DOPPS - Restoring and conserving habitats and birds in Skocjanski Zatok Nature Reserve, Slovenia

Year of issue

2025

Summary

The project, part of a wider pollution-reduction programme, restored key habitats for bird conservation by improving lagoon water circulation, removing ~185 000 m³ of polluted sediments, creating a new freshwater marsh at Bertoška bonifika, flooding former farmland, and installing sluices to regulate marine and freshwater inflows. About 40 000 m³ of clean material was reused to form mudflats and nesting islets, enhancing habitats for species such as little bittern, great reed warbler, and little grebe. The restoration also included construction of visitor facilities and observation points (2009–2015), and establishment of a circular educational trail. Management is ongoing under DOPPS – BirdLife Slovenia, with adaptive measures such as late mowing and grazing by Istrian cattle and Camargue horses to maintain wet meadows. The reserve is involved in recent cross-border projects (e.g. POSEIDONE 2023–2025) promoting green and blue infrastructure, and continues active monitoring of birds, water quality, and hydrology.

Photo Gallery



Location

45.55, 13.73

Project

NWRM

National ID

Slovenia_04

Sector

Hydromorphology

Installation Date

2007-06

Implementation status

Completed

Contact

REC

Overview

Location of the project

The Škocjanski Zatok Nature Reserve is located on the outskirts of Koper, Slovenia, on the north-eastern shore of the Bay of Koper in the northern Adriatic. It lies between the urban area of Koper, the port facilities (Luka Koper), and the main road H5 expressway connecting Koper to the Slovenian motorway network and to Šmarje/Dragonja. The site is adjacent to the railway line and close to the main road link toward the Škocjan settlement.

Country

Slovenia

NUTS2 Code

Zahodna Slovenija

Sponge measures implemented in the case study

Floodplain restoration and management

Wetland restoration and management

Objectives

Approximately 225,000 cubic meters of mud were dredged from the lagoon: 185.000 cubic meters of organically polluted mud was removed to the disposal site, which resulted in reducing the eutrophication and organic pollution, enable water circulation inside the lagoon and increase of bioproduction, which all contributed towards improved ecological conditions in the lagoon and substantially reduced risk of botulism.
The remaining 40.000 cubic meters of non-polluted mud was used to create 20 ha of mudflats and nesting islets in order to create conditions for the habitat types, listed on Annex I of the EU Habitat Directive as well as provide breeding and feeding grounds for endangered breeding birds.
Water inflow improved upon several activities, including two most important ones: cleaning of the Rižana river left discharging channel Ara outlet and riverbed (Ara is the only freshwater source for the reserve) and mounting of the sluice system at the sea channel, which will enable full water level control in the future.

Involved partners

Authority type	Authority name	Authority role	Comments	Authority responsibility
NGO	DOPPS-Birdlife	Implementation	Project implementation (LIFE project), design and execution of restoration works, current site management and maintenance, monitoring of birds, hydrology, and habitats, public outreach, and visitor services.	Responsible
National water authority	Ministry of Environment and Spatial Planning	Financing	Co-financing and oversight during LIFE project, legal designation and regulation of the reserve, funding for infrastructure (2009–2015), coordination with EU programmes.	Supporting
Other	Luka Koper d.d. (Port of Koper)	Financing	Co-financing of the LIFE project as part of environmental mitigation.	Supporting
Research institute / University	Institute of the Republic of Slovenia for Nature Conservation (ZRSVN)	Determination of design details of the measure	Technical expertise, monitoring support, management plan development, and compliance with Natura 2000 requirements.	—

Site Information

Climate Zone

Warm temperate moist

Precipitation

950.00 mm

Temperature (°C)

13.50 °C

Elevation range

8

Slope range

0-1%

Vegetation class

It is one of the sites in the network of coastal Mediterranean wetlands in N Adriatic, important for migratory birds and one of only two such sites located on the Slovenian coastline. Due to the obvious rarity of such habitats at the country level it was important to re-establish its favourable conservation status in order to support the favourable conservation status of other site as well.

WFD Ecological status

Good

WFD Chemical status

Failing to achieve good

Water quality status

Before restoration, the lagoon was silted and polluted with organic matter and nutrients from urban, port, and farm runoff; 185 000 m^3 of contaminated sediments were removed.

