



## Terms of Reference

# **A Guide for Applying Working with Nature to Navigation Infrastructure Projects**

### **1. Background**

PIANC published a position paper, originally in 2008 and in revised form in 2011 that describes the Working with Nature philosophy. The Position Paper defined the concept of Working with Nature and addressed how the approach can be applied to navigation and port infrastructure, providing a basis for maximizing opportunities for working with natural processes delivering environmental restoration and enhancement outcomes that go beyond merely avoiding or just compensating environmental impacts. The Position Paper did not address the specific tools, steps, and practices that would be needed to put the Working with Nature approach into practice. A new effort is therefore proposed to fill this gap by developing a guide for informing the development and progression of projects that are informed by the Working with Nature philosophy. This effort will raise awareness and promote expanded acceptance of Working with Nature as applied to navigation infrastructure projects.

### **2. Objective**

Working with Nature provides an opportunity to:

- a. support sustainable delivery of project benefits by utilizing science and engineering to produce operational efficiencies supporting sustainable delivery of project benefits;
- b. reduce demands on limited resources by way of using natural processes to maximum benefit, thus minimizing the environmental footprint of projects while enhancing the quality of project benefits;
- c. gain triple-win outcomes that broaden and extend the base of benefits provided by projects;
- d. reduce social friction, project delays and resistance by applying science-based collaborative processes to organize and focus interests, stakeholders, and partners.

The objective of the proposed WG is to provide technical information regarding the Working with Nature approach for navigation infrastructure projects by drawing from existing approaches and best practices worldwide. The report will give guidance to important relevant PIANC and other reports and how to use them for WwN implementation. The report will give orientation about the difference and relationship between various so-called "with nature" – initiatives,

The Working with Nature process should be written using understandable terms and as appropriate integrate current knowledge from existing frameworks, such as those developed by the PIANC EnviCom Permanent Task Group 3 on Climate Change (PTGCC). It will build on the Working with Nature PIANC position paper, initially published in 2008 and later revised in 2011. The WG will work closely with other proposed WGs related to Ecosystem Goods and Services to ensure consistency and synergy among the WGs. The WG will give consideration to the role, influences, and implications of climate change for Working with Nature.

Managing navigation infrastructure projects typically involves meeting multiple objectives and Working with Nature proposes the achievement of multiple benefit streams (e.g. environmental, social and economic). A methodology, which combines existing tools and state-of-the-art practices, is required to inform project management decisions for the inclusion of Working with Nature components relevant to navigation infrastructure. The WG should provide a practical methodology for managing projects to include identifying opportunities for Working with Nature from project start to completion thereby potentially reducing project costs and delays while expanding project benefits. The WG should identify recent case studies worldwide, summarizing them in a way that illustrates and highlights the key factors and practices leading to successful implementation of Working with Nature.

### **3. Earlier Reports to be Reviewed**

The Working with Nature report will appropriately integrate current knowledge from existing frameworks, such as those recently developed by the PIANC EnviCom Permanent Task Group 3 on Climate Change (PTGCC). It will build on the existing Working with Nature PIANC position paper (PIANC 2008, 2011). Other relevant sources of information include:

- USACE. 2012. Engineering With Nature Fact Sheet
- EcoShape. 2012. Building with Nature: Thinking, Acting, and Interacting Differently.

### **4. Scope**

Working with Nature is defined as an integrated approach which involves working to identify and exploit win-win solutions which respect nature and are acceptable to both project proponents and environmental stakeholders (PIANC 2008; 2011). The Working Group (WG) will develop a report that demonstrates how to migrate Working with Nature into practice as it relates to navigation infrastructure by integrating natural systems and engineering. The process developed should describe the integrated approach and a project development and management methodology that will serve to identify, define and ultimately realize triple-win solutions for projects that systematically integrate social, environmental and economic considerations into decision making. Positive examples of Working with Nature opportunities are enhancements of habitat value e.g. associated with navigation infrastructure development or strategic placement of dredged sediments. The process developed should align with Ecosystem Goods and Services concepts as well as other relevant EnviCom publications, by considering existing methods for managing navigation infrastructure projects while providing an open, deliberative, and transparent decision-making process. The Working with Nature process should:

- Define the concepts of Working with Nature and existing scientific knowledge related to dynamic natural ecosystems;
- Present an integrated approach to Working with Nature that is practical and implementable;
- Address such topics as sustainability, resilience, and collaborative processes;
- Review available methods that support alignment of natural and engineering processes;
- Present Working with Nature as a process of shifting toward more sustainable practices for achieving multiple project benefits (i.e., environmental, social and economic);
- Discuss the role of sustainability and life-cycle analysis in the context of Working with Nature; and,
- Incorporate adaptive management principles and practices, as appropriate.

In developing the approach, elements addressing issues associated with expert knowledge of the system, including an understanding of the ecosystem, project components and their different

construction techniques as well as stakeholder participation should be included as a means of developing a practical Working with Nature approach.

## **5. Intended Product**

The report shall comprise:

- An introduction to Working with Nature and how the concept fits into the existing knowledge base from PIANC, CEDA and others;
- Discussion of progress and approaches developed through Engineering With Nature and Building with Nature programs being promoted elsewhere in the world;
- A connection with the Ecosystem Goods and Services WG for identifying, characterizing, and substantiating the environmental and other benefits of Working with Nature projects.
- A description of the Working with Nature approach; the method should address the steps and timing needed to meet project objectives in an ecosystem context. The approach must show how stakeholders can be included in the process and identify and exploit triple win solutions by systematically integrating social, environmental and economic considerations into decision making and actions at every phase of a project.
- A demonstration of how Working with Nature is much more than simply avoiding, reducing or mitigating the impact of a pre-defined design.
- Potential impediments to applying the process and ways in which these can be overcome.
- A focused international survey of projects where Working with Nature has been applied to port, navigation and associated infrastructure projects.
- An easily understood description of two or more case studies where the Working with Nature concept has been successfully applied in practice.
- A summary of existing PIANC, CEDA, IADC and other publications to ensure the process developed is practical and integrates current knowledge.

## **6. Working Group Membership**

Members of the WG should include representatives from the target audience, i.e., consultants, regulators and contractors, and Port Authorities who are tasked with making decisions. The range of expertise should cover at least practical port design and construction knowledge and experience, geomorphology, physical processes, biology, ecology and hydraulic as well as hydro-ecological modeling. A regulator should be included to represent the regulatory perspective.

## **7. Relevance to Countries in Transition**

The primary audience in both developed and developing countries would be project designers, contractors, ecologists, civil engineers, planners, politicians and environmental stakeholders who have an influence on the decision-making responsibility pertaining to navigation infrastructure projects. The report will be written in a manner easily understood in both developed and transitional countries.

## **8. Climate Change**

The Working with Nature report will consider the role, influences, and implications of climate change and will integrate current knowledge from reports produced by the PIANC Permanent Task Group on Climate Change (PTGCC).