THE BALTIC SEA – UNIQUE AND FRAGILE

Low salinity

The Baltic Sea is one of the largest brackish or low salinity water bodies in the world. The average salinity of the Baltic Sea is about five times less compared to the Atlantic Ocean, being especially low in the northern and eastern parts.

Unique biodiversity

Although biodiversity (the variety of animals and plants and their living spaces) is low in the Baltic Sea, the brackish water provides the environment for a unique combination of marine and freshwater species. The total number of species is low, therefore all are important.

Lots of humans

The Baltic Sea drainage area, where all the water comes from, is densely populated with 90 million people, 15 million of them living in the coastal area.

«Presents» from the mainland

Households, agriculture and intensive forestry have generated huge amounts of nitrogen and phosphorus that overfeed the Baltic Sea through the many rivers. The Baltic Sea is one of most eutrophic («nutritious») water bodies in the world. Nutrient abundance has already affected the sea by changing the traditional balance among species.
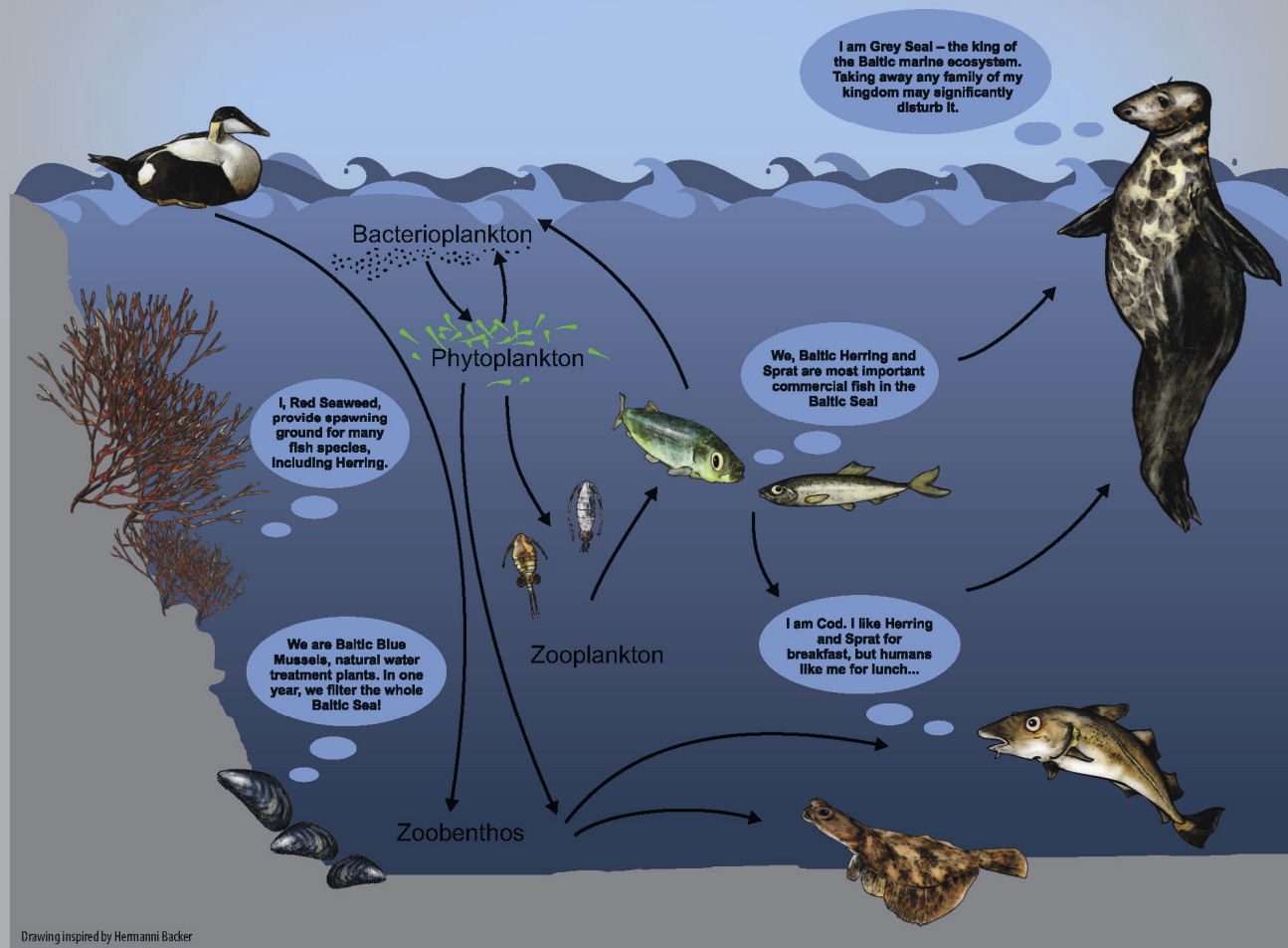
The Baltic Sea in numbers:

