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Nature-Based Solutions Implementation Resource Guide

HOW TO: USING THE IMPLEMENTATION RESOURCE GUIDES FOR PROJECT SCOPING

OVERVIEW & DISCLAIMERS

The following resource guides have been prepared to support the initial planning and budgeting of individual Nature-based Solutions (NbS) projects, prior to complete analyses and design processes for specific sites.

Commented [MC1]: This doc can be the beginning of a fully compiled PDF with each town's memos included below this doc.

As such, these resource guides represent the collective guidance of designers, ecologists, resilience planners, and other practitioners with experience with NbS projects, so that users can begin to understand the opportunities, challenges, key considerations, orders of magnitude, and limiting factors associated with planning, scoping, and executing an NbS project.

Review of these resource guides should occur in concert with review of your municipality's "NbS Tool" (also referred to as the "matrix") which identifies all sites that were analyzed and the recommended NbS projects for each site, ranked by both impact and feasibility.

The BSC Group Nature-based Solutions Budget Tool can be used to develop more detailed, preliminary concept budgets.

Coordination with a vendor or multiple vendors will be required once a site and its associated NbS project(s) is identified.

- **NbS Tool Disclaimers**
  - The NbS Tool was developed for your municipality based on what was *seen and heard* during a general site assessment, and the recommendations present *potential* solutions. Other kinds of solutions, including non-NbS projects, may be worth considering.
  - When specific sites are targeted for an NbS project, additional studies maybe needed (e.g., survey, flushing, hydrographic, etc.)
  - The NbS Tool (nor the resource guides) does not explicitly address *time scale*. Some of the NbS project recommendations should be considered in the near-term, whereas others should be considered over the coming 50-100 years and therefore, may not be suitable today. Similarly, some recommendations may be suitable for today but would not be suitable in 50-100 years given projected sea level rise, increased precipitation, and/or the other anticipated climate hazards for your region.

- **NbS Resource Guide Disclaimers**
  - These resource guides are *not* to be used as an exclusive, nor comprehensive, source for developing the project scope for permitting, design, construction, and/or environmental monitoring.

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ORGANIZATION OF RESOURCE GUIDES

Resource guides are organized according to the following headings and sub-headings:

Name of NbS
Refers to the name of the individual NbS or the general category of related NbS strategies (e.g., Architecture, Regulatory).

Project Number Per Matrix (NbS Tool)
Refers to the appropriate row or rows in the NbS Tool (also referred to as the "matrix") that was provided to your municipality or organization, detailing the

Prerequisites
Refers to the conditions that must be addressed before any project can be executed. This discussion point is intended to bring these factors to bear before significant investment of time and effort. These are notes for discussion to ensure limiting prerequisite factors are addressed before any project is considered or pursued. Of course, other limiting factors of an individual project may be discovered through analysis and design.

Recommended Implementation Steps (Project Planning and Administration, NbS Installation, & Maintenance)
This section provides a simplified list of significant activities that will likely be part of the implementation process and should be considered in relation to prerequisites, environmental impacts, volunteer opportunities, and other relevant considerations. Constraints are also noted.

Nature-based Solution Specs, Budget Estimate & Schedule Estimate
On Budget Order of Magnitude
Budget estimates are often the aspect of planning where limited information is available, especially in the early stages of planning when it would be helpful to reference for comparison, feasibility, and scope assessment. As such, these budget estimates, presented as estimate ranges or orders of magnitude, provide some basis for development of preliminary budget (per a designer's opinion) – costs are broken down to minimum practical units.

Some of these resource guides were first drafted in 2021 and updated each subsequent year. It is recommended to consider an estimated escalation cost of 2% per year from this point forward, or appropriate inflation/deflation. Additionally, costs are subject to change based on factors such as the project location, subsurface information, observed conditions, and more – all of which would be fleshed out in greater detail if the individual NbS project is selected and scoped for implementation.

On Units
Unit information has been provided as an opinion of the minimum practical unit(s) for any project. Unit recommendations (as well as budget estimates) are affected by factors such as full truckloads of material, an average amount of labor per unit, and practical limits of ecological function or critical mass needed for effective establishment.

In some resource guides, additional series of bullets further describe the key units of measure that drive the bulk of the budget estimate. They are provided with the intention of helping users understand the primary drivers and variables associated with project costs.

On Schedule
This describes the core construction schedule for one NbS project. Users should also consider local and regional factors such as weather patterns, time of year, mobilization to site, bidding process, design schedule, environmental testing, follow up monitoring, establishment of vegetation and maintenance

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constraints.

QUESTIONS TO CONSIDER WHEN SELECTING AN NBS PROJECT FOR A GIVEN SITE

Questions that we recommend the user(s) should bring to the planning group when choosing an NbS project are as follows. They relate to the appropriateness of the NbS project for the site, impact and feasibility, co-benefits, unintended consequences, and opportunities for imbuing additional resilience and sustainability into the final project design.

Opportunity:

- Does it increase resource value, size, potential?
- Is it self-sustaining once set in motion?
- Does it avoid or prevent catastrophic loss, or long-term degradation?
- Does it benefit a sensitive species, and/or multiple species?
- Does it provide stability or value to an economic resource?
- Does it provide an opportunity for future profit from local resources?
- Is this the best available investment for our current resources?
- Can we use the material on site to solve a problem or add a benefit?
- Could this be both useful for habitat and profitable to an owner?
- Does it restore a function that historic uses have removed?

Avoidance:

- Is it easily reversible if a problem arises?
- Will it result in rapid or potentially destructive change?
- Could it conflict with private use?
- Could it conflict with infrastructure?
- Could this be misperceived? Does it need interpretation?

Social:

- Can this be replicated by others?
- Could this be turned into a standard requirement for development or maintenance without adding cost?
- Could this be done by volunteers instead?
- Will this raise awareness and appreciation?
- Does adding access threaten ecological integrity?
- Does adding access mean this area will be appreciated and easier to observe and protect?

Efficiency:

- Is there a more efficient method or material?
- Isolated/ divided resources are at risk, does this connect two resource areas?
- Is it already functioning without intervention?
- Could it be improved by intervention and by how much?
- Could this block an undesirable outcome?