Design and Implementation

Project scale

Micro

Project scale specifications

This is a micro-scale project, as it concerns a single protected wetland site – the Škocjanski Zatok Nature Reserve (122 ha) – with localised hydromorphological works, habitat restoration, and site-specific management measures.

Project area

26,5

Area subject to Land use change or Management/Practice change (ha)

23.00 ha

Size

71.00

Size unit

ha

Financing

Total cost

4269252.00 €

Total cost information

LIFE restoration project (2001–2007): €899,252.
Visitor infrastructure programme (2009–2015) : €3.37 million

Financing authorities

Authority name	Type of funding	Comments	Financing share
European Union	EU-funds: LIFE+	€669,439	74 % LIFE project budget
Ministry of Environment of Slovenia	National funds	€30,000	3.3 % LIFE project budget
Luka Koper d.d. (Port of Koper)	Local funds	€199,813	22% LIFE project budget
European Union	EU-funds: Rural development funds	€2.35 million	70 % Visitor infrastructure programme (2009–2015)
Slovenia	National funds	€1.02 million.	30 % Visitor infrastructure programme (2009–2015)

Policy and Governance

Policy description

Drastic loss of habitat and species due to Industrial development.

Land ownership

The Škocjanski Zatok Nature Reserve is state-owned land under the Republic of Slovenia, designated as a protected area and managed under national conservation law.

Policy targets

Pollutants Removal

Improved Biodiversity

Runoff control

Part of a wider plan

Yes

Wider plan

Wider plan type	Wider plan focus	Name	Comments
National	Environment & Biodiversity	Decree on Program of conservation and development of Å kocjanski zatok Nature Reserve for the period 2007-11	Reserve Management Plan for the period 2007-11 was the most crucial document for the future of the reserve, as it guarantees sustainability and continuation of this project. On 30.8.2007, it was adopted by the Government of the Republic of Slovenia in a form of a legal act: Decree on Program of conservation and development of Skocjanski Zatok Nature Reserve for the period 2007-11

Public consultation

Yes

Consultation activities

Activity stage	Activity type	Comments

Design phase	Awareness-raising and educational activities	Because of the exceptional importance of the project for the nature conservation in Slovenia as such, great emphasis was placed on the project activities aiming to increase the conservation awareness. Among those were very important regular contacts and presentations to the local people at lectures and guided tours, to the school children on the field classes, and also preparing and updating of the web site and publication of bulletins. All stages of the largest restoration of a protected area in Slovenia have been filmed and at the project end, an educational documentary film was prepared and a publication released.

Has contractual arrangements

Yes

Contractual arrangements

Arrangement type	Name	Comments
Other	Partnership	Firm and successful partnership between DOPPS †“ BirdLife Slovenia and the Ministry of the Environment and Spatial Planning, which is quite unique in the field of co-operation between governmental and non-governmental sectors in Slovenia, was one of the basis of the project success. That†™s how we managed to implement a pilot project, which doubtlessly ranks among top ten restoration projects of degraded natural areas in the Mediterranean part of Europe. On the other hand, existing BirdLife partnership and newly established Adriawet network, where the beneficiary actively participated brought additional value-added to the project through knowledge and expertise gained.

Impacts and Monitoring

Monitoring System

Monitoring requirements

DOPPS monitors birds, water quality, hydrology, and habitats with national partners.

Monitoring parameters

Monitoring covers avian populations (species presence, breeding success, abundance), water quality (nutrient concentrations, pollutants), hydrological variables (water levels in lagoon and freshwater marsh, sluice operations), and habitat status (extent and condition of reed beds, mudflats, and wet meadows). These data are used to adapt management practices, ensuring that target habitats and species maintain favourable conservation status.

Maintenance

Maintenance requirements

DOPPS maintains habitats via mowing, grazing, and water level regulation.

