Kauaʻi Niu:
Hope is Still Breathing – Don't Sit Too Long!

Indrajit Gunasekara
Lead, Community Coconut Project & Co-Founder, Niu Now
indrajit.s.gunasekara.researcher@hawaii.gov

Kanileʻa Smith
Assistant, Community Coconut Project
kanilea.e.smith.researcher@hawaii.gov

Introduction

The coconut tree, *Cocos nucifera* (L.) (Arecaceae)—commonly known as the "niu" throughout the Pacific—is one of the most culturally significant trees. For countless generations across the tropics, niu has been cherished as a staple food, a foundational resource, and a deeply respected plant relative. In Hawai‘i, niu remains one of the most common trees in urban landscapes across all islands. Coconut is the tree many of our ancestors collectively called *the tree of life,* a recognition of this intimate kinship with humanity. Every part of the niu serves a purpose: food, drink, materials, ceremony, architecture, and the spiritual grounding of daily life.

As tropical islanders, we understood the deep symbiotic relationship: when coconuts thrived, so did the people who depended on and cared for them. When the coconut tree lived long, the people lived long. "*Kupu ka niu, kupu ke kanaka*—When coconuts grow, humanity flourishes" (He Pule Niu, 1897).

Impact of the Coconut Rhinoceros Beetle (CRB)

The arrival of a serious invasive pest—the coconut rhinoceros beetle (CRB), *Oryctes rhinoceros*—has accelerated the ongoing erosion of Hawaiian coconut genetic diversity. First detected on 23 December 2013 at Joint Base Pearl Harbor–Hickam, O‘ahu, which has since become the epicenter of the outbreak. Soon after arriving, CRB has spread across West and Central O‘ahu and is now found throughout the entire island, causing widespread devastation to coconuts. On Kaua‘i, the first CRB detection occurred on 31 May 2023 near Līhu‘e Airport and the transfer station. In less than two years, CRB has killed thousands of coconut trees across the island.

Mainly, CRB spread through human movement of infested materials, such as mulch, compost, and decaying plant matter where CRB larvae and adults thrive. Moving these materials—even over short distances—can easily spread the beetles. They can also be transported in entire palm trees, plant trimmings, and even store-bought soil or compost products. Although adult beetles can fly short distances or accidentally hitchhike on vehicles or plants, these methods cause far fewer new infestations. Overall, human-vectored transport of breeding materials is the primary driver of their spread.

Purpose of This Report

This report is written after a year of discussions with several active community leaders who expressed deep concern about Kaua‘i's current spread of the CRB. It incorporates a field examination we conducted and summarizes the following:

- A two-day islandwide field survey and assessing CRB damage
- An evaluation of the CRB infestation timelines using Pacific Community's (SPC) rapid damage assessment protocol and biological clock method on CRB
- Identification of early infestation centers and current hotspots

One of the main purposes of this survey is to provide a clear indication of how far CRB has spread on Kauaʻi and how much damage it is currently causing in each area. Our route covered roughly 200 miles from Kekaha to Hāʻena. Primarily from the road side, we observed over 10,000 mature coconut trees and formally inspected 1,200 opportunistically selected trees across 40 randomly assigned blocks (30 trees in each block).

Figure 1: The five sites marked in red are the sites detected for CRB. Left to right: Hanapēpē, Kalāheo, Līhuʻe-Wailua, Wailua Homestead and surrounding area, and Anahola.

Key Findings

- Despite already losing over a thousand kumu niu, Kauaʻi's niu can still be saved, but action must happen immediately as CRB is spreading fast.
- The infestation is at a stage where coordinated community efforts can still slow or reverse the damage to ensure that Kauai's niu survives for future generations.
- Using accurate information about the level of infestation, response to injection, and improved possible CRB breeding site management practices are essential to avoid ineffective or harmful approaches.