Area: 377,000 km^2
Average depth: 55 metres
Maximum depth: 459 metres (the Landsort Deep)
Water volume: 20,000 km^3
Salinity: from 20‰ near the Danish Straits to 6-7‰ in the Baltic Proper and almost fresh water with 1-3‰ in Bothnian Bay and the Eastern part of the Gulf of Finland

The busy sea

Along with traditional fishery and shipping, which is one of the most intense in the world, new economic interests have risen like oil extraction and energy production in offshore wind farms.

Continuous nutrient overfeeding of the Baltic Sea favours growth of toxic cyanobacteria or blue-green algae – look at the green areaa!
Source: EOS – MODIS 2005-07-11, NASA, processed by Oceanography Unit of Swedish Meteorological and Hydrological Institute

I am Grey Seal – the king of the Baltic marine ecosystem. Taking away any family of my kingdom may significantly disturb it.

Bacterioplankton

Phytoplankton

I, Red Seaweed, provide spawning ground for many fish species, including Herring.

We, Baltic Herring and Sprat are most important commercial fish in the Baltic Sea!

We are Baltic Blue Mussels, natural water treatment plants. In one year, we filter the whole Baltic Sea!

Zooplankton

I am Cod. I like Herring and Sprat for breakfast, but humans like me for lunch...

Zoobenthos

Drawing inspired by Hermanni Backer

We need to monitor the nature of the sea to check the trends and timely react to various threats. The project "Innovative approaches for marine biodiversity monitoring and assessment of conservation status of nature values in the Baltic Sea" (MARMONI, LIFE09 NAT/LV/000238) aims at improving monitoring methods. For more information visit the marmoni.balticseaportal.net

THE GULF OF RIGA: BRACKISH PARADISE

Heavy traffic in the air

The Gulf of Riga is an important migration, moulting and wintering area for birds. Internationally important concentrations of red- and black-throated divers, common and velvet scoters, long-tailed ducks, little gulls, black guillemots, common eiders and goldeneyes have been found there. Shallow coastal areas with numerous islets on the Estonian side of the Gulf of Riga are important breeding areas for birds like the black-headed gull, arctic tern, mew gull, herring gull, Caspian tern and great cormorant.

The Gulf in numbers

Area: 18,000 km²
Average depth: 26 metres
Maximum depth: 67 metres (North-West from Mērsrags)
Salinity: 4-7‰, and only 0-2‰ in near-coastal areas

