

PIANC

Working-with-Nature

Collection of Waterborne Infrastructure Projects Acknowledged by PIANC



May 2014



This booklet briefly describes the nine projects which have been submitted to the Working-with-Nature Database by project managers from 2012 (since the database was opened) until today (May 2014) and which have been granted one of the three categories of PIANC WwN certificates. These are (i) the WwN Certificate of Recognition, (ii) the Candidate for Certificate of Recognition and (iii) the Supporter of WwN.

The Certificate of Recognition is being granted to submitted projects which have been positively evaluated by the WwN Jury for having implemented at least one or more elements of the PIANC WwN philosophy (see PIANC WwN position paper, updated 2011). The PIANC WwN Jury consists of six international experts representing all technical commissions of PIANC and is chaired by an EnviCom representative.

For assigning the **Certificate of Recognition** the project must have legal consents, thus planning must be completed, realization is in progress, or the project is already finalized. Every four years on the occasion of the PIANC World Congress the best of out these projects which have been submitted and acknowledged in the meantime is going to be granted with the PIANC WwN Award.

If a project doesn't yet have legal consents, but fulfils the characteristics of a WwN approach, the project has been designated as a **Candidate for Certificate of Recognition**.

Navigation projects which are not operational, but which include or demonstrate elements of WwN are considered as **Supporter of WwN**. These extraordinary projects can be assigned as research projects, individual pilot projects, part of programs or modules of a research consortium.

You are invited to explore these projects and to get stimulations for the setting up and planning of your projects. It is the aim to learn from practical experiences in our sector and to exchange how the PIANC Working with Nature philosophy can be implemented best. You can find more information about these projects in the public part of the WwN database on the PIANC website (www.workingwithnature.pianc.org) and we are looking forward to getting a submission online about your project if it implements elements of WwN. You are invited to be part of the international exchange experiences via our WwN Linkedin Group.



Louis Van Schel
Secretary-General



Geoffroy Caude
President

May 2014



Project	Submitter	Country	submitted
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Certificate of Recognition

Flood Spillway Rees	Waterways and Shipping Office Duisburg-Rhein	Germany	2012 Aug
The Restoration of Salhouse Spit	Broads Authority	United Kingdom	2012 Dec
Cleveland Harbor East Arrowhead Breakwaters	US Army Corps of Engineers	United States of America	2013 Aug
New tidal Area Kreetsand	Hamburg Port Authority (HPA)	Germany	2013 Aug
3 Meter Navigation Channel Middle Mississippi	US Army Corps of Engineers		2013 Sep
Deer Island Restoration Biloxi Harbor	US Army Corps of Engineers	United States of America	2013 Aug
Seine-Scheldt Project – Lock of Harelbeke	Waterwegen en Zeekanaal NV	Belgium	2013 Oct



Candidate for Certificate of Recognition

EMERHODE	Port of le Havre Authority	France	2012 Aug
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Supporter of WwN

Tentative Technical-Biological Bank Protection	Waterways and Shipping Office Mannheim	Germany	2013 Aug
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**Projects
with**

Certificate of Recognition



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Flood Spillway Rees

GERMANY



Certificate of Recognition

Objectives

On the Lower Rhine, Germany, ongoing river bed erosion causes harm to navigable water levels. By constructing a flood spillway passing the sinistral floodplain at the City of Rees a significant portion of river discharge will be transferred to the spillway starting to operate at a water level threshold of Mean Water Level +100cm. Reduced flow velocity in the main river channel will reduce risk of bed erosion. At the same time the City of Rees will be relieved from the danger of severe flooding as the maximum peak of highwater level will be lowered by 8cm. While realising the project, intensive ecological measures are performed within the construction area aimed at enhancing nature's value in the floodplain and the societal integration of inhabitants needs (e.g. farming, recreation, nature conservation).

