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Technical Report 160

Rehabilitation of 'ōhi'a-swordfern (*Metrosideros polymorpha-Nephrolepis multiflora*) woodlands following the Kupukupu Fire, Hawaii Volcanoes National Park

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ABSTRACT

The 2002 Kupukupu Fire burned more than 3,367 acres (1363 hectares) in Hawaii Volcanoes National Park. Four hundred and fifty-five acres (184 hectares) were in transitionally dry to mesic 'ōhi'a swordfern woodland of which portions had previously burned in 1972, 1981, and 1992. Based on past studies, the effects of this fire were expected to result in a reduction of abundance and diversity of native species. In contrast, alien swordfern was expected to quickly re-establish. Wildfire was expected to recur in this area given the abundance of fine fuels provided by alien swordfern and grasses, extended dry periods, and continued ignition sources provided by nearby lava flows. Consequently, park managers adopted an aggressive approach to restore native species by a combination of seeding and planting into the burn. Establishment was focused primarily on fire-tolerant species. Restoration efforts began in October 2002 and continued to March 2005. Approximately 1,500 worker days were spent on the project, propagating plants, planting, seeding and monitoring individuals in the field. Thirty-five native plant species were established in the burn area by a combination of direct seeding nearly 400,000 seeds and planting 12,646 individuals that were propagated in temporary greenhouses at HAVO. Average survivorship of planted individuals was greater than 50% and ranged between 10% and 92% by species. Of these, fourteen species had reached reproductive maturity by Fall 2006. Seeds of seven of the thirteen species seeded in the burn area germinated. Five species survived beyond the first year seedling stage. Continued monitoring will determine long term successional outcomes.