DETECTING THE VEILED CHAMELEON (CHAMAELEO CALYPTRATUS) ON MAUI: ENHANCING CONTROL OF AN INJURIOUS SPECIES

FINAL REPORT
PRESENTED TO HAWAI‘I INVASIVE SPECIES COUNCIL

MAUI INVASIVE SPECIES COMMITTEE
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INTRODUCTION

The veiled chameleon (*Chamaeleo calyptratus*) is native to Yemen and Saudi Arabia, but in Hawai‘i it is an injurious alien reptile, capable of causing significant harm to fragile environments. The veiled chameleon is a member of the Chamaeleonidae family (Figure 1), with most genera highly adapted to arboreal life. The veiled chameleon belongs to the same genus as the Jackson’s chameleon (*Chamaeleo jacksonii*), which had become well established on Maui by the 1990s.

![Phylogeny of the Veiled Chameleon](image)

State officials consider the veiled chameleon to pose a greater risk to native plants and animals than the Jackson’s chameleon. The veiled chameleon is larger (up to two feet long), is known to tolerate a wider range of environmental conditions than the Jackson’s, and is an omnivorous feeder. Suitable habitat for the Jackson’s chameleon on Maui appears to be moisture limited with desiccation occurring during times of drought. In contrast, the veiled chameleon’s native range includes dry plateaus and it can consume vegetation to replace moisture. The Jackson’s chameleon is not known to eat vegetation. The veiled chameleon has been known to consume small birds, comparable in size to the native amakihi (*Hemignathus virens*) or apapane (*Himatione sanguinea*). The veiled chameleon is a prolific breeder, maturing in as little as four months, and laying an average of 30-40 eggs per clutch (range 12-85), several times per year. The veiled chameleon’s cryptic coloration and habits make it hard for the public to detect or distinguish it from the Jackson’s chameleon.
History on Maui
The presence of veiled chameleons on Maui was first discovered in 2002 when a dead specimen was discovered in a coffee field in rural West Maui. As a result of local media coverage about the discovery, a resident in upcountry Maui (Makawao) turned in a male and female chameleon to the Hawai‘i Department of Land and Natural Resources (DLNR). Initial searches of suitable habitat concentrated in the area near the Makawao residence. In December 2002, officials from state and federal agencies and from the Maui Invasive Species Committee (MISC) began searching a core area of approximately three acres to capture live animals (Figure 2).

Captured animals included both males and females, as well as juveniles, immature individuals, and adults, indicating the presence of an actively breeding population. Captures of live veiled chameleons were clustered around a gulch, although individuals were found up to ½ mile distance from the core area. Additional searches were conducted in the West Maui area where the first animal was recovered, but no additional chameleons were ever sighted. The discovery of a breeding population of veiled chameleons in close proximity to important conservation areas on Maui underscored the need for more effective action (Figure 3).
The Makawao population is the only known breeding population of veiled chameleons in Hawai‘i, although there have been reports of veiled chameleons on O‘ahu. The potential for establishment of breeding populations on other islands further highlighted the need for effective control strategies.

Project Objectives and Highlights
The intent of this research project was to obtain information about the breeding population to improve detection of veiled chameleons and to test different detection and capture methods to enhance effectiveness of control efforts.

Objectives:
- Research natural history information to enhance effectiveness of control efforts.
- Conduct field observations to learn about movement patterns, habitat use, dispersal distances, and reproductive cycles.
- Develop alternative methods for detecting and capturing individual chameleons

Highlights:
- Eight radio-tagged chameleons
- 58 days of observation; 131 hours of observation
- Highest perch above ground: 50 feet
- Furthest distance traveled from release point: 138 feet
- Diet included arthropods and vegetation
- Aggressive interactions between adult males and Jackson’s chameleons
- Chameleons difficult to locate, even when approximate location was known
METHODS

Literature Review: Information about the life history strategy of the veiled chameleon was obtained by searching scientific literature databases and online exchanges associated with the reptile trade. The Maui Invasive Species Committee hosted a visit by herpetologist and researcher, Kenneth Barnett, who has studied behavioral aspects of the veiled chameleon.

Radio Tracking: To better document movements of the cryptic veiled chameleon, animals were fitted with radio tags. The Maui veiled chameleon population is located in a residential area, which required permission from private landowners to capture, release, and observe the chameleons on their properties. Most of the landowners in the area were already familiar with efforts to control the chameleons and were supportive and cooperative.

