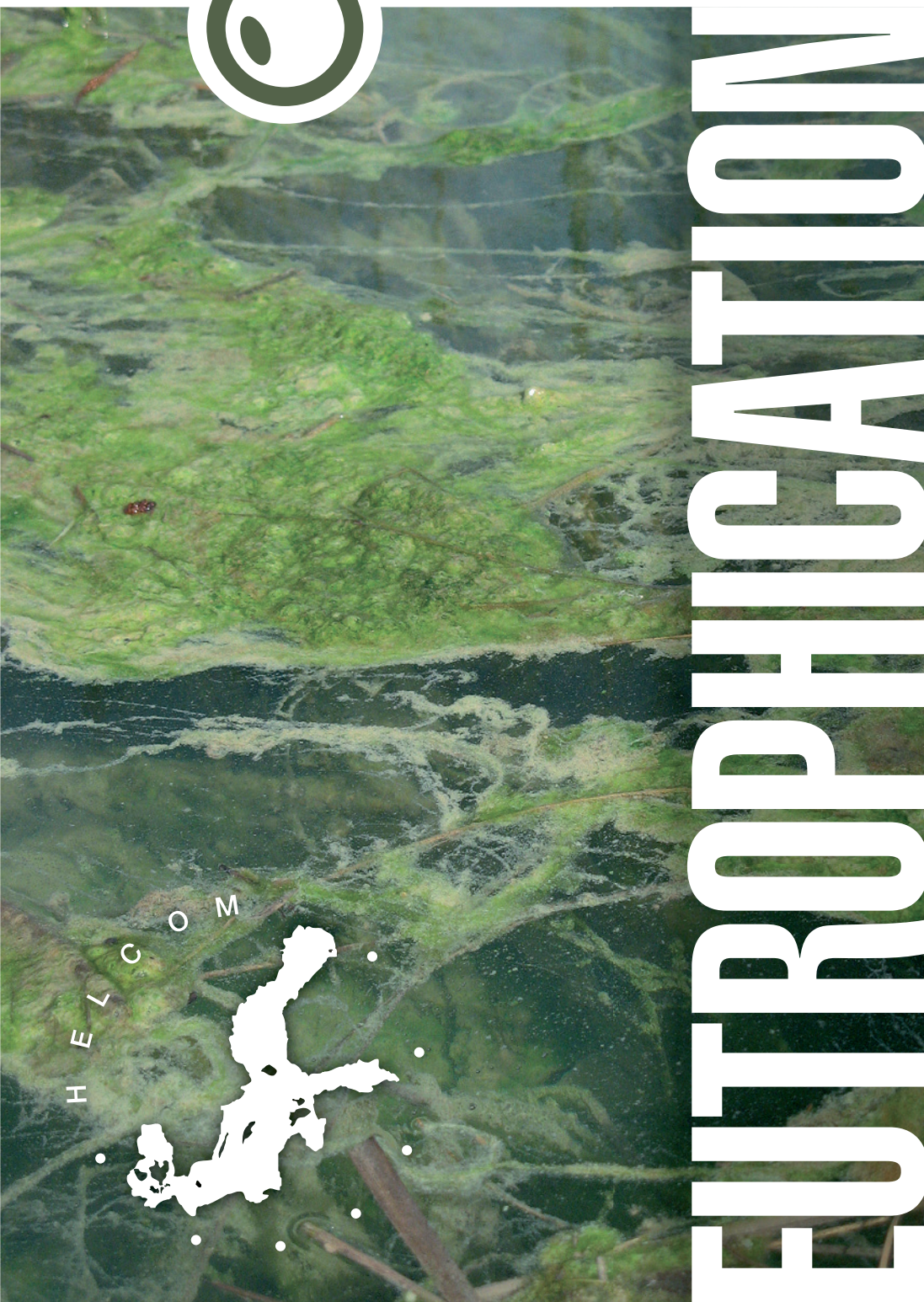
OUR COMMON CHALLENGE



WHAT IS EUTROPHICATION?

Eutrophication suffocates the life in lakes and seas. Some of the sea beds in the Baltic are the largest dead areas in Europe.

EUTROPHICATION is nutrient enrichment, mainly of nitrogen and phosphorus, in water ecosystems that generates the increased production of organic matter. This has many drastically negative consequences, such as reduced water transparency, an overgrowth of filamentous algae and reed beds on the shorelines, intensive algal blooms in the open sea areas, and a lack of oxygen in deep waters near the seabed. Many species of microscopic blue-green algae are toxic to animals and humans.

