

## SURVEY METHODS

Methods for this survey (Figure 2) followed protocols outlined by Conant and VanGelder (2003) which included using peanut butter baited chopsticks laid out a few meters from each other and left for about an hour, after which, ants were collected and identified.

The survey attempted to cover major portions of the island accessible by road, but focused on likely high risk areas, most notably newly landscaped areas within new developments. To locate new developments, the ArcView mapping program was used to overlay the tax map key (TMK) maps for Maui from 2000 and 2006 (Figure 3). Overlaying the two maps with different colors identified which land parcels had been subdivided recently. These new subdivisions generally install new plantings as part of the development process. It was in the vicinity of these plantings where this study focused survey efforts (Figure 4).

Additionally, other high risk areas were surveyed, including nurseries, gardens, and sites with plantings of species known to have been intercepted with LFA (*Caryota* palms, mondo grass). A few roadside transects were also done, generally representing both wet and dry climates and high and low elevations. The surveys employed distances of variable length between stations (0.25 - 1.5 miles), focusing on areas where there were good roadside pull-offs and a variety of apparently suitable habitat for LFA.

At each site, information about that site was recorded on a label, which was placed inside a vial to be used upon retrieval of the ants. Information on each label included the date, location, GPS coordinates, site number, and collectors' names. The GPS used was a Garmin eTrex unit that recorded locations and a track of the survey route to help with navigating back to collection sites.

Chopsticks covered lightly in Jif creamy peanut butter were used to test for presence of *Wasmannia* (Figure 5). It should be noted that peanut butter bait is standard for LFA surveys, but is not equally effective for all ant species. Thus other ants are likely to be under-represented in results of this survey.

Prior to use, chopsticks were cut in half and spray-painted orange on one half to make retrieval easier. At each site, about 12 peanut butter baited chopsticks were placed in areas that would likely harbor LFA, such as at the base of trees, near or in potted plants, in tree crotches, in leaf litter, near logs, planks, or bricks, near wet spots or water features (seeps, irrigation, etc.), and in cracks in concrete, such as sidewalks or walls.

Once the sticks were placed, the next site was visited and the same method repeated until an hour had passed, after which the survey team would return to the starting site and retrieve the ants from the peanut butter baited chopsticks. A standard entomological aspirator was used to collect a representative sample of ant species from the chopsticks at that site (Figure 6). Ants in the vicinity of the sticks were also collected, such as those in nearby bushes, leaf litter, under rocks, or on concrete near the bait stick. Snap cap plastic 9 dram vials with ants and labels were stored in a cooler for transport back to the lab.

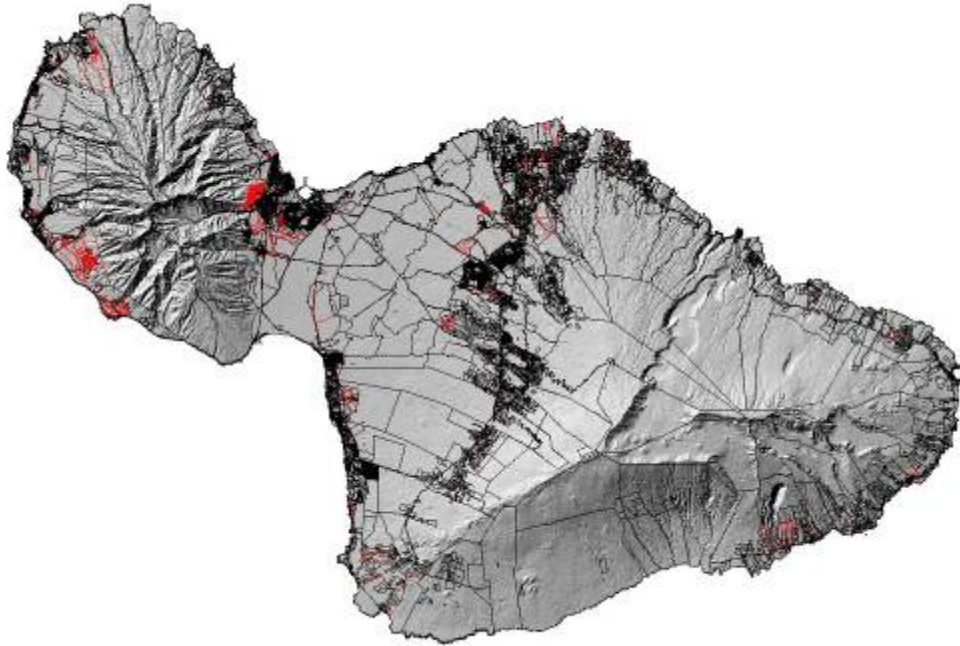


Figure 3. Subdivisions on Maui in 2000 (black lines) and new subdivisions by 2006 (red lines).

