REPORT

to

Hawai‘i Department Lands and Natural Resources

from

UNIVERSITY OF HAWAI‘I
Office of Research Services
2440 Campus Road, Box 368
Honolulu, HI 96822

Pacific Cooperative Studies Unit
University of Hawai‘i at Mānoa

Early detection and response to Little Fire Ants on O‘ahu
June 2022 to June 2023

SUMMARY

The early detection and prevention of Little Fire Ants on O‘ahu is a project of the Hawai‘i Ant Lab, Pacific Cooperative Studies Unit (PCSU), University of Hawai’i (UH) with funds provided by the Department of Lands and Natural Resources, Division of Forestry and Wildlife (PCSU acc 4506580 DLNR C22095)

Preventing the establishment of invasive species and detecting incipient populations before they have an opportunity to spread are the most cost-effective approaches to invasive species management. This is especially so for invasive ant species such as the Little Fire Ant (*Wasmannia auropunctata*) which are difficult to detect in infested cargo and spread rapidly once established. The Hawai‘i Department of Agriculture, Plant Quarantine (PQ) branch, implements an inter-island biosecurity program which regulates the movement of plants, foliage, and propagative material between the islands of Hawai‘i. This PQ program prevents the majority of invasive species, including invasive ants, from spreading between islands. It is likely however, that a small number of infested shipments and movement of materials not regulated by HDOA escape detection by the PQ biosecurity program. The neighboring island of Hawaii is heavily infested with Little Fire Ants and there is a substantial amount of trade between Hawaii and Oahu.

The Little Fire Ant (*Wasmannia auropunctata*) was first reported on Oahu in 2014 when it was detected on shipments of hapuu (tree fern) logs originating in Hawaii. Shortly after this detection, Little Fire Ants were also found in nursery in Waimanalo and a group of houses in Mililani Mauka. This project began in late 2014 with funding from DLNR Division of Forestry and Wildlife, and has continued to the present with funds from various sources. This report details the activities undertaken between June 2022 and June 2023.

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Program highlights

At the commencement of the reporting period a total of 31 existing infested sites had been recorded (Fig 1): Twenty sites were under treatment, 6 additional sites where the treatment phase had been completed and sites undergoing periodic post-treatment monitoring and 5 sites putatively eradicated. During the progress of this contract, an additional 12 infested sites were detected through surveillance activities and resident reports. As at 30 June 2023, there are 43 known infestations of Little Fire Ants on Oʻahu: 30 of these are under treatment, 8 sites are at the post-treatment monitoring phase and 5 are putatively eradicated. All sites are actively managed to eradicate LFA where this is feasible. The project employs a trained survey team of three people. Staff are supervised from the HAL Hilo office.

During 2023, HAL Oahu vacated the space occupied at 1428 King St due to a shortage of suitable accommodations. The lab is now located at the CTAHR Waimanalo Research Farm. Staff members continued to receive and respond to public inquiries and implement the survey and treatment programs. HAL has initiated a gradual pivot away from total site management to resident-driven treatment. New infestations are assessed to determine if they can be managed by affected residents and when appropriate, residents are provided with training, equipment and baits. Sites are still monitored and surveyed by HAL to determine eradication progress and status. Sites which were not able to be treated by residents continue to be treated by HAL staff.

New detections

Twelve new infested sites were recorded during this contract, bringing known infested sites on Oahu to 43 (Figure 1). Maps and additional details are available if required.

#32 Lanikai 3, Lanikai - August, 2022
A resident was being stung while picking fruit from their orange tree. Surveys revealed a population covering 7 properties and half an acre. Additional roadside surveys revealed a handful of properties half a block away that have ants at least along the roadside. These properties need to be surveyed and will be incorporated into this site.

#33 Kaneohe 4, Kaneohe - August 2022
Originally reported by a property manager who was trimming a mango tree and being stung by ants. Original site was combined with another report from a nearby townhome complex- ants had moved inside and were stinging the resident inside their home. Area is fairly extensive and needs access permissions to treat entire area.

#34 Kaneohe 5, Kaneohe - September 2022
Mail in sample submitted to HAL revealed a population on a steep, cliffy property along Kaneohe Bay Drive. The area will need additional survey help to delimit.