Where flounder and pike live together

In the Gulf of Riga one can find freshwater fish (e.g. pike, perch, roach), marine fish (e.g. Baltic herring, garfish, flounder) and fish migrating between the sea and freshwater (e.g. salmon, river lamprey, sea trout, vimba bream, European eel).
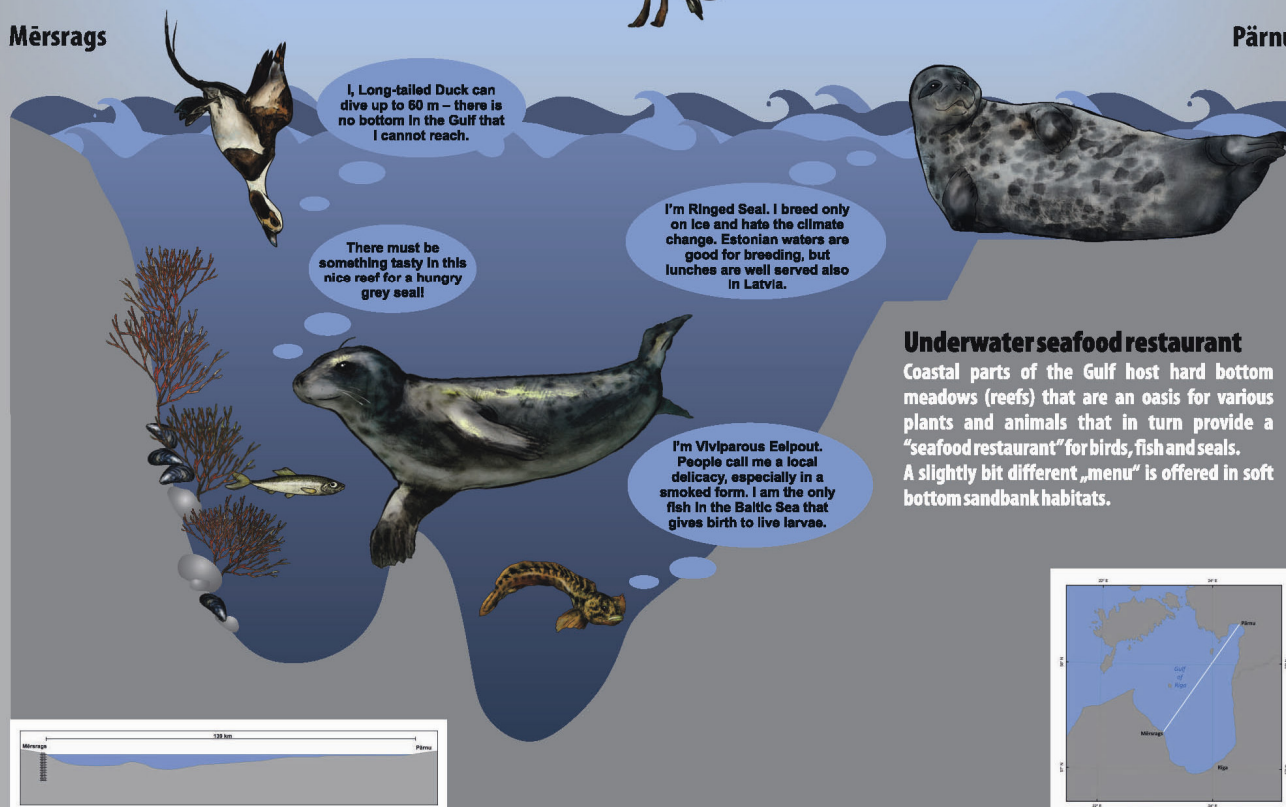
Ringed but not married

The Gulf of Riga hosts nearly ¼ of the Baltic Sea ringed seal population and is the southernmost place where this arctic animal lives. Ice cover is very important for the ringed seal as it breeds only on ice, unlike the grey seal whose pups can be born on ice or land.

Plain water behind the stones – typical seascape of the Gulf of Riga
Photo: Rita Poikāne

Mērsrags

Pärnu

I, Long-tailed Duck can dive up to 60 m – there is no bottom in the Gulf that I cannot reach.

There must be something tasty in this nice reef for a hungry grey seal!

I'm Ringed Seal. I breed only on ice and hate the climate change. Estonian waters are good for breeding, but lunches are well served also in Latvia.

