

ABSTRACT

The Population Dynamics of *Roystonea oleracea* (Jacq.) O.F. Cook
in the Nariva Swamp

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The *Roystonea oleracea* populations in the Nariva Swamp are presently threatened by numerous incidences of fire, agricultural activity, and harvesting of palms for palm heart. The population dynamics and regeneration status of four *Roystonea oleracea* populations in the Nariva Swamp were monitored from July 1997 to December 1998. Each site was treated separately as they were found to vary significantly in air and soil temperature, water depth, and light intensity. The population structure at each site based on stage densities was that of an inverse-J type distribution typical of tropical aboreal plant populations.

Stage specific survivorship, fecundity and growth rates were calculated from observations over a one year period and Lefkovitch matrices constructed. Population stability and critical stages were identified based on calculated lambda values, sensitivity and elasticity analysis, and its life history categorisation was inferred.

Calculated lambda values were > 1.0 at all sites indicating positive intrinsic rates of growth, and showing that populations at all sites were increasing and naturally regenerating. Lambda values were most sensitive to proportional changes in densities of individuals between 1-9.0m, which was determined to be the critical life stage for the different sites. Based on average growth rates *R. oleracea* had an estimated mean life span of 110 years, becoming reproductive at 32 years of age with a type III survivorship curve.

Height at first fruiting varied between sites, but showed a general pattern of fecundity increasing with height and then leveling off. Fecundity was significantly lower at Bush Bush possibly due to reduced light intensity. Mortality was highest for the seed and seedling stages. Seedling mortality was related to seedling density at Cascadou Trace and Bush Bush, and to humidity and temperature at Kernaham. Growth rates were highest at the sites with higher light intensity. The observed life history traits suggest that *R. oleracea* may be a late secondary succession species.

Keywords: Nariva Swamp; *Roystonea oleracea*; palms; population ecology; plant demography; seedlings; matrix models, lambda, fecundity; and growth.