#35 Kaneohe 6, Kaneohe - October, 2022
Mail in sample from the “Stop the Ant Month” PR effort. Resident saw a report about LFA on the news, recognized the ants as the ones stinging him inside of his home and sent away for a test kit. Population is small and isolated- consisting of 11 small properties. Residents have begun treating.

#36 Kaneohe 7, Kaneohe - October, 2022 Resident had been controlling the ant on their own before learning about LFA from the newspaper. Sample was confirmed to be LFA, initial surveys have been conducted and the area is being treated.

#37 Kaneohe 8, Kaneohe - October, 2022
Site was originally reported when a resident heard from a friend about the ant and recognized them in her backyard. Population extends across the road and onto forested land. Needs access permissions to delimit completely.

#38 Hau'ula 2, Hau’ula - November, 2022
Sample received from an OISC school outreach presentation. Resident is being assisted with treatment. Area will need further outreach via mailers and phone calls in order to delimit the population.

#39 Kaneohe 9, Kaneohe - November, 2022
Resident reported LFA after a friend alerted him to the issue and he collected the stinging ants on his property. Resident is extremely cooperative and wants to begin treatment. Most boundaries of the infestation have been identified. One more property needs to be surveyed in order to begin treating the site on a whole.

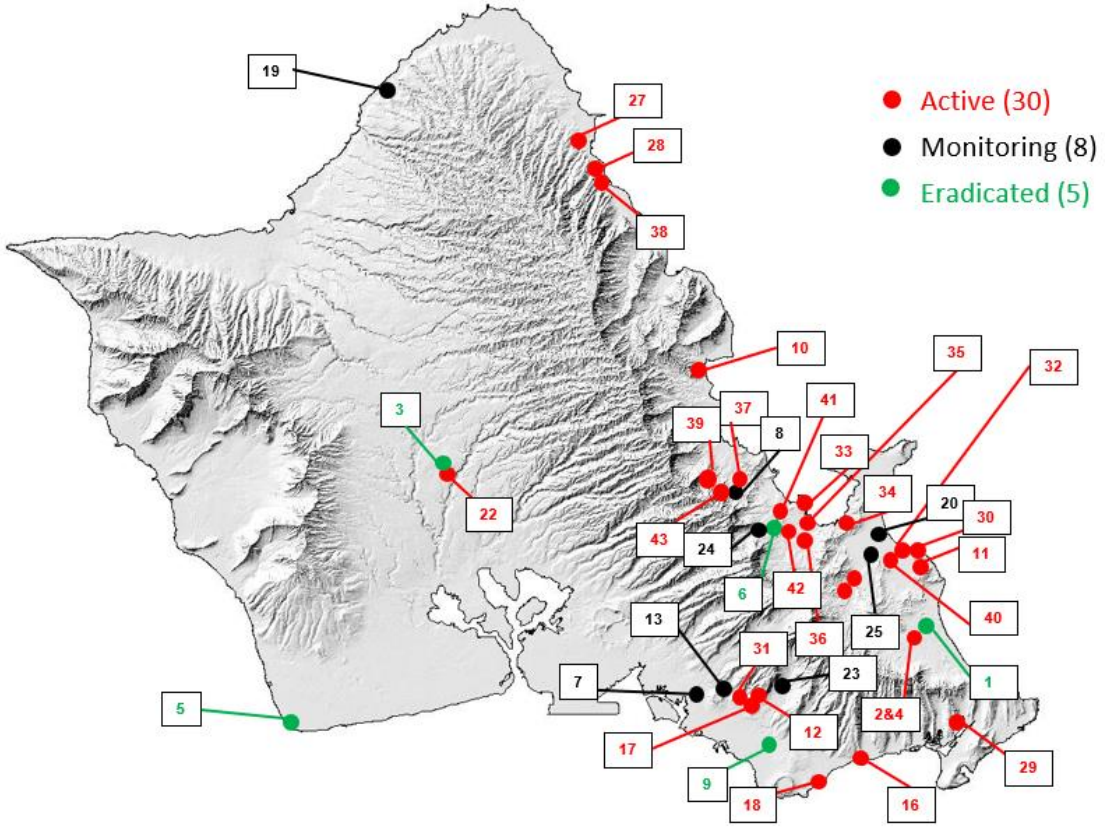
#40 Lanikai 4; Lanikai - December, 2022
A resident at a townhome complex in Lanikai reported stinging ants inside her home to the PEST hotline. Surveys revealed a modest population on the Townhome’s property. In coordination with the groundskeeper, the site is now in treatment by HAL.

