



# Development of ecosystem-based maritime spatial planning decision support system for the marine protected areas designation process

The Baltic Sea is in need for common platform for Maritime spatial planning (MSP), that includes whole sea area and would ease work with local stakeholders and cross border collaboration. BONUS BASMATI project is planning to develop integrated and innovative solutions for maritime spatial planning from the local to the Baltic Sea Region scale. The goal for this project is to ensure broad and easy access to data and information through an innovative web-based multi-channel decision support system and advanced tools for impact assessment and stakeholder involvement in the decision making process. This decision support system will be developed through several case studies and based on results of former MSP projects. In order to achieve the goal will be created a decision-support tool – the Baltic Explorer. Current research on the Latvian case study aims at the creation of a tool for facilitating identification of new off-shore Marine Protected Areas (MPAs) and re-assessment of location of the existing MPAs in the MSP context.

## Goal - create a tool for facilitating identification of new off-shore Marine Protected Areas (MPAs) and re-assessment of location of the existing MPAs in the MSP context

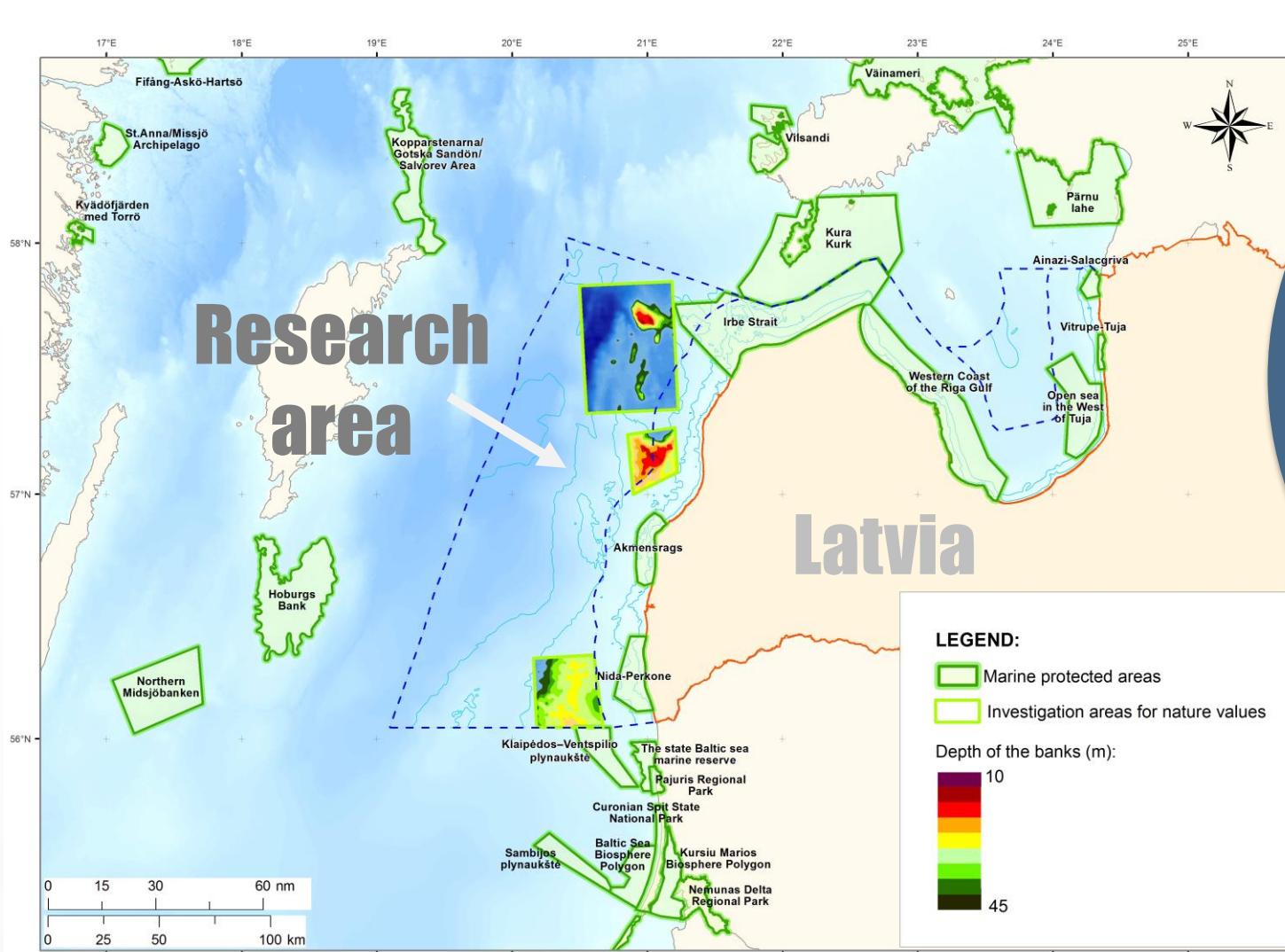


Fig.1. Research area of Latvian case study - marine waters under Latvian jurisdiction (territorial sea and exclusive economic zone).

**MPAs → based on most valuable benthic habitats**

The analysis is based on underwater video survey data and existing data systems (e.g. HELCOM Map and Data Service, EMODnet)

The list of benefit from the habitat - ecosystem services habitats (e.g. fish for food, recreational services, nutrient regulation)

**Benefit from the habitat**  
ecological socioeconomic

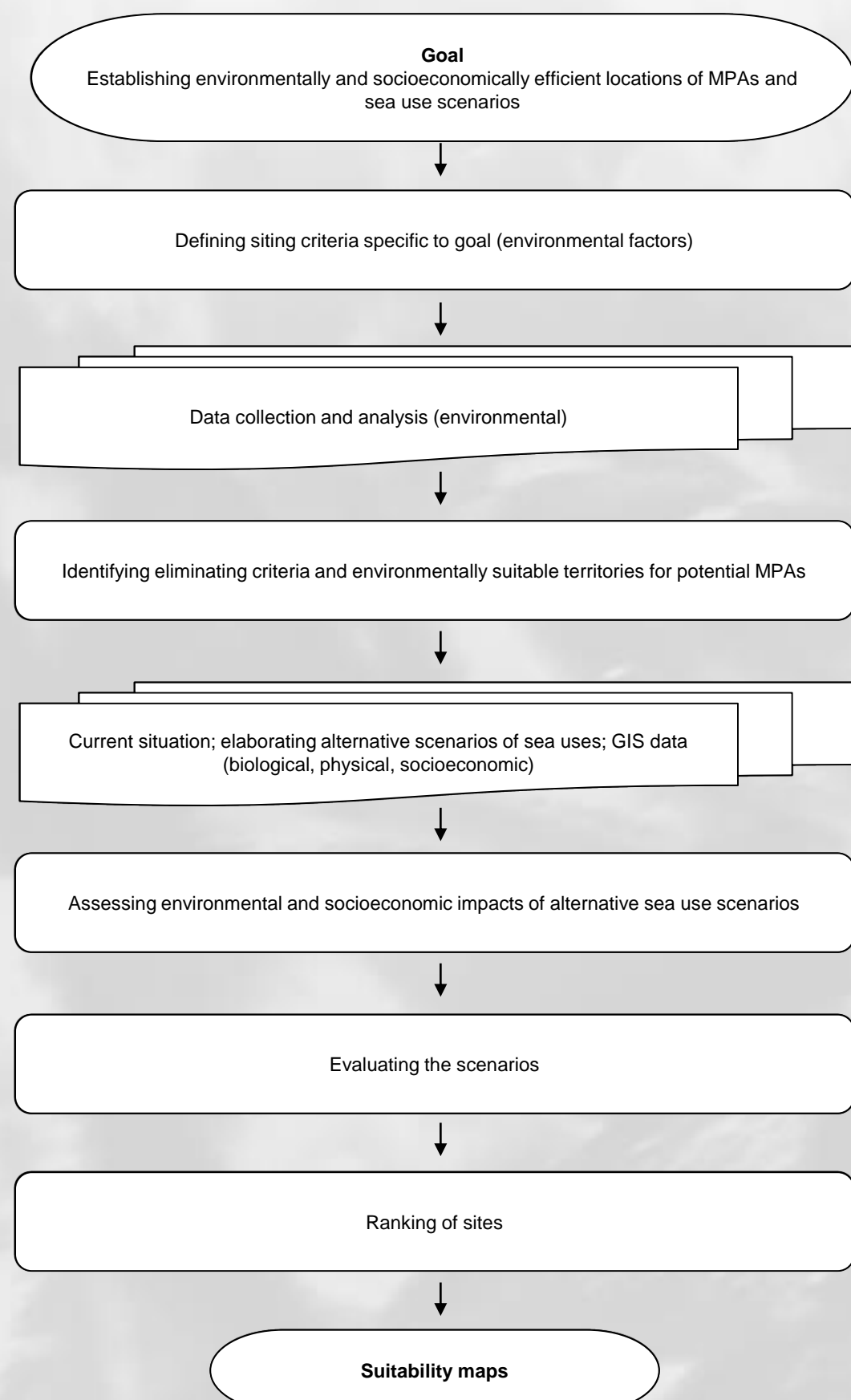


Fig.5. General analytical steps of the Latvian case study

### Baltic Explorer

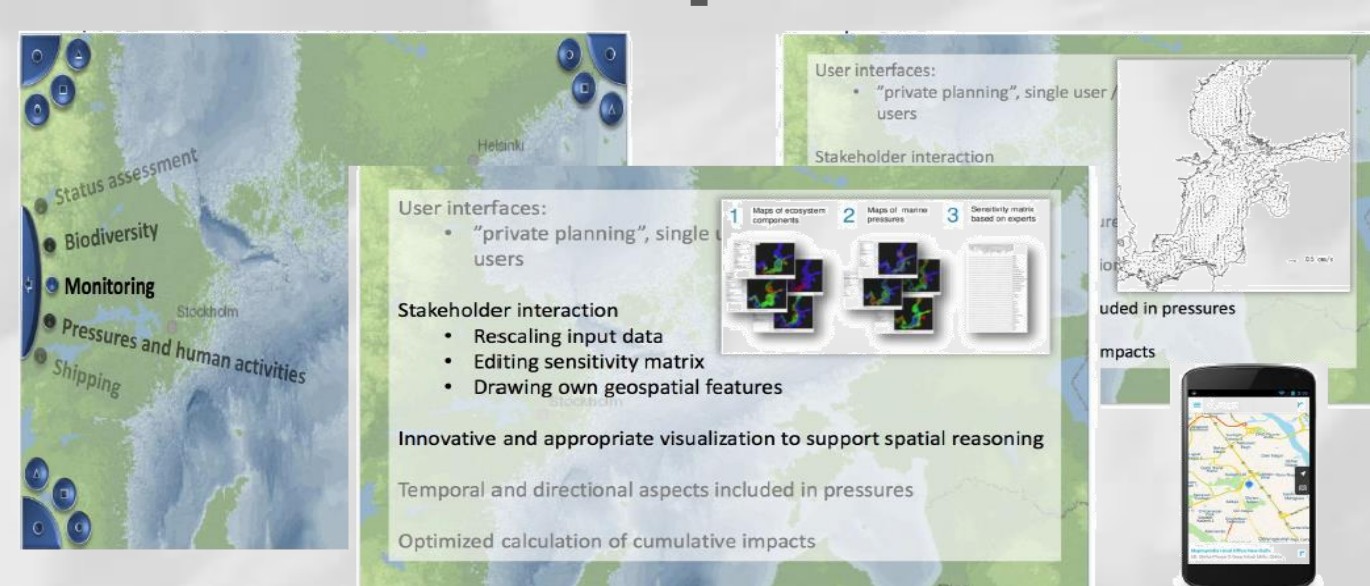


Fig. 6. A multi-channel platform offering an interactive web map and a large multi-touch display for accessing, displaying and analyzing harmonized cross-border data from marine spatial data infrastructures available in the Baltic region.

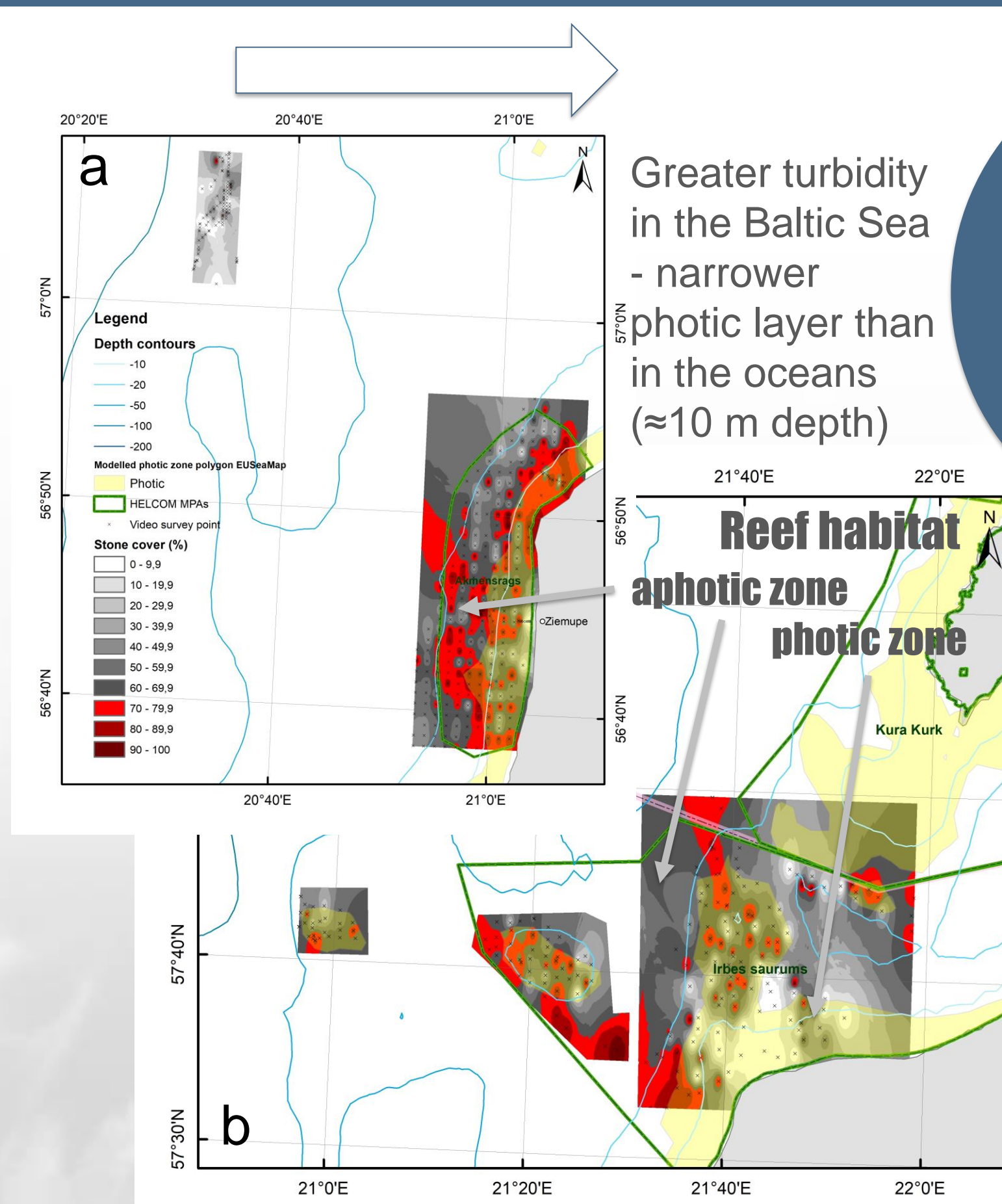


Fig.2. Reef habitat that exceed 70% of stone coverage, a – area near Pavilosta - Akmenrags, b – area near Ovisi – Irbe Strait.

**Determining habitat quality**

Greater turbidity in the Baltic Sea - narrower photic layer than in the oceans (≈10 m depth)

The quality of habitats is based on amounts of stones and boulders in the reef. Larger stone coverage – higher density of species on stones.

**Main species**

### Mussel cover on the stones

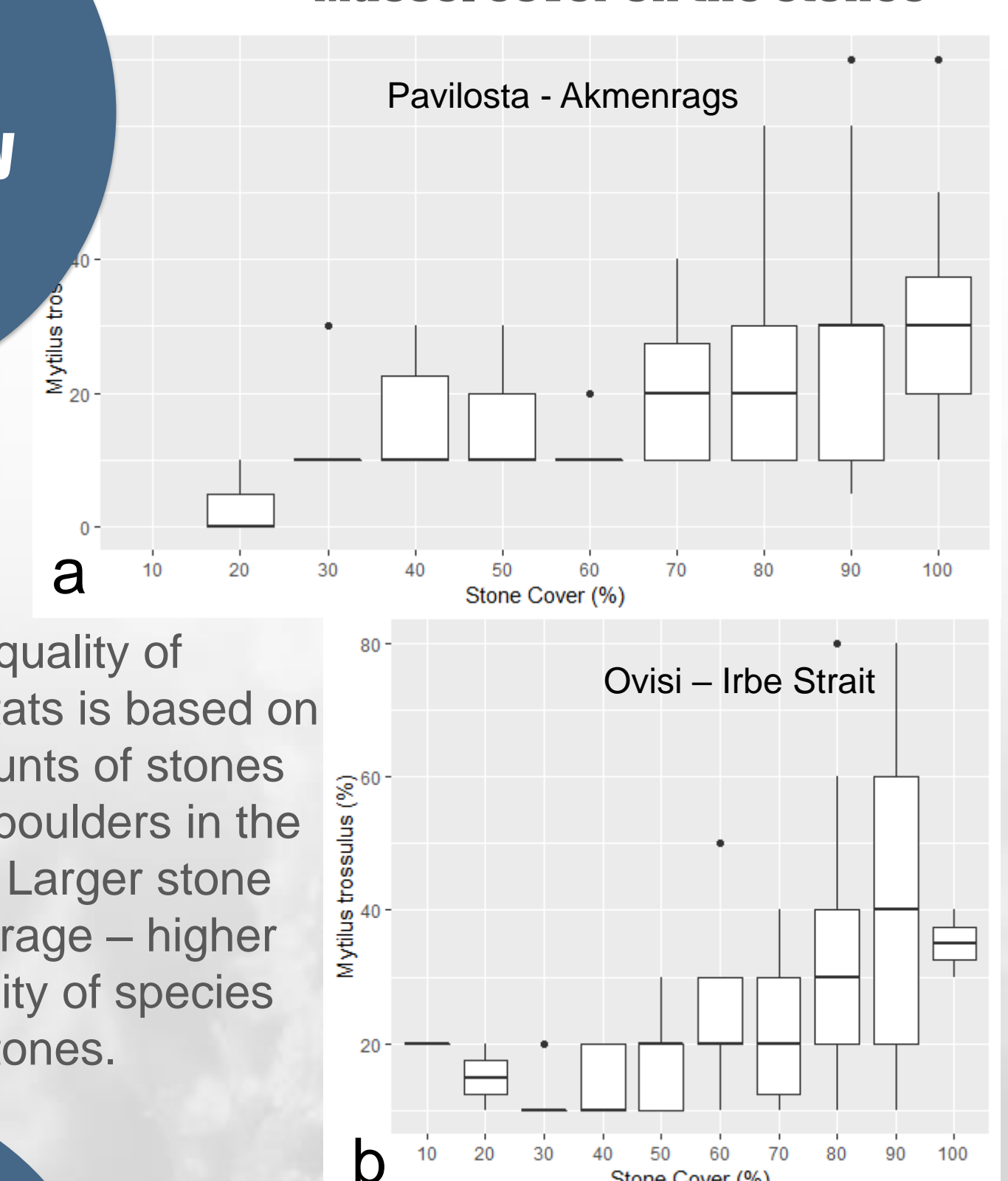


Fig.3. Relationship between mussels and stone coverage, a – area near Pavilosta - Akmenrags, b – area near Ovisi – Irbe Strait.

The tool is planned to:

- Help indicate valuable reef habitat
- List the information about benefits from the stony reef habitats
- Quantify the value of benefit - significance of ecosystem services
- List the alternative sea use and how it will affect the habitat → pressure on habitat

Baltic Explorer:

- Build with Open source components
- Support negotiations between the regional stakeholders
- Utilize open existing data sources/infrastructures
- Include Cumulative Impact Assessment tool, suitability analysis tool and collaborative application

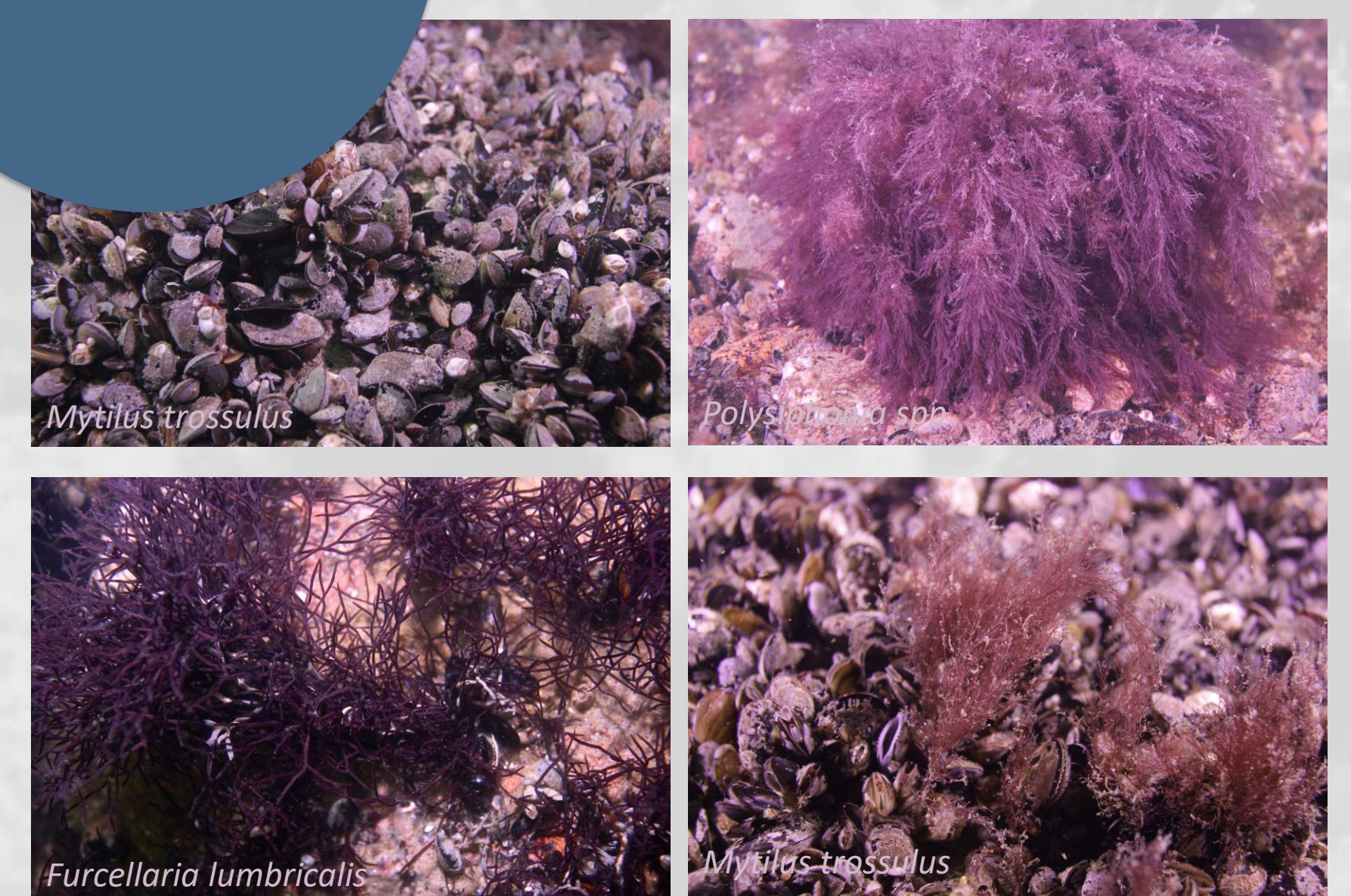


Fig.4. Main species on stone reefs in Latvian case study

Baltic Explorer will help determine optimal size of territory that should be protected, to maintain ecosystem services and neutralize pressures from probable activities.

Acknowledgments.

All the photos are by Dr. Juris Aigars. All information about Baltic Explorer was prepared in collaboration with Ümit Dost, Finnish Geospatial Research Institute.