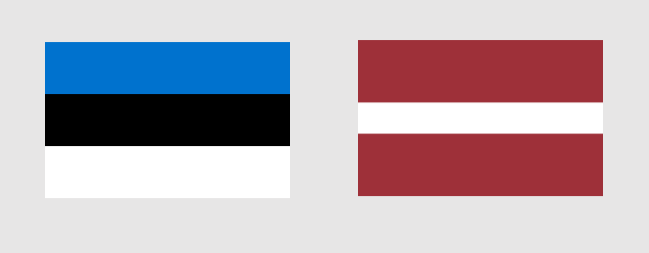


Development of joint methodology for groundwater dependent terrestrial ecosystem identification and assessment in transboundary area (Estonia - Latvia)

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01 INTRODUCTION

Motivation

- Groundwater dependant terrestrial ecosystems (GWDTEs) are valuable ecosystems (many in Natura 2000 network of protected sites) which existence rely on groundwater input
- Groundwater is the main drinking water source in Gauja – Koiva river basin area

Political framework

- Gauja - Koiva river basin is divided by border between Estonia and Latvia, still it has a common water cycle
- Requirements from EU water policy (Water Framework Directive 2000/60/EC) demand joint management of transboundary water bodies

Problem

- If a significant damage to GWDTE is caused by anthropogenic alterations of groundwater level or chemical composition, a whole groundwater body is in poor status
- The identification of GWDTEs is complicated and their studies requires interdisciplinary approaches
- Human induced activities (such as extraction of mineral deposits and groundwater or fertilization) are significant treat for GWDTE quality or even existence



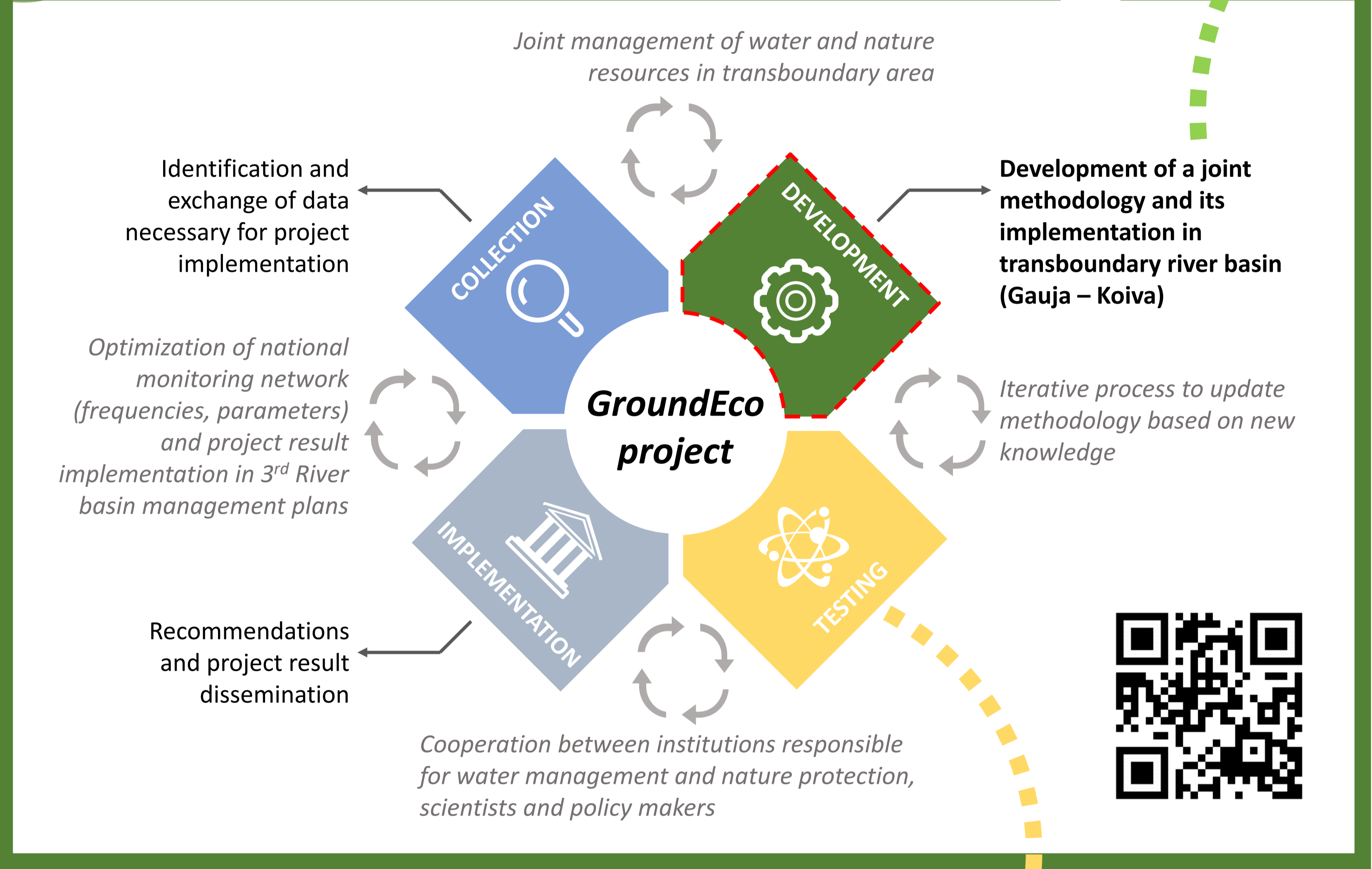
Methodology for the identification and assessment of groundwater dependent ecosystems in Estonia