Searches in the Makawao area to find animals for radio tagging occurred after dark using flashlights, when the animals’ bright colors are most reflective (Figure 4). Search areas were identified in advance to facilitate obtaining access from the landowners. Handouts and flyers were developed to remind residents about planned searches. Teams of two to three persons moved through a property, thoroughly searching every plant.

Figure 4. Veiled Chameleon on Night-time Perch
All captured animals were sexed using the presence/absence of a tarsal spur (presence = male). Each animal’s body length was measured and adult females were checked for presence of eggs. Captured animals selected for radio tracking were fitted with Sirtrack single-stage transmitters. Four transmitters were acquired; two were smaller (less than 2 grams) for use with smaller animals, and two were larger (up to 6 grams). Each transmitter was equipped with a whip antennae. Maximum transmitter duration was estimated to be 1-2 months for the smaller transmitters and up to 6 months for the larger transmitters. Transmitters were attached to the animal either with glue or with a harness (zip-tie) system. A Communications Specialists R-1000 telemetry receiver, tuned to 148-152 MHz, was used to track signals from active transmitters. An RA-150 3-element folded Yagi antenna was attached to the receiver. All capture, handling, attachment and removal of transmitters was done in accordance with rules of the Hawai‘i Department of Land and Natural Resources or Hawai‘i Department of Agriculture (HDOA), and in accordance with protocols of the University of Hawai‘i’s Institutional Animal Care and Use Committee (IACUC). IACUC approval was obtained before commencement of any research involving direct handling of the chameleons. All study animals were turned over to HDOA at the end of field observations.

Observations: All field observations were made on radio-tagged individuals to enhance the feasibility of detection. The following information was recorded during observation periods: location, time at discrete location, habitat used, plant species, height and location on plant, distances traveled, interactions with other chameleons, feeding, incidental behavior, and weather.

RESULTS

Literature Review: Current literature and online herpetological sites provided information about the species’ habitat preferences, diet, and activity patterns.

Weather: Weather conditions were variable during the project period. Temperatures ranged from 60°F to 89°F. Winds varied from slight breezes to moderately windy. Cloud cover varied from none to overcast and precipitation was either none or passing showers. It was not possible to attribute behavioral changes to weather conditions.

Radio Tracking: A total of 18 animals were captured from April 2006 to May 2007 (Table 1). Eight of these animals were fitted with radio transmitters for tracking and observation (Figure 5). Five males (four adults, one subadult) and three females (one adult, one subadult, and one juvenile) had transmitters attached to them. One animal was moved from its original location for release because of property access issues. The other animals were fitted with transmitters and released quickly at the point of capture. Capture, tracking and observations occurred from April 2006 through May 2007.
Selection of animals for radio-tagging was not random. The substantial reduction in the veiled chameleon population limited options to randomize the study. Study animals were selected based on sex and age of the animal in an effort to examine variations in movement patterns by gender and age. Most of the radio-tagged animals were captured and released outside the original “core” population because that is where most animals were found during the study (Figure 6).
Figure 6. Locations of Veiled Chameleon Captures

Previous capture efforts had shown that outlier chameleons were more likely to be large males than females and this tendency held true for the research animals as well (Figure 7).
Field Observations
The number of days during which observations was made on radio-tagged animals ranged from three days for one of the adult males to 13 days for a different adult male. In total, approximately 132 hours of observation were conducted on the eight radio-tagged animals over 58 different days (Table 2). Despite the presence of radio tags and knowing the general location of an animal at the start of an observation session, it proved difficult to fully monitor all movements of the animals. Observations focused on recording changes in perch height, any feeding activities, and interactions with other chameleons. An effort was made to observe chameleons during different times of the day to explore temporal variation in movement patterns. Observations of Animals #1, 3, and 4 suggested that the chameleons did not move around very much during the early part of day, possibly because they were not warm enough. Subsequent observations of other animals focused on the latter three time periods. The first four animals were the focus of most of the observation effort.
Table 2. Observations (Minutes) on Radio-tagged Chameleons by Time of Day

