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December 10, 2021

**TO:** Advisory Committee on Plants and Animals

**FROM:** Darcy Oishi  
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Plant Pest Control Branch

**SUBJECT:** Request for: (1) A Finding that the Unrestricted Movement of Coconut Rhinoceros Beetle Host Materials, Including But Not Limited to: Entire Trees, Green Waste, Mulch, Trimmings, Fruit and Vegetative Scraps and Decaying Stumps of Palmeceous Plants and Other Trees, All of Which are Hosts or Harbor the Coconut Rhinoceros Beetle, *Oryctes rhinoceros*, To, From and Within the Island of Oahu, And Other Areas Confirmed with Coconut Rhinoceros Beetle, Constitutes an Emergency Justifying an Interim Rule; and

(2) A Finding that the Adoption of an Interim Rule to Restrict the Movement of Coconut Rhinoceros Beetle Host Materials, Including But Not Limited to: Entire Trees, Green Waste, Mulch, Trimmings, Fruit and Vegetative Scraps, and Decaying Stumps, is Required to Prevent the Spread of the Coconut Rhinoceros Beetle, *Oryctes rhinoceos*, To, From and Within the Island of Oahu to un-infested areas within the State.

## **I. Introduction**

The Hawaii Department of Agriculture (HDOA) Plant Quarantine Branch (PQB) is proposing an interim rule to establish a quarantine to restrict the movement of entire trees, green waste, mulch, trimmings, fruit and vegetative scraps and decaying stumps of palmeceous plants and other trees, to prevent the spread of the Coconut Rhinoceros Beetle (CRB), *Oryctes rhinoceros*, From and Within the Island of Oahu.

## **II. Background**

On November 15, 2013 an adult Coconut Rhinoceros Beetle (CRB) was collected on the international arrivals baggage floor of the Honolulu International Airport. Positive identification was obtained on November 20, 2013. At this time it was thought that this

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was an isolated incident and that the beetle had hitchhiked on baggage or had been someone's pet.

On December 23, 2013 an adult beetle was collected in a trap set up to monitor for another palm pest, the Red Palm Weevil, at the Joint Base Pearl Harbor Hickam (JBPHH). Positive identification of the specimen collected was obtained on January 3, 2014.

On January 8, 2014 a large area containing coconut green waste on JBPHH was found to be heavily infested with all life stages of CRB.

Problem:

Adult beetles bore into the crowns of palm trees (mostly coconut palms) to feed on the sap the wounded tree produces. New unopened fronds are damaged in this way and when fully opened may break and fall from the tree unexpectedly. If the beetles kill or damage the growing point of the palm, the tree may die. Secondary fungal or bacterial pathogens may also attack the wounded area caused by the beetle, thereby killing the tree as well. Tree mortality after attack has been reported to be anywhere from 10% to 50%. Dead trees then become a safety hazard as they may fall unexpectedly after the trunk rots, causing bodily injury or property damage. Furthermore, dead trees also become preferred breeding sites for CRB once the top of the tree starts decomposing.

Adult Beetles also use mulch and compost piles as breeding sites. Beetles can be spread inadvertently when infested mulch or compost is moved from one location to another and may include island to island movement.

Any CRB life stage may also be transported purposefully as CRB may be kept as pets (a practice common in Asia) and possibly bred for the pet trade.

Description:

Larvae of CRB may grow up to 3 inches in length and may measure more than a ½ inch wide. Larvae have 3 instars, with each instar larger than the previous one followed by a molt. During its first two instars, CRB larvae may be easily confused with the larvae of a related species, the Oriental Flower Beetle (*Protaecia orientalis*). Larvae of the two species can be quickly differentiated in the field. CRB larvae have a larger head capsule than Oriental Flower Beetle and lack the raster (line of hair at the tip of the abdomen) that Oriental Flower Beetles have. Larvae live in decomposing plant material such as mulch or compost piles, animal manure and even in the crowns or trunks of palm trees where enough plant material has been built up over time to support larval development.

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Adult CRB are large, growing up to 2 inches in length. They are generally black in color and have a horn on the top of their head. Although female beetles generally have shorter horns, they are distinguishable from males by the presence of reddish hairs on the tip of their abdomen (Vargo, 1995).