Tue, 09 Apr, 10:45–12:30 Hall A

Groundwater dependent terrestrial ecosystems in hemi-boreal climate: two pilot studies

Wed, 10 Apr, 16:15–18:00 Hall A

02 SOLUTION

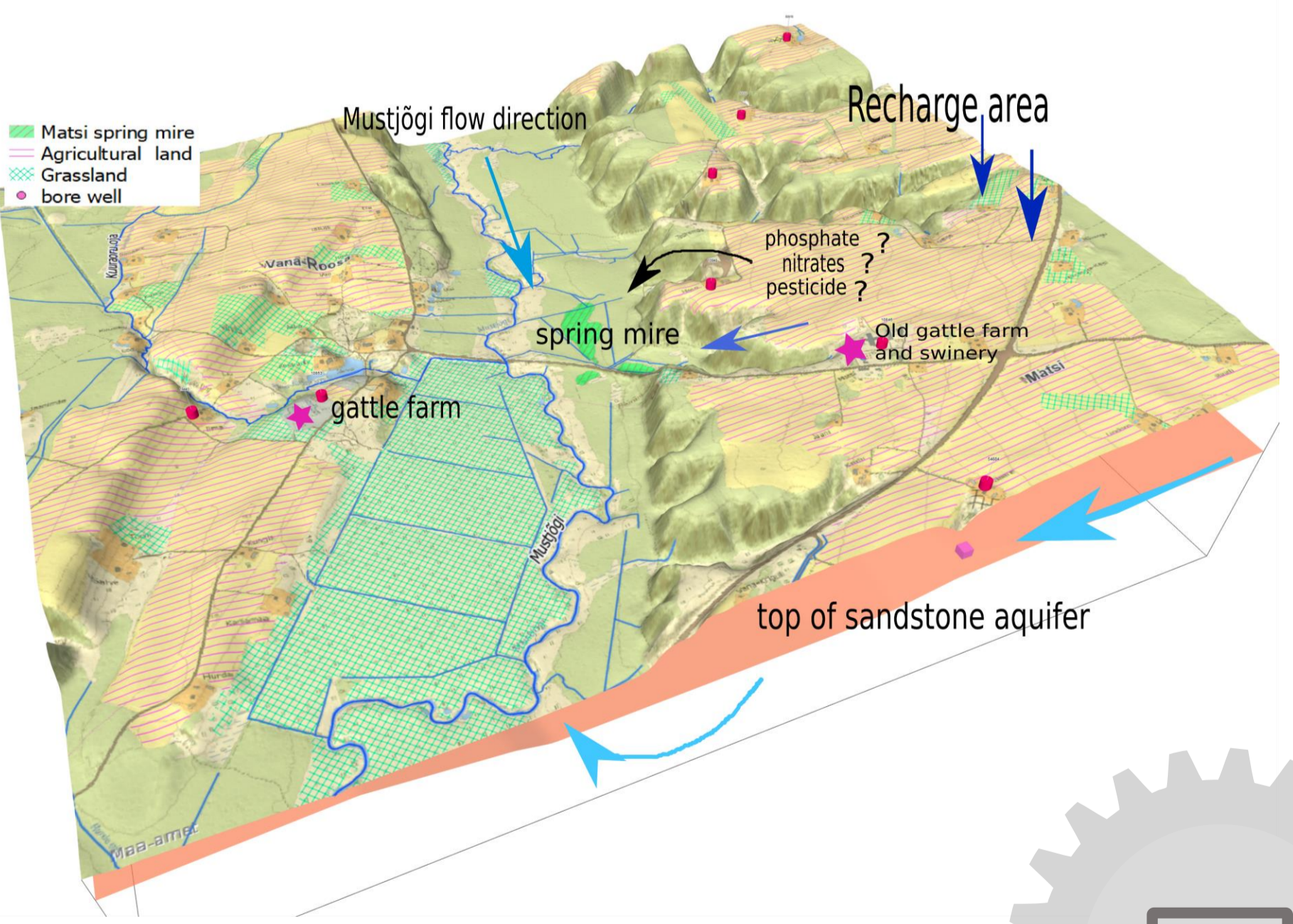


PILOT STUDIES AND CONCEPTUAL MODELS

Ongoing works

- Monitoring - water quality sampling and groundwater level measurements
- Development of conceptual models and low cost sensors
- Vegetation analysis
- Ground penetrating radar and thermal imaging studies

Find out more about GroundEco project activities and visit two other posters!



Find upcoming project events and newest results at bit.ly/GroundEco

03 RESULTS: PROPOSED APPROACHES

GWDTE identification

Two-step approach:

STEP 1: selecting habitat types listed in Annex I in the EU Habitats Directive 92/43/EEC

STEP 2: applying additional criteria (area, occurrence within GWDTE complexes, presence of certain species) to select the GWDTE sites

However, though the criteria help to exclude non-relevant habitat types and use the existing habitat data with varying quality, still the final decision in site selection is largely based on **expert judgement** (e.g. decision on what is a habitat complex is based on terrain, soil and forest data).

The criteria are applied both inside and outside Natura 2000 network. Currently the approach is being tested in Gauja-Koiva river basin.

