

Kure Atoll Big Headed Ant (*Pheidole megacephala*) Eradication Program Summary

Big-headed ant (BHA) eradication efforts began during the summer of 2014. Since then a notable ecosystem response has been observed. Native plants appear to be healthier and more resilient. Terrestrial invertebrates have become more abundant and different species are being documented. Semi-annual monitoring is in place to ensure Big-headed ants are eradicated and infestations are addressed when discovered.

For the initial treatment two application of Amdro (active ingredient Hydramethylnon) were broadcast at the rate of 1-2 pounds per acre from June through September 2014. The entire island (200 acres) was treated during each application.

The first BHA monitoring survey was conducted in November 2014. Approximately 300 person hours were required to complete the survey. A combination of honey, peanut butter and spam was placed on an index card within a Ziploc bag at 859 locations across the island at 30-meter intervals. Of the 859 bags that were deployed for 2-3 hours, 174 bags were collected containing ants. All 174 bags containing ant samples were analyzed under a dissecting scope. One bag was confirmed to contain Big-headed ants, 7 bags contained unknown species and the remainder contained *Cardiocondyla sp.* The site confirmed for BHA was at H53 (Sector 5 West).

The second survey was conducted in May 2015 and again just one station contained BHAs. The area was treated and subsequently monitored. On 9 September - Five monitoring stations were deployed at and around site E49 in SW Dunes where Big-headed ants were detected in May. Stations were retrieved after 2 hours. No Big-headed ants were present.

The third BHA monitoring survey was conducted from November 30 to December 4, 2015. The entire grid was skewed 15m to the North. Of the 944 bags deployed, 644 contained ants and were analyzed with a dissecting scope to determine species. A total of 21 bags contained BHA, 641 bags contained *Cardiocondyla sp.*, and 16 bags contained unknown species. The following points were confirmed for BHA:

Confirmed BHA Points:

L51 Sector 5 West
 M46 Southwest Dunes
 M51 Sector 5 West
 M52 Sector 5 West
 N46 Back 4
 O46 Back 4
 Q43 Southwest Dunes
 W37 Southwest Dunes
 X36 Southwest Dunes
 X37 Southwest Dunes
 Y36 Southwest Dunes
 Y37 Kukaulike
 Z36 Kukaulike
 AA41 RA 12
 AB41 RA 12



Wedge-tailed shearwater chick with BHAs.

AH34 Huliau
 AO41 Sector 4 East
 AO42 Sector 4 East
 AP41 Sector 4 East
 AP42 Sector 4 East
 AQ41 Sector 4 East

- December 4: Deployed Amdro stations at all 21 points with 4 additional stations in a 15m circumference around the point.
- January 6: Monitored 21 points with spam bags for BHA. Found 2 points still containing BHA; AO42 and N46.

The fourth BHA monitoring survey October 2016 (207 person hours)

- The Big-headed ant survey was conducted Oct 17th through the 22nd.
- The 30m grid was skewed .5° West.
- The monitoring bags consisted of spam, honey and peanut butter. They were deployed in the afternoon and picked up the following morning.
 - Spam bags were collected on the morning of the 18th during heavy rain that lasted 20 minutes. Despite rain, *Cardiocondyla* sp. were present in some bags.
 - There was heavy rain lasting 5 min early morning on the 20th that didn't appear to affect the presence of ants.
- The following points contained BHA
 - P44, Q44, R44, P45, Q45, R45, S45, Q46, R46, M47, P48, Q48, F49, P49, Q49, R49
 - This area encompasses the south portion of the island where large HELFOE are present from the Back 4, across the Runway and into Sector 5 East. In the Winter 2015 survey, BHA were also found in this area as well as further north in the Southwest Dunes, RA12 and Kukaulike where large HELFOE are not present. It appears that the colonies in these locations were eliminated in 2015 but the colonies treated near and around large HELFOE further south (Back 4) were not.
 - AS13 (RA10) still needs to be confirmed for BHA.
 - On Oct 28 Amdro stations were set at each point and in a 5 side of a dice pattern, 15 m from the BHA point. In total 52 stations were deployed.
 - Care was taken to screen stations closest to the beach to avoid ghost crab predation. Some stations were covered with sticks and debris to deter crabs and prevent moisture from spoiling the Amdro.
 - During Amdro station deployment, BHA were observed everywhere on the ground in between the points in Sector 5 East and small amounts of Amdro was sprinkled on them between stations. BHA were observed farming aphids on *Elusine indica*, none were observed on naupaka or WTSH. On Oct 31

Amdro stations in Sector 5 East were checked during spray treatment, both live and dead BHA were observed inside.