Life History:

CRB eggs take about 12 days to hatch (Giblin-Davis, 2001). Larvae may take anywhere from 82 – 207 days to develop before pupating (Schmaedick, 2005). The prepupal and pupal stage may last for about a month with the adult remaining in the pupa for another 2-3 weeks before emergence (Giblin-Davis, 2001). Adults can live for about 4 -9 months. Females can lay between 70-140 eggs during their lifetime (Schmaedick, 2005). Once adults become active, they will fly to a palm plant to feed for 2-3 days. Mating may take place either while feeding or in decaying plant material.

Distribution of Host Material:

Palm plants, especially coconut palms, which CRB feed on and decaying plant material where the larvae develop can be found almost everywhere on all the major islands in the state of Hawaii. In many areas of the state, coconut palms grow wild without maintenance, which provides a ready supply of food and breeding material. Sugarcane, banana, taro, papaya, pineapple, and sago palm can also be attacked by CRB adults.

All life stages may also be distributed island wide and statewide in mulch or compost. Adults will even bore through the plastic in bagged compost to lay eggs (Aubrey Moore, personal communication).

Distribution of the Coconut Rhinoceros Beetle in Hawaii:

CRB is limited to the south and southwestern parts of the island of Oahu, but trap catches have been recorded in the North Shore and other areas outside the initial infestations (See Attachment A (current CRB Map)). Specimens have been collected from Sand Island and Honolulu International Airport to Campbell Industrial Park, a distance of approximately 16 miles.

Dissemination:

Natural dissemination of this pest may be quick if left unchecked. CRB are strong fliers capable of flights of up to 4 km at a time after feeding (Hinckley, 1973). Although strong fliers, the beetles also tend to use the wind as an aid for dispersal. On Oahu, prevailing trade winds blow from east / northeast to the west. This explains why many captures farthest away from Joint Base Pearl Harbor Hickam are to the west in areas such as Iroquois Point, Ewa Beach, Kapolei, and Campbell Industrial Park.

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However, the movement of mulch, compost, and other rotting or decaying vegetation or plant material may represent the biggest aid of dispersal for CRB on Oahu. Since decomposing plant matter is an oviposition (egg laying) site and larval food source, all life stages of CRB may be spread island-wide if material is moved from an infested location to an uninfested location or from an infested island to an uninfested island. Adults are active between dusk to dawn.

On their own, beetles may disperse for a variety of reasons. The search for food, mates, or suitable breeding and egg laying sites are all factors for a beetle to take flight. Recent eradication efforts are beginning to limit the beetles' breeding sites on and near the most heavily infested areas of the island.

Another method of dispersal is that Coconut Rhinoceros Beetles may also be kept and bred as pets. Rhinoceros beetles as pets are common in Asia and the novelty in Hawaii of possessing an insect this large and unique may help CRB to spread around the State.

Eradication/Control Strategy:

Currently there are no chemical insecticides available in Hawaii that can effectively control CRB. However, recent studies have shown that cypermethrin (Demon Max) mixed with the synergist piperonyl butoxide (Prentox Pro-8) at higher than recommended rates has been able to kill all adult CRB.

The Hawaii Department of Agriculture (HDOA) has obtained permits for both open burning and containerized burning of green waste and 6 containerized burners are on order (one each for HDOA and United States Department of Agriculture (USDA), and four for JBPHH). However, burning of mulch and compost is not a recommended option since it is typically very moist with small particles which generate a lot of smoke and may even smother a fire completely.

HDOA, the University of Hawaii (UH), and the USDA are all collaborating to investigate various control methods, but if any are discovered, they may be months to years away from implementation.

Although deep burial (recommended at least 2 meters deep) remains an option, no responses have been received from inquiries to the local landfill. But with the high quantities of mulch and compost piles in the infested area, landfills may not be able to adequately contain much of the existing green waste.

Incineration at H-Power remains very costly (\$91.07 per ton). It is also important to note that with these last two options, infested material will have to be transported through and to uninfested areas before any treatment can begin, possibly introducing CRB to new areas.

