

**Amendment to Deborah J. Ward, Written Direct Testimony. Submitted: July 19, 2011.**

chose instead to work with the UHIfA to institute a more effective monitoring and enforcement program for the mountain.

Exhibits ~~D-2~~ (D-14), Mauna Kea Science Reserve Complex Development Plan sections relating to mitigation

Exhibit ~~D-3~~ (D-07), Letter to Mr. Mike Wilson, DLNR Director, dated 11 May, 1996

Exhibit ~~D-4~~ (D-06), Investigation of the Destruction of Wekiu Bug Habitat

Exhibit D-5, Letter to Mr. Mike Wilson, DLNR Director, dated 29 May, 1996

Exhibit ~~D-6~~ (D-08), Photographs of Wekiu Bug habitat alteration

Exhibit ~~D-7~~ (D-09), Letter from Mr. Mike Wilson, DLNR Director, dated 25 September, 1996

As a result of the violations identified, the University funded a study in 1997-8 that reported a 99.7% decline in the Wekiu bug numbers in comparison to the 1982 reports. Subsequent studies have modified this drastic assessment, and have identified additional habitat utilized by Wekiu bugs.

- It has been estimated that since 1963, approximately 62 acres (25 hectares) of potential arthropod habitat have been lost to astronomy-related development on the summit.  
2.2.2.3 Threats to Invertebrate Communities on Mauna Kea CMP NRMP p 2.2-43
- "The Wekiu bug is currently a candidate for Federal listing under the Endangered Species Act" CDUA Section 2.3.

This listing is based on two criteria; its known threats are impacting the population of the organism, and evidence of significant population decline. The Wekiu bug was listed as a candidate for Federal protection on June 13, 2002.

**"Cumulative" Means Impacts of Past, Present and Reasonably Foreseeable Future Actions**

A review of cumulative impacts of telescope construction and related infrastructure on Wekiu bug habitat included in the December 1999 MK Science Reserve EIS for the 2000 Master Plan described only potential impacts looking forward (no review of cumulative impacts of past, present and reasonably foreseeable future actions).

The 2000 Master Plan (FEIS Volume I Section 6.1.3)

- "avoids facilities expansion into *Nysius* habitat wherever possible to avoid potential habitat disruption. In particular, observatory redevelopment will be limited within the existing site along the summit ridge to avoid expansion onto the surrounding cinder substrate. Mitigative Measure—the following measures *will be implemented*... 1) Minimize earthwork beyond existing disturbed sites... New facility development will also be contained to the smallest possible disturbance area to minimize impacts to endemic arthropods. 2) No new facilities on undisturbed cinder cone habitat."