



LakeRevive: A Decision-Support Tool for Implementing Nature-based Solutions (NbS) in Urban Lake Restoration

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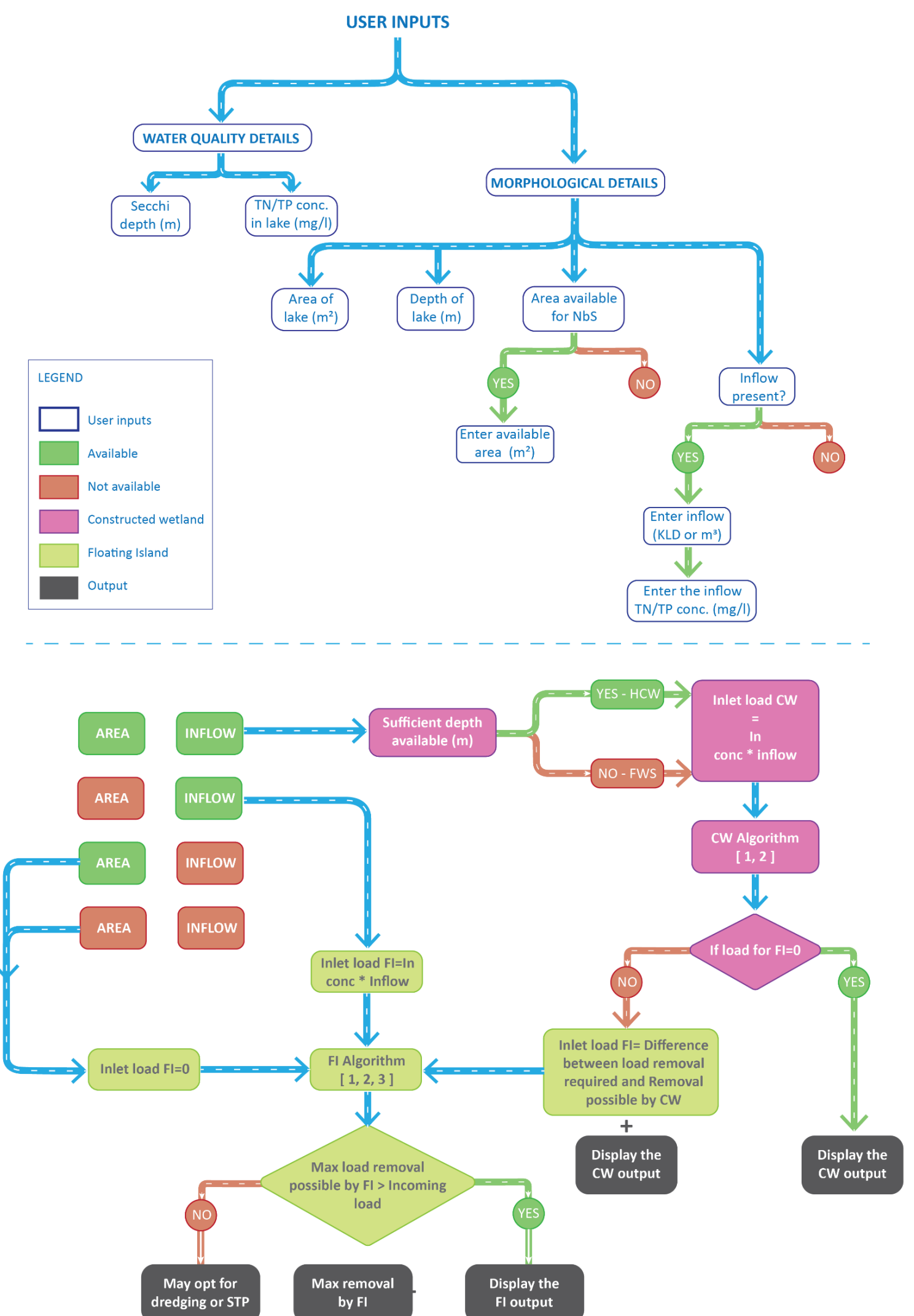
Problem statement – Why cities Needs Smarter Lake Restoration Tools?

Lakes in rapidly urbanizing cities face multiple pressures such as polluted inflows, reduced storage, encroachment and fragmented management. Traditional restoration approaches often miss integrating scientific design of Nature-based Solutions (NbS) at the planning stage.