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Although there is a possibility that CRB may not be successfully eradicated or contained even with the establishment of quarantine zones, its dispersal and establishment elsewhere may be delayed for some time if an effective quarantine is implemented and maintained. The spread of CRB can and will be assisted by human activity such as the movement of infested mulch, compost or trees within and between islands or by people actively collecting beetles for pets. The dissemination of this pest can be slowed significantly given time and proper pest management and if green waste sanitation practices can be applied. With more time, better and a wider variety of successful control methods can be developed including biological control (use of the CRB's natural enemies to suppress a population). Time will allow for the Neighbor Islands to increase their detection surveys and time will allow for more concentrated control efforts to be undertaken in the areas already infested by this pest.

Boundaries of Proposed Quarantine Zone:

The HDOA proposes to quarantine the entire island of Oahu and to regulate movement of CRB host material. This quarantine area is established to prevent the spread of the CRB from areas infested to uninfested areas within the island of Oahu and outside the island of Oahu. CRB defined host material can only be moved under a state compliance agreement.

Permit Required for Intra-Oahu Island and Interisland Movement

Under this proposed interim rule, movement or transportation of CRB host material, including but not limited to entire trees, green waste, mulch, trimmings, fruit and vegetative scraps and decaying stumps of palmaceous plants and other trees, within the Island of Oahu, to and from the Island of Oahu and other areas known to be infected with CRB to other un-infected islands is prohibited, except under the following instances:

1) movement of any host material for the CRB, including but not limited to palmaceous plants and other trees, mulch, trimmings, fruit and vegetative scraps and decaying stumps, compost, and green waste under a state compliance agreement; 2) commercial and private processing of any CRB host material in approved facilities under a state compliance agreement, 3) inter-island movement of any CRB host material under a state compliance agreement; 4) sale and trade of CRB host material under a state compliance agreement; and 5) movement of nursery stock material considered CRB host material under a state compliance agreement.

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Movement For Export

Currently there are no restrictions for the export of propagative Coconut Rhinoceros Beetle host material such as palms. However, this may change quickly if Coconut Rhinoceros Beetle is intercepted in plants that originated in Hawaii.

**Plant Quarantine Branch Recommendation:** Although natural dissemination of the Coconut Rhinoceros Beetle may be fairly quick, dissemination by human aid can rapidly spread CRB to uninfested areas of the State. The Plant Quarantine Branch recommends that the Advisory Committee on Plants and Animals find: (1) That the unrestricted movement CRB host material including but not limited to: entire trees, green waste, mulch, trimmings, fruit and vegetative scraps and decaying stumps of palmeaceous plants and other trees, all of which are hosts or harbor the Coconut Rhinoceros Beetle, *Oryctes rhinoceros*, to, from and within the Island of Oahu, and other areas confirmed with Coconut Rhinoceros Beetle, constitutes an emergency justifying an interim rule; and (2) That the adoption of an interim rule to restrict the movement CRB host material including but not limited to entire trees, green waste, mulch, trimmings, fruit and vegetative scraps and decaying stumps of palmeaceous plants and other trees, is required to prevent the spread of the Coconut Rhinoceros Beetle, *Oryctes rhinoceos*, to, from and within the Island of Oahu to un-infested areas within the State.

Literature Cited

1. Giblin-Davis, R. M. 2001. Borers of Palms. In F.W. Howard, D. Moore, R. M. Giblin-Davis, and R. G. Abad [eds.] Insects on Palms. CABI Publishing. Pp. 267-304.
2. Schmaedick, M. 2005. Coconut Rhinoceros Beetle. Pests and Diseases of American Samoa. No. 8. American Samoa Community College, Community and Natural Resources, Cooperative Research and Extension.

**III. Procedural Background**

Pursuant to section 150A-9.5, Hawaii Revised Statutes (HRS), the HDOA may establish an interim rule governing the transport of flora and fauna into and within the State. Pursuant to §150A-9.5(b), HRS, an interim rule may be adopted in the event that the importation or movement of any flora or fauna, in the absence of effective rules, creates a situation dangerous to public health and safety or to the ecological health of flora or fauna present in the State which is so immediate in nature as to constitute an emergency. No interim rule can be adopted without a prerequisite finding by the Advisory Committee on Plants and Animals that the foregoing criteria stated in §150A-9.5(b), HRS, is met. The interim rule shall not be effective for more than one year.

