

ARTHROPOD SURVEY AND ASSESSMENT

HO‘OPILI PROJECT

‘EWA DISTRICT, O‘AHU, HAWAI‘I

May 2008

Prepared for

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INTRODUCTION

A survey of arthropods on the Ho'opili Project Site was conducted on May 09, 2008 by Dr. Gregory Brenner of Pacific Analytics, LLC. The primary objectives of the survey were to provide a general description of the arthropod fauna of the Ho'opili Project Site, evaluate the habitats, and search and assess the potential for threatened and endangered arthropod species as well as species of concern (DLNR 1997, Federal Register 1999, 2005).

GENERAL SITE DESCRIPTION

The approximately 1,550 acre (627 hectares) Ho'opili Project Site in the 'Ewa District on the Island of O'ahu includes three main parcels, Parcels A, B, and C, and seven smaller parcels, Parcels D1, D2, E1, E2, E3, F, and G (see Figure 1.5, DEIS page 4). The Ho'opili Project Site ranges in elevation from near sea level to about 430 ft (131 m). The Ho'opili Project Site was cultivated in sugarcane from the late 1800s to 1995, and currently contains cultivated fields for diversified agriculture, pasturage, and agricultural research, and some small gulches and cliffs. The edges of the fields and the small gulches and cliffs on the site are weedy areas dominated by alien plant species (LeGrande 2006).

There are neither unique floral habitats nor unique avian and mammalian faunal habitats on the Ho'opili Project Site and a survey for botanical, avian, and mammalian resources found no threatened endangered, or species endemic to Hawai'i at the site (LeGrande 2006, David 2008).

SURVEY METHODS

Prior to the site visit a search of literature pertaining to arthropods found in the 'Ewa District was conducted. Maps and aerial photographs of the Ho'opili Project Site were examined to familiarize the principal investigator with the general area and locate potential arthropod habitats. After examining the maps and aerial photographs it was determined that special attention should be given to the gulch and the cliff areas where the botanical survey identified scrub vegetation with native plant elements (LeGrande 2006). These areas were determined to have the best potential as native arthropod habitats.

The areas selected as requiring special attention include Honouliuli Gulch running through Parcel B, two flumes that run east-west through Parcel C, and the cliffs along the eastern boundary of Parcel C.

The arthropod survey was conducted on May 9, 2008. Roads were driven on the Ho'opili Project Site to locate potential arthropod habitats previously identified from maps and aerial photographs. A Staged Random-Walk survey method was used in these areas. Vegetation was sampled on foot along roads and between cultivated fields where arthropods would likely be found using the following methods.

Aerial Netting - Flying insects were captured in aerial nets and placed into vials for immediate identification in the field. Species present were recorded in a field notebook with annotations about relative abundance and other ecological information. Specimens were released after identification.

Sweep Netting - Grasses, small shrubs and other low-lying vegetation was sampled with a sweep net. An insect net was brushed along the top of the vegetation or grass to capture insects. Specimens were released after identification.

Foliage Beating -Foliage was sampled using a beating sheet. An insect net was placed under a branch and the stem was struck with a short stick. Arthropods on the foliage were dislodged and fell onto the sheet where they were collected with an aspirator into vials for identification. Specimens were released after identification.

Visual Inspection – Plants were visually inspected for arthropods that were not collected by other methods. Time was also spent observing larger flying insects that could be identified on the wing. The Honouliuli Gulch was also visually inspected for aquatic insects after water began flowing, apparently released from the state flood control detention pond upstream of the site.

Sampling Transects – The length of sampling transects varied with location. Staged Random-Walk sampling transects were used to survey each area. Sampling transects were selected at random to represent at least twenty percent of the vegetation on each Parcel. Sampling intensity was increased to at least fifty percent in those areas identified from maps and aerial photographs as requiring special attention.

DESCRIPTION OF THE ARTHROPOD FAUNA

Twenty-seven species of insects representing eight orders and at eighteen families were observed at the site. In addition three species of spiders were also recognized.

The entire site is disturbed by agriculture and related activities, and the vegetation is composed of non-indigenous, weedy species. This is reflective of the overall arthropod community which is almost entirely non-indigenous. Only one indigenous species, *Pantala flavescens*, a common dragonfly, was observed. No endemic native Hawaiian arthropods were detected.

Plants that were in bloom attracted pollen and nectar feeders, especially bees and butterflies. Other insects were found feeding on plant juices, under leaves and on stems. Ants were the most abundant insect on the ground.

There have been no previous arthropod surveys at the Ho'opili Project Site and a search of literature revealed only one reference of an arthropod study in the Barbers Point vicinity. The nearest and most complete comparative survey was one conducted in 2006 by the principal investigator for the proposed development of the Kapolei Harborside Center (Pacific Analytics 2006). In that study one hundred and ninety-five species of insects representing sixteen orders and at least seventy-five families were collected with an additional nineteen species of spiders, three species of other arthropods, and five species of fossilized snail.

More than ninety percent of the species collected in the Kapolei Harborside Center Project Site survey were non-indigenous. Many are cosmopolitan, weedy species found throughout the Pacific and the World. The few indigenous and endemic species observed at the Project Site are common and no rare, endangered, threatened, or species of concern were detected. The large proportion of non-indigenous species was an indication of the amount of habitat degradation that resulted from the various agricultural and mining operations that have occurred at the site.

Similar degradation has occurred at the Ho'opili Project Site as a result of the more than one hundred years of agricultural use. The vegetation at the Ho'opili Project Site is similar to but less diverse than that at Kapolei Harborside Center Project Site. In my judgment, the arthropod fauna at the Ho'opili Project Site is not substantially different from that found at the Kapolei Harborside Center Project Site and it is unlikely that an intensive inventory of the site would yield significantly different findings from the 2006 study.

Despite particular attention to gulches, flumes, and water detention areas, no native Hawaiian damselflies or other endemic aquatic arthropod species were detected. Given the intermittent nature of the water flow in these some of these areas it is unlikely that aquatic species would persist there. Only one species of native Hawaiian damselfly is historically known from this area, *Megalagrion xanthomeles*, and that species is nearly extirpated from Oahu, known recently from only one locality above Honolulu (BPBM 2008).

SUMMARY OF THE ARTHROPOD FAUNA

The arthropods species that were collected during this study would be considered typical of what would be found in lowland sites with little or no native vegetation and disturbed by agricultural operations. No species were found that are locally unique to the site. Nor were any species found whose habitat would be threatened by the proposed development at the site.

The results of this arthropod survey at the Ho'opili Project Site indicate there are no special concerns or legal constraints related to invertebrate resources in the project area. Although several species of Hawaiian endemic arthropods may occur on the 'Ewa plain, these species are not likely to be abundant in the highly disturbed agriculture lands that comprise the Ho'opili site. No invertebrate species listed as endangered, threatened, or that are currently proposed for listing under either federal or State of Hawai'i endangered species statutes are known to exist at the Project Site (DLNR 1997, Federal Register 1999, 2005).

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