On the coast of the Baltic Sea, the beach rose is spreading and the effects of climate change are starting to show

In the assessment of threatened habitat types, the coast of the Baltic Sea was divided into 45 habitat types, 58% of which were assessed to be threatened and 15% to be near threatened. Only a bit over a quarter of them (27%) was assessed to be in the category "Least Concern". The most significant reasons for the habitats becoming threatened are coastal overgrowing due to the eutrophication of the Baltic Sea and eutrophication-increasing atmospheric fallout, construction activities and wear of vegetation in popular recreational areas. As for future threats, the effects of climate change are becoming as significant as eutrophication and, with regard to introduced species, especially the spread of beach rose poses an increasing threat to many kinds of coastal habitat types.

The coastal zone is at its widest in the south-western archipelago and at its narrowest in the Bothnian Sea. The total length of the Finnish coastline is approximately 46,000 kilometres and there are roughly 97,000 islands. The dominant shore types are rock and moraine shores. Sand beaches and gravel shores are rarer. Many coastal habitat types are by nature small in area and consequently vulnerable to environmental changes. When the sea level rises as a result of climate change, there are not many possibilities of habitat transition when habitats are next to fields or built environment, for instance.

Our most threatened coastal habitat types are, for instance, Critically Endangered fixed coastal dunes with *Empetrum nigrum* (brown dunes) and Endangered sand beaches and drift lines with organic material that are formed of bladder wrack (*Fucus* spp.) or common eelgrass (*Zostera marina*).

Beach rose continues to thrive and preventive work is needed!

Originally from the shores of the Pacific Ocean in East Asia, beach rose (*Rosa rugosa*) continues its conquest of our coastline at an increasing pace. It can grow in many different places: the most extensive growths can be found on sand beaches, dunes with *Leymus arenarius* and sandy meadows. Spreading is also boosted by growths on gravel, shingle and boulder shores and even in cracks in rock outcrops.

Volunteers removing beach rose on the Jussinkari island in Porvoo.

Beach rose has already spread to the furthest reaches of our outer archipelago. In recent years, actions have been taken to prevent beach rose growth in many places and with good results. Efforts to slow down the spreading and also support for preventive work will be needed to an increasing extent.

Sand beaches and dunes become worn and eutrophicated but care measures help

The recreational value of sand beaches and dunes is significant, which also means that shores are subject to intensive wear and the original flora and fauna disappear. On the other hand, sand beaches are threatened by the eutrophication of the Baltic Sea and the resulting spread of common reed (*Phragmites australis*).

An open beach is gradually overgrown when vegetation gains ground and begin perennial vegetation succession. Photo Riku Lumiaro.

Masses of filamentous algae and reeds accumulating on the beach form a substrate that enables perennial vegetation and scrubs to spread on the beach and, as a result of overgrowing, the open beach may disappear entirely. Sand beaches in sheltered bays are particularly threatened. The situation on sand beaches and dunes can be improved by removing common reed and other aggressively spreading plants from them.

Effects of climate change – drift lines with organic material as an example

Climate change has many kinds of effects on the coast of the Baltic Sea. Bladder wrack (also known as black tang and rockweed) and common eelgrass are important key species for the ecosystem of the Baltic Sea and form underwater forests and meadows. They offer places of refuge, feeding and spawning for many marine animals. Even when dead, bladder wrack and common eelgrass are important. When a storm brings detached shoots on the shore and they decompose, they form organic drift lines that, in turn, are an important habitat for many invertebrates, plants, grass snakes and birds.

The potential changes caused by climate change, such as the increase in seawater temperature, nutrient washout accelerated by increased rainfall and the decrease in salinity over a long term, may significantly impair the underwater living conditions of bladder wrack and common eelgrass. When this happens, on-shore drift lines are no longer formed.

For further information, please contact

Senior Researcher **Terhi Ryttäri**, Finnish Environment Institute, tel. +358 400 148 692, firstname.lastname@ymparisto.fi

Conservational Biologist **Kasper Koskela**, Metsähallitus, tel. +358 400 322 440, firstname.lastname@metsa.fi