THE OVERLOAD of nutrients mainly comes from sources based on land. Among the largest human-induced sources of nutrients are municipal waste water treatment plants, and some industries without proper waste-water management. For nitrogen, aerial deposition originating from traffic and combustion is also an important source. Moreover, the biggest share of nutrients in the Baltic Sea catchment area originate from agriculture, mostly through scattered loading from the cultivated fields, but also from point sources such as large animal and poultry farms.

PHOTOS: Samuli Korpinen, Lotta Ruokanen, Reetta Ljungberg, Essi Keskinen, Seppo Knuuttila, Metsähallitus

WHY IS EUTRO PHICATION BAD FOR OUR COMMUNI TIES AND BUSINESS?

Eutrophication destroys the quality of the marine environment and the many benefits that a healthy sea could provide to people – ecosystem services.

1 Ecosystem services are essential to society, both to maintain human health and economic activities. A change in the environmental status of the sea will change ecosystem services which, in turn, will affect both wellbeing and profits.

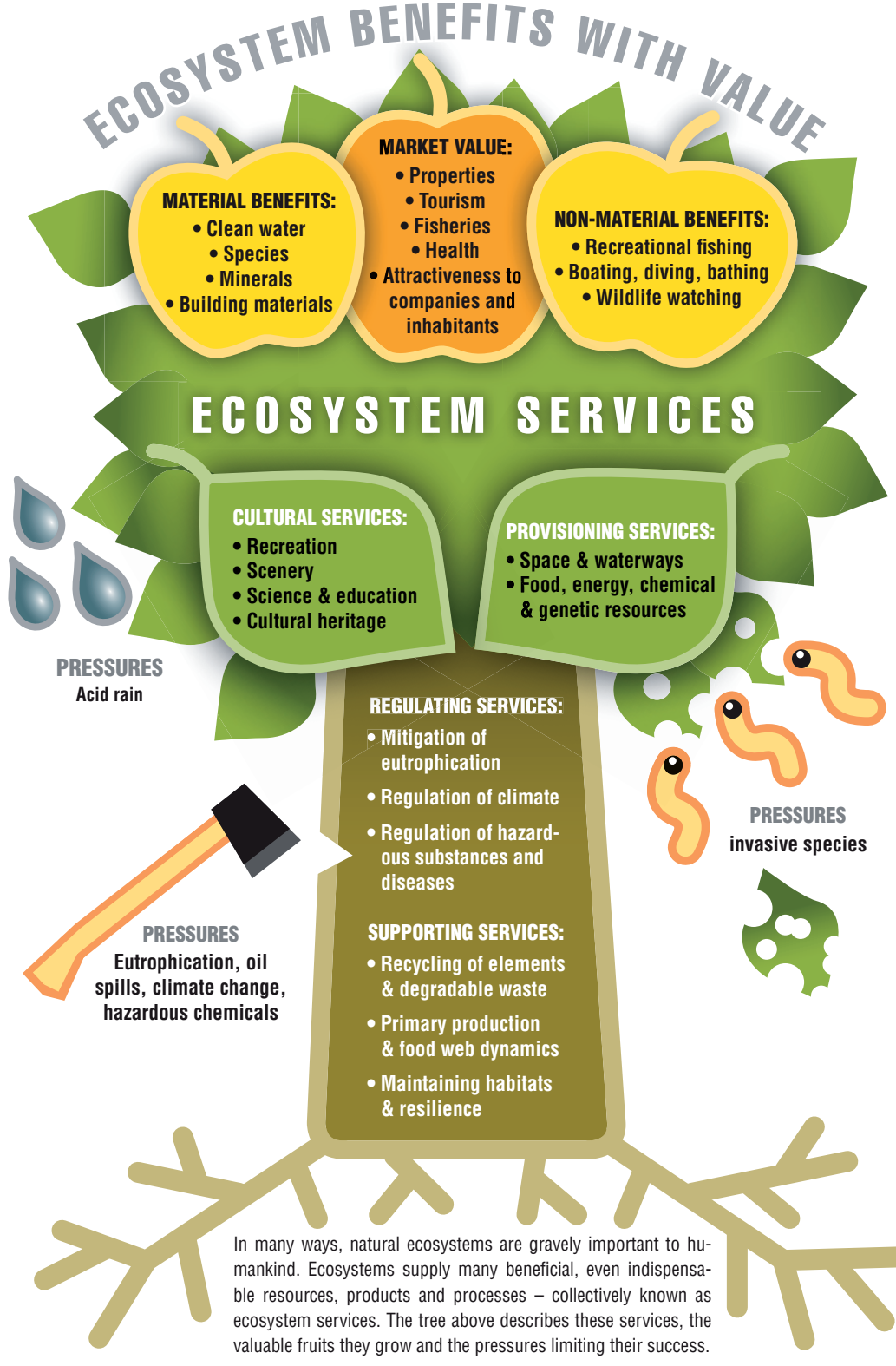
2 Eutrophication reduces the attractiveness, competitiveness and welfare of the whole region. The excessive algal growth has impacts on food web dynamics and the natural diversity of different species, and impairs the functionality of the whole ecosystem.