To address these issues we have developed LakeRevive, an innovative decision-support tool designed to help contractors, site engineers, environmental professionals & citizen volunteers select appropriate nature-based solutions (NbS) for urban lake restoration initiatives. The tool guides users through a systematic process to determine whether blue-green infrastructure such as constructed wetland (CW), floating islands (FI), or a combination of both would be most effective for their specific lake conditions. Additionally, it also provides guidance on rejuvenation of shoreline for water quality and biodiversity enhancement.



The above image represents a lake receiving secondary treated water with no NbS interventions



Logic flow behind the tool



Scenario 1



Scenario 2



Scenario 3

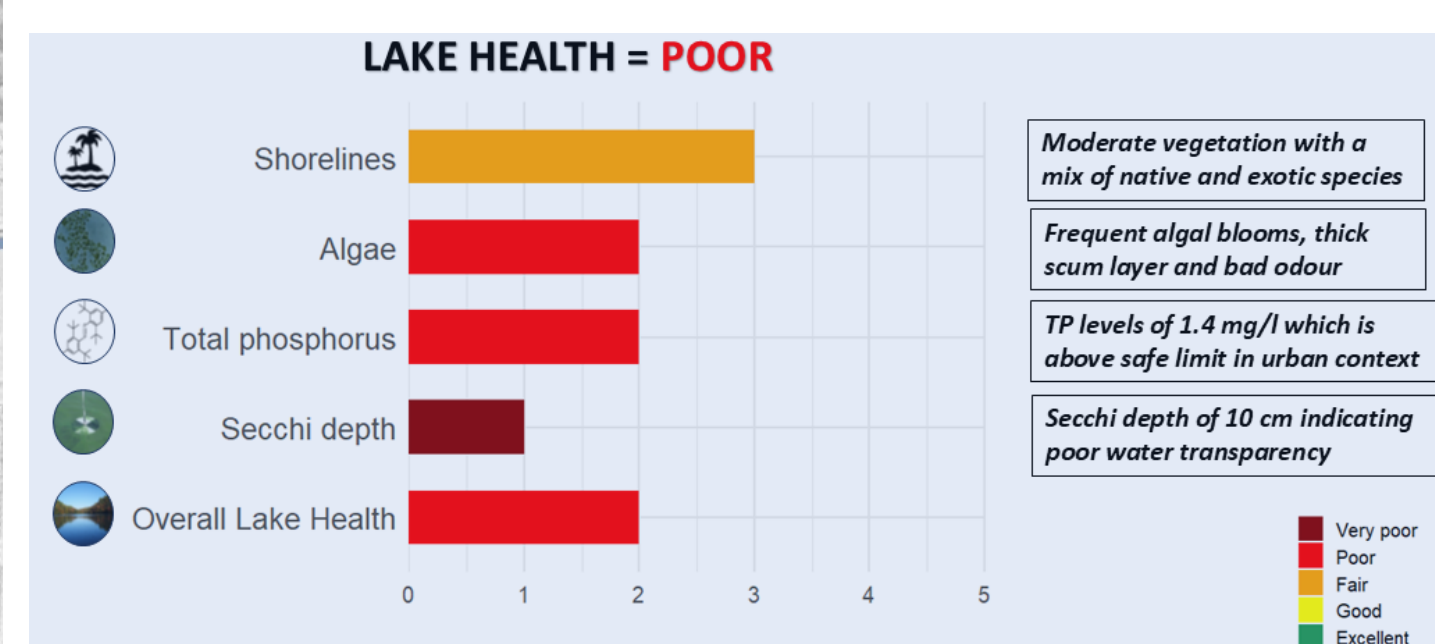
Scenarios for NbS Implementation

Scenario 1: When sufficient area is available, the tool recommends a **constructed wetland**.

Scenario 2: When space is limited, it suggests a **combination of constructed wetland and floating island**.

Scenario 3: When no land area is available, it recommends **floating islands only**.

Note: The tool's recommendations are based on ATREE's studies in rapidly urbanizing catchments, where secondary treated water high in phosphorous leads to algal growth and reduced water clarity. Based on user inputs for available area and pollution load, the tool estimates the optimal NbS area required to achieve target water clarity and suggests feasible interventions accordingly.



When pollution loads are high or no space is available for NbS, the tool recommends **grey infrastructure** options like aeration or treatment units. The web tool also features a **Lake Health Index (LHI)** to track restoration progress and provides **SoPs and maintenance manuals** to guide users in implementing and sustaining NbS interventions effectively.