<table>
<thead>
<tr>
<th>Animal</th>
<th>6:01-10:00</th>
<th>10:01-14:00</th>
<th>14:01-18:00</th>
<th>18:01-22:00</th>
<th>Totals</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>307</td>
<td>1427</td>
<td>812</td>
<td>75</td>
<td>2621</td>
<td>43.7</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>627</td>
<td>634</td>
<td>0</td>
<td>1261</td>
<td>21.0</td>
</tr>
<tr>
<td>3</td>
<td>240</td>
<td>1040</td>
<td>180</td>
<td>0</td>
<td>1460</td>
<td>24.3</td>
</tr>
<tr>
<td>4</td>
<td>240</td>
<td>1000</td>
<td>180</td>
<td>0</td>
<td>1420</td>
<td>23.7</td>
</tr>
<tr>
<td>5</td>
<td>42</td>
<td>105</td>
<td>259</td>
<td>45</td>
<td>451</td>
<td>7.5</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>125</td>
<td>69</td>
<td>60</td>
<td>254</td>
<td>4.2</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>21</td>
<td>113</td>
<td>57</td>
<td>191</td>
<td>3.2</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>40</td>
<td>122</td>
<td>80</td>
<td>242</td>
<td>4.0</td>
</tr>
<tr>
<td>Total</td>
<td>829</td>
<td>4385</td>
<td>2369</td>
<td>317</td>
<td>7900</td>
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</tr>
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Several animals proved very difficult to find in the vegetation, even with a good signal indicating the tree or area of shrubbery where the animal was located. For example, there were very few direct observations of animal #3 once it was released at its original capture site, despite nearly 20 person hours spent searching for the animal at its known location. This animal also had the highest perch site of any chameleon, at 50 feet (Table 3). Animal #8, a subadult female, was similarly difficult to observe. Observed perch heights for radio-tagged animals ranged from a low of zero feet (ground) to a high of 50 feet. One other animal was observed at 45 feet. The highest observed perch for the remaining animals ranged from 5-25 feet.

The farthest distance that any one animal, a subadult female, was observed to travel from the initial post-tagging release was 138 feet and included crossing a street. The maximum amount of time for this dispersal was over a three-day period. The next greatest distance from release point was 120 feet and involved a subadult male, which was initially recovered from the same tree as the subadult female. The male made its 120-foot trek over the same time period as the female and also crossed the street, but ended its journey at a different property. There were no apparent trends in perch height or dispersal distances related to age or sex of the study animals, perhaps in part due to small sample sizes (Tables 4 & 5).
<table>
<thead>
<tr>
<th>Animal</th>
<th>Sex</th>
<th>Age</th>
<th># days Observed</th>
<th>Lowest Perch (ft. from Ground)</th>
<th>Highest Perch (ft. from Ground)</th>
<th>Avg. High Perch</th>
<th># Perch Obs.</th>
<th>Max Distance (ft) from Release</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>Adult</td>
<td>13</td>
<td>0</td>
<td>25</td>
<td>14.1</td>
<td>11</td>
<td>79</td>
</tr>
<tr>
<td>2</td>
<td>Male</td>
<td>Adult</td>
<td>7</td>
<td>5</td>
<td>22</td>
<td>19.9</td>
<td>7</td>
<td>38</td>
</tr>
<tr>
<td>3</td>
<td>Female</td>
<td>Adult</td>
<td>5</td>
<td>7</td>
<td>50</td>
<td>32.5</td>
<td>2</td>
<td>46</td>
</tr>
<tr>
<td>4</td>
<td>Male</td>
<td>Adult</td>
<td>5</td>
<td>3</td>
<td>12</td>
<td>10.5</td>
<td>4</td>
<td>105</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>Juvenile</td>
<td>4</td>
<td>2</td>
<td>12</td>
<td>6.2</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>Male</td>
<td>Adult</td>
<td>3</td>
<td>5</td>
<td>45</td>
<td>23.7</td>
<td>3</td>
<td>69</td>
</tr>
<tr>
<td>7</td>
<td>Male</td>
<td>Subadult</td>
<td>10</td>
<td>0</td>
<td>5</td>
<td>3.4</td>
<td>5</td>
<td>120</td>
</tr>
<tr>
<td>8</td>
<td>Female</td>
<td>Subadult</td>
<td>11</td>
<td>2</td>
<td>20</td>
<td>7.5</td>
<td>4</td>
<td>138</td>
</tr>
</tbody>
</table>

