

Recommendations

1. Utilize established implementation guidelines

For successful NbS implementation, establish an early-stage action plan based on core principles and guidelines from the literature and the implementation roadmap. This cohesive framework includes steps like problem identification, understanding the context, solution identification, prioritization, implementation, monitoring, evaluation, and maintaining continuous dialogue with stakeholders.

2. Prioritize and plan for long-term maintenance

Address the challenge of maintenance responsibility and funding for Bällstaån by prioritizing resource allocation for post-construction maintenance and assessment of NbS. Ensuring success and functionality by incorporating maintenance considerations early in the planning and design process, acknowledging time and financial constraints faced by the municipality.

3. Prioritize and broaden evaluations

To address evaluation challenges of NbS it is important to address knowledge gaps. Relevant stakeholders should prioritize comprehensive assessments especially in larger urban projects, to counter the dominance of conventional solutions. Broadening evaluations beyond environmental aspects to include economic, social, and health impacts for a holistic understanding of NbS as well as fostering adaptability through continued learning.

4. Ensure participation and stakeholder engagement

Adopt established NbS guidelines emphasizing long-term stakeholder engagement and co-management in Bällstaån. Actively involve participants across sectors to enhance adaptive capacity and ensure success of projects. To bolster public acceptance, strategic site selection and awareness campaigns can play pivotal roles. Cultivate a collaborative environment, address conflicts early, and promote informed public awareness for successful future NbS initiatives.

5. Conduct further exploration of NbS for Bällstaån

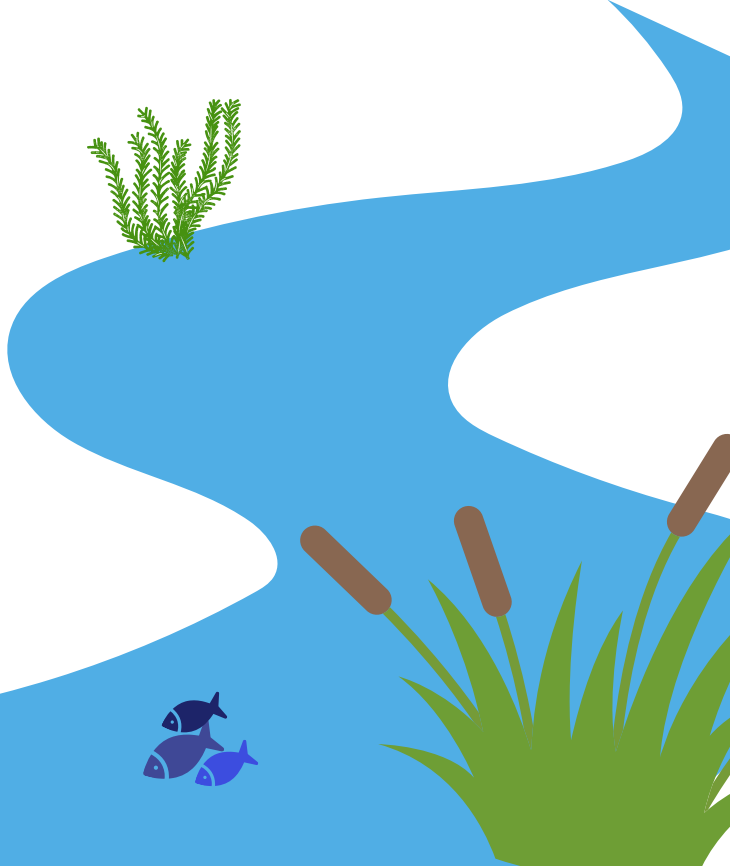
There are potential NbS for addressing eutrophication in Bällstaån, but further exploration is needed. It is therefore recommended to initiate small-scale pilot testing to investigate specific species and plants for biomanipulation and phytoremediation, suitable locations for constructed wetlands, and optimal plant types for buffer strips.

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Restoring Bällstaån

Exploring Nature-Based Solutions for Eutrophication Remediation



Eutrophication

Eutrophication can be described as the process of excessive plant and algal growth due to increased nutrient loading, specifically phosphorus (P) and nitrogen (N).

The process leads to the degradation of freshwater and is primarily caused by a variety of human activities such as sewage discharge, agricultural runoff, and urban expansion.

Nature-based Solutions

One type of measure that have gained recognition as an effective approach to addressing eutrophication is nature-based solutions (NbS)

NbS are characterized by using natural and constructed systems inspired by nature, in order to offer multifunctional benefits like climate adaptation, biodiversity enhancement, and efficient water management

Bällstaån

Bällstaån starts in Järfälla and flows through Stockholm and Sundbyberg before reaching its end point at Bällstaviken, a part of Lake Mälaren.

The ecological status of Bällstaån is inadequate, and good chemical status is not achieved. Per the EU Water Framework Directive, Bällstaån should have achieved such status by 2021 but has been granted an extended time frame until 2027. To reach the goal by 2027, actions need to be taken.

Potential Solutions

1. Constructed Wetlands

Help filter sediments and nutrients in connection to the river, preventing nutrient rich runoff from entering it

2. Buffer Strips

Intercepting runoff by filtering or absorbing sediments, contaminants and nutrients

3. Phytoremediation

Utilizing the natural ability of plants and microorganisms within the water body to remove, stabilize and transform pollutants

4. Biomanipulation

Involves manipulation of key components of ecosystems, such as fish removal or fish stocking, to ensure good ecological status

Implementation roadmap