3 Toxic algal blooms cause health risks, and are adverse to ecosystems and resources that the water environment provides society with.

4 A deteriorated marine environment causes economic damage. The values of properties decrease at more severely eutrophicated sites. An improved environment generates many benefits such as beaches for swimming and recreation, and recovered fisheries resources.

5 Well-functioning ecosystem services – preconditions for good living and working environments – are investments for future profits.

Healthy Marine Ecosystems Have Many Benefits



In many ways, natural ecosystems are gravely important to humankind. Ecosystems supply many beneficial, even indispensable resources, products and processes – collectively known as ecosystem services. The tree above describes these services, the valuable fruits they grow and the pressures limiting their success.

WHAT CAN WE DO ABOUT IT?

The drastic reduction of nutrient loading is urgently needed to improve the state of the Baltic Sea. It is easier and more cost-efficient to cut point source inputs than loading from scattered sources.*

Transboundary inputs from non-coastal regions of the Baltic drainage area are distinct; in some countries, substantial share of the loading comes via rivers.

BETTER TREATMENT OF URBAN AND INDUSTRIAL WASTEWATERS

Municipalities are a key source of nutrients to the Baltic Sea. Improved phosphorus removal from urban wastewaters is cost-efficient and improves the state of the watercourses effectively. Separate treatment or pre-treatment of industrial wastewaters are necessary. Also stormwater management is important for avoiding additional loading to treatment plants and to the natural waters.

HOUSEHOLDS

Approximately one third of municipal phosphorus load could be cut with phosphorus-free detergents – this applies to the countries where they are not yet widely used. In scattered settlements, dry toilets are much easier to manage than treating water closet sewage satisfactorily.

SLUDGE MANAGEMENT

Sustainable sludge management in the waste water treatment plants is essential as the phosphorus removed from sewage is accumulated in the sludge. Recycling nutrients is important – especially the globally depleting mineral phosphorus. The renewable energy from both agricultural and urban sludges could be utilised much more effectively.

AGRICULTURE

Overfertilisation and overfeeding are not environmentally sustainable solutions. These can be replaced by recycling excessive manure and other biowastes as fertilisers, or by turning them into biogas and energy. It is important to favour cultivating practices that prevent erosion such as direct sowing and plant cover in the winter (more than 90% of the agricultural loading is generated in winter). Field sections that flood frequently should be left uncultivated or transformed into grasslands. The construction of buffer zones and wetlands can decrease nutrient loads and at the same time improve biodiversity of the rural environment.

ATMOSPHERIC DEPOSITION OF NUTRIENTS

Increasing the share of public transport and electronic vehicles reduces atmospheric nitrogen loading. In shipping traffic, there is technology and solutions available to help cut the loading. Supporting the use of renewable energy sources and energy efficiency reduces loading from energy production.

* HELCOM Baltic Sea Action Plan (2007–2021) recommends reaching a yearly average of 0.5 mg/l phosphorus in treated wastewaters. It is stricter than the EU requirement of 1 mg/l that is sufficient for the much bigger and deeper seas of the Mediterranean and Atlantic. The criteria for Best Environmental Practices (BEP) and Best Available Technology (BAT) in agriculture are also defined in the Action Plan, both very important in reaching a healthier Baltic Sea.

PHOTOS: Jan Ekebom, Sewage Management Facilities Lübeck, Juha Räty, Lotta Ruokanen, Harri Huhta/MTT, Reetta Ljungberg

THE UNIQUE BALTIC SEA

The Baltic Sea is a challenging environment for organisms. Many species are very sensitive to changes in the environment and thus live on the extreme limits of their adaptability because the Baltic Sea:

- **is relatively small and very shallow**
- **has approximately 85 million people living in its exceptionally large catchment area**
- **has a slow water exchange - nutrients and harmful substances stay in the sea for decades**
- **has brackish water – a mixture of fresh and saline seawater**
- **is cold in winter and has an ice cover**

The International Maritime Organization (IMO) designated the Baltic Sea as a Particularly Sensitive Sea Area in 2004.

PHOTOS: Jannica Haldin, Metsähallitus / Jan Ekebom, Essi Keskinen, Pekka Lehtonen COVER PHOTO: Samuli Korpinen

PURE
project on urban reduction of eutrophication
www.purebalticsea.eu

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Baltic Sea Region
Programme 2007–2013

Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument