Mapping of ecosystems and their services – Latvian coastal ecosystems case study

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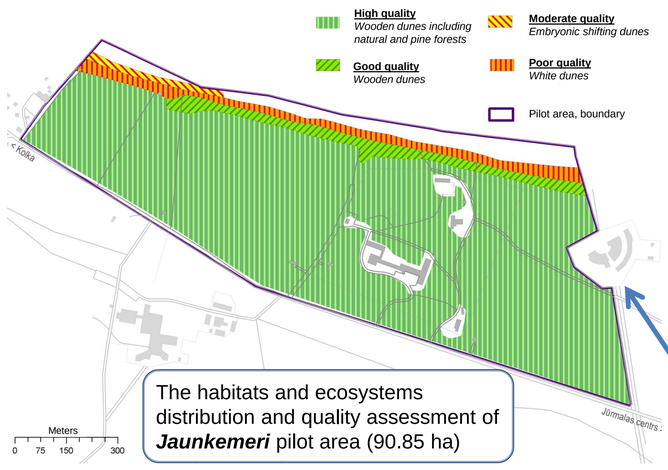
Abstract

The aim of the paper is to present and discuss the approach taken to mapping ecosystems and their services in Latvia coastal areas – two pilot implementation areas. The paper focus on verified mapping methodology appropriate for specific Latvia condition and introducing with developed indicators for ecosystem services biophysical assessment. The paper includes visual presentation of mapping results and discusses methodology challenges and their resolving approaches.

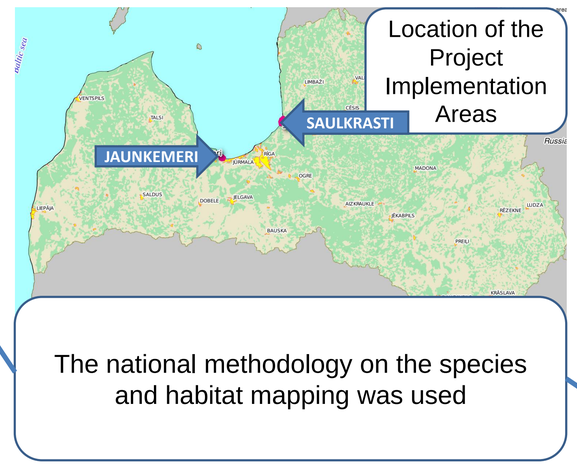
Assessment of ecosystem services (ES) has been set a strategically important role at the European Union countries, including it to the EU Biodiversity Strategy to 2020. In the context of Latvia the concept of ecosystems and their services and researches of ecosystem services are relatively new. Assessment of ecosystem services in Latvia was started within several projects and one of them is LIFE + "Assessment of ecosystems and their services for nature biodiversity conservation and management" (EcosystemServices) within which Latvian coastal ecosystem and their services assessment methodology has been verified in two pilot implementation areas – coastal areas Jaunkemeri and Saulkrasti.

The ecosystem services identification and classification was based on the Common International Classification of Ecosystem Services (CICES). Expert method for identifying and biophysical assessment appropriate ecosystem services was used combine with real data, for example gained within ecosystem quality assessment (habitats assessment) and real forestry data. Experts of different fields were involved and worked on more than 20 indicators. One or more criteria were used describing each ecosystem service indicator. Finally matrix for multi-layered ecosystem services assessment and multi-layer map for each pilot implementation area were developed.

Methods



The habitats and ecosystems distribution and quality assessment of ***Jaunkemeri*** pilot area (90.85 ha)



The national methodology on the species and habitat mapping was used

The habitats and ecosystems distribution and quality assessment of ***Saulkrasti*** pilot area (132.86 ha)

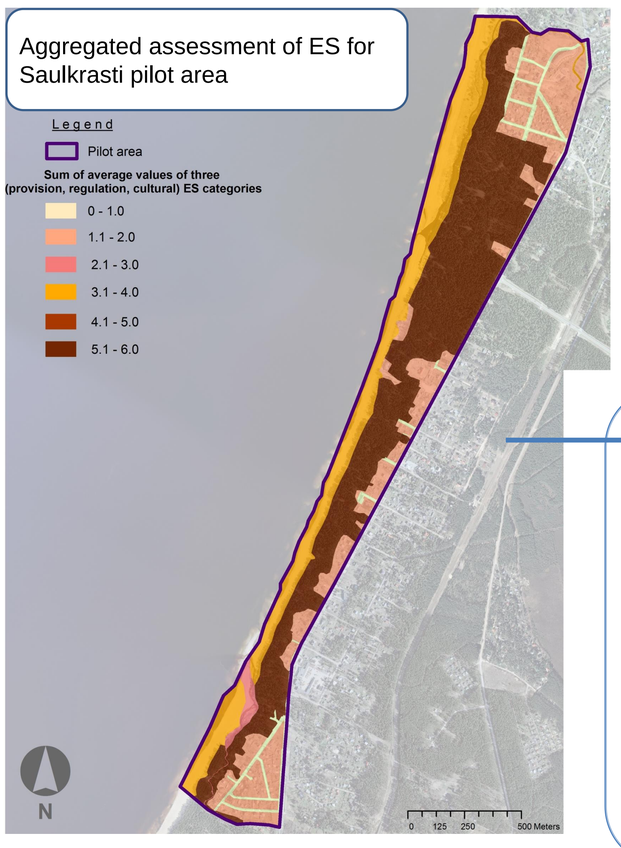
Additional criteria and parameters was used to carry out ecosystem assessment :