Summer 2016 – no survey

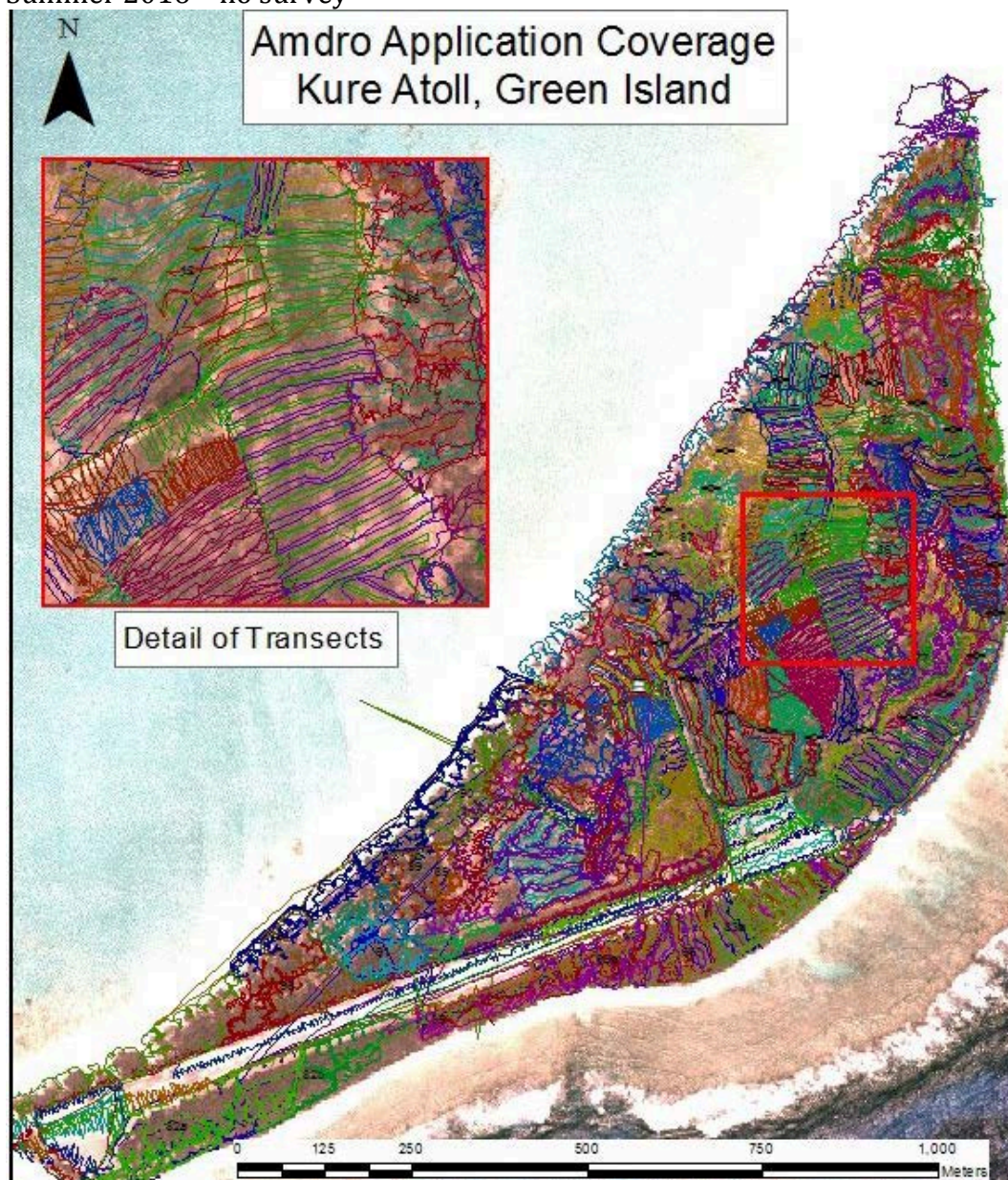


Figure1: Teams of 2-4 people lined up and walked abreast of each other in a straight line across a Restoration Areas (RAs). The two end people used flags to mark the edge of the treatment area. The flagging was followed when the team returned in the other direction to insure complete coverage. The teams stopped and calculated

how many pounds of Amdro was broadcast per acre every 1/8 acre and adjusted accordingly.

