EFFECTS OF EUTROPHICATION ON WATER QUALITY AND BIODIVERSITY

Nutrient-poor rivers and lakes typically have clear water, sand, gravel, pebble or rock bottom and small overgrowth of aquatic plants.

WHY DO DIFFERENT BODIES OF WATER HAVE DIFFERENT FLORA AND FAUNA?

Substances constantly circulate in nature and water enrichment with nutrients - phosphorus and nitrogen compounds, or eutrophication is a natural process that takes place since the watercourse or body of water is formed and until they are completely overgrown and disappear.

All living organisms have adjusted to certain environmental conditions. Some are less demanding, while others are very sensitive to changes in environment. Therefore, animal and plant species composition depends on the amount of nutrients and other dissolved substances in the water, clarity, depth, temperature, flow rate, bottom composition, shading, as well as chances for species to spread and reach the particular place.

Organisms living in nutrient-poor, clear, cold and rapidly flowing waters will not be found in nutrient-rich, turbid, warm and standing waters and vice versa.

HOW DOES AQUATIC PLANT AND ANIMAL LIFE CHANGE UNDER THE EFFECTS OF EUTROPHICATION?

Natural eutrophication is a very slow process and watercourses and bodies of water change very gradually, thus maintaining habitat for various species for long periods. Human activities - discharge of waste water, deforestation, wetland drainage, development of arable land and fertilization have accelerated the eutrophication process several times. Consequently, water enrichment with nutrients and the subsequent overgrowth of blue-green algae, green algae and other plants, accumulation of silt and overgrowing happens very rapidly. Not only the quality of water deteriorates but also species typically found in nutrient-poor and clear waters become rare and disappear altogether due to decrease in suitable habitats.

Rivers and lakes very rich in nutrients are characterised by lush growths of aquatic plants, dense overgrowth and silt bottom. Water transparency during summer can be only a few tens of centimetres and frequently the water is covered in blue-green algae or «blooms».

This publication, which is produced within the framework of the EU project Snowbal (Saving the Sea from Nutrient Overload by managing Wetlands/grasslands BaLtically), reflects the author´s views. The Managing Authority can not be held liable for the information published.

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CHARACTERISTIC AND EASILY NOTICEABLE SIGNS OF HEAVILY EUTHROPIC BODIES OF WATER

LOW WATER TRANSPARENCY

Excess microscopic algae and their residue «cloud» the water. Therefore, sunlight required for plants to grow can only penetrate the very upper layer of the water, whereas deeper levels are completely dark and plants are not able to grow there anymore.

Scientists use a special white disk tied to a string to measure the water transparency - *Secchi* disk, but everyone can try it themselves by using a white pot lid tied to a string.

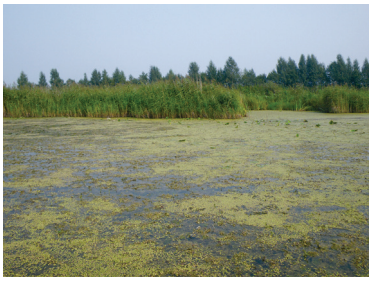
The lowest transparency was recorded in Talsu ezers and Limbažu Dūņezers - 20 cm, Vīragna ezers - 25 cm (www.ezeri.lv). It must be borne in mind that brown water (marsh) lake transparency is not related to level of euthropication but rather to the dark colour of water from the dissolved humic substances in the water.

WATER BLOOM

Microscopic blue-green algae rapidly spread in warm waters rich in nutrients (especially phosphorus compounds) and even form a blue-green skin on the surface of the water. When the algae cells die, oxygen in the water is consumed and substances poisonous for plants and animals are released. Consequently, fish can start suffocating and it is not recommended to go swimming and water livestock in such waters.

LUSH AQUATIC PLANT GROWTHS AND DENSE OVERGROWTH

The nutrients in water facilitate the growth of aquatic plants and euthropic water bodies are typically filled with lush and dense aquatic plant growths. If depth and bottom conditions are suitable, then aquatic plants can take up the whole river, lake or pond area. Euthropication process, which is characterised by introduction and increasing overgrowth of aquatic plants, can also be observed in backyard ponds and other artificially created bodies of water. Shallow bodies of water bordering with fertile agricultural lands become euthropic and overgrow quickly, whereas, for example, former sand quarries in forests become euthropic at a much slower rate.



SPECIES CHARACTERISTIC FOR EUTHROPICATION

Nutrient-rich waters are most often in great numbers inhabited by species that find the certain conditions most favourable. Those are, for example, floating aquatic plants - several species of duckweed, greater Duckweed, Frogbit, which all absorb the nutrients straight from the water. Euthropic bodies of water typically have good conditions for spreading of filamentous green algae (*Cladophora glomerata*), rigid Hornwort, as well as «large plants» - yellow Water-lily, other species of water-lilies, branched Bur-reed and small-fruited Bur-weed, common Club-rush and common Reed.

Branched Bur-reed.

Greater Duckweed and common Duckweed form a covering layer on the water surface.

Rigid Hornwort and floating aquatic plants.

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