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WRACK4COAST – using beach wrack for dune restoration for coastal protection

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CONTRA Final Conference 1 & 2 May 2021, Online

Implementation area



Kaliningrad Oblast (Russia)

The length of the **sea shore** of the Kaliningrad Oblast is ~**145 km**,

including the Russian parts of Curonian (48 km) and Vistula (35 km) spits



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Case study partner:

Atlantic Branch of P. P. Shirshov Institute of Oceanology of Russian Academy of Sciences (ABIORAS) in cooperation with the National Park "Curonian Spit" & coastal authority "BALTBEREGOZASTITA".

Location of the case study:



Aim of the case study:

Test if **beach wrack** can be used for coastal protection measures (for the **planting of greenery** and sand retention in **wooden cells**).

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Scientific Background

Beach Wrack could be involved in soft engineering techniques to manage the coastline that is similar to a natural process:

use of Beach Wrack for planting of greenery (as nutrients) for the dune wall stability



Natural process: the thickets of vegetation of the back of the beach accumulate some amount of Beach Wrack



Photo: O. Rylkow

The National Park "Curonian Spit"

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Beach Wrack processing for dune greenery purposes

- BW must first be composted for 5-6 months.

- BW composting is carried out in wooden container that insulated with hay in the outdoors (low costs).

- Aeration of the compost mass by mixing of it (1-3 times per exposition).











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Dune greenery



Substantiation of the plant species for dune greenery

- The plant must be tolerant to wide range of temperature, dryness, sanding, exposure of roots, recreational loads and be a species of local flora.

In the experiment, Berberis vulgaris showed a good result

BW compost application for dune greenery

- Use yearlings for planting with a stem length of more than 10-15 cm.

- Compost consumption depending on the needs of the plant for 1-2 years. In the case of *Berberis vulgaris* yearlings is 0,6-0,9 l per seedling.

- Compost under the roots of seedlings to a depth of 15-30 cm when planting.







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Use of Beach Wrack for planting of greenery



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Alternative use of Beach Wrack for dune restoration, the experiment with wooden cells



Beach wrack is to use it as a filler in the first layer of wooden cells used to restore the dunes and wind-blown gaps in them

The shore of the Vistula Spit:

(a) selected site (right pass through the foredune),

(b) during constructions, December 2019,

(c) after the winter time, March 2020,

(d) after the summer, October 2020.

Photos: B. Chubarenko.

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The main Conclusions:

- The use of BW for dune greenery is effective and its use is preferable compared to other materials, as it is not an extrinsic agent for the coastal ecosystems;
- It is more **fast** plant growth approximately in **2 times** when BW apply;
- High **sand content** in BW is **not a problem** when use in dunes;
- **The survival rate** of seedlings grown with and without beach wrack compost was practically **equal** after one vegetation season;
- **The cost** of growing plants with beach wrack compost is about **3.5 times higher** than without;
- Beach wrack is suitable as initial filler for wooden structures only when seeds of sand-holding grasses are inserted;

- Beach wrack has the *capability of being an additional improver in ongoing shore consolidation activities* and offers the opportunity to make use of *amounts of beach wrack* that is collected anyway to clean beaches for *touristic purposes*.

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