Methods

We followed guidelines from *Coconut rhinoceros beetle (Oryctes rhinoceros): A manual for control and management of the pest in Pacific Island countries and territories* provided by Pacific Community. This report also reflects the guidance and knowledge shared in our conversations over the last three years with Dr. Mark Ero (lead entomologist managing CRB project at member countries and territories of the Pacific Community), Dr. Roland Bourdeix (renowned coconut expert at the French Agricultural Research and Cooperation Organization), Dr. Aubrey Moore (CRB researcher at University of Guam), and various community activists, and other subject matter experts.

Our assessment included:

- Rapid damage assessment of frond injury (see figure 2)
- Biological clock estimation of frond age to determine the earliest CRB attack in each area (see figure 3)
- Damage Index (DI%) calculation across affected sites

Field observations were conducted on 13-14 November 2025, with about 12 hours of roadside and limited on-site inspections guided by:

- Visible CRB damage on each site
- The Kauaʻi Invasive Species Committee's (KISC) CRB trap detection map to determine specific site observation
- Information received from members of the local community and Kauaʻi County Department of Agriculture

Forty total sites were evaluated. Within each site, 30 coconut trees were opportunistically assessed for: damage intensity and the estimated time of earliest CRB damage.

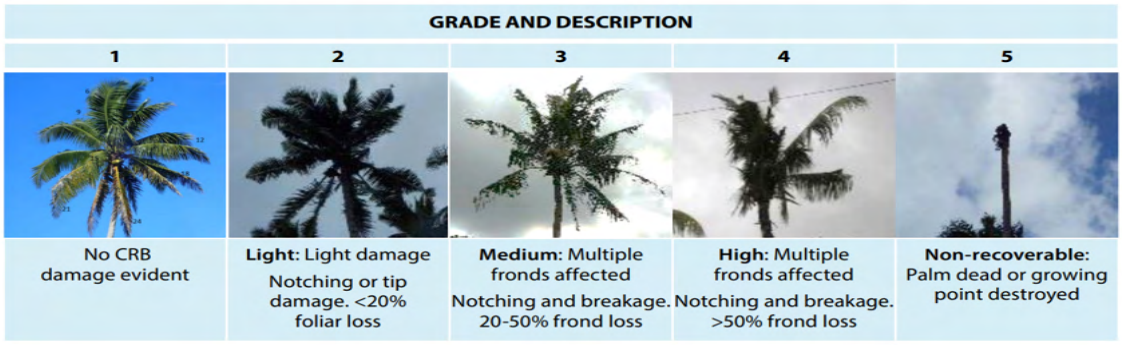


Figure 2: Grading scale for assessment of damage to coconut tree fronds caused by CRB (source: SPC).

Figure 3: Estimated age in months of fronds (from formation) on a matured coconut tree (source: SPC).

Survey Results

Out of 40 surveyed sites, five sites showed CRB damage (see marked in red on figure 1). Three of these sites had severe, widespread infestation and appear to be active or early hotspots. It is also reasonable to assume that there may be other sites with current CRB damage that we were unable to access during this limited visit.

Listed below are the results from the five out of forty sites where we observed and evaluated CRB damage during this survey:

Sites with CRB damage	Trees Observed	Trees with CRB Damage	Damage Index (DI %)
1. Hanapēpē	30	3	10%
2. Kalāheo	30	22	73%
3. Līhu‘e -Wailua	30	28	93%
4. Wailua Homestead	30	25	83%
5. Anahola	30	8	27%

Table 2: A calculation of the damage index using the rapid damage assessment protocol for the 5 sites mentioned above.

Sites with CRB damage	Age of the oldest frond damaged (months)
1.Hanapēpē	3
2. Kalāheo	12
3. Līhu‘e -Wailua	18+
4. Wailua Homestead	15
5. Anahola	3

Table 3: CRB damage assessment using a biological clock reading based on frond formation.