I'm Viviparous Eelpout. People call me a local delicacy, especially in a smoked form. I am the only fish in the Baltic Sea that gives birth to live larvas.

Underwater seafood restaurant

Coastal parts of the Gulf host hard bottom meadows (reefs) that are an oasis for various plants and animals that in turn provide a "seafood restaurant" for birds, fish and seals. A slightly bit different „menu" is offered in soft bottom sandbank habitats.

THE ARCHIPELAGO SEA: THE INTERPLAY OF SEA AND LAND

This story was written with an ice-heavy pencil

History has left its message. The last thick cover of ice began to melt 11,500 years ago followed by an uplifting of the land - still going on today. Thanks to this process, tens of thousands of islands form today a complex archipelago (a continuation of the Stockholm archipelago towards the Finnish coast), unique by worldwide standards. Besides islands there is plenty of other habitat types like sand banks, coastal lagoons, cold water reefs and minute islets. These fine-featured rocky islets are an outstanding attraction admired by the many visitors who come to spend their leisure-time in the area.

The Archipelago Sea in numbers

Total area: 9,436 km²
Average depth: 23 metres
Maximum depth: 146 metres
Number of islands: about 40,000
Area of the national park: 500 km²

The Archipelago national park - preserving the environment for tomorrow

The Archipelago Sea forms an important breeding ground for the grey seal and some hundreds of ringed seals.

Bird life is rich, the island and sea environment protects several waterfowls: the canadian goose, eider, black guillemot and various terns and gulls. Waders like the turnstone and occasionally the rock pipit can also be seen.

Under the water surface the annual filamentous algae harbor tens of organisms, including isopods, serving as a "kindergarten" before the animals move to deeper perennial algae zones.

In the shallow coastal areas, the eelgrass and many vascular plants form subaquatic meadows on the sandy and moraine bottoms providing food for isopods, snails and many birds.
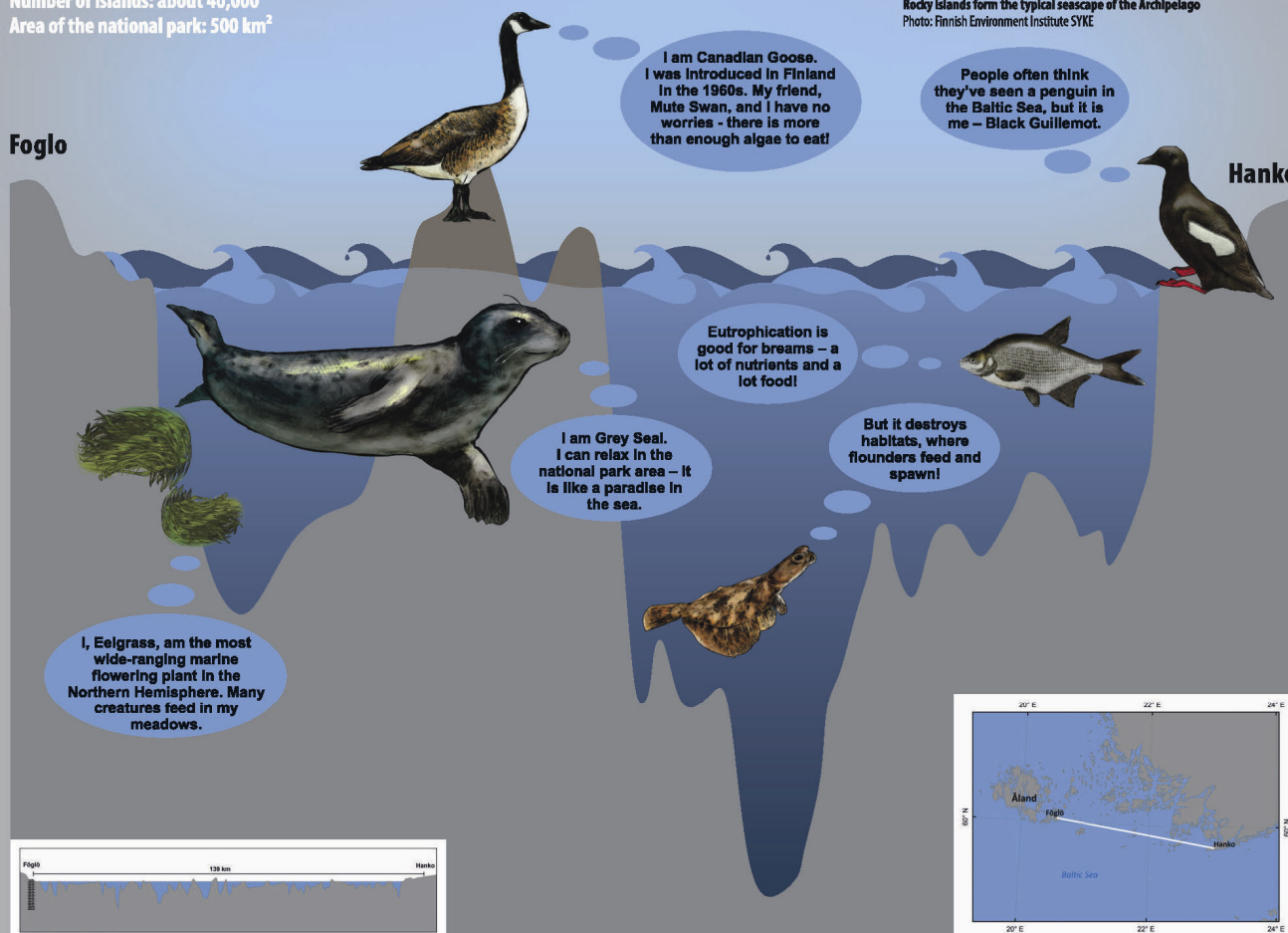
Changes in coastal fish stocks