- Forests - classified according to the age structure (2 groups);
- The beach and coastal dunes - classified according to the intensity of the erosion and accumulation process (4 groups)

The following steps were carried out to map and assess ES in Jaunkemeri and Saulkrasti pilot areas

1. Development of typology of the ecosystems/land cover classes for the assessment needs
2. Identification of the coastal ES according to the CICES
3. To select robust indicators for mapping and assessment of ES
4. To develop a scoring system for assessment of ES provisioning by collecting data and information from literature and available data bases on the indicator values
5. To provide an assessment in a relative scale from 0-5 for each ecosystem/land cover type in the pilot areas

Results

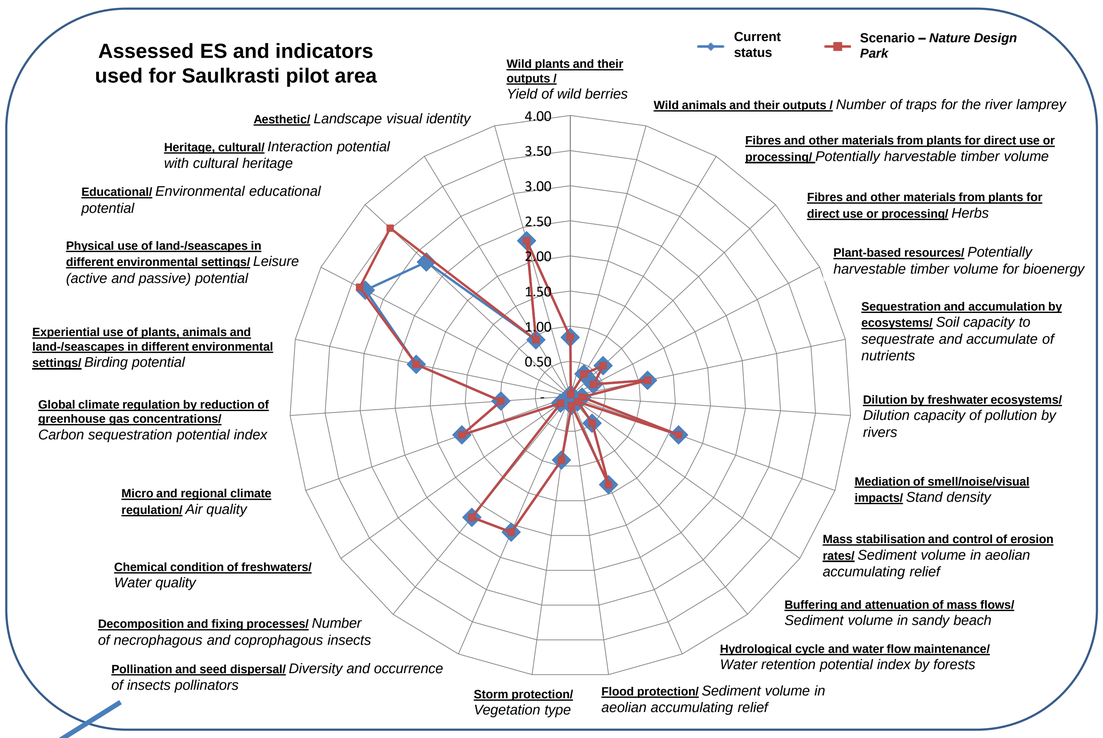