Site Summaries

Hanapēpē:
Damage is minor (10%) and appears recent (≤ 3-month-old fronds). CRB presence is new and likely manageable with mulch management and improved CRB trapping system. However, this area is within a less than 10-mile radius to one of the heavily CRB infested areas, Kalāheo, increasing risk.

Kalāheo:
Severe CRB activity—especially within the National Tropical Botanical Garden, which contains:

- Over 300 mature coconut trees
- A number of native loulu species and a variety of other palm trees
- Over 70% of all palm trees including loulu and other palm trees are being attacked by CRB

Frond damage suggests CRB presence for over 12 months. Large mulch piles remain highly vulnerable as breeding sites despite partial netting. This garden is located on Lāwa‘i Bay and is home to one of Kaua‘i’s ancient uluniu (coconut grove), hosting over 300 mature coconut trees and a large number of loulu trees. Some rare long-shaped “niu kafa” varieties were observed, though a deeper genetic assessment is yet to be conducted to fully assess diversity.

Līhu‘e -Wailua:
This appears to be ground zero for CRB on Kaua‘i. Frond damage of 18+ months indicates CRB has been active the longest here.

Figure 4: Failure of systemic chemical injection at Wailua golf course. Over 400 coconut trees continue to show signs of ongoing CRB attack and die after having been injected with chemicals.

Observations:

- Several hundred standing trees are dead and now serve as ideal CRB breeding sites (see figure 4).
- Over 400 trees tagged for chemical injection show new CRB attacks on emerging fronds, indicating the attack is ongoing.
- Standard protocols prohibit injections of palms with inflorescences; however, we observed over 400 trees with inflorescences that had been tagged as injected.
- Flowering inflorescences (2–3 months old) were *not removed* (see figure 5) despite known best practice of removing inflorescence before and after injecting. This poses a contamination risk to pollinators including honeybees. Nectar/pollen contamination may affect "organic" honey production, and poses potential ecological and public health hazards.

We noted that the pheromone traps are widely used to monitor coconut rhinoceros beetle activity, but current practices may be doing more harm than good. Field observations suggest that these traps can increase local beetle density—especially when placed too close to coconut trees or deployed far more densely than recommended—leading to artificial beetle movement and additional damage. In fact, these particular traps are designed for data collection purposes and capture only a small fraction of attracted beetles, offering little to no population control. Furthermore, trap data add limited practical value, as infestations are already easily detected visually and have not led to effective management responses. CRB management experts outside of Hawai‘i recommend mapping boundaries to clearly delineate infested areas, spacing traps at least 500 meters apart, and avoiding the use of traps in areas where no infestation is present.

Additionally, what we learned from the failure of such strategies on O‘ahu suggests that trap data have not led to the development or implementation of effective management interventions at all, nor do trap catches typically reach levels that contribute meaningfully to population suppression.

Although the intended purpose of this particular type of pheromone trap is to monitor activity in conjunction with visual surveys results indicate that their quantitative value is minimal and does not provide actionable information for improving CRB control strategies.

