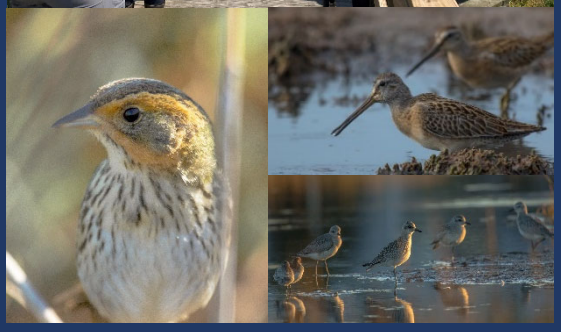
Engineering With Nature® to Enhance Urban Marsh Resilience, Biodiversity, and Habitat

Belle Isle Marsh, Boston MA

MULTI-AGENCY KICKOFF WORKSHOP
August 25 - 26, 2022

Above: Burton Suedel (USACE ERDC) leading multi-agency discussion on opportunities of EWN in urban marsh environments

Below: Sean Riley (DCR) pointing out habitat features at Belle Isle during the project site visit



Saltmarsh Sparrow (left), Black-bellied Plover (top right), and Short-billed Dowitcher (bottom right) in Belle Isle Marsh (Photo curtesy Sean Riley/ DCR)

Background

Natural infrastructure in coastal areas provides critical functions to increase coastal resiliency, manage flood risks, and enhance ecosystem services. Threats from sea level rise, increasing severe weather events, and urban densification intensify pressures on coastal environments and communities. Enhanced coastal resilience and natural infrastructure function requires new approaches. The Belle Isle Marsh presents a unique opportunity to apply leading Engineering with Nature® (EWN) practices to achieve these goals.

A recently initiated EWN research task (ERT) conducted a multi-agency workshop on August 25-26, 2022 at the Belle Isle Marsh (Boston, MA). Belle Isle is the largest and last remaining coastal saltmarsh in the greater Boston area and provides critical habitat to numerous listed and endangered species, including the Saltmarsh Sparrow. The goal of the ERT is three-fold:

1. Add or enhance ecological function and resilience of Belle Isle Marsh using EWN principles;
2. Collaborate with local stakeholders to strengthen relationships;
3. Expand the US Army Corps of Engineers' (USACE) knowledge base for applying EWN principles in other urban wetland settings.

The workshop brought together local stakeholders and the USACE ERT project team to better understand stakeholder values and priorities and identified marsh enhancement opportunities, constraints, data sets, and data gaps. Local participants included subject matter experts currently managing Belle Isle, community education and outreach professionals, and researchers studying biodiversity and marsh grass resilience. Collectively, participants:

- Identified challenges facing the long-term stressors and management of the marsh;
- Meaningfully engaged with stakeholders to gain insight into common goals and objectives;
- Introduced the use of EWN principles and plant biodiversity to achieve resilience goals.

Guest Speakers

Catherine Pedemonti / Mystic River Watershed Association, "Belle Isle Site Background"

Burton Suedel / USACE & **Andrew McQueen** / USACE, "Engineering With Nature® Primer"

Randy Mandel / Ramboll & **Randall Hughes** / Northeastern University: "Plant Genetics and Biodiversity"

Sean Riley / MA Department of Conservation and Recreation (DCR), "Belle Isle Marsh Habitat Management Overview"

Multi-agency workshop participants

- Mystic River Watershed Association
- Friends of Belle Isle Marsh
- Massachusetts Department of Conservation and Recreation
- Northeastern University
- Ducks Unlimited
- U.S. Fish and Wildlife Service
- The Nature Conservancy
- Decision Partners
- USACE ERDC
- Ramboll US Consulting

For more information

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Research Approaches

- Define stakeholder needs, values, interests and priorities related to the Belle Isle marsh and its restoration potential.
- Use existing hydrodynamic modeling and environmental inventory data to focus EWN opportunities.
- Collaborate with the established Belle Isle project team; provide marsh management design ideas which promote EWN concepts and principles.
- Identify data and information to broadly inform beneficial use of sediment based on lessons learned from prior USACE dredging projects.
- Synergize amongst stakeholders and collaborators to collect additional data and communicate progress on the project.

Vision

As part of a broad multi-agency effort, the USACE EWN team will strengthen design, application, and implementation of EWN to support Belle Isle Marsh restoration. Building on EWN principles and practices, the team will identify specific project features that will produce engineering, ecological, and social benefits to encourage and facilitate resilience of urban marsh habitats aligned with Belle Isle stakeholder priorities.

What's next?

The ERT will use information discussed during the workshop to focus field data collection and analysis, conceptual designs, and stakeholder mapping in partnership with multiple federal, state, NGO, and university collaborators. Initial data collection and synthesis of existing information will lay the foundation for science-based design.