

Hydrological conditions for the survival/remaning of a unique southern Baltic marsh as a habitat of endangered fauna and flora species

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Abstract

The coasts of the southern Baltic are characterized by diverse environmental conditions, caused by different genesis of physical and biochemical processes. In this special region where an interaction of salt-water with fresh water occurs, there are essential differences in local hydrological conditions. The southern Baltic is famous for separate, extensive branches of great rivers, direct mouths of rivers from postglacial lake areas, estuaries, coastal lakes (inner-dune, trough, deltaic) and numerous wetlands. Quoted types of objects differ from one another by area, depth and connection with the sea.

Keywords: Marsh; Coastline; Habitat; Human influence.

The uniqueness of the southern Baltic marshes

The current environmental condition of the Polish coast is a result of both a natural development and human activity, as well as of water circulation. For several years the Department of Hydrology of Gdańsk University conducts research in order to define the hydrological conditions, which must exist if these unique environments are to remain. One of the objects of our interest is a unique hydrological area on the Polish stretch of coast-marsh, located near the Reda river mouth and Puck Bay (Gdańsk Bay – southern Baltic).

The object of investigation

Salt-marshes are very attractive as regards environment, landscape and tourism. This is an area of landscape protection (Seaside Landscape Park), proposed for the system of Baltic Sea Protected Area (BSPA). This is also a mainstay of European rank.

In 1988, in order to preserve and take into account the avifauna breeding and flying (*Calidris alpina schinzii*, *Motacilla citreola*) as well as moisture salt meadow so-called

Juncetum gerardi (*Plantago maritime*, *Epipactis palustris*), Beka reserve has been established. Marsh is a low-situated zone in humid times swamped by the soil-water. From a hydrological point of view, the uniqueness of this marsh is a result of the fact that the marsh is situated on a coast with a half-closed sea, where tides do not exist. Fluctuations of water level induced by wind set-ups are the factors which cause cyclic swamp.

Natural conditions

All the hydrological conditions result in biotope environmental (halophile plants, flying fowl, periodic settled and breded flow) variability. They cause sea-water intrusions from Puck Bay. They create numerous, ephemeral pools. Simultaneously from the higher parts there is a confluence of fresh water. The hydraulic gradient is minimal. That is why the phreatic waters are low. The effects of this fact are the spatial and temporal differences in physical and chemical water composition. They decide about the remaining or extinction of unique habitats of endangered flora and fauna species in the southern Baltic.

Anthropogenic pressure

Very essential for the preservation of this area is human activity. The positive action is an annual mowing of reed during the spring time. This makes the reed weaker. A grazing of different species of animals also positively influences the salty plant. The animals that are grazing are: cows, sheep and horses. Also the number of animals changes. The best animals for grazing are the cows, whereas the worst are the sheep. That is because the sheep eat the plants growing a few millimeters from the ground.

The negative fact is that in this place there is no proper supervisor over the land improvement system. The result is the overgrowing of a number of channels, hence their reduced conveyance and hydrological rank. Simultaneously uncontrolled tourism, especially during birds breeding time is another negative form of human activity. Also illegal cottage building in the outline of the reserve, results in disturbance of water circulation.

Conclusion

To recapitulate, the hydrological processes and human influence very closely shape the biotope environment of the present marsh. The effect of this interaction between nature and human activity is the 'Beka reserve' which, should be propagated as a unique marsh on the southern coast of the Baltic.

References

Augustowski B. 1979. Kasubian postglacial lake area, Gdańsk, Poland.

- Lenartowicz Z., M. Machnikowski, E. Król and M. Angiel. 1995. The project of protection: The Beka Reserve, Institute of Environmental Protection, Gdańsk, Poland.
- Wróbel B. 1969. Water conditions of the Reda and Zagórska Struga river basin, Warszawa, Poland.