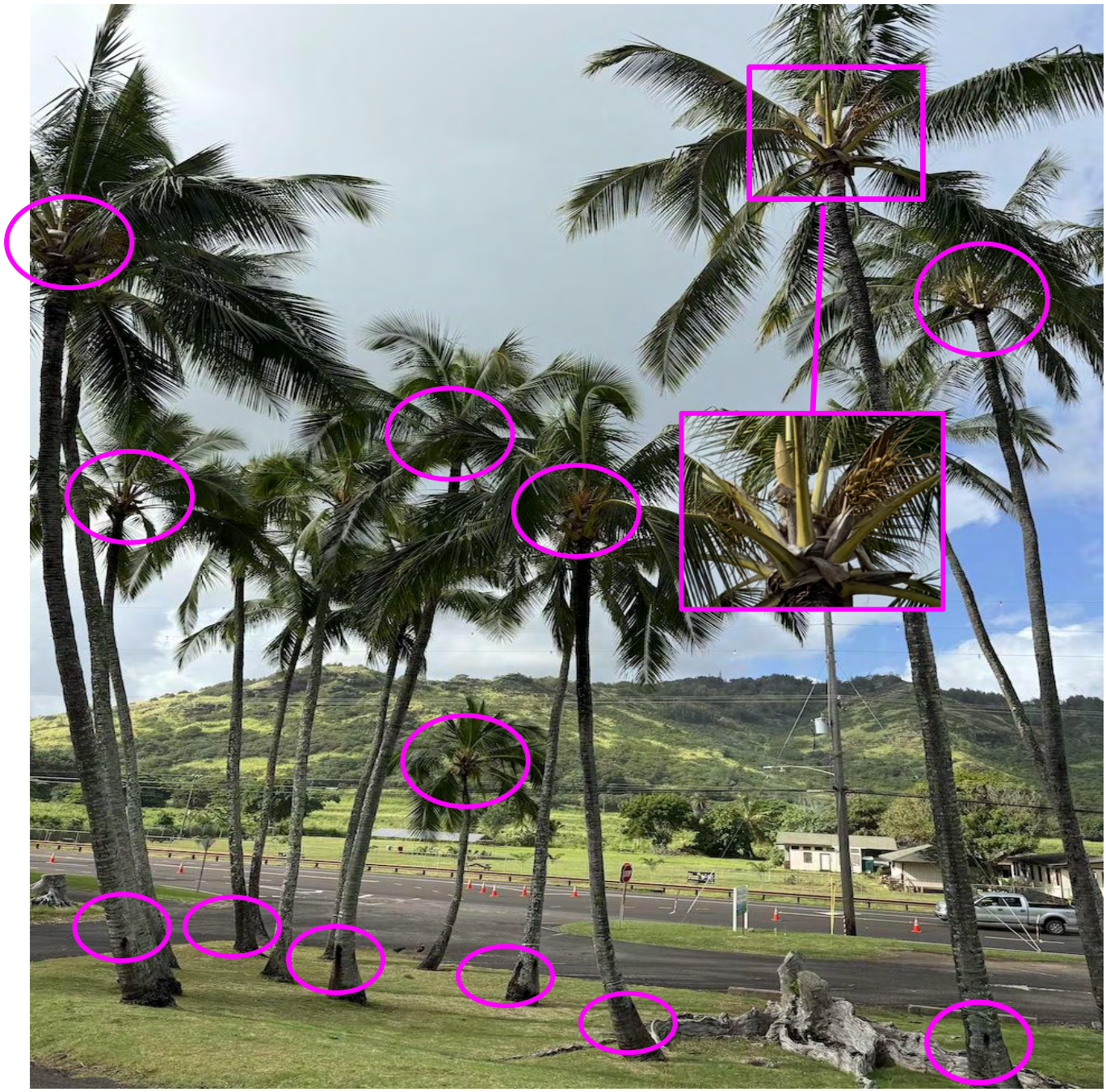


Figure 5: Wailua golf course with injection scars indicating chemical treatment which poses an environmental health hazard because the inflorescences have not been removed, thereby impacting pollinators.

Wailua Homestead:
This site also borders Līhu‘e -Wailua and has a large area demonstrating widespread CRB damage (20+ miles), especially near the Wailua River and around the Hindu Monastery. Biological clock analysis of frond formation indicates CRB has been active here for over 15 months. Many of the trees appeared to have been injected with chemicals but still died from ongoing CRB attacks, resulting in the loss of those coconut varieties.

Figure 6: Even though some trees are still green and standing after chemical injection at Wailua River State Park, many need to be removed as their meristem points have already been damaged beyond recovery due to ongoing CRB attacks. Removal is necessary to prevent them from becoming CRB breeding grounds.