Table 3. Days Observed, Perch Heights, & Dispersal

<table>
<thead>
<tr>
<th>Sex</th>
<th>Lowest Perch (ft. from Ground)</th>
<th>Highest Perch (ft. from Ground)</th>
<th>Avg. High Perch</th>
<th>Range High Perch</th>
<th>Max Distance (ft.) from Release</th>
<th>Avg. Max Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>0</td>
<td>45</td>
<td>21.8</td>
<td>5-45</td>
<td>38-120</td>
<td>82.2</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>50</td>
<td>27.3</td>
<td>12-50</td>
<td>35-138</td>
<td>73</td>
</tr>
</tbody>
</table>

Table 4. Perch Heights & Dispersal by Sex

<table>
<thead>
<tr>
<th>Age</th>
<th># of Animals</th>
<th>Lowest Perch (ft. from Ground)</th>
<th>Highest Perch (ft. from Ground)</th>
<th>Max Distance (ft.) from Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>5</td>
<td>0</td>
<td>50</td>
<td>105</td>
</tr>
<tr>
<td>Subadult</td>
<td>2</td>
<td>0</td>
<td>20</td>
<td>138</td>
</tr>
<tr>
<td>Juvenile</td>
<td>1</td>
<td>2</td>
<td>12</td>
<td>35</td>
</tr>
</tbody>
</table>

Table 5. Perch Heights & Dispersal by Age

**Diet:** During the course of the project, veiled chameleons were observed to consume the following prey items:

- Asian spiny-backed spider (*Gasteracantha mammosa*)
- Spider egg sack
- Fly (*Diptera* spp.)
- Pepper berry drupe (*Schinus molle*)
- Royal poinciana leaf (*Delonix regia*)
- Jacaranda flower (*Jacaranda mimosifolia*)
Most observations of diet items were single occurrences. One individual was observed to consume several spiders and two different chameleons were observed eating flies. One chameleon appeared oblivious to the presence of bees within apparently easy striking distance. The challenges associated with obtaining a clear view of an individual chameleon during feeding activities made it difficult to gather more definitive data on diet preferences of the veiled chameleon.

Habitat Use: Radio-tagged chameleons were observed in a wide variety of plant families (Figure 8). The most commonly observed species used was Christmasberry (*Schinus terebinthifolius*), a member of the Anacardiaceae family, which accounted for 19% of all plant species used by the chameleons. The chameleons also used *S. molle*. These observations were consistent with habitat use observed during chameleon captures from 2002-2007 (Figure 9). *S. terebinthifolius* was a common tree / shrub in the Makawao infestation and likely has the largest biomass of any single species in the area. Thus, it was not possible to determine whether the chameleons were exhibiting a preference for *Schinus* or whether the prevalence of this species simply reflected relative abundance in the overall habitat. It also is possible that searchers might find it easier to find chameleons in *Schinus* than other plants; however, the difficulty searchers experienced in locating some of the radio-tagged animals known to be in *Schinus* indicated that it wasn’t exceptionally easy to find chameleons in this plant species.

![Plant Families Used by Radio-tagged Chameleons](image)

Figure 8. Plant Families Used by Radio-tagged Veiled Chameleons
Figure 9. Plant Families Used by Captured Veiled Chameleons: 2002-2007 (includes research animals)

Behavioral Observations: Some of the most interesting observations involved two different adult males interacting with Jackson’s chameleons. The first interaction was captured on video using a cell phone camera and the footage is included on the CD provided as part of this report. Animal #1 moved directly towards a male Jackson’s chameleon shortly after it was released after tagging. The veiled chased the Jackson’s and then engaged in physical jostling, eventually causing the Jackson’s to fall from its location on the tree. Animal #2 was observed to pursue both male and female Jackson’s, chasing them around the tree, in full circle at one point. Animal #2 was never observed to make physical contact with a Jackson’s, but was seen to puff its belly and inflate its gular pouch in a show of aggression.

Locating the animals for field observations proved challenging at times. The animals were left in the habitat overnight, so it was necessary to relocate the animal at the start of each observation session. It was possible to home in on the general location of the animal and yet not be able to locate it for some time, occasionally for 5-10 minutes. The most extreme example of this challenge occurred when the lead observer was not available to conduct observations and eight different people spent over 20 person-hours searching for two chameleons in several trees where the radio signal indicated they were located. The searchers all had considerable experience with previous veiled.
chameleon searches, yet were unable to detect the animals. Upon return to the site, the lead observer found each of the chameleons within 1-2 hours.

