



Project part-financed by the European Union (European Regional Development Fund)



## 'Spadenländer Spitze'

Measure analysis 09  
in the framework of the Interreg IVB project TIDE

J. Knüppel<sup>1</sup>

<sup>1</sup> Hamburg Port Authority (HPA)

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Johanna Knüppel  
Hamburg Port Authority (HPA)

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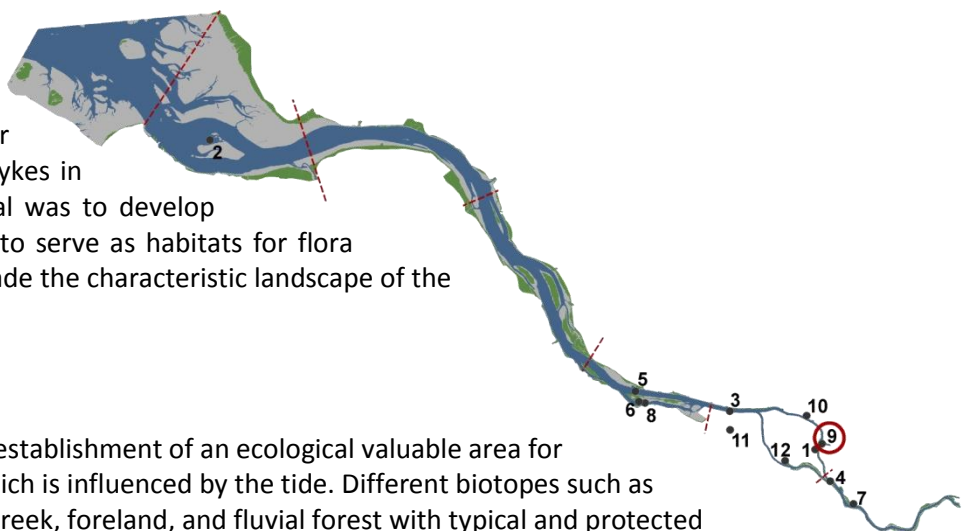


## Part 1: Measure description

measure category	biology, ecology
estuary	Elbe
salinity zone	freshwater
pressure	habitat loss and degradation
status	implemented 2000
river km	615
country/location	Germany, Hamburg, near the Dove-Elbe
responsible authority	Agency for Roads, Bridges and Waters

### 1.1 Introduction

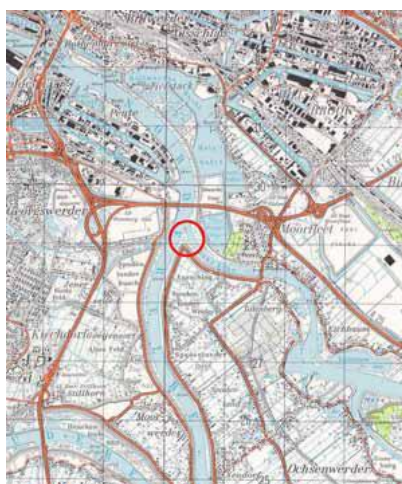
The measure "Spadenländer Spitze" was implemented in 2000 as a compensation for the strengthening of the dykes in Hamburg in 1989. The goal was to develop typical estuarine biotopes to serve as habitats for flora and fauna in order to upgrade the characteristic landscape of the Elbe estuary region.



### 1.2 Objectives

The measure aimed at the establishment of an ecological valuable area for aquatic flora and fauna, which is influenced by the tide. Different biotopes such as shallow water area with a creek, foreland, and fluvial forest with typical and protected vegetation and fauna should evolve. Especially additional space for habitats and species, which are protected in Annex I of the BHD e.g. floodplain forest with *Alnus glutinosa* and *Fraxinus excelsior*, some fish species and the 'Elbe Water Dropwort' (*Oenanthe conioides*) should establish there. An undisturbed retention and spawning area for fish species should evolve.