Anahola:
Anahola is about 10 miles away from Wailua, which, as discussed above, has the heaviest CRB damage and is the probable first site of CRB on the island. We did not monitor any damage beyond the surrounding area of the Wailua River to Anahola. In Anahola, around Hokualele Road, there is some damage that shows signs of early CRB attack. At this time the damage appears to be on fronds estimated to be 3 months old and spread across an area of about 2-mile radius around Hokualele Road.

On the way to Anahola from Wailua, there is an older uluniu of approximately 100 trees located 1.5 miles mauka of the Wailua River along Kūhiō Highway. Assessing its heritage and

identifying any older varieties will help prioritize preservation of these potentially significant and unique Hawaiian cultivars before it becomes another lost site.

Figure 7: Earliest CRB damage signs showing up on around Anahola.

Conclusion

The findings of this assessment make one message unmistakably clear: **there is still hope for Kaua‘i niu—but only if we act now.** CRB is spreading quickly across the island, and each day of delay allows the beetle population to grow, damage to intensify, and culturally significant uluniu, niu varieties, and other CRB vulnerable native species to disappear. Yet our observations also show that the infestation is still at a stage where coordinated, community-driven action can meaningfully slow, contain, and in some areas even reverse its impact.

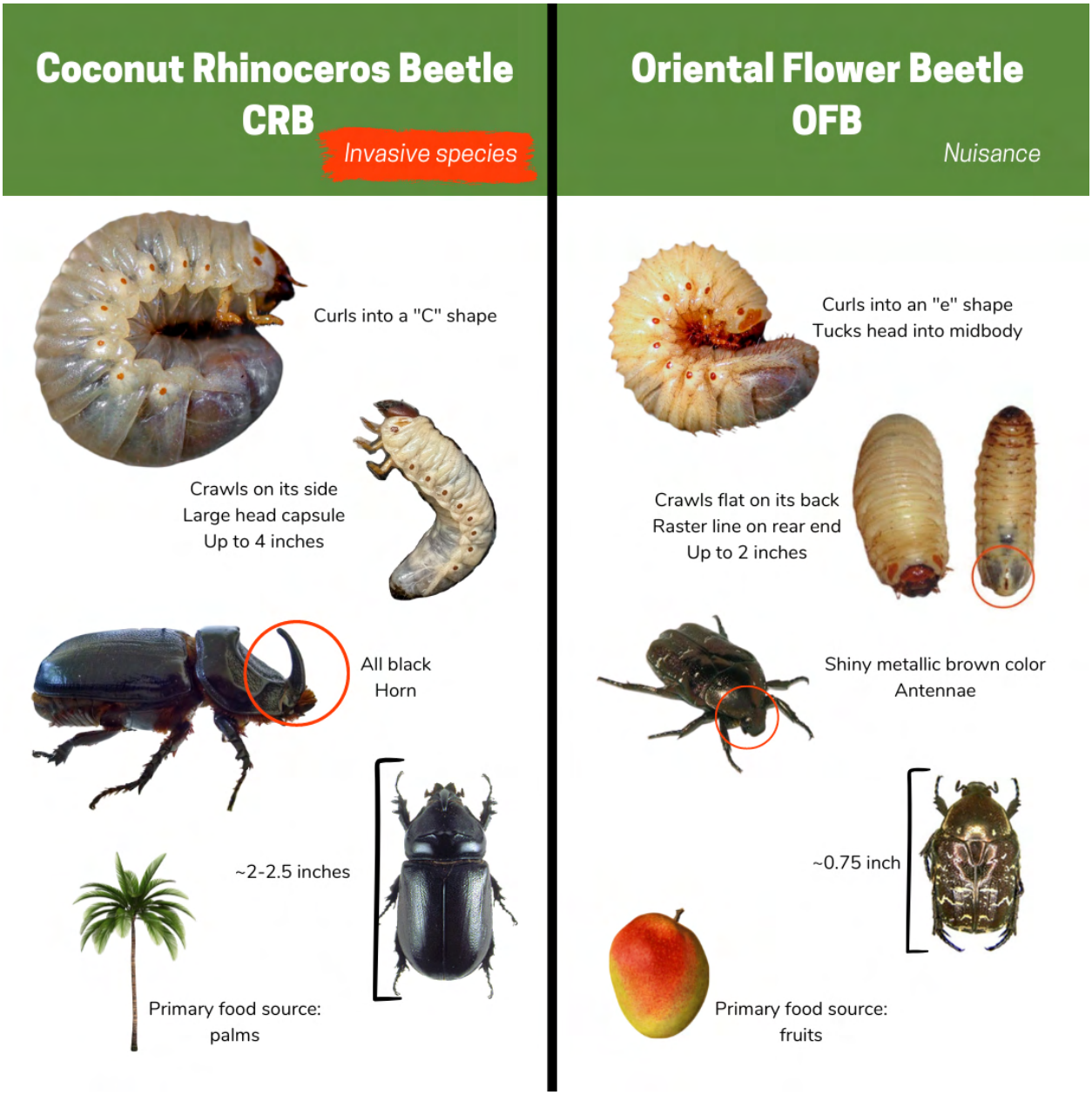
Protecting niu is more than an ecological necessity, it is our cultural heritage. Responsible government agencies, community members, land stewards, and cultural practitioners all have a role in this effort. By grounding our actions in accurate information, avoiding harmful or ineffective pesticide practices, and implementing proven management strategies used successfully in other tropical regions, Kaua‘i can strengthen its resilience and protect its living coconut heritage. Caring for niu is a sacred act. Niu enriches our lives with nourishment, medicine, cultural material, and provides places of ceremony. Many of the uluniu in Kaua‘i

