

**IMPACT OF WATER MANAGEMENT ALTERNATIVES TO SECURE
FAVOURABLE STATUS IN ZUVINTAS LAKE AND AMALVAS WETLAND IN
LITHUANIA**

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The Zuvintas Lake, located in southern Lithuania in the catchment of the Dovine River is one of the biggest lakes and oldest nature reserves of the country. Despite the inflow of nutrients and related eutrofication, the Zuvintas Lake is still one of Lithuania's most significant nature reserves and both the Lake as well as the adjacent wetlands is a potential Site of Community Interest (SCI) according to the Habitats Directive. Once designated as SCI Lithuania is obliged to maintain the conservation status of the site and species for which the site is designated and to make sure that the favourable conservation status is achieved or maintained. There are three main parts of the Zuvintas Biosphere Reserve: 1) the Zuvintas Lake itself, 2) the adjacent bogs and fen meadows and 3) the Amalvas wetland.

The changes in the hydrology of the Dovine River Basin, because of a large scale melioration and water management works carried out in the 20th century, are the main causes for the decreasing biodiversity of the Zuvintas Lake. These works included the building of dams at the outlets of various lakes (including the Zuvintas lake) to retain spring water, regulation of the river Dovine itself, melioration of the Amalvas wetland downstream of the Zuvintas Lake and intensive agriculture and fish-breeding activities upstream Zuvintas. The biodiversity of the Amalvas wetland have significantly been impacted by drainage and melioration works during the last thirty years as well.

The basic impediment to find a solution for the ongoing deterioration of the Zuvintas Lake and adjacent wetlands has been the lack to see the Lake as an integrated part of the Dovine River basin and to acknowledge that solutions for the Zuvintas Lake have to be found at a basin level. Therefore, the main objective of this research has been to evaluate the impact of various water management alternatives of the Dovine river on the Zuvintas Lake and Amalvas wetland benefiting to the favourable conservation status of the area. Various scenarios including the removal of some sluice-gates have been analyzed to get insight in the impact of changes of the river regime on the water levels in the Zuvintas Lake and adjacent wetlands.

For such a complex system as the Dovine basin it required the use of a combined groundwater and surface water model to predict the effect of measures. For such situations the SIMGRO model was developed. The model simulates the flow of water in the saturated zone, the unsaturated zone and the surface water. The model is physically-based and therefore suitable to be used in situations with changing hydrological conditions. Different scenarios were defined to represent the changes in water management practices and land use. From these simulations results will be presented.