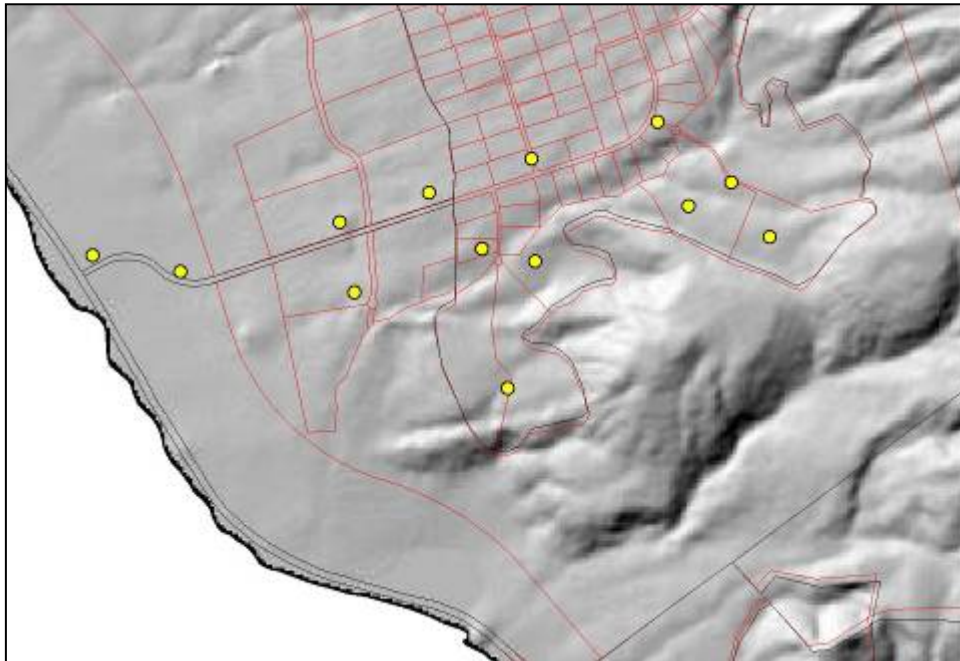


Figure 4. A typical new subdivision (red lines), and testing sites (yellow dots).



Figure 5. Ants on a peanut butter baited chopstick.



Figure 6. Collection site in newly landscaped area in new development in Kahului.

Back at the lab, ants were frozen at least overnight, then sorted and identified using a 30x power microscope (the microscope used during this survey was sufficient for identifying most ants, but could not discern very small features), placed in smaller 5 dram plastic snap cap vials with a label, and finally put back in the freezer for storage.

Data were entered (date, site number, site description, species found, GPS coordinates) into an excel spreadsheet and maps for each species were created in ArcView. At the end of the project, ants were deposited with P. Krushelnycky for archival and further analysis.

Several websites were used to help with determinations, such as AntWeb (2007) and a link tool developed by W. Haines (CTAHR 2007), as well as the current Hawaii ant key created by N. Reimer. P. Krushelnycky helped calibrate the identifications made during this study by confirming a sample of the specimens early on.

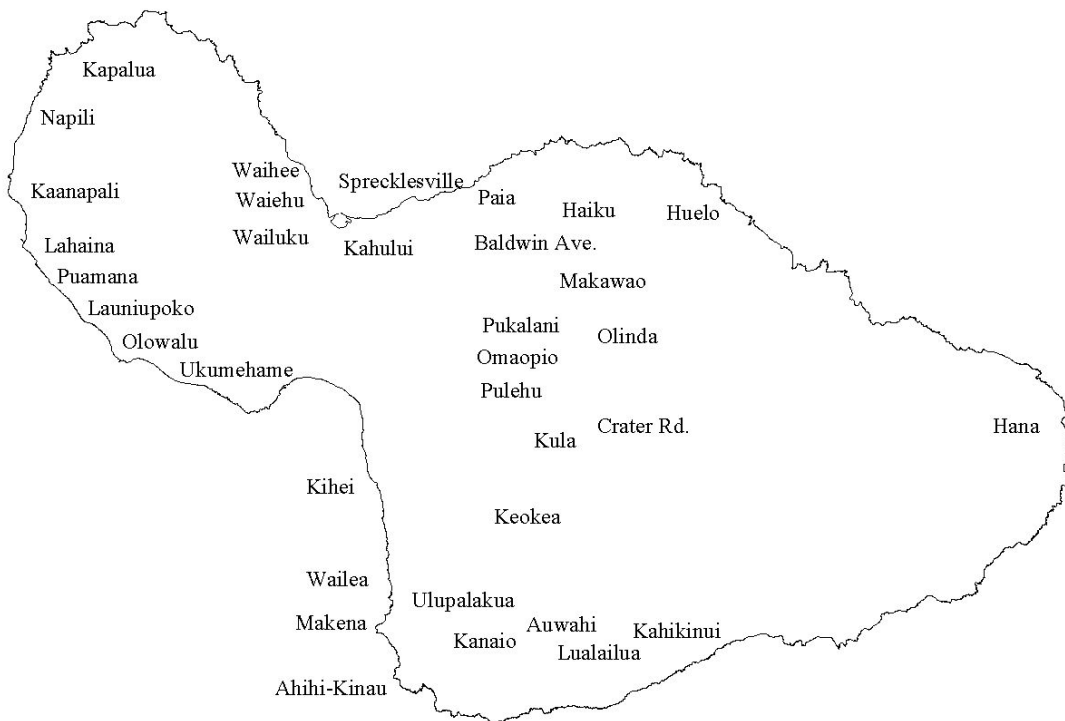


Figure 7. Map of locations used in the text.