represent ancestral knowledge, royal legacy, and genetic biodiversity. Our loss of kumu niu would be a profound cultural and ecological grievance for Kauaʻi, Hawaiʻi, and the Pacific.

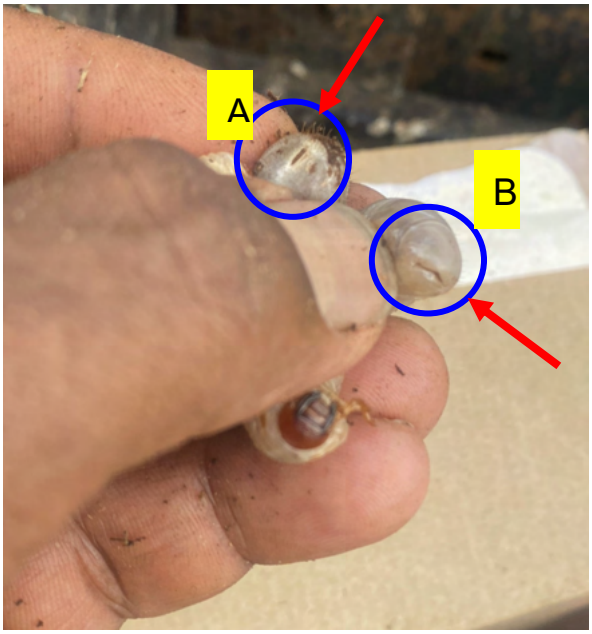
The path forward requires urgency, unity, and clear communication. With these elements in place, Kauaʻi can ensure that niu continues to stand tall for generations to come—rooted in its ancestral lands, thriving as a cultural relative, and supporting the communities that have cared for it for centuries.

