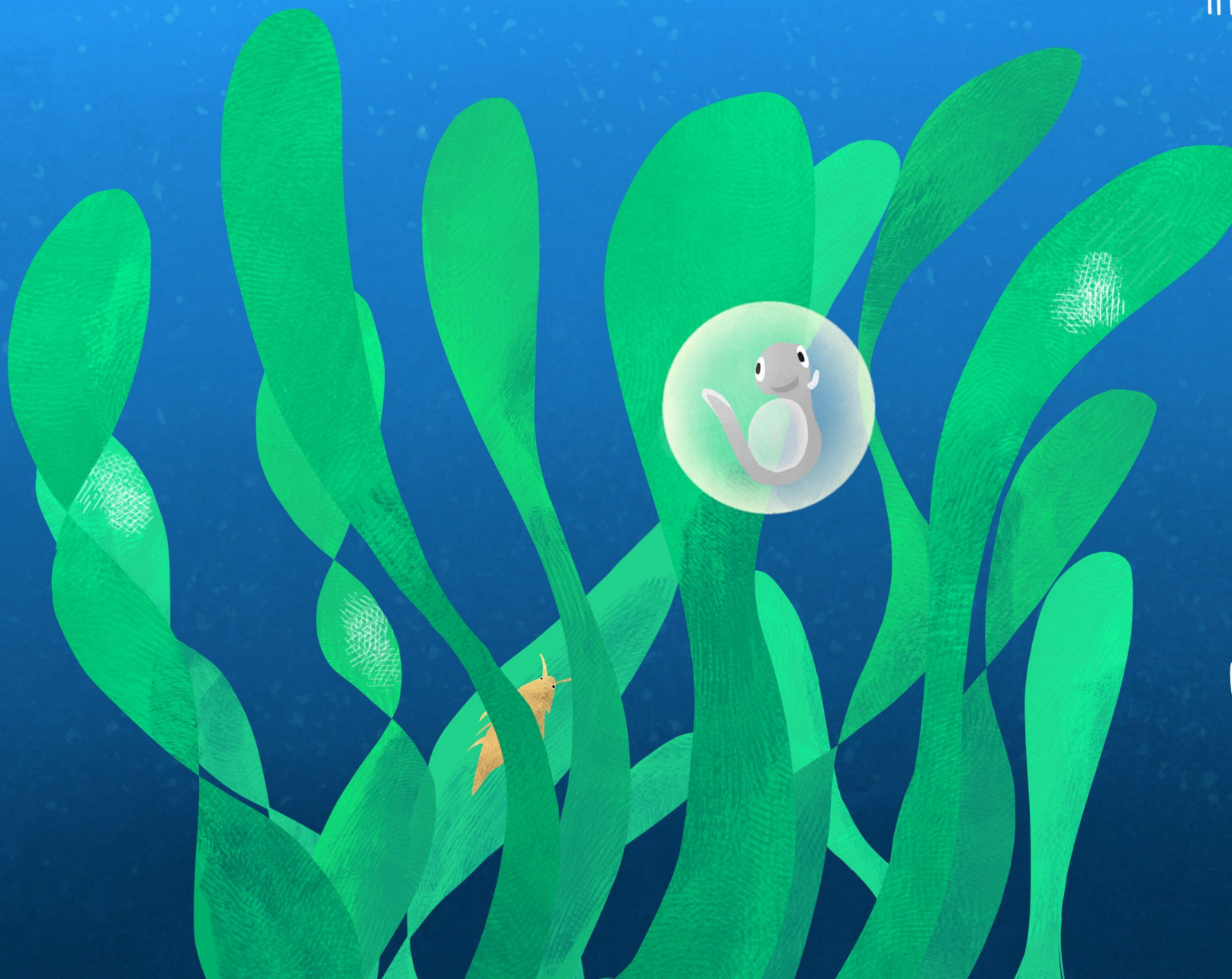


...whether the fish have been eaten.



...where you are.

We hope you enjoyed our story. If you want to know more about the science and methods of the INSPIRE project, please visit our project website.
http://www.bonus-inspire.org



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