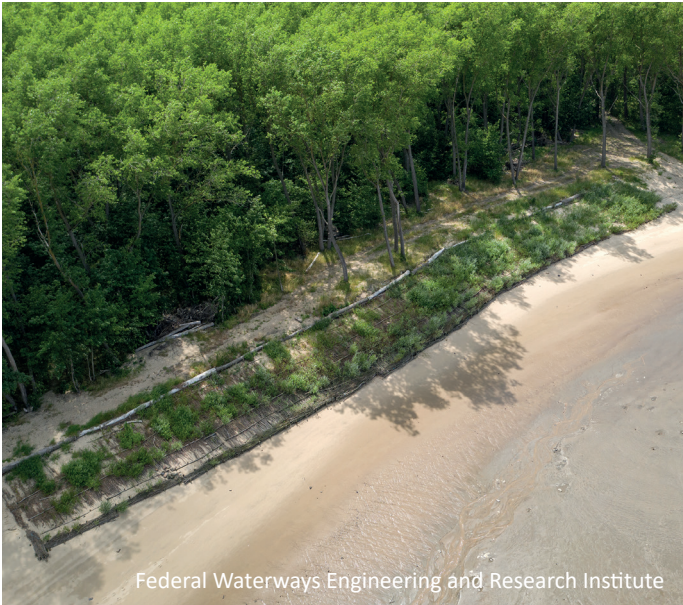


Willow mattress



Key Data

Measure-ID	Elb642li_01_02
Estuary	Elbe
Waterway	Elbe (0701)
Chainage	Km 642,3 - 642,7
Bank side	Left

Contact

WSA Elbe-Nordsee, branch office Wedel: abz-wedel@wsv.bund.de

Available documentation

Presentation, report, photo documentation 3-4 times per year

DESCRIPTION OF THE MEASURE

Living measure

Sprouting willow mattress

Bank protection required due to:

Ship waves, storm surges

Reason for implementing the measure

Bank protection: beach protection, sediment trap

Development and maintenance of measure

The production of approx. 1,035 m² of willow mattress required 43 working days with 7 days of preparatory work. No information is currently available on maintenance costs. Repairs for damages and pruning are required every 3-5 years. Three years after construction, successful growth was recorded and the measure provides sufficient bank protection. After 2-3 storm events in spring 2021, minor damage was detected. Following the initial construction in 2017, additional beach sections were protected with willow mattresses between 2017 and 2023. All measures have successfully sprouted and provide adequate beach protection.

MATERIAL

Material input

For 1,035 m²: 280 m³ of willow brushwood material; 97.5 m³ of brushwood rolls (toe protection); 150 willow piles (Riegel): length = 6-8 m; 500 sprouting willow piles; 250 m of wire; equipment: excavator (rental) 35 working days, wheel loader 27 days

Live materials used

Rootable willow cuttings, sprouting willow piles
Origin: from own stock

Pile material

Willow, spruce, living willow material as fixing piles
Origin: from own stock, regional

EXPENDITURE

Work days/person	43
Number of persons	5
Construction period	May 2017 - April 2017

Boundary conditions

CHARACTER OF WATER BODY



Type of water body

Main water channel

Characteristic water levels*

Mean tidal range	3,4 m
Mean high water	1,92 m
Mean low water	-1,47 m

Mean Water Salinity Classification**

Limnic

* from measurements over the period 01.01.2010-31.12.2019 at the Schulau gauge

** from measurements over the period 01.01.2008-31.12.2017 at the position D1 Hanskalbsand

CHARACTER OF THE RIPARIAN ZONE



River bend

Undercut bank

Slope inclination

1:3 or flatter

Dominant soil type

Sand

Pollutant load

no information

Natural structures below mean high water

Not specified

Natural structures above mean high water

Not specified

Vegetation cover

Mixed forest

Land use

No grassland use
Camping tolerated

NATURE CONSERVATION



Special Protection Area under the Birds Directive

No

Special area of conservation under Habitats Directive

Lower Elbe (DE2018331)

Natural habitat type under Habitats Directive

Estuaries (1130)

Nature conservation area

Elbe and Islands (ni_NSG LÜ 00345)

Legally protected biotopes

(Bundesnaturschutzgesetz)
No

Specially protected plants

Not specified

Specially protected animals

Not specified

SHIPPING TRAFFIC



Navigation by ships

Freight shipping, recreational shipping

Location in relation to navigation channel

Facing the navigation channel

Speed limit

10 kt (Area of buoy 119/Hn1 to buoy 125)

Shipping traffic parameters*

Number of ships/year	36962
Mean distance between passing ships and shoreline	595 m
Ship dimensions**	Length > 236 m Width > 32 m

*source: AIS data analysis from 2019

**10 % of the largest passing ships

PROPERTY DATA



Land owner (bank)	German Federal Waterways and Shipping Administration (WSV)
Land owner (foreshore)	German Federal Waterways and Shipping Administration (WSV)
Lease	Not specified