

Population dynamics of the heart of palm tree (*Euterpe edulis* Mart., Arecaceae) at the Brazilian Atlantic Rainforest

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Background: Studies on population dynamics are useful for planning and monitoring conservation actions as well as for the sustainable exploitation of species. *Euterpe edulis* Mart. (Arecaceae) is a palm tree considered a keystone species in the Brazilian Atlantic Rainforest due to its massive production of fruit, which is consumed by a large range of frugivores. The species also produces an edible palm heart with high economic value and hence is dramatically exploited in some sites. Short-term demographic studies for some populations of *E. edulis* have shown contrasting patterns of the annual population growth rate (λ), which ranged from 1.24 (24% of population growth) to 0.87 (13% of population retraction). The goals of our study were to provide (i) a λ estimative in a higher spatial and temporal resolution, and (ii) insights into the variation of the population dynamics of *E. edulis*.

Method: All individuals with diameter at breast height (DBH) ≥ 4.8 cm were sampled and measured in four permanent 1 ha-plots installed at a protected site of Brazilian Atlantic Rainforest in SE Brazil. Three censuses were conducted along a nine year-period. We categorized all sampled individuals into four DBH classes and constructed three transition matrices from which we calculated λ . We also calculated the stochastic λ , which includes temporal variation in population dynamics.

Result: λ values ranged from 1.03 to 1.11 among censuses and the population tends to grow 1.6% per year in the long term. The permanency of individuals in the largest size classes contributed the most for λ .

Discussion: There are reports of sporadic exploitation of *E. edulis* at the study site, but it seems that the protection of the forest has enabled the persistence of local populations through the survival of large individuals. Variations in λ along time are likely a result of gap opening effects on recruitment rate. The annual population growth rate calculated by us is comparable to those estimated in small fragments by other authors. However, it is higher than in populations subject to monkey herbivory of the palm heart and lower than in populations previously enriched with seedlings of *E. edulis*. This indicates that the population dynamics of this species is much more influenced by the disturbance regime than by the size of fragments. When protected and properly managed, small sites may be able to maintain sustainable populations of *E. edulis*.