

Assessment of the Nutrient Load in the Upper Arda River Catchment – Prediction of the Trophic State of the Madan Reservoir

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Abstract: Three reservoirs are planned to be built in the upper section of the Arda River, Central Rhodope Mountains, Bulgaria. Pursuant to a decision of the Environment and Waters Ministry relating to the Environmental Impact Assessment of the Madan Reservoir, a feasibility study was conducted on the loading and the eutrophication mitigation measures. Nutrient source apportionment modelling, and estimation of instream loads on which such modelling is validated, is made. The level of uncertainty increases when monitoring frequencies are low. In order to illustrate the level of variability that such uncertainty can generate in modelling results, the most likely nutrient load with probable upper and lower boundary levels are calculated to demonstrate the likely possible range of nutrient loads from individual pressures (sources). The results are used to forecast the trophic state of the Madan Reservoir. Source apportionment modelling should only be used as an indicator of the likely contribution of different pressures towards observed eutrophication impacts in the upper sections of the Arda River basin, but not as actual contributions.

Key words: nutrient load, predictive models, trophic state, watershed – reservoir interactions