Perch and pike-perch are the most important coastal fish species. Cyprinids, such as roach and bream, have become increasingly abundant during the last few decades - one major reason being eutrophication. Flounder catches have recently decreased significantly.

Rocky islands form the typical seascape of the Archipelago
Photo: Finnish Environment Institute SYKE

Foglo

Hanko

I am Canadian Goose. I was introduced in Finland in the 1960s. My friend, Mute Swan, and I have no worries - there is more than enough algae to eat!

People often think they've seen a penguin in the Baltic Sea, but it is me – Black Guillemot.

Eutrophication is good for breams – a lot of nutrients and a lot food!

I am Grey Seal. I can relax in the national park area – it is like a paradise in the sea.

But it destroys habitats, where flounders feed and spawn!

I, Eelgrass, am the most wide-ranging marine flowering plant in the Northern Hemisphere. Many creatures feed in my meadows.

STOCKHOLM ARCHIPELAGO: BETWEEN THOUSANDS OF ISLANDS

A varied environment

In the archipelago you can find everything from sheltered bays in the inner archipelago to exposed rocks in the outer archipelago with changing environmental conditions.

Terrestrial landscape continues under the water

The varying topography of the archipelago is part of the landscape typical for central Sweden. It is a mixture of deep and shallow bottoms of different kinds that provides habitats for different compositions of life forms.

In deep areas where little or no light reaches the bottom, animals such as crustaceans, mollusks, worms and fish dominate.

Shallower areas with more accessible sunlight are home to many species of vascular plants and algae and numerous species of small animals and fish that live in the vegetation.

The Archipelago in numbers

Number of islands: 30,000–35,000
Area: over 1,700 km²
Salinity: nearly fresh water in central Stockholm up to about 6 ‰ in the outer archipelago

Underwater forests in the inner archipelago

The shallow bays of the inner archipelago are sheltered from big waves and accumulate soft sediments, where many species of vascular plants and stoneworts form extensive and dense underwater forests.

But you may also find algae, such as bladderwrack, sea lace and slippery green algae growing on rocks.