#41 Kāneʻohe 10
Kāneʻohe - February, 2023
O’ahu Invasive Species Committee received a report from a nursery manager familiar with LFA and its impacts.. Surveys of the nursery found a very small population on the nursery and surrounding lawn. Treatment is in the hands of the nursery manager with guidance from HAL.

#42 Kāneʻohe 11
Kāneʻohe - June, 2023
Report of ants at a resident’s property revealed a significant population stretching along a drainage canal in Kāneʻohe. Further delimiting surveys are needed to determine the extent of the population. Plants from the resident were being sold to a local nursery. The resident was informed of the best practices to contain the ants and encouraged to stop movement of plants and material off site.

#43 ʻĀhuimanu 4
A resident reported ants stinging them while they trimmed back overgrowth on their property. Surveys revealed ants on more than 8 properties. The infestation extends into an undeveloped property and is a high risk site for introduction into the forest. This infestation is in close proximity to several other populations in ʻĀhuimanu. A concerted effort from the Neighborhood watch committee and concerned residents has proven extremely effective at outlining this site. Additional partnership with this group is scheduled for August with a plan to conduct resident-led treatments and surveys of infested properties.

Figure 1. location of infested sites and eradication status for *W. auropunctata* on Oahu, June 2023



DELIVERABLES AND MEASURES OF EFFECTIVENESS

Survey 150 high risk sites for Little Fire Ants

During the term of this contract, 122 site surveys were conducted, representing 81% of the estimated target of 150. (Table 1). The demands of the treatment program has impacted survey targets.

Identify ant samples from surveys (10,000)

A total of 10,090 survey vials were deployed in surveys. These vials were returned to the laboratory and the contents identified. Non-target species were also identified and those results are displayed in Table 2. Presence and absence data were summarized according to the general location where they were detected. A total of 21 ant species were recorded. Of the target species, *W. auropunctata* was recorded in east, north, south and central Oahu. Specimens are retained and pinned for addition to the HAL and HDOA insect collection.

Implement treatment programs at infested sites and eradicate LFA where this is feasible.

A total of 153 treatments were applied in total: 121 by HAL staff and 32 by residents under the supervision of HAL staff. The total number of infested sites increased over the term of this contract (from 31 to 43) (Figure 1). Of these, 30 sites are currently active or under treatment (putatively active), 8 putatively ant-free sites being monitored by regular surveys and 5 sites where LFA has not been recorded for 3 years or longer. Sites range in size from less

than 1 acre to over 20 acres and are designated by site numbers rather than location in order to due to community privacy concerns. Site details are available on request.

Community Support

A total of 293 enquiries were received from members of the public, mostly from residents; 200 telephone calls, 89 emails and 4 walk-ins. Public interaction also resulted in submission and identification of 224 ant samples. The overwhelming majority of these were received during, and in the month following "Stop the Ant Month" (STA) in Oct 2022.

Record results in a database and map survey locations

All data are recorded in Excel spreadsheets, and stored in the Podio database, including the geolocations of each vial. A map showing the location and number of infested sites is shown in Figure 1.

Table 1. Summary of activities on O'ahu during contract term (June 2022 to June 2023).

	Q3-4 '22	Q1-2 '23	total
# surveys	64	58	122
# survey vials	4035	6055	10090
# public samples	197	27	224
total sites	40	43	
# new sites this period	9	3	12
HAL treatments	63	58	121
Community treatments	12	20	32
total treatments	**75**	**78**	**153**
public enquiries			
phone	104	96	200
email	55	34	89
walk-in	4	0	4
total	**163**	**130**	**293**

Discussion and recommendations

The current LFA strategy on Oahu commenced in January 2015 with an objective of aggressive containment through survey of high-risk sites and spot eradication of any infestations. Staff were accommodated at HDOA, 1428 King st Honolulu and had access to a vehicle when this was available. In recent times, both accommodation and vehicular access were discontinued leaving staff to work from home and use personal vehicles to implement the work program. In early 2023, this situation improved when suitable office space was secured at the CTAHR Waimanalo Research Farm. More recently, a vehicle is also available for general use by HAL staff.