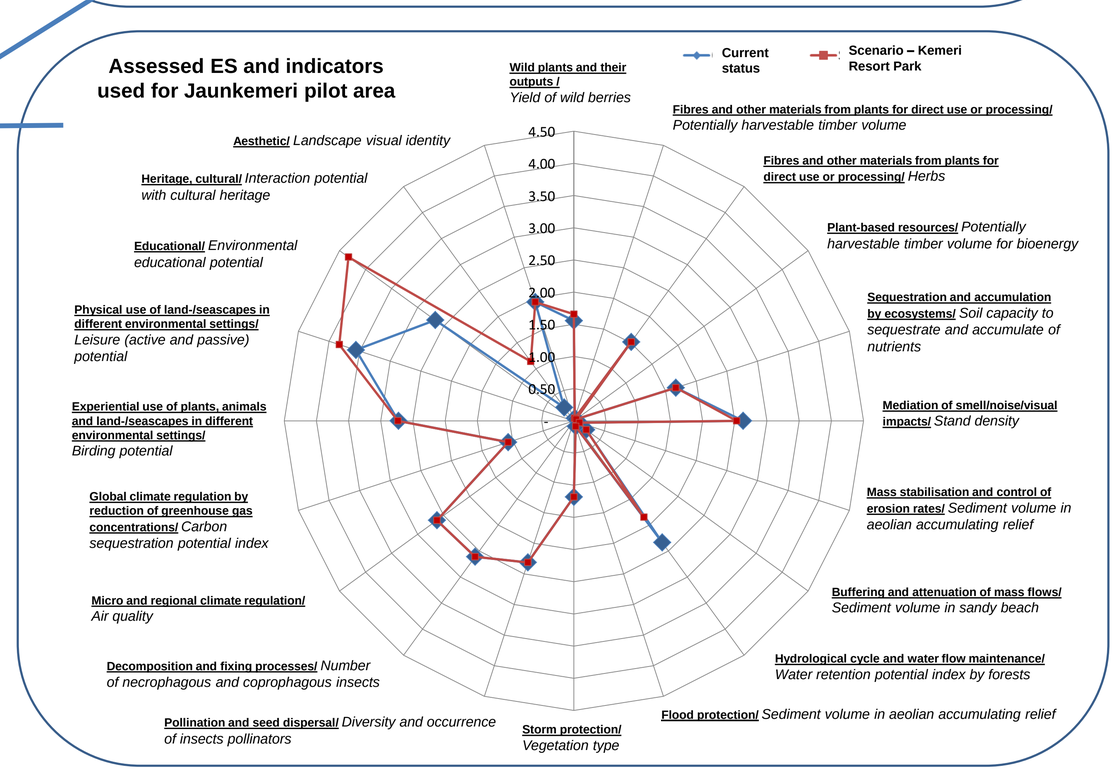
To create a map for each ES

The assessment values are used

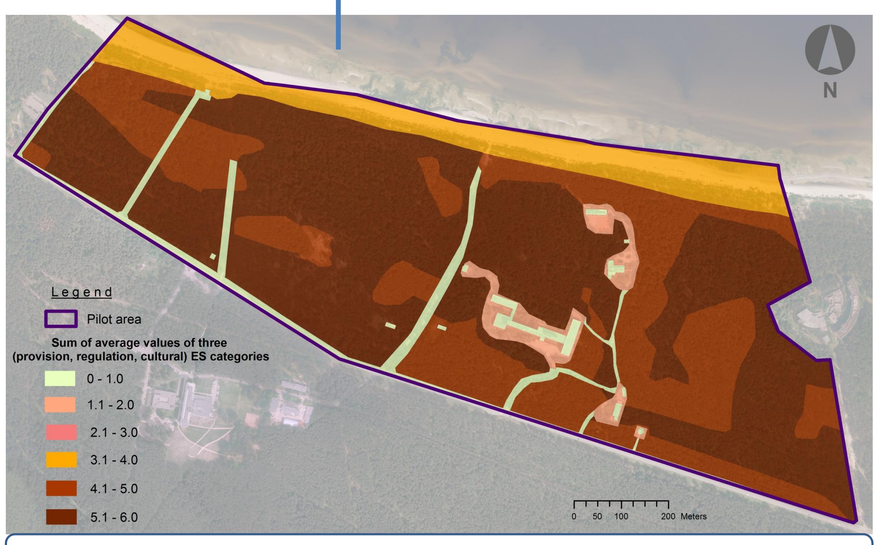
To generate an aggregated assessment of ES – an index was calculated for each spatial unit as a sum of the average assessment values of each ES category (provision, regulation and cultural)

To assess the impact of the scenarios on current status of ES - on each ES class an average weighted assessment value was calculated by relating the ES value with an area covered by the respective land cover/ecosystem in the pilot area





The forest ecosystem has been assessed as most valuable, followed by sandy beach, dunes and river ecosystems



Aggregated assessment of ES for Jaunķemeri pilot area

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