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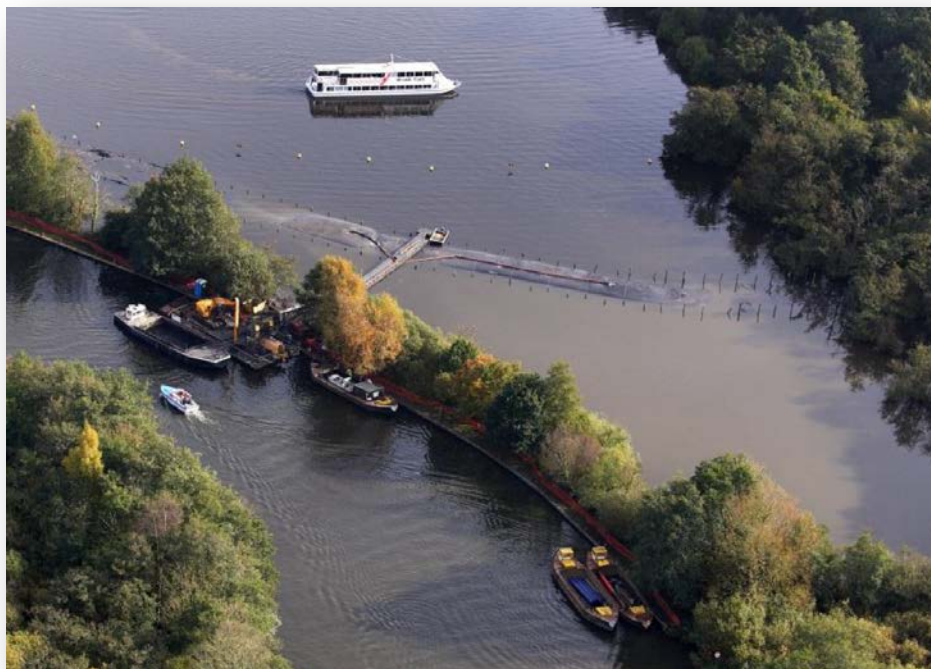
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The Restoration of Salhouse Spit

UNITED KINGDOM



Certificate of Recognition

Objectives

The Broads Authority is restoring a lost reed bed and eroded strip of land at Salhouse Broad, Norfolk, UK. Erosion over the last 60 years has caused the land between Salhouse Broad and the River Bure to become significantly narrow threatening the integrity of the river bank and its riverside mooring. Shoals have accumulated on the inside of bends and other slow flowing areas. Now 7,000m² of reed bed is being constructed using dredged sediment retained by four giant geotextile bags. Dredging of the River Bure is required for navigational purposes, allowing pleasure cruisers and sailing vessels to navigate. Geotubes[®] are fixed to locally sourced alder poles; cut from adjacent river banks. The geotubes are being filled with 3,000m³ of sediment dredged from the River Bure to provide a 170m retaining bank. The geotubes, which are 8.5m wide and have a circumference of 18.6m, are filled and sink below the waterline. The void behind the bags is filled in with 8,000m³ of dredged sediment to restore the reed bed as it was in 1946.

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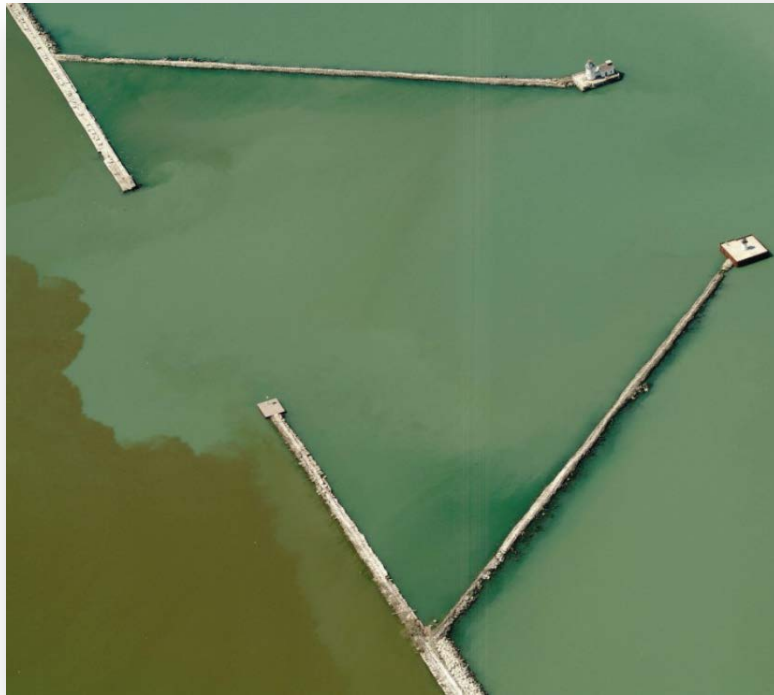
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Cleveland Harbor East Arrowhead Breakwaters