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Once adopted by HDOA, any interim rule must be published within twelve days of issuance at least once in any newspaper of general circulation in the State.

**IV. Authority**

Chapter 4-72, Hawaii Administrative Rules (HAR), the HDOA's Plant and Non-Domestic Animal Quarantine, Plant Intrastate Rules, regulates the intrastate movement of plants, generally. Section 4-72-3, HAR, requires inspection of propagative plants and plant parts prior to being transported between islands of the State. Section 4-72-4, HAR, prohibits interisland movement of commodities infested with a pest unless treated with a pesticide that exterminates the pest. An interim rule provides the means for quarantine and safeguard measures to restrict or prohibit the movement of pests and their plant or commodity hosts to prevent the spread and establishment of pests that are detrimental to agriculture, horticultural industries, and forest lands on uninfested islands and in uninfested localities of the State.

**V. Procedural Background**

Pursuant to section 150A-9.5, Hawaii Revised Statutes (HRS), the HDOA may establish an interim rule governing the transport of flora and fauna into and within the State. Pursuant to §150A-9.5(b), HRS, an interim rule may be adopted in the event that the importation or movement of any flora or fauna, in the absence of effective rules, creates a situation dangerous to public health and safety or to the ecological health of flora or fauna present in the State, which is so immediate in nature as to constitute an emergency. No interim rule can be adopted without a prerequisite finding by the Advisory Committee on Plants and Animals that the foregoing criteria stated in §150A-9.5(b), HRS, is met. The interim rule shall not be effective for more than one year.

Once adopted by HDOA, any interim rule must be published within twelve days of issuance, at least once in any newspaper of general circulation in the State.

**VI. Authority**

Chapter 4-72, Hawaii Administrative Rules (HAR), the HDOA's Plant and Non-Domestic Animal Quarantine, Plant Intrastate Rules, regulates the intrastate movement of plants, generally. Section 4-72-3, HAR, requires inspection of propagative plants and plant parts prior to being transported between islands of the State. Section 4-72-4, HAR, prohibits interisland movement of commodities infested with a pest unless treated with a pesticide that exterminates the pest. An interim rule provides the means for quarantine and safeguard measures to restrict or prohibit the movement of pests and their plant or

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commodity hosts to prevent the spread and establishment of pests that are detrimental to agriculture, horticultural industries, and forest lands on uninfested islands and in uninfested localities of the State.

## **VII. Proposed Interim Rule**

The proposed interim rule establishes a quarantine to restrict the movement CRB host material including but not limited to entire trees, green waste, mulch, trimmings, fruit and vegetative scraps and decaying stumps of palmeaceous plants and other trees, to, from and within the Island of Oahu, or other areas infested, to prevent the spread of CRB to other non-infested islands in the State. An interim rule is necessary to prevent the further spread and establishment of CRB, *O. rhinoceros*.

Impact of Quarantine: This quarantine is intended to prevent the spread of CRB from areas of infestation to other areas. CRB will severely impact the commercial, natural and private coconut trees on Oahu Island, and any other Island subsequently found to have CRB. If effective measures are not taken immediately to control the spread of this invasive pest, then CRB could spread statewide. If CRB spreads further, then great economic burdens will be placed on coconut tree owners and producers.

### Boundaries of Proposed Quarantine Zone:

The HDOA proposes to quarantine the entire island of Oahu to regulate movement of CRB host material or any other island found to be infested with CRB. This quarantine area is established to prevent the spread of the CRB from areas infested by CRB to uninfested areas within the island of Oahu and outside the island of Oahu. Defined CRB host material can only be moved under a state compliance agreement.

