# Nature-Based Solutions for Bank Protection along Estuarian Waterways





# **Fact Sheets**

# Brushwood boxes between the groynes 9 and 11 in Belum



# **Key Data**

Measure-ID Ost073li\_01\_01

Estuary Elbe

Waterway Oste (3501)

Chainage Km 73.14 - 73.375

Bank side Left

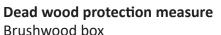
#### Contact

WSA Elbe-Nordsee, branch office Cuxhaven ABZ-Cuxhaven@wsv.bund.de

#### **Available documentation**

Photos, monitoring reports for the structures, site plan

#### **DESCRIPTION OF THE MEASURE**



# Reason for implementing the measure

Required under maintenance agreement

#### Bank protection required due to:

Failure of material, storm surge, ice drift

#### **Development and maintenance of measure**

In some areas, loss of fascines due to storm surges and ice drift so that fascines must be replaced annually. In some sections lost fascines were replaced with coir fascines; however, they have not proved suitable; therefore, hardwood fascines were used subsequently. Bank protection is ensured.

The maintenance interval required for the measure is 1-2 years; the replacement interval is 6-10 years.

#### **MATERIAL**

#### Material input

Not specified

#### **Fascine material**

Willow, birch, oak, coir fascines

Origin: regional

#### Pile material

Spruce

Origin: regional

# **EXPENDITURE**

Work days/person Not specified
Number of persons Not specified
Construction period September 2011





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# **Fact Sheets**

# **Boundary conditions**

#### **CHARACTER OF WATER BODY**

# Type of water body

Main water channel

#### Characteristic water levels\*

Mean tidal range2.80 mMean high water1.53 mMean low water- 1.27 m

#### Classification as moderately saline\*\*

mesohaline

- \* from measurements for the period 02.11.2013-01.12.2019 at the Osteriff MPM gauge
- \*\* from measurements for the period 01.04.2001-24.03.2011 at the measuring station LZ 3C Altenbrucher Bogen

# **CHARACTER OF THE RIPARIAN ZONE**

#### River bend

Undercut bank, straight bank

#### Slope inclination

Flat

#### Dominating soil type

Silt

#### Pollutant load

Unknown

# Natural structures below mean high water

Not specified

#### Natural structures above mean high water

Not specified

#### Vegetation

Reed, rushes

#### Land use

No grassland use

# PROPERTY DATA

Land owner (bank) German Federal

Waterways and Shipping Administ-

ration (WSV)
Land owner (foreshore) Federal state

Lease No.

# **NATURE CONSERVATION**

# **Special Protection Area**

Lower Elbe (DE2121401)

# Special area of conservation under Habitats Directive

Lower Elbe (DE2018331)

#### **Natural habitat type under Habitats Directive**

Estuaries (1130), mudflats and sandflats not covered by seawater at low tide (1140)

#### Nature conservation area

Hadeln and Belum Outer Dike (ni NSG LÜ 00100)

#### **Legally protected biotopes**

(Bundesnaturschutzgesetz)

No

#### Specially protected flora species

Not specified

#### Specially protected fauna species

Not specified

#### **SHIPPING TRAFFIC**

**Navigation by ships** 

Cargo vessels, recreational ships

#### Location in relation to navigation channel

Facing the navigation channel

### **Speed limit**

15 knots

#### Shipping traffic parameters\*

Number of ships/year 43,994

Mean distance between

passing ships 1,656 m Ship dimensions\*\* Length > 225 m

Width > 32 m

\*source: AIS data analysis from 2019
\*\*10 % of the largest passing ships