UNITED STATES OF AMERICA



Certificate of Recognition

Objectives

The existing East Arrowhead breakwater of Cleveland Harbor had deteriorated over time due to wave damage from the open waters of Lake Erie. Thus, routine maintenance of the breakwater was needed. Objectives also are to provide features that will create habitat opportunities for Great Lakes species that would not otherwise be present and to help reduce beneficial use impairments within the Great Lakes region. Stakeholders identified in this win-win project are the Ohio Department of Natural Resources, the US Fish and Wildlife Service, and the US Geological Survey. The project involves modifying the design of the standard concrete toe blocks used for breakwater maintenance to provide aquatic habitat features. The repair section is 41 m long. 17 toe blocks were installed. Habitat surface is created on the breakwater by modifying the shape and surface texture of the toe blocks. 3 separate block modifications are being investigated. Based on monitoring results, textures found to best serve as habitat to native species will be in the future incorporated more broadly across navigation repair and maintenance projects.

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New tidal Area Kreet sand GERMANY



Certificate of Recognition

Objectives

The project in the tidal River Elbe aims at reducing the tidal range and the subsequent tidal pumping effect, preventing further silting up of anabranches and side banks, thus reducing the amount of necessary dredging activities. The target is in line with the overall Concept for a Sustainable Development of the tidal River Elbe. The Hamburg Port Authority (HPA) will open up an area of 30 ha for the tides directly in the city of Hamburg, creating new shallow water areas which will provide an additional 1 Mio m³ of tidal volume. Although the dyke in front of the area Kreet sand area was realigned 10 years ago, the foreland is not exposed to daily tides. The excavation of 2 Mio m³ soil will allow free oscillating tides and set the stakes for future developments. About one third of the dredged material has to be disposed, but large portions will be re-used in harbor construction measures. The integrated planning process has advantageously combined interests and needs from port users, water management, nature conservation and local recreation. The planning criteria, besides hydraulic efficiency and stability, have been nature and landscape planning, soil management as well as perceptibility for the public.

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3 Meter Navigation Channel Middle Mississippi

UNITED STATES OF AMERICA



Certificate of Recognition

Objectives

The 3 meter navigation project of the Middle Mississippi River has been ongoing since 1890. Initially, large wooden pile dikes, willow matt revetments, clearing and snagging operations, and dredging, were all used to maintain a 1 meter channel. Eventually a 3 meter channel depth was authorized. River engineering consisted of large perpendicular stone dikes for channel accretion and stone revetment for bank stabilization. In the 1980s, two endangered species (the Bird LeastTern, the Fish Pallid Sturgeon) required river engineers to re-think their design. They had to come up with innovative ways to not only solve dredging problems, but create enhanced habitat for fish and wildlife. Since the mid 1980s, using physical sediment modeling, engineers were able to design and construct a variety of rock training structures that replaced traditional structures, including bendway weirs, blunt-nosed chevrons, w-dikes, side channel enhancement dikes, rootless dikes, hard points, multiple round point structures, and notched dikes. These structures were all designed to create environmental diversity and enhanced habitat while still being able to improve the navigation channel. In many locations, the structures have eliminated or substantially reduced repetitive maintenance dredging.

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Deer Island Restoration Biloxi Harbor

UNITED STATES OF AMERICA



Certificate of Recognition

Objectives

The project beneficially uses dredged material to restore Deer Island and creates long term disposal capacity for material dredged from the nearby Biloxi Harbor Navigation Project, Mississippi. Catastrophic storm events over the last century destroyed forested areas of the 3.5-mile long Deer Island, eroded the sandy shoreline, and left elevations too low to for marsh vegetation. The project included the filling of a breach in the west end of the island and the restoration of the southern shoreline with approximately 1.95 million cubic yards of hydraulically-dredged material. Over 300,000 plants were strategically planted on the island. The project included the construction of a 1 million cubic yard capacity lagoon specifically designed for the beneficial use placement of fine-grained dredged material from Federally-authorized navigation channels. Approximately 170,000 cubic yards of material from Biloxi Harbor are already placed there. The applied practices provide environmental benefits, as well as protection for the City of Biloxi from storm events, recreation opportunities, and hard-to-come-by economically feasible and environmentally acceptable beneficial use opportunities for dredged material.