### 1.3 Background and side conditions



The realignment was implemented in 2000, approx. 7 km south east of the City of Hamburg where the branch 'Northern Elbe' and the 'Dove Elbe' join each other, in order to develop natural floodplain habitats. The 8 ha wide area is part of the Natura 2000 area 'Hamburger Unterelbe'.

Figure 1 : Location of the 'Spadenländer Spitze'



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## 1.4 Measure

The floodplain habitat include mudflats and a 1.3 ha shallow water area which is connected to the 'Northern Elbe'. At the opening of the creek a sill was placed in order to permanently ensure a certain water level and to prevent erosion within the area.

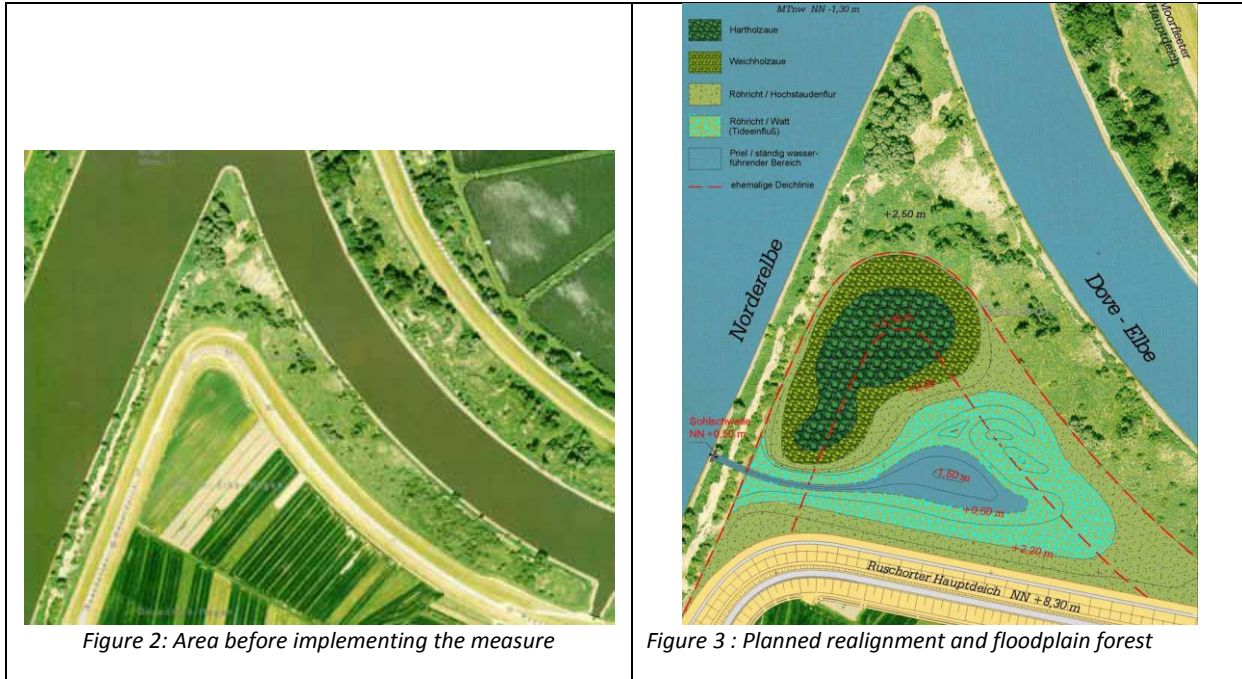


Figure 2: Area before implementing the measure

Figure 3 : Planned realignment and floodplain forest

## 1.5 Expected effect

Several monitoring programs were carried out from 2002 to 2005, e.g. the morphological development was investigated. Furthermore an ecological study was conducted in which the succession of the vegetation was investigated and the success of the complete measure was evaluated (Bielefeld & Berg, 2006).

