

POPULATION BIOLOGY OF WOODY PLANT SPECIES OF  
HALEAKALA: A PROGRESS REPORT

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Most tree species of goat-inhabited areas of East Maui have not often reproduced by seed for well over a century. Studies initiated in mid-1981 are aimed at determining the potential of woody species of the Crater and south slope of Haleakala to reproduce in the absence of browsing animals. Most species flower and fruit abundantly.

The major factor (besides browsing) preventing reproduction by seed of most of the 60 species being investigated seems to be competition from exotic grasses and forbs. Holcus lanatus provides the most interference at high elevations; Pennisetum clandestinum at 900-1500 m; and Bidens pilosa at 400-900 m.

Rodent predation on seeds is a critical factor reducing seedling establishment for some species. Seedlings of Santalum haleakalae were found almost exclusively in relatively barren areas with low rodent populations. Caged Rattus rattus ate Santalum seeds readily, leaving broken seed cases identical in appearance to those found under Santalum trees. Several lines of evidence suggest, however, that rodent predation is not a critical factor for most species.

Seed germination and survival of all species for which data are available are enhanced by wet weather. Restriction of seedlings of most species to shaded sites under trees or shrubs suggests a requirement for sustained soil moisture levels and protection from high soil surface temperatures. Since tree and shrub cover has been reduced from past times and exotic plants usually thrive in habitats otherwise adequate for seedling survival, safe sites for establishment of native trees are few indeed. Reproduction for many native species would be greatly enhanced by removal of browsing pressure, however.