Many species of freshwater fish such as roach, bream and rudd thrive in the sheltered and relatively fresh waters. Pike and pikeperch are two common predatory fish that are a popular catch among anglers.

Rocky bottom and open sea in the outer archipelago

The most untouched part of the Archipelago is perhaps the outer archipelago. The rocky bottoms are inhabited by blue mussels and red algae.
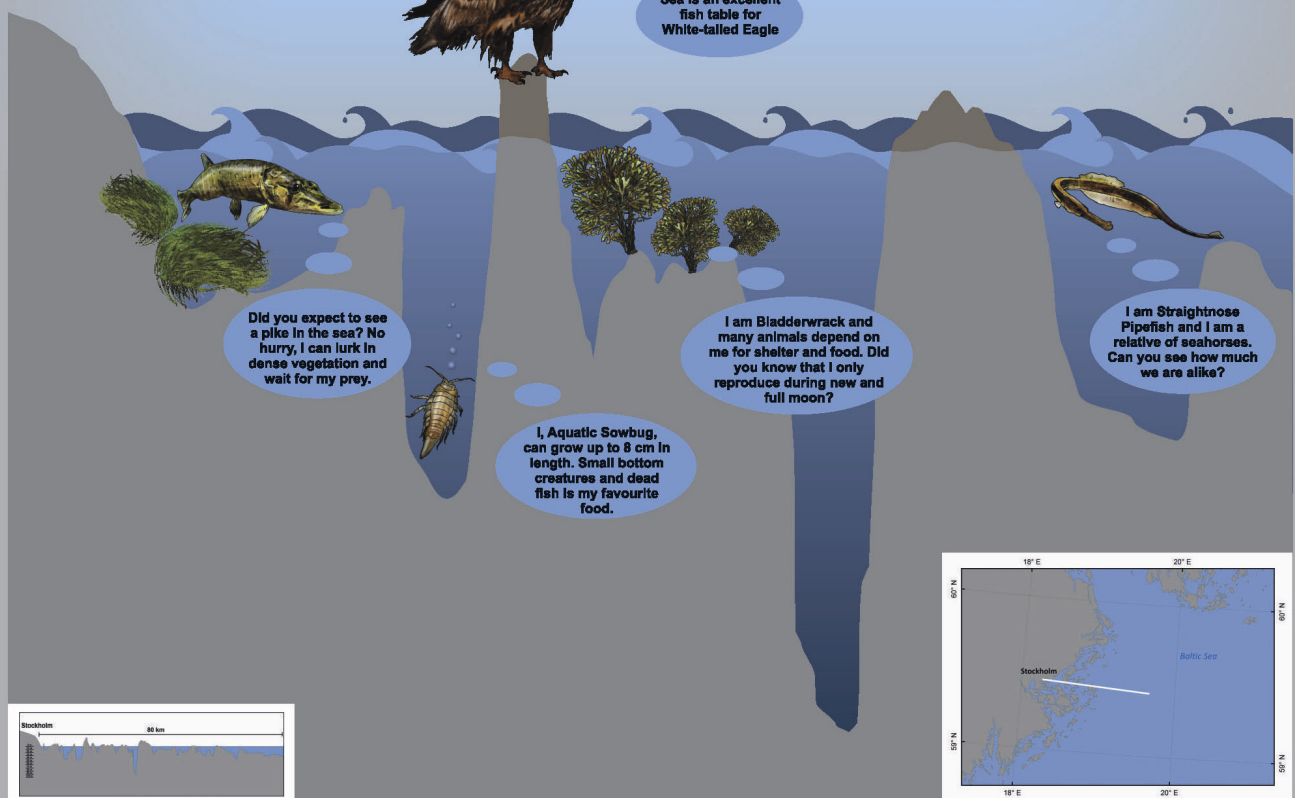
Grey seals are often seen on rocks and skerries and the white-tailed eagle can be spotted while it is patrolling the airspace or resting on a rock.