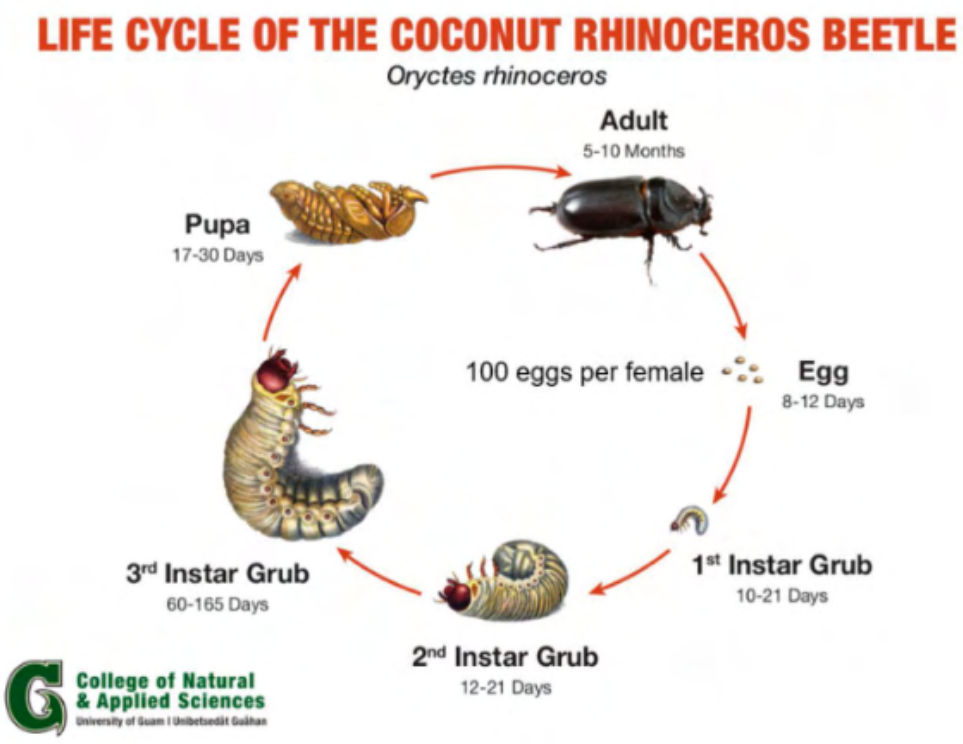
Hope is still breathing.
E Ola ka Niu.
E Ola nā Uluniu.
E Ola Hawaiʻi nei.

Listed below are a few resources to further understand CRB and their life cycle:



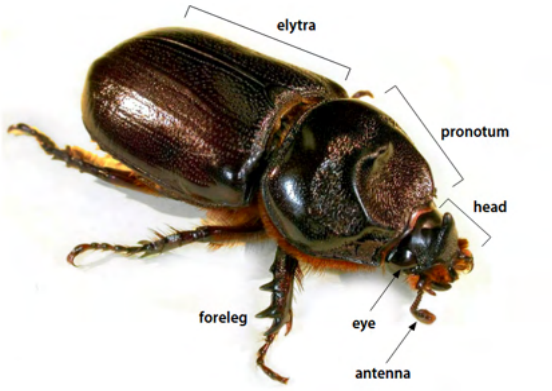
Identification of differences between CRB and OFB (source MISC).

	
3rd instar of a Larva of CRB, approximately 60-165 days old	The key differences in the rectal area (specifically the raster pattern and anal plate) of OFB (A) and CRB (B)



Male vs. Female Coconut Rhinoceros Beetle

Feature	Male CRB	Female CRB
Horn	 Long, prominent horn on head	 Short horn or small bump
Ventral (underside) hair	 Sparse hair; smooth underside	 Dense hair; helps with egg-laying
Body shape	  Slightly elongated	  Broader, rounder abdomen
General appearance	 Sleek look (less hair)	 Rugged underside, rounder body
Behavior	More often seen flying at night	Often stays near breeding material



Matured female CRB

Coconut Rhinoceros Beetle feeding damage on coconut (left) and loulu (right) fronds

CRB damage on hala (left) and banana tree (right).

CRB damage on royal palms (right) and mediterranean palm trees (left).

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