## Part 2: Execution of the main effectiveness criteria

### 2.1 Effectiveness according to development targets of measure

#### Definition of development targets:

Establishment of a tidally influenced ecological valuable area:

- Development of a mosaic of typical estuarine biotopes such as shallow water areas, mudflats, alluvial meadows and alluvial forest.
- Development of habitats for the 'Elbe Water Dropwort' (*Oenanthe conioides*)
- Development of spawning area for protected fish species
- Upgrading of the characteristic landscape of the Elbe estuary region

#### Achievement of development targets

The measure "Spadenländer Spitze" can be considered as an important part in rebuilding the characteristic landscape of the tidal influenced Elbe estuary. The realignment had a positive effect on the conservation aims and stimulated the development of scarce and endangered species. Species diversity became enormous, and settlement of typical species took place on its own, new species were introduced by the tides very quickly. Therefore planting was not necessary. The area was also colonized by the endemic species *Oenanthe conioides*. Though not explicitly monitored it was observed that the area was very attractive for several species of birds including geese and ducks. In general, the measure was considered as a success, most biotopes developed well, only at the shore of the creek some erosion could be observed. One year after implementation, the little pond that should function as resting and spawning area for several fish species showed high sedimentation rates. Therefore the development target of establishing a permanently water filled realignment area could only be partly achieved.

### 2.2 Impact on ecosystem services

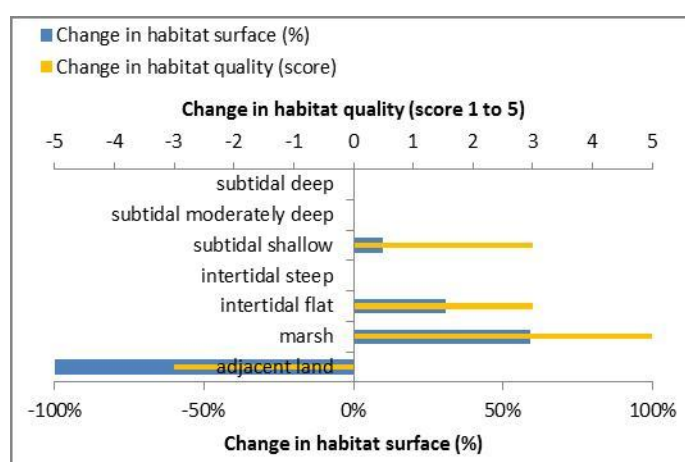


Figure 4: Ecosystem services analysis by Spadenländer Spitze: Indication of habitat surface and quality change, i.e. situation before versus after measure implementation.

- From the ES assessment it is concluded that this measure generates overall a positive expected impact for many ES, mainly for:
  - o “biodiversity”
  - o Cultural services: Aesthetic information
  - o Some regulating services: Erosion and sedimentation regulation (by water bodies); Water quality regulation: reduction of excess loads coming from the catchment; Climate regulation: Carbon sequestration and burial; Regulation extreme events or disturbance: Flood water storage
- The expected impact on the development targets (“Biodiversity”) is very positive.
- The expected impact for the different beneficiary groups is overall very positive, with a very positive expected impact for indirect and future use and for local and region use.

Table 1: Ecosystem services analysis for Spadenlander Spitze: (1) expected impact on ES supply in the measure site and (2) expected impact on different beneficiaries as a consequence of the measure.

Spadenlander Spitze		
Cat.	Ecosystem Service	Score
S	"Biodiversity"	3
R1	Erosion and sedimentation regulation by water bodies	3
R2	Water quality regulation: reduction of excess loads coming from the catchment	3
R3	Water quality regulation: transport of pollutants and excess nutrients	0
R4	Water quantity regulation: drainage of river water	0
R5	Erosion and sedimentation regulation by biological mediation	2
R6	Water quantity regulation: transportation	0
R7	Water quantity regulation: landscape maintenance	2
R8	Climate regulation: Carbon sequestration and burial	3
R9	Water quantity regulation: dissipation of tidal and river energy	0
R10	Regulation extreme events or disturbance: Wave reduction	1
R11	Regulation extreme events or disturbance: Water current reduction	1
R12	Regulation extreme events or disturbance: Flood water storage	3
P1	Water for industrial use	0
P2	Water for navigation	0
P3	Food: Animals	0
C1	Aesthetic information	3
C2	Inspiration for culture, art and design	2
C3	Information for cognitive development	2
C4	Opportunities for recreation & tourism	2

Beneficiaries:	
Direct users	0
Indirect users	3
Future users	3
Local users	3
Regional users	3
Global users	2

Legend: expected impact*	
3	very positive
2	positive
1	slightly positive
0	neutral
-1	slightly negative
-2	negative
-3	very negative

X Targeted ES

\*: Indicative screening based on ES-supply surveys and estimated impact of measures on habitat quality and quantity. Quantitative socio-economic conclusions require local supply and demand data to complement this assessment.