Marine species like the herring, sprat, eelpout, cod and flatfish dominate the fish fauna in the outer area.

Humans and nature have formed the traditional seascape of the Stockholm Archipelago
Photo: Julia Carlström, AquaBiota Water Research

Stockholm

Sea is an excellent fish table for White-tailed Eagle

Did you expect to see a pike in the sea? No hurry, I can lurk in dense vegetation and wait for my prey.

I, Aquatic Sowbug, can grow up to 8 cm in length. Small bottom creatures and dead fish is my favourite food.

I am Bladderwrack and many animals depend on me for shelter and food. Did you know that I only reproduce during new and full moon?

I am Straightnose Pipefish and I am a relative of seahorses. Can you see how much we are alike?

Stockholm   80 km

18° E   20° E
Baltic Sea
Stockholm

THE GULF OF FINLAND: WHERE LIMESTONE AND GRANITE MEET

The different North and South

The Northern coast of the Gulf is high and winding, with abundant small bays, skerries and rocky islands. The Southern shores are smooth and shallow but along the entire coast runs the Baltic Klint - an erosional limestone escarpment with a height up to 55 m (in Ontika, Estonia). In the middle of the Gulf, there is the natural border on the sea bottom between mostly granite bedrock in the North and mostly limestone bedrock in the South.

The Gulf in numbers

Area: 30,000 km²
Length: 400 km
Width: 60–130 km
Average depth: 38 metres
Maximum depth: 123 metres (near Keri Island in Estonia)
Salinity: between 0.2 and 5.8 ‰ at the surface and 0.3–8.5 ‰ near the bottom.

Heavy traffic in the air

The Gulf of Finland forms a key link in the migratory flyways of many arctic waterbirds. Hundreds of thousands of long-tailed ducks, black scoters, barnacle geese and brant geese cross the Gulf of Finland every spring and autumn.

Dozens of water bird species nest on the shores and islands of the Gulf, including for example, the common eider, black-backed gull, black guillemot, sandwich tern, tufted duck, gulls, common tern, ringed plover, arctic tern.

