Patuxent Wildlife Research Center
Science Brief for Resource Managers

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The Effect of Nutria (*Myocastor coypus*) on Marsh Loss in the Lower Eastern Shore of Maryland: an Exclosure Study

Description:

The objective of the study is to demonstrate whether exclusion of nutria from Olney 3-square dominated habitats can stabilize and ultimately recover marsh vegetation. Using an experimental design adopting randomly selected fenced exclosures and control (unfenced) plots, we predict that exclusion of nutria will result in a minimum of decelerated loss and a maximum of expanded vegetative cover within exclosures, while marsh loss will continue unabated on unprotected sites.

Progress to Date:

Exclosures continue to serve as satisfactory barriers to surface oriented nutria but are in most instances inadequate to exclude muskrats that are more prone to dig and swim under fencing, sometimes gaining access through plunge holes some distance from the fencing. Also some exclosures have been breached by nutria which gain access generally by enlarging muskrat runs. During the past 3 growing seasons, measurement of vegetative coverage in fixed subplots has revealed that although few plots have shown dramatic recovery, vegetation continues to increase slowly within fenced exclosures while it continues to decline in unfenced controls. This preliminary result suggests that nutria damage is 4 to 5 times that of muskrat damage within the breached exclosures. The 4 exclosures breached by nutria displayed an overwhelming 83% of subplots in vegetative decline; this compares to 61% decline for all random control subplots indicating generally that higher nutria densities were present at sites where exclosures have been breached. In spring 1998, the question of marsh elevation as a factor controlling vegetative recovery was addressed experimentally by adding sediment to test plots. The effects were dramatic in that in one short growing season nearly all plots showed immediate vegetative recovery. This finding provides strong evidence that using "thin-layer" sediment procedures to enhance marsh elevation would result in a positive vegetative response. We note that this manipulation not only increased marsh elevation but it added nutrients and provided a greater degree of protection from herbivores by using the finer mesh wire.

Management Implications:

Our preliminary findings indicate that marsh recovery in the absence of nutria remains slow or nonexistent because areas devoid of vegetation have been reduced in elevation by the direct activities of nutria, or the combined effects of nutria activity, oxidation, and erosion of the marsh surface. Nutria activity is most detrimental when it destroys the fibrous peat mat that is the fabric that holds the marsh surface together. Our findings indicate that the marsh is in delicate balance with regard to stress from inundation and extremely vulnerable to erosion associated with tidal action. Combined with the broad effect of sea level rise and forces of tidal erosion, the activity of nutria could be viewed as a major catalyst to marsh loss in the Blackwater system. These findings underscore the ecological incompatibility of this large non-native herbivore in a system that has evolved with the much smaller North American muskrat.

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