

INTRODUCTION

Subalpine shrubland and alpine aeolian ecosystems occur in Hawaii on the upper portions of Mauna Kea, Mauna Loa, Hualalai and Haleakala volcanoes on the islands of Hawaii and Maui. These high elevation ecosystems make up a relatively small percentage of the total land area in the state, but because most of them remain fairly intact, they represent important habitats for native species. In particular, they serve as home to a number of unique and highly adapted arthropod species that occur nowhere else (Loope and Medeiros 1994).

On Maui, shrubland and alpine ecosystems occur in and around Haleakala National Park (HALE) on the mountain's upper west slope, upper south slope, and within the crater (actually a large erosional depression). They form core protected habitats for the park, being not only the most visible and identifiable components for HALE visitors, but also serving as central foci for the park's mission to preserve native biodiversity. A critical prerequisite of effective resource management in these areas is knowledge of their biological diversity, both native and introduced. The arthropod fauna of these areas has been studied on numerous occasions, beginning with collections by Blackburn and Perkins in the late 18th century (Blackburn and Sharp 1885, Liebherr and Polhemus 1997), and including a relatively exhaustive inventory in the mid- 1970's (Beardsley 1980). These and other collections have ensured that the endemic arthropod fauna in HALE's subalpine shrubland and alpine aeolian zones is relatively well known. While new endemic species continue to be found, the fauna in well-studied taxonomic groups is probably relatively complete (but poorly-studied groups are likely to yield considerable numbers of new species when specialists finally address them). In contrast, the introduced fauna continues to grow by virtue of continual new introductions, and repeated inventories (i.e. monitoring) are the only way to measure the rate of this growth and to make early detections of particularly destructive species.

The shrublands and alpine habitats on Haleakala's upper west slope and summit are the most accessible, both to study by researchers and to anthropogenic source pools of introduced species. This portion of the mountain houses the park headquarters, service area and park road – which provides vehicular access to visitor centers, overlooks and the scientific observatories at the summit. Thousands of visitors, staff and others use this road each day, making it a likely route of entry into the park for many introduced arthropod species. Compared to other flanks of the mountain, the upper west slope is also the most directly exposed to major areas of development below. We conducted an inventory of arthropods in this area using three systematic sampling techniques in two elevational zones, supplemented by limited opportunistic hand collecting. This report catalogues all arthropod species collected in the course of the inventory, and when possible, provides additional information relevant to the species listed. We assess inventory completeness and the relative effectiveness of the different sampling techniques. We also make limited comparisons between our inventory, which took place between 2001 and 2004, and the most recent similar effort, conducted in 1975 to 1977 (Beardsley 1980).