Twelve new infested sites were detected during the contract period, bringing the total number of infested sites from 31 to 43. Of these, 8 have completed the treatment phase and are now being monitored, and 5 are now putatively eradicated, leaving a total of 30 actively infested sites.

The rapid increase of new infested sites also heralds important changes to the macro-environment of LFA spread and consequent impacts to Oahu. Some of the additional workload has been addressed by encouraging residents in newly discovered infestations to conduct their own treatment program with technical assistance (training and overall guidance) as well as provision of baits, applicators and other equipment necessary for this work. Not all sites are suitable for resident-initiated control programs, so each site was assessed for suitability before developing a management plan. Overall, this has resulted in a 20% reduction of the total possible area where HAL-applied treatment is needed.

The number and total area of infested locations throughout Oahu will increase in the years to come, much like it has on the Big Island over the past 15 years. Effective management of this situation will require greater resources (funds and staff) in order to reduce the rate of spread and associated impacts. Additionally, as the extent of this problem increases, it may no longer be possible to continue the current aggressive containment strategy and there will be a need to increase extension activities to assist residents with self-management. Further, outreach efforts will need to increase at a level commensurate with the risk faced by residents and businesses on Oahu.

Table 2. Ant species detected during surveys on Oahu June 2022 to June 2023

species	central	north	east	south	west
Anoplolepis gracilipes					
Brachymyrmex sp. nr obscurior			x	x	
Camponotus variegatus			x		
Cardiocondyla emeryi					
Cardiocondyla kagutsuchi/venustula					
Cardiocondyla minutior					
Cardiocondyla obscurior					
Cardiocondyla wroughtonii					
Hypoponera opaciceps					
Hypoponera opacior					
Hypoponera punctatissima					
Hypoponera sp nr. ragusai					
*Hypoponera sp. HI01**					
Hypoponera zwaluwenburgi					
Lepisiota sp. HI01			x		
Leptogenys falcigera					
Linepithema humile					
Monomorium dichroum				x	
Monomorium floricola				x	x
Monomorium indicum					
Monomorium liliuokalanii					
Monomorium orientale					
Monomorium pharaonis					
Monomorium sahlbergi				x	
Nylanderia bourbonica					
Nylanderia vaga					
Ochetellus glaber	x	x	x	x	
Odontomachus nr ruginodes					
Paratrechina longicornis			x	x	
Pheidole fervens					
Pheidole megacephala	x	x	x	x	x
Pheidole navigans			x		
Plagiolepis alluaudi				x	
Platythyrea punctata					
Ponera swezeyi					
Pseudomyrmex gracilis					
Solenopsis abdita					
Solenopsis geminata	x	x	x	x	x
Solenopsis globularia				x	

Solenopsis papuana					
Stigmatomma zwaluwenburgi					
Strumigenys emmae					
Strumigenys godeffroyi					
Strumigenys lewisi					
Strumigenys membranifera					
Strumigenys rogeri					
Syllophopsis sechellensis					
Tapinoma melanocephalum complex			**x**	**x**	
Tapinoma sessile					
Technomyrmex albipes				**x**	
Technomyrmex difficilis					
Technomyrmex pallipes					
Technomyrmex vitiensis					
Tetramorium bicarinatum			**x**		
Tetramorium caldarium	**x**	**x**	**x**	**x**	**x**
Tetramorium insolens					
Tetramorium lanuginosum				**x**	
Tetramorium simillimum			**x**		
Tetramorium tonganum					
Trichomyrmex destructor				**x**	
Target species					
Lepisiota frauenfeldi					
Myrmica rubra					
Nylanderia fulva					
Solenopsis invicta					
Wasmannia auropunctata	**x**	**x**	**x**	**x**	