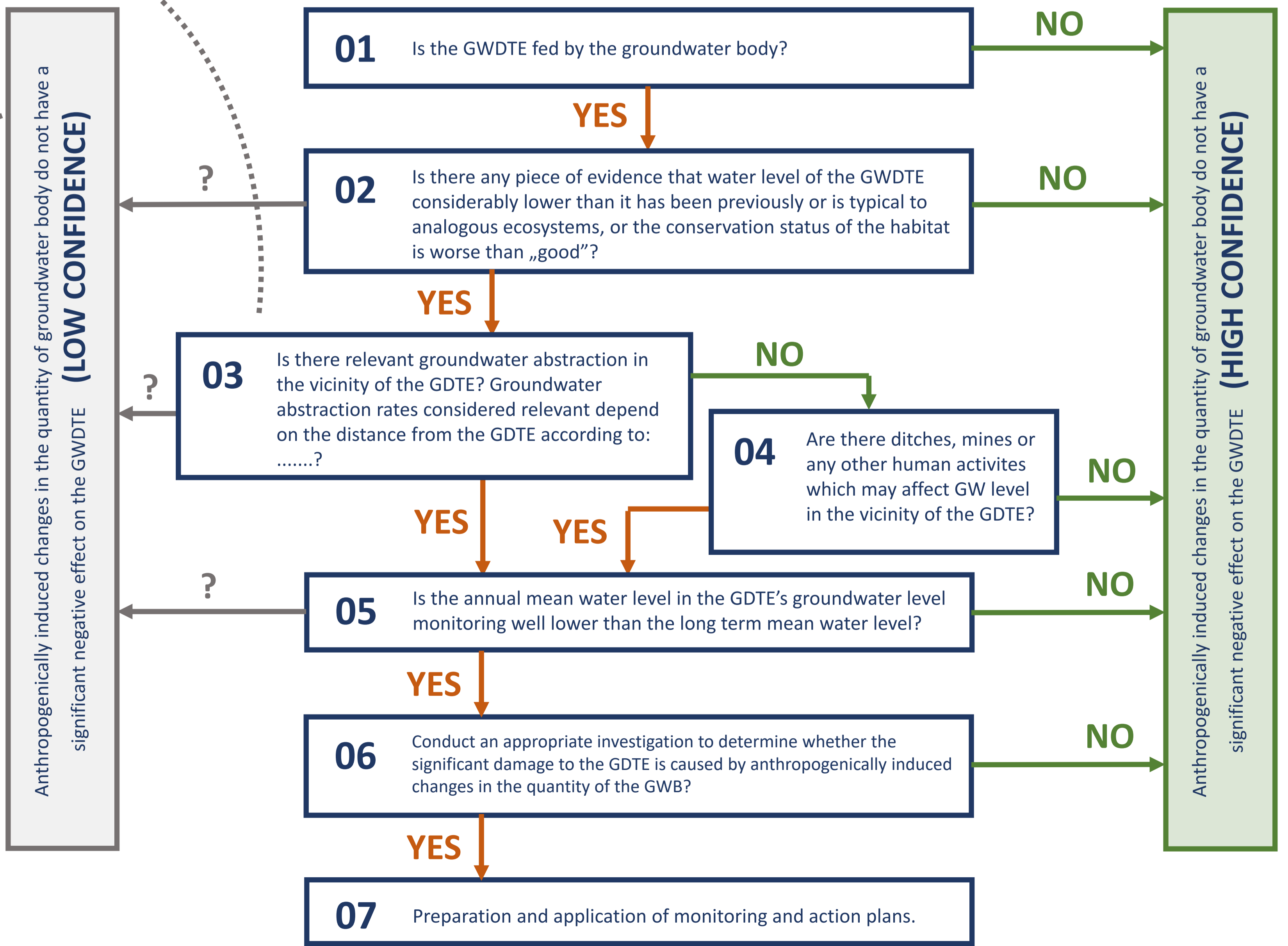
Habitat types listed in the Annex I of the EU Habitats Directive	Minimum area and other considerations (Latvia/Estonia)
Considered as GWDTEs	
Humid dune slacks (2190)	–
Fennoscandian mineral-rich springs and spring fens (7160)	Single polygon with 10 ha/20 ha area or smaller if part of a habitat complex with the total area of at least 20 ha
Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> (7210*)	Single polygon with 10 ha/20 ha area or smaller if part of a habitat complex with the total area of at least 10 ha/20 ha. <i>Cladium mariscus</i> stands in lakes are excluded
Petrifying springs with tufa formation (<i>Cratoneurion</i>) (7220*)	Single polygon with 1 ha area or smaller if part of a habitat complex with the total area of at least 1 ha
Alkaline fens (7230)	Single polygon with 10 ha/20 ha area or smaller if part of a habitat complex with the total area of at least 10 ha/20 ha
Fennoscandian deciduous swamp forests (9080*)	Single polygon with 20 ha area or smaller if part of a habitat complex with the total area of at least 20 ha
Considered as GWDTEs in exceptional cases	
Hygrophilous tall herb fringe communities of plain and of the montane to alpine levels (6430)	Single polygon with 20 ha area or smaller if part of a habitat complex with the total area of at least 20 ha (only in Estonia where the habitat type includes non-calcareous fens and poor paludified grasslands)
