

ABSTRACT

FLORAL ECOLOGY OF THE CARONI MARSHES WITH REFERENCE
TO THE IMPLICATIONS FOR FRESHWATER MARSH RESTORATION

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The aim of this study was to investigate the ecology of the Caroni marshes. These tidal marshes were originally freshwater, which due to changes in the hydrologic regime became brackish. Loss of biodiversity prompted an investigation into the feasibility of restoration, with the particular aim of increasing avifaunal diversity. Since this was the first study conducted on Trinidad salt marshes, it was important to keep the methods simple and to gain as much baseline information as possible. Soil type, salinity and water depth were assessed, in addition to several biotic factors such as, vegetation height, productivity, phenology and decomposition rate.

Measurements were made over one growing season, which included a dry and wet season. Variations in biotic process efficiencies were monitored, over the two seasons. These abiotic and biotic evaluations were correlated with each other in order to produce a basic ecological model of the marsh. Variations in soil analyses were very small, with organic matter content being the most variable during periods of high decomposition. Potassium and phosphorus were found to occur in high concentrations throughout, as observed in other salt marshes.

Conditions were hypersaline throughout most of the dry season and became slightly less saline during the wet season. Water depths were quite variable over the seasons, from a few centimetres during the dry season to over 60 cm in the wet. A large annual biomass was produced, 180 gms dry wt. $m^2 yr^{-1}$ during optimum conditions, while a maximum decomposition rate of 0.89 / 20gms dry wt. was obtained at peak conditions, both occurring during the wet season.

Flowering of *Eleocharis mutata* ((L.) Roem and Schut) began in late April and seed production followed in June, both producing large numbers of flowers (41/ 0.25m²) and seeds (1093/ 0.25m²) Germination experiments conducted on seeds showed 96% germination success at an optimum 15 cm water depth. At both higher and lower water depths success rates fell off gradually. Seasonal trends indicated that the dry season was the drawdown period when only slow growth took place. The wet season was the period at which ecological processes occurred most efficiently. The significance of these results to the proposed restoration is discussed.

Keywords: sedges, *Eleocharis mutata*, Caroni, marsh, brackish, restoration