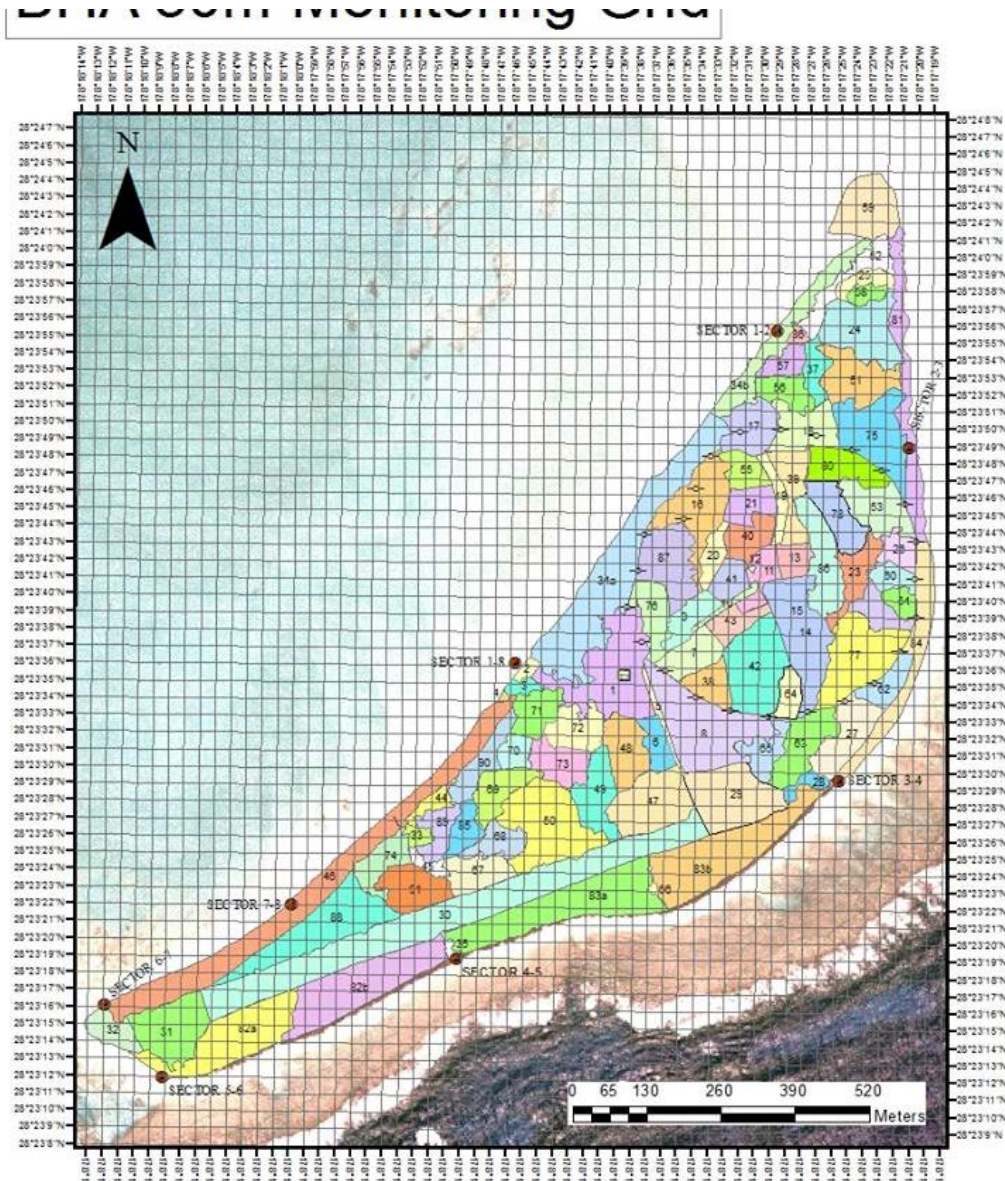


figure 2: BHA monitoring 30-meter grid.

On January 31, 2017, the Kure team met with Cynthia King and Sheldon Plentovich to strategize about the method to eradicate BHAs on Kure. The experts advised broadcasting Amdro at a rate of 2 pounds per acre when BHAs are detected and increased monitoring in hotspots.