**Trap Development:** Although the veiled chameleon is a “sit-and-wait” predator, they are known to move to capture prey items. Field observations confirmed this behavior. The literature also reported that male animals would move in response to reproductively receptive females. The observed interactions between veiled chameleons and Jackson’s chameleons also indicated that the presence of other chameleons in the immediate vicinity could provide a stimulus for movement. These different aspects of veiled chameleon behavior provided the impetus for development of a potential trap.

The basic concept of the trap was to provide a stimulus (insects, another animal) that would cause a chameleon to travel across a slender horizontal bar (Figures 10 & 11). The bar is covered with a metal sleeve and is held in the horizontal position by a magnet on one end. As the animal moves across the bar, towards the stimulus, the weight triggers release of the magnet. As the bar drops vertically, the metal sleeve slides off and the animal and sleeve are dropped into a mesh bag attached to the open bottom of the box. The sides of the box are lined with metal, which is too slippery for the chameleon to gain traction. Life-like decoy veiled chameleons were created using a frozen male chameleon as a mold (Figures 12 & 13). The trap has been deployed at the location where the last two veiled chameleons have been found. The arm has been triggered but no animals were caught. Without either direct observation or a movement-triggered camera in place, it was not possible to know what is triggering the bar.

![Figure 10. “Break-Away Swing-Arm” Veiled Chameleon Trap](image-url)
Figure 11. Trap Concept, Potential Lures, and Trap Deployment
Figure 12. Live Veiled Chameleon (at MISC’s Headquarters)

Figure 13. Decoy Veiled Chameleon
Review of the literature about capturing small lizards suggested that deployment of sticky traps might be successful. However, this approach was not tested because of the likely result of capturing non-target animals, including Jackson’s chameleons and geckos. A number of residents in the project area allowed searches and capture of the veiled chameleons on their properties only after being assured that no Jackson’s would be removed. For this reason, use of sticky traps was not deemed feasible in a residential area where the presence of Jackson’s chameleons and other lizards, such as geckos, were viewed favorably by private landowners.

Vegetation Removal: Removal of vegetation was explored to determine whether the density of vegetation could be hindering the ability of searchers to detect veiled chameleons (Figure 14). This activity focused on removal of a large area of *Schinus terebinthifolius* in the gulch. Each branch was carefully examined before sending it through a chipper. No chameleons (either Jackson’s or veiled) were discovered either immediately before or during vegetation clearing.

![Figure 14. Clearing Schinus terebinthifolia in Gulch](image)

**Figure 14. Clearing Schinus terebinthifolia in Gulch**

Ongoing Control Efforts: This research project took place within an overall effort to reduce the Makawao population of veiled chameleons. Initial searches in the Makawao area during the first few years of the control effort (2003-2004) were very productive, with a high ratio of chameleons found per property searched (Figure 15). The ratio remained relatively high until late 2004 and then declined dramatically, even as the total number of properties searched continued to increase. The decrease in animals was not a function of decreased time spent searching as the capture rate per search hour also declined over time (Figure 16).
Figure 15. Chameleons Captured per Property Unit Searched: 2002-2007

Figure 16. Chameleons Captured per Search Hour: 2002-2007
The decreasing numbers of chameleons captured relative to effort expended or the total area searched suggested that the overall control efforts were being successful at reducing the number of veiled chameleons in the project area.

**DISCUSSION**

Observations of radio-tagged animals provided information about the behavior, movement patterns, and habitat use of veiled chameleons. This research project also provided valuable insights into the efficacy of search strategies. This information would not otherwise have been available to the multi-agency effort to control this injurious species. Field observations revealed that the chameleons used all heights of the plants. The chameleons were quite catholic in their use of different plant species or families, but were most frequently observed in *Schinus terebinthifolius*. Distances traveled by chameleons from the post-tagging point of release indicated that some chameleons were quite sedentary, rarely moving from the same tree, whereas other chameleons readily moved over 100 feet. Paved roads presented no apparent barrier to chameleon movement.

The sample size of chameleons observed, along with the reduction in population resulting from ongoing control efforts, limited the possibility of observing interactions between veiled chameleons. No reproductive behaviors were observed and no gravid females were tagged. However, two subadult chameleons (male and female) did remain in relatively close proximity to each other during much of the time they were observed. It is not known whether males attempt to "guard" females, although the literature suggests that the chameleons are typically solitary, unless the female indicates reproductive receptivity by changing color. The study did provide the opportunity to document aggressive interactions between male veiled chameleons and Jackson’s chameleons, demonstrating inter-specific competition within the available habitat. These observations led to the design and development of a potential trap which relies on the observed willingness of chameleons to move towards prey items and other chameleons.