Active raised bogs (7110*) and Degraded raised bogs (7120), Transition mires and quaking bogs (7140)	20 ha (only in NE Estonia in oil shale mining region)
Bog woodlands (91D0*)	20 ha (bog woodlands only in NE Estonia in oil shale mining region if occurring in GWDTE complexes); transition mire woodlands (included in 91D0*) – min. area 20 ha in both countries (single polygons or part of GWDTE complex with min. total area 20 ha)

DISCUSSIONS

Ongoing discussions

- Addition of confidence levels in case if no data available
- Calculation of area affected by groundwater abstraction is necessary – area needed for groundwater recharge to compensate abstraction
- A buffer area around each well
- Several buffer areas merged into one larger based on worst case scenario
- Only abstraction from Quaternary aquifer and hydraulically linked uppermost bedrock aquifer should be considered
- Inclusion of wells with unknown water consumption to consider worst case scenario

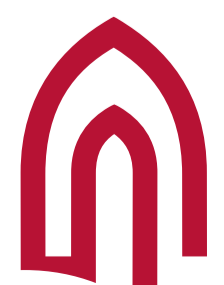
GWDTE quantitative assessment scheme



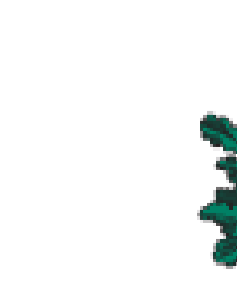
GEOLOGICAL SURVEY OF ESTONIA



KESKKONNAMINISTEERIUM



TALLINNA ÜLIKOOL



Dabass aizsardzības pārvalde



VIDZEME