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Seine-Scheldt Project – Lock of Harelbeke

BELGIUM



Certificate of Recognition

Objectives

Within the Seine-Scheldt project connecting the Seine basin in the Paris region with the Scheldt basin in the region of Antwerp-Rotterdam, the Belgian region of Flanders is preparing navigability enhancements of the River Lys. In the city of Harelbeke this calibration implies the construction of a new lock and weir together with the restoration of fish migration in a multiple-use urban environment. To get a best fit solution a so-called “Design & Build” procedure was launched. The goals for the project were specified, ranging from spatial quality over technical, hydraulic and nautical merit to aspects of nuisance during execution, durability of the design, planning and overall management. Water management and flood control were very important factors. A specific design of a fish ladder to bypass the weir was asked for. Natural landscaping and environmentally friendly river banks serve for enhancement of the urban area of the River Lys. Emphasis was laid on minimizing the total Life Cycle Cost of the infrastructure. A hydraulic actuator for the lock was installed to achieve an energy neutral project. Other important factors in Life Cycle Costing are the costs of system downtime and the costs of maintenance.

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EMERHODE FRANCE



Candidate for Certificate of Recognition

Objectives

The project will be realized in the area of the Port of Le Havre, Seine Estuary, France. The project consists of four main parts: A new canal approximately 4 km long and 120 m wide with vertical berths will be constructed; the industrial zone will be extended (400 ha maximum) and backfilled with the dredged material; existing roads and railway tracks will be restored with a new layout not crossing the existing nature reserve using 2 mobile bridges high above the new canal; and environmental measures as hydraulic feeder to maintain the water table level in the Seine and its estuary will be established. Presumably the intertidal zone will be extended in the estuary. Mitigation measures will be included. All planning details are discussed in forums and workshops integrating all relevant stakeholders to find common win-win-solutions, especially for the upcoming plan approval procedure

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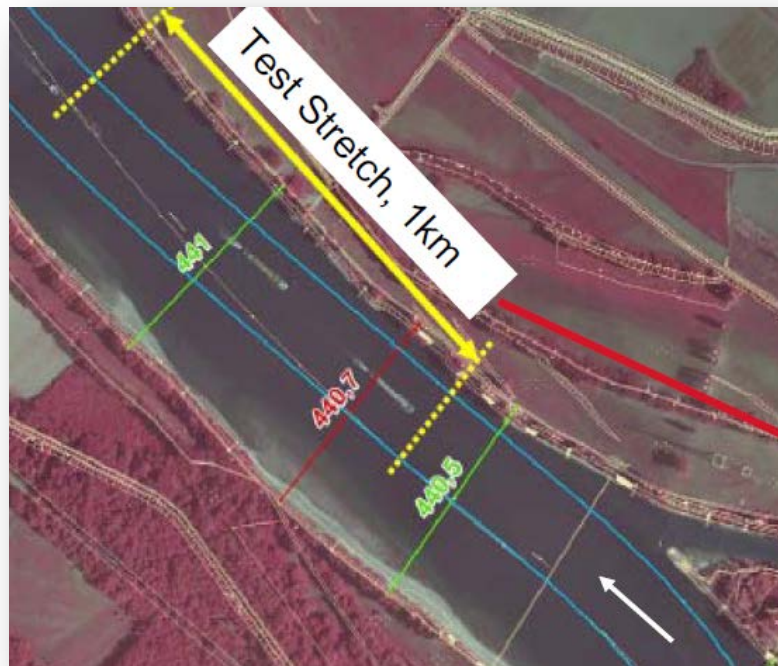
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Tentative Technical-Biological Bank Protection

GERMANY



Supporter of WwN

Objectives

The banks of the upper River Rhine are mostly reinforced by technical revetment often being poor in natural habitats. Nowadays, new concepts are required combining bank stability for the safety of navigation and the riparian hinterland as well as the improvement of biological diversity. The test stretch comprises a range of alternative technical-biological bank protection measures to gain practical experience in technical and ecological issues. In four test fields, the rip-rap was removed and replaced by new technical-biological protection e.g. willow brush mattresses, reed gabions, pre-cultivated vegetation mats. Along another four test fields, the rip-rap was left in place, but ecologically improved with plants or other structural elements e.g. willow branch cuttings, living fascines, wood fascines, a shallow-water zone behind a stone wall. One field was left to a nearly pristine status without any measures. The construction alternatives are being monitored for 5 years. Results will help to improve acceptance of waterway maintenance works among local residents and in future to be applied for managing waterways considering the ecological demands of the German Federal Water Act and the European Water Framework Directive.

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Please submit

YOUR

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www.workingwithnature.pianc.org

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and be part of the

worldwide WwN Community





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Time Period 2012 - 2014
PIANC, May 2014