The screening of the ecosystem services (ESS) that were effected by the measure `Spadenländer Spitze` showed the additional benefits that were achieved with the implementation of the realignment.

### 2.3 Degree of synergistic effects and conflicts according the uses

A conflict occurred with the former agricultural use. The area was taken away from agriculture.



## Part 3: Additional evaluation criteria in view of EU environmental law

### 3.1 Degree of synergistic effects and conflicts according WFD aims

Table 2: Effect of the measure concerning the main pressures in the freshwater zone of the Elbe estuary

Indicator Group	Code	Main pressures freshwater zone Elbe	Effect?					Description: Aim of the measure 'Spadenländer Spitze'
			--	-	0	+	++	
S.I.	-	Habitat loss and degradation during the last about 100 years: Subtidal			0			
S.I.	1.1	Habitat loss and degradation during the last about 100 years: Intertidal			0			
S.I.	1.4/ 1.5	Gross change in morphology/hydrographic regime during the last about 100 years			0			
S.I.	3.1/3.2	Decrease of water and sediment chemical quality			0			
D.I.	2.3	Discharge of nutrients or harmful substances			0			
D.I.	1.3	Land claim during the last about 100 years					++	Dyke realignment and creation of new marsh habitats.
D.I.	2.6	Capital dredging			0			

S.I. = state indicator; D.I. = driver indicator

The measure 'Spadenländer Spitze' was not assigned to the WFD, nevertheless it covers one of the main pressures of the freshwater zone of the Elbe estuary.

### 3.2 Degree of synergistic effects and conflicts according NATURA 2000 aims

Table 3: Effect of the measure concerning the main conservation objectives in the operational area 2

Operational area (zone)	Natura 2000 conservation objectives	Effect of Measure on conservation objectives			Description
		Positive	No effect	Negative	
2					
2	Prevention of further increase and/or reduction of tidal range (energy)		-		
2	Conservation and development of primarily floodplain/alluvial forest (*91E0)	+			
2	Conservation and improvement of alluvial meadows of river valleys (6440) and lowland and hay meadows (6510)		+		
2	Conservation of the primarily 'Elbe Water Dropwort' ( <i>Oenanthe conioides</i> ) with species specific dynamic, development of further habitats to improve the habitat network	+			
2	Conservation and development of spawn and growth habitats for asp, ensuring the habitat potential for the twaite shad	+			
2	Conservation and development of the transition functionality between the Middle Elbe and the Estuary downstream for migratory fish species of Annex II BHD	+			

The measure 'Spadenländer Spitze' was not assigned to the BHD, nevertheless it covers a couple of management targets of the BHD in the freshwater zone of the Elbe estuary.

#### Part 4: Crux of the matter

The realignment had a positive effect on the conservation goals and enhanced the development of species diversity. The settlement of typical species took place on its own, e.g. spores come with the tide. Initial planting was not necessary.

A good design of the measure is very important in order to create an area with the most possible dynamics of the tides. The design should provide different elevation levels with respect to the tide. Flat areas with little depressions below mean high water are very important for the establishment of creeks, serving as a habitat for *Oenanthe conioides*, waders and - after extension - also for juvenile fish. The special design of tidal creeks has turned out as superfluous; the tidal dynamics were too dominant. It turned out to be important to have prevented the area of human disturbance.

## Contact

Hamburg Port Authority  
Manfred Meine  
Neuer Wandrahm 4  
20457 Hamburg

+49 (0)40 428 47-3052

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