Socio-economic Impacts

Direct benefits

40,000 m³ of clean sediment reused to create habitats.
Creation of a 2 km circular educational trail, observation towers, and visitor centre (2009–2015) improved public access and environmental education.
Increased attractiveness for eco-tourism and birdwatching, integrating the site into local and regional tourist offerings.
Regular guided tours, school programmes, and exhibitions run by DOPPS, raising awareness of wetland conservation and Natura 2000 values.
Involvement of local stakeholders, including the Port of Koper (Luka Koper d.d.) as co-financier, linking industrial actors with conservation goals.
Public perception of the site improved due to its transformation from a polluted, degraded wetland to a valued recreational and natural area.

Biophysical impacts: Hydrology

Information on retained water

Improved water circulation between the lagoon, sea, and freshwater inflows (Rižana/Ara channel) through sluice installation and channel cleaning.
Hydraulic control allows seasonal water level management in lagoon and freshwater marsh, supporting habitat needs.
Creation of new hydraulic annexes: ~20 ha of mudflats/islets and freshwater marsh (13 ha wet meadows, 10 ha open water/reedbeds, 3.5 ha outside project).

Biophysical impacts: Biodiversity

Improved biodiversity

Yes

Information on improved biodiversity

Improving the habitats along the lagoon borders, mainly mudflats and nesting islets, important for enhancing the halophyte habitats and as nesting sites for endangered birds using another 40,000 cubic meters of dredged sediment;
Increase of bird populations during the project period and increase of the number of species and populations of the breeding birds in the first breeding season after the restoration.

Biophysical impacts: Water & Soil Quality

Water quality overall improvements

Positive impact-WQ improvement

Information on water quality overall

Removal of ~185,000 m^3 of contaminated sediment (polluted with nutrients and organic matter) reduced eutrophication risk and improved lagoon water quality.

Biophysical impacts: Others

Ecosystem impact climate regulation

No information available

Lessons Learned

Key lessons

A key lesson from Škocjanski Zatok is that large-scale ecological restoration in highly degraded urban–industrial settings is possible when ecological, engineering, and stakeholder interests are integrated. The site was heavily polluted and hydrologically altered, yet targeted dredging, reconnection of water flows, and habitat creation reversed decades of degradation.

Strong, long-term institutional commitment proved essential. DOPPS – BirdLife Slovenia's continuous involvement, from planning to current management, ensured that restoration gains were maintained. Coupling restoration with a clear management plan and regular monitoring allowed adaptive responses to ecological changes.

Securing diverse funding sources was another success factor. Combining EU programmes (LIFE, ERDF), national funds, and private contributions (Port of Koper) made it possible to cover both the capital-intensive restoration phase and subsequent infrastructure for education and tourism.

Integrating public access and education early in the project built local support and helped shift public perception of the site. Facilities such as screened trails and observation towers balanced human use with wildlife needs, increasing the reserve's socio-economic value without undermining conservation goals.

Finally, the project highlighted the importance of multifunctionality in wetland restoration. By improving biodiversity, water quality, and recreational opportunities, Škocjanski Zatok became a model for linking habitat restoration with broader community and regional benefits.

It's the first example in Slovenia of an NGO managing a protected area.

Drivers

Driver type	Driver role
Organisation committed to it	Main driver

Success factors

Success factor type	Success factor role	Comments
Attitude of relevant stakeholders	Main factor	Cooperation: DOPPS, BirdLife Slovenia and the Ministry of the Environment and Spatial Planning have created firm and successful partnership for the organisation and management of Skocjanski zatok, which is quite unique in the field ofco-operation between governmental and non-governmental sectors in Slovenia.

Success factor type	Success factor role	Comments
Financing possibilities	Main factor	—

Transferability

The restoration approach at Škocjanski Zatok is highly transferable to other degraded coastal wetlands, especially near urban or port areas, if strong stakeholder cooperation, long-term management, and diverse funding are secured. Key points to watch are sediment contamination handling, hydrological reconnection design, and balancing public access with habitat protection to avoid disturbance of sensitive species.

Sources

Sources

DOPPS - Restoring and conserving habitats and birds in Skocjanski Zatok N.R.

Reserve restoration

Naravni rezervat Škocjanski zatok – Uradna spletna stran

LIFE00NAT/SLO/7226 – Obnova Škocjanskega zatoka

Operativni program razvoja okoljske in prometne infrastrukture 2007–2013 (ERDF co-financing for Škocjanski zatok visitor infrastructure)