



# Salt Application at Stewart's Creek to Abate *Phragmites australis* for New England District

## ERDC Dredging Operations Technical Support Program (DOTS)

U.S. ARMY CORPS OF ENGINEERS

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### Response Summary:

The New England District requested technical support to investigate salt application to the soil surface as a management strategy for the invasion and establishment of *Phragmites australis* in salt marsh restoration projects involving beneficial reuse of dredge material. The request focused on an ongoing restoration project in Stewart's Creek estuary. Stewart's Creek experienced a severe reduction in tidal influence in the 1880's, which was restored by USACE in 2013 through the installation of a larger culvert. Monitoring in 2018 indicated that while tidal flow has been restored, high tides are not inundating the marsh plain, resulting in persistence of *Phragmites* and low salinity conditions in the soil porewater. In response, ERDC visited Stewart's Creek estuary, collected soil samples, and completed a small-scale salt application study to determine the feasibility of surface salt application for *Phragmites* management. Results of the small-scale salt application study and recommendations for future work were compiled and provided to the district to inform the restoration effort.



Figure 1. Intact soil cores after surface salt application

### Period of Performance:

May 16, 2022 – September 6, 2022

### Benefits of the Response to the USACE Dredging/Navigation Program:

Preliminary results indicate that salt application to the soil surface is a potentially effective abatement strategy for *Phragmites* within restoration sites. Results show that salt concentrations remain elevated in the soil after four simulated tidal cycles in all surface application treatments and samples exposed to tidal water only. Future work is planned to continue testing the feasibility of this strategy within Stewart's Creek estuary. Surface salt application is cost effective and widely applicable to all salt marsh restoration projects where *Phragmites* abatement is necessary, including restoration projects involving dredge material.

### Deliverable:

The DOTS response resulted in a 7-page document reporting preliminary results and identifying future research opportunities to inform restoration efforts and further feasibility studies. The preliminary study highlights factors such as differences in soil texture and cation exchange capacity that influence surface salt application effectiveness.

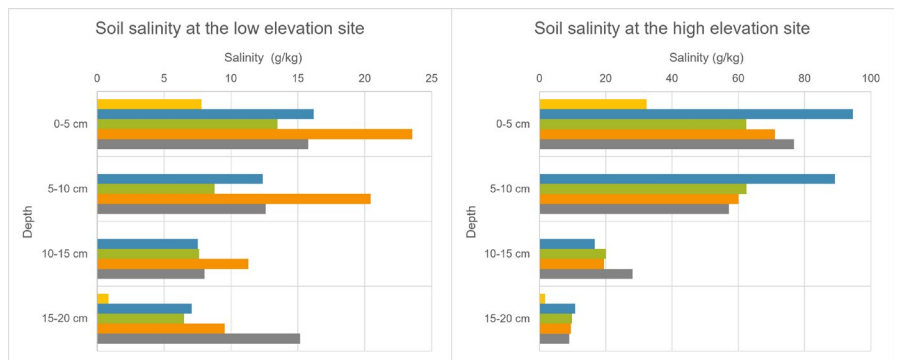


Figure 2. Preliminary study results



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers Operations and Maintenance navigation and dredging missions