



## **Methodology for the identification and assessment of groundwater dependent ecosystems in Estonia**

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Dynamic interactions at the surface–ground water interface are widely recognised but due to the spatiotemporal complexity, the role of groundwater in terrestrial and aquatic ecosystems is poorly understood and documented. The majority of the countries have not finished the assessment of groundwater dependent ecosystems (GDEs). GDEs are valuable ecosystems that depend on groundwater input and cannot be considered and assessed separately. Any changes in the water supply or chemical composition often result in significant and permanent damage of dependent flora and fauna. GDEs are directly or indirectly protected by a number of international agreements (e.g. Ramsar convention on wetlands) and in many EU directives. Estonia started with the identification of GDEs a few years ago and has now worked out a theoretical approach on how to identify, assess and monitor the GDEs. The first step in this methodology is to find indicators and define criteria for the evaluation of quantitative and qualitative effects of groundwater bodies on GDEs. For that status assessment of GDE is needed. If the ecosystem status is unfavourable, potential other causes have to be ruled out at first. Only after that the assessment of the quantitative and qualitative effects on GDEs using assessment schemes follows. Quantitative effect means that human influence has caused too low groundwater level to sustain the GDEs in their natural state. Qualitative effect means that human influence has affected the groundwater body in a way that its chemical composition causes the deterioration of the ecological value of the GDE. When GDEs are identified and assessed, monitoring can start. Altogether 197 groundwater dependent lakes, 27 karst phenomena, 114 flowing water bodies and 70 terrestrial ecosystems (mires) were identified. Hereby we are presenting Estonian methodology for GDEs identification and assessment. Development and testing of the GDE methodology continues with the financial help of the GroundEco project (Est-Lat62 “Joint management of groundwater dependent ecosystems in transboundary Gauja-Koiva river basin”) funded by ERDF Interreg Estonia-Latvia cooperation programme.