

**Succession in a large restored tidal marsh: first-year
vegetation patterns and the role of wrack in
colonization**

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Abstract

Salt marsh restorations have shown species recruitment limitation due to dispersal constraints and harsh substrate conditions. In restored marshes, wrack may play a key role in recolonization because it is a vehicle for seeds and can reduce salinity by shading bare substrate. I described first-year succession in Sherman Marsh (Newcastle, Maine), a 90 ha tidally restored site that was reconnected to the sea in 2005 after 70 years of freshwater submersion. To investigate the recruitment potential of large, tidally restored salt marshes, I examined vegetation patterns for evidence of dispersal limitation of salt marsh plants. Additionally, I experimentally simulated wrack deposition to test its role in succession as both a seed dispersal mechanism and in ameliorating harsh sediment conditions.

Sherman Marsh revegetated rapidly with freshwater, brackish and salt marsh species. These communities were very different from those of the adjacent reference marsh. Surface and pore water salinities were indicative of fresh to brackish waters. Nine of 11 salt marsh species recorded were confined to the first ¼ of the marsh, closest to the marsh inlet. Among salt marsh plants, *Juncus gerardii* and *Schoenoplectus maritimus* dominated the revegetation. It appears that *J. gerardii* regenerated from a seed bank. *Schoenoplectus maritimus* may have been dispersed by birds. Because substrate stress did not appear to limit seedling emergence and survival and because salt marsh species were absent in most of the marsh, this study demonstrated dispersal limitation. Wrack deposition did not increase seedling emergence or have any effect on substrate conditions. However, cover by wrack decreased *J. gerardii* cover.

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