

THE FERN JUNGLE ENCLOSURE IN HAWAII VOLCANOES NATIONAL PARK:  
13 YEARS WITHOUT FERAL PIGS IN A RAIN FOREST

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A pig-proof enclosure of approximately 900 m<sup>2</sup> was established in 1968 about 700 m southeast of Thurston Lava Tube in Hawaii Volcanoes National Park. We relocated the enclosure and conducted a follow-up study in October 1981. Over 25 percent of the enclosure interior was sampled with contiguous 3 x 5 m plots, and an equal area outside the enclosure was also checked in the same manner. We recorded all species present in 0-0.5 m and 0.5-2 m strata and estimated cover via the Braun Blanquet cover abundance scale. Percent of litter, exposed soil; the potential area diggable by feral pigs, the percent of the area actually dug, and the degree of root exposure (as an index to erosion) were also estimated. Exotic plants recorded in 1968 (Smathers, NPS files) but not in 1981 inside the enclosure were: 1) Cyperus rotundus, 2) C. brevifolius, 3) Fragaria vesca, 4) Cuphea carthagenensis, 5) Sporobolus africanus, 6) Paspalum dilatatum. The exotic grass Holcus lanatus increased in cover in the area and Psidium cattleianum and Andropogon glomeratus are now present in the area. We recorded 19 native species inside the enclosure in 1981, as compared with the 11 recorded in 1968, but our sample was 300 percent larger than the earlier effort. Natives that have increased in cover inside the enclosure in the 13 years include Isachne distichophylla, Dicranopteris linearis, Sadleria pallida, Ilex anomala, and Coprosma rhynchocarpa. Seedlings and/or saplings of the last three species were conspicuous in our survey. Differences inside and outside the enclosure in 1981 were observed in: 1) more abundant cover of exotic grasses and herbs outside, 2) more exposed soil and roots outside, 3) greater average number of exotic species per plot outside, 4) greater frequencies of the exotics Hypericum mutilum and Microlaena stipoides outside and native Uncinia uncinata, Ilex anomala, Lycopodium cernuum and Dicranopteris litter inside, and 5) greater densities of natives Sadleria pallida, Isachne distichophylla, Ilex anomala, Lycopodium cernuum and bryophytes inside and exotic Microlaena stipoides outside. Coprosma rhynchocarpa was found in equivalent density and frequency inside and outside the enclosure. Feral pigs had been present in the Thurston area for at least 50 years prior to erection of the enclosure. They continue to affect plant composition and cover outside the enclosure through consumption of plants and disturbance of substrate. However, inside the enclosure native plants have become increasingly important despite nearby sources of aggressive exotics and continued disturbance by feral pigs to the surrounding vegetation.