Many waterbirds can be seen during ferry trip between Tallinn and Helsinki, like the herring gull, common gull, common eider, cormorant, barnacle goose, mute swan.
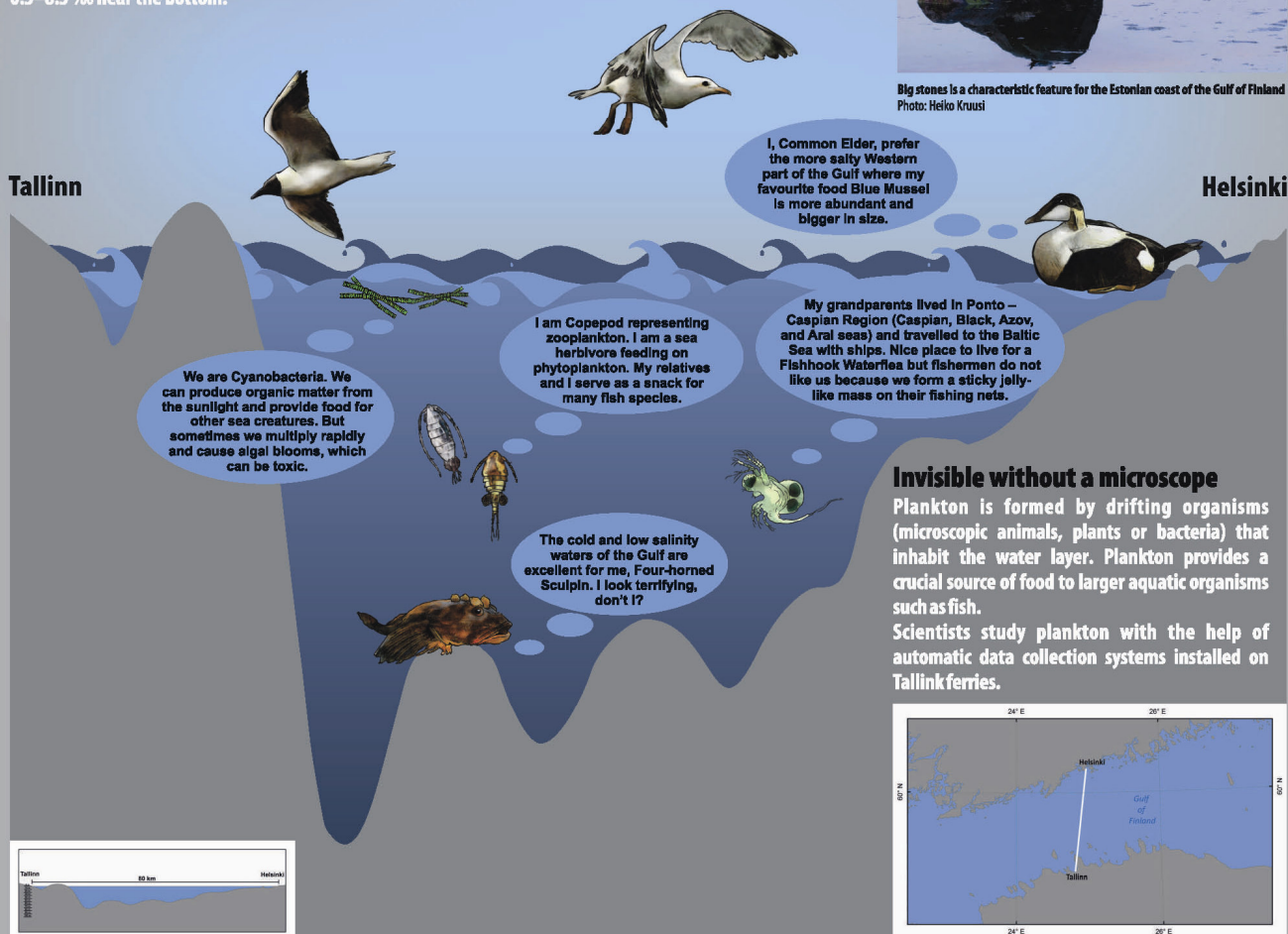
Where flounder and perch live together

More than 50 fish species live in the Gulf of Finland. One can find here freshwater fish (e.g. pike, perch, roach), marine fish (e.g. Baltic herring, garfish, flounder) and fish migrating between the sea and freshwater (e.g. salmon, river lamprey, sea trout, vimba bream, European eel).

Commercial fishing is mostly targeting Baltic herring, sprat, flounder, perch, sea trout, whitefish, pikeperch, prussian carp, bream, salmon and smelt.

Big stones is a characteristic feature for the Estonian coast of the Gulf of Finland
Photo: Heiko Kruusi

Tallinn

Helsinki

I, Common Eider, prefer the more salty Western part of the Gulf where my favourite food Blue Mussel is more abundant and bigger in size.

We are Cyanobacteria. We can produce organic matter from the sunlight and provide food for other sea creatures. But sometimes we multiply rapidly and cause algal blooms, which can be toxic.

I am Copepod representing zooplankton. I am a sea herbivore feeding on phytoplankton. My relatives and I serve as a snack for many fish species.

My grandparents lived in Ponto – Caspian Region (Caspian, Black, Azov, and Aral seas) and travelled to the Baltic Sea with ships. Nice place to live for a Fishhook Waterflea but fishermen do not like us because we form a sticky jelly-like mass on their fishing nets.

The cold and low salinity waters of the Gulf are excellent for me, Four-horned Sculpin. I look terrifying, don't I?

Invisible without a microscope

Plankton is formed by drifting organisms (microscopic animals, plants or bacteria) that inhabit the water layer. Plankton provides a crucial source of food to larger aquatic organisms such as fish.

Scientists study plankton with the help of automatic data collection systems installed on Tallink ferries.