Quarantine exceptions: The proposed interim rule will allow the movement of CRB host material for the specific purposes listed below under permits issued by the PQB:

Movement or transportation of CRB host material, including but not limited to entire trees, green waste, mulch, trimmings, fruit and vegetative scraps and decaying stumps of palmaceous plants and other trees, within the Island of Oahu, to and from the Island of Oahu and other areas known to be infected with CRB to other un-infected islands is prohibited, except under the following instances:

1) movement of any host material for the CRB, including but not limited to palmaceous plants and other trees, mulch, trimmings, fruit and vegetative scraps and decaying stumps, compost, and green waste under a state compliance agreement; 2) commercial and private processing of any CRB host material in approved facilities under a state compliance agreement, 3) inter-island movement of any CRB host material under a state compliance agreement; 4) sale and trade of CRB host material under a state



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compliance agreement; and 5) movement of nursery stock material considered CRB host material under a state compliance agreement.

ADVISORY COMMITTEE REVIEW: May we request your recommendation and comments at the next meeting of the Advisory Committee on Plants and Animals.

**PROPOSED INTERIM RULE:** The proposed wording for the interim rule is as follows:

“HAWAII DEPARTMENT OF AGRICULTURE

PLANT QUARANTINE INTERIM RULE 21-1

Prohibits the Intra- and Inter-island Movement of Coconut Rhinoceros Beetle Host Material, Including But Not Limited to Entire Trees, Green Waste, Mulch, Trimmings, Fruit and Vegetative Scraps and Decaying Stumps of Palmaceous Plants and Other Trees,

Within the Island of Oahu, To and from the Island of Oahu, And Other Areas Known to be Infested With Coconut Rhinoceros Beetle (*Oryctes rhinoceros*)

Except by a Compliance Agreement Issued by the Hawaii Department of Agriculture

Under authorization granted in Section 150A-9.5, Hawaii Revised Statutes (HRS), the Hawaii Department of Agriculture (Department) hereby establishes this interim rule to impose a quarantine on the movement of coconut rhinoceros beetle (CRB) (*Oryctes rhinoceros*) host material, including but not limited to entire trees, green waste, mulch, trimmings, fruit and vegetative scraps and decaying stumps of palmaceous plants and other trees, within the Island of Oahu, to and from the Island of Oahu and other areas known to be infected with CRB to other un-infested islands in the state except by a compliance agreement issued by the Department. These quarantine areas are established to prevent the spread of the CRB from areas infested by CRB to un-infested areas within the State.

Movement or transportation of CRB host material, including but not limited to entire trees, green waste, mulch, trimmings, fruit and vegetative scraps and decaying stumps of palmaceous plants and other trees, within the Island of Oahu, to and from the Island of Oahu and other areas known to be infected with CRB to other un-infected islands is prohibited, except under the following instances:

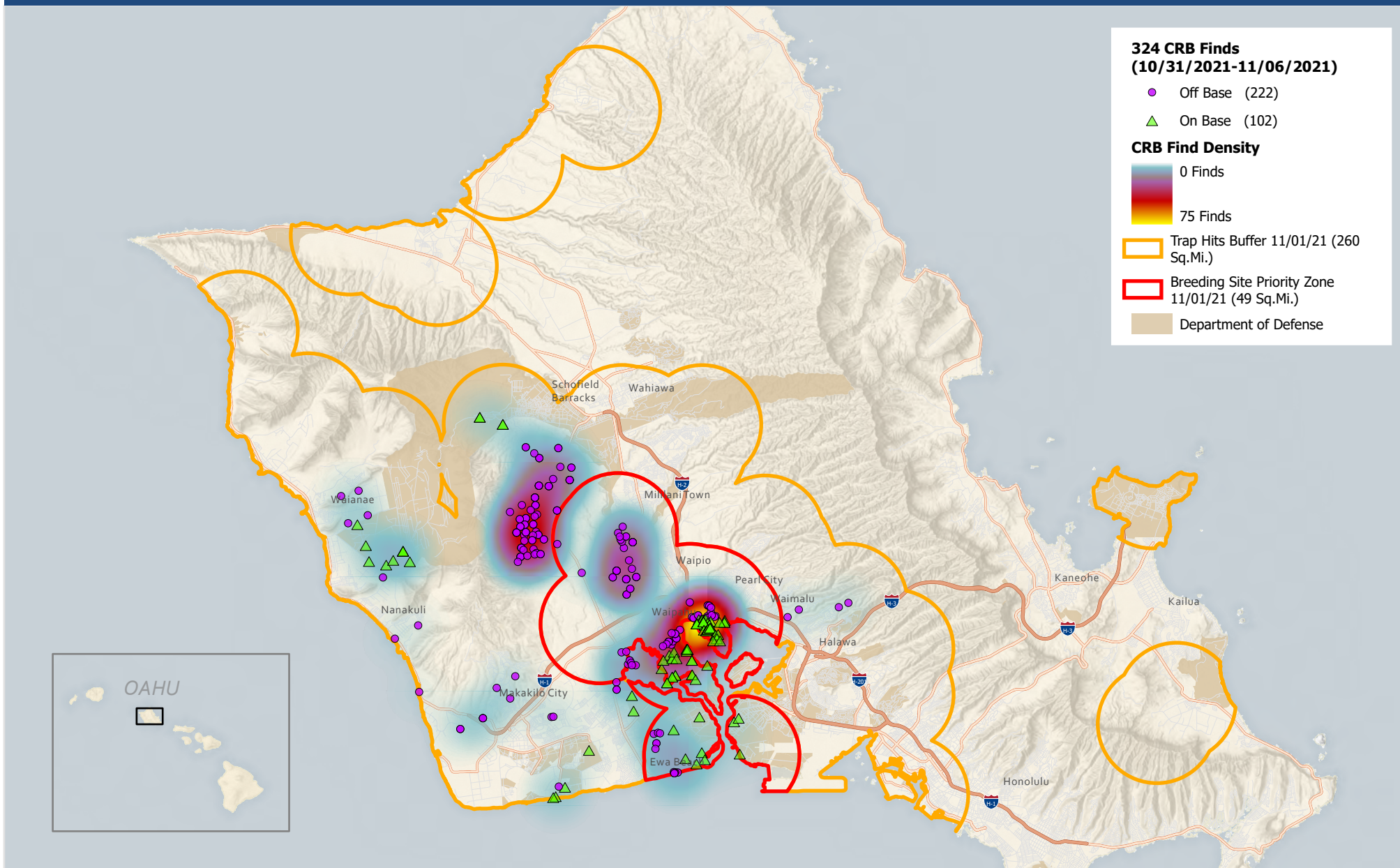
1) movement of any host material for the CRB, including but not limited to palmaceous plants and other trees, mulch, trimmings, fruit and vegetative scraps and decaying stumps, compost, and green waste under a state compliance agreement; 2) commercial and private processing of any CRB host material in approved facilities under a state

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compliance agreement, 3) inter-island movement of any CRB host material under a state compliance agreement; 4) sale and trade of CRB host material under a state compliance agreement; and 5) movement of nursery stock material considered CRB host material under a state compliance agreement.

Any person who violates this interim rule shall be guilty of a misdemeanor and fined not less than \$100. The provisions of HRS section 706-640 notwithstanding, the maximum fine shall be \$10,000. For a second offense committed within five years of a prior conviction, the person or organization shall be fined not less than \$500 and not more than \$25,000.

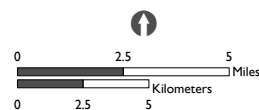
This interim rule shall become effective on Monday, January 3<sup>rd</sup>, 2022 and is valid for no longer than one year from its inception.”



For additional information on finds, traps, and canine data, visit the CRB Reporting Dashboard found [HERE](#)

The numbers for CRB finds and CRB traps represent the number displayed in the map.  
The 2 mile Buffer and the Priority Zone are based on the CRB finds for the last 12 months.

Document Path: C:\Users\mjmeroni\OneDrive - USDA\Documents\GIS\Hawaii\CRB\PPQ CRB HI\PPQ CRB HI Map.aprx Coordinate System: NAD 1983 HARN StatePlane Hawaii 3 FIPS 5103 Feet



Data Source:  
USDA, APHIS, PPQ  
HI Dept. of Agriculture  
ESRI

Date Created:  
11/10/2021

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