One of the most revealing pieces of information obtained from the study was the difficulty observers faced in locating radio-tagged animals, at least in dense vegetation. This difficulty held true even for some of the most skilled searchers (those who found the most chameleons per hour of effort). Thus, the uncertainty associated with interpreting negative data (no chameleons found) was amply illustrated by these results. The decline in number of chameleons captured from 2002-2007 probably does reflect successful control efforts; however, it is evident that searchers could be missing a fairly high number of animals in the higher and denser patches of vegetation. The chameleon’s apparent preference for *Schinus* might also be related to the density of this vegetation, although this variable was not studied.

Another variable that could not be measured or controlled was the potential impact of the radio-tagging and observations on the chameleon’s behavior. The lead observer noted that the chameleons often seemed to be aware of his presence. Efforts were
made to minimize the impact of handling and tagging and to make observations as unobtrusive as possible. Some animals seemed unaffected by the tags or human presence; however, it is possible that other animals sought out perch locations to minimize visibility to observers.

Vegetation removal may help limit the availability of difficult-to-search habitat, but given the wide variety of vegetation used by the chameleons, it probably would have no effect in terms of reducing suitable habitat. It did not appear to be an effective way to locate veiled chameleons, although this result could simply be an artifact of an already reduced population.

**MANAGEMENT ADAPTATIONS & RECOMMENDATIONS**

As a result of this research project, changes were made to the ongoing control effort. A 200-yard buffer zone was created around the existing core infestation to identify new search areas (Figure 17). A second zone, 400 yards from the core infestation, was delineated within which an educational “blitz” was conducted using flyers to inform local residents about the veiled chameleon. No verified reports of veiled chameleons have been received from the blitz area since initiating the intensified outreach efforts.

Management units were delineated within the expanded search area (Figure 18) and numbered according to order of search. Area #1, located to the southwest of the core infestation, was considered a high priority because the vegetation “corridor” of the gulch extended into this area (Figure 19). Searches have been completed in all six management units and Area #1 was the only new area where veiled chameleons were found.

![Figure 17. New Search & Outreach Zones](image)
Figure 18. Management Units within Expanded Search Area

Figure 19. Management Units & Vegetation Corridor
Results from the expanded search suggested that focusing efforts along vegetation corridors might be most productive. Information about the reproductive strategy of the species, in particular where the females are laying eggs, would be very helpful in stopping the spread of the species. Any future radio tagging efforts would most productively focus on gravid females. Additional information about the diet of the species would also shed light on the species’ use of the habitat as well as the potential threat of the veiled chameleon to native invertebrates and/or vertebrates. More than 200 animals have been captured from this population, many of which should be available for stomach analysis. The difficulty in finding animals in dense vegetation indicated that total eradication might not be feasible. However, success to date in controlling this species does suggest that a carefully managed strategy, based on a solid understanding of the species’ behavior in its adopted habitat, can prevent this population from expanding beyond its current distribution.

ACKNOWLEDGEMENTS

This project was supported by funding from the Hawai’i Invasive Species Council’s Research and Technology Grant program. Funding for ongoing control efforts has been provided in part by the County of Maui. Brooke Mahnken (MISC) was responsible for project implementation, including equipment scoping and acquisition, the majority of the field observations, radio tagging, trap design and development, decoy production, spatial analysis, and map production. Other MISC staff participated in the project, including Sarah Townsend, who assisted with decoy production and coloration. The overall veiled chameleon project is under the direction of Adam Radford (MISC). Dr. Fern Duvall II (DLNR) provided insights and guidance for the project. Anna Mae Shishido and Domingo Cravalho (HDOA) provided assistance in ensuring regulatory compliance and participated often in night searches. Dr. David Duffy (University of Hawai’i – Pacific Cooperative Studies Unit) was the Principal Investigator. Kate Cullison (UH – PCSU) was the University liaison for IACUC compliance. Other agency personnel from the U.S. Fish & Wildlife Service, HDOA, and DLNR have participated in search activities over the years. Last, but not least, the patience and cooperation of the Makawao residents must be acknowledged for their willingness to allow MISC and partner agency staff to “camp” in their yards for many hours at a time (often accompanied by the complaints of local dogs), and for their commitment to protecting Maui’s natural resources from this invasive species.

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