

Audit of Hawai'i Department of Agriculture's Plant Quarantine Branch

A Report to the Governor
and the Legislature of
the State of Hawai'i

Report No. 17-05
July 2017

PQ-5A
12/91

HAWAII DEPARTMENT OF AGRICULTURE

QUARANTINE

Destroy High Infestation insects
DO NOT REMOVE until released by
State Quarantine Inspector.



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Pursuant to Article VII, Section 10 of the Hawai'i State Constitution, the Office of the Auditor shall conduct post-audits of the transactions, accounts, programs and performance of all departments, offices and agencies of the State and its political subdivisions.

The Auditor's position was established to help eliminate waste and inefficiency in government, provide the Legislature with a check against the powers of the executive branch, and ensure that public funds are expended according to legislative intent.

Hawai'i Revised Statutes, Chapter 23, gives the Auditor broad powers to examine all books, records, files, papers and documents, and financial affairs of every agency. The Auditor also has the authority to summon people to produce records and answer questions under oath.

Our Mission

To improve government through independent and objective analyses.

We provide independent, objective and meaningful answers to questions about government performance. Our aim is to hold agencies accountable for their policy implementation, program management and expenditure of public funds.

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We conduct performance audits (also called management or operations audits), which examine the efficiency and effectiveness of government programs or agencies, as well as financial audits, which attest to the fairness of financial statements of the State and its agencies.

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We report our findings and recommendations to the Governor and the Legislature to help them make informed decisions.

For more information on the Office of the Auditor, visit our website:
<http://auditor.hawaii.gov>

Foreword

Our audit of Hawai'i Department of Agriculture's Plant Quarantine Branch was performed in response to Act 243, Session Laws of Hawai'i 2016. We conducted the audit pursuant to Article VII, Section 10 of the Hawai'i State Constitution and Section 23-4, Hawai'i Revised Statutes, which require the Auditor to conduct post-audits of the transactions, accounts, programs and performance of all departments, offices and agencies of the State and its political subdivisions.

We express our appreciation to the officials and staff of Hawai'i Department of Agriculture for their cooperation and assistance.

Leslie H. Kondo
State Auditor

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Auditor's Summary

Audit of Hawai'i Department of Agriculture's Plant Quarantine Branch

Report No. 17-05



PHOTO: OFFICE OF THE AUDITOR

What problems did the audit work identify?

IN REPORT NO. 17-05, *Audit of Hawai'i Department of Agriculture's Plant Quarantine Branch (PQB)*, we found that the branch lacks the data gathering and data analysis tools necessary to define and respond to threats posed by invasive species. Other biosecurity agencies, both domestic and foreign, use data-driven risk analysis to continually guide operations, but PQB is unable to collect consistent, meaningful pest interception data or disseminate up-to-date information to its inspectors. As a result, we found that PQB inspection activities vary from inspector to inspector, based on the individual's experience. The little guidance inspectors do receive from the department is outdated or infrequently updated. Other information is communicated, in the words of one PQB inspector, "caveman style"—handed down verbally from one inspector to another.



Little Fire Ant

INVASIVE SPECIES

An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

— *Hawai'i Interagency Biosecurity Plan 2017–2027*

PHOTO: ELI SARNAT

Why did these problems occur?

After more than a decade of development and close to \$4.2 million in new and amended contracts, the Hawai'i Department of Agriculture (HDOA) has failed in its attempt to implement a central integrated database system that can perform its necessary core functions. The branch's current database, Invicta, does not include important taxonomic data, communicate with other PQB databases, or support e-manifesting, a screening process that allows low-risk cargo to be pre-cleared. Because of Invicta's limited capabilities, pest interception data and other information collected by inspectors are not shared throughout the branch or integrated with other data sources to provide the branch with a necessary tool to reassess the risk of entry of invasive species.

Why do these problems matter?

In today's globally interconnected world, the State of Hawai'i must be vigilant, responsive and flexible in guarding against the threat of invasive species. Given the tremendous volume of cargo arriving through Hawai'i's ports, PQB inspectors cannot examine every box of produce, every plant or even every shipping container. Instead, the branch must develop processes and incorporate technology to deploy its inspectors and direct its biosecurity efforts efficiently and effectively. However, without a reliable source of data on which it can base decision-making, HDOA cannot and does not monitor, evaluate, adjust or improve its inspection activities. As a result, PQB inspectors operate in a bubble, inspecting today as they did yesterday. Meanwhile, new and emerging invasive species risks may be going unaddressed.

PEST

As defined by Hawai'i Revised Statutes, Chapter 150A, "any animal, insect, disease agent or other organism in any stage of development that is detrimental or potentially harmful to agriculture, or horticulture, or animal or public health, or natural resources including native biota or has an adverse effect on the environment... ."

— *Hawai'i Interagency Biosecurity Plan 2017–2027*



PHOTO: SHIZU WATANABE

Coconut rhinoceros beetle



Risky Business

WHEN IT COMES to biosecurity, all pests are not equal because their potential impacts are not equal. Some insects are harder to eradicate or trap than others, while others may have longer-term effects. Couple this with the fact that agricultural inspectors can only inspect a fraction of incoming cargo, agencies responsible for biosecurity must carefully pick and choose what they inspect and how they inspect it.

For instance, the USDA's Plant Protection and Quarantine program used to measure the performance of its biosecurity efforts by the number of the insects it intercepted, not the risks it mitigated. According to its Agricultural Quarantine Inspection Monitoring Handbook, "Inspection tables were filled with QIM [quarantine inspection monitoring] pests found, justifying a good job performance. The seriousness

of the threat posed by the pest was not considered. In other words, effort was based on quantity, not the quality of the risk."

Today, USDA puts quality over quantity, using risk analysis to decide what to inspect and how to inspect it. According to the program, the entry potential of the worst pests is decreased when risk is predicted, pathways are tracked, and inspection work reassigned.



PHOTO: J. SANEISHI / HDOA

“BioInsecurity”: Audit of Hawai‘i Department of Agriculture’s Plant Quarantine Branch

The Hawai‘i Department of Agriculture has been unable to implement key elements of its biosecurity program after more than a decade of development.

Perhaps more than any other state, Hawai‘i’s natural environment is its most valuable asset: The Islands’ beaches, forests, mountains, and national parks are the main attraction for the visitors that fuel the economy, and the State’s agricultural lands are vital to the burgeoning diversified agriculture industry. At the same time, this environment is fragile—it is home to about one-third of all federally listed endangered species in the United States—and especially vulnerable to invasive plant and animal species that could threaten our remote home’s unique biodiversity.



BIOSECURITY

“the set of measures taken to manage the risk from invasive species to the economy, environment, and health and lifestyles of the people.”

— *Hawai‘i Interagency
Biosecurity Plan
2017–2027*



A SECURE FUTURE

IN 2016, a Hawai'i Interagency Biosecurity Plan (HIBP) was proposed as a coordinated effort between Hawai'i Department of Agriculture (HDOA), Hawai'i Department of Land and Natural Resources (DLNR), Hawai'i Department of Health (DOH), University of Hawai'i (UH), as well as other state, federal, county, and private agencies to increase biosecurity efforts across the state. The HIBP, designed to be implemented over a period of 10 years, is based on the idea that HDOA alone cannot protect Hawai'i from the constant threat of invasive species. The plan proposes new legislation, systems, and procedures to protect Hawai'i's complex ecosystem.

The Hawai'i Interagency Biosecurity Plan defines *biosecurity* as “the set of measures taken to manage the risk from invasive species to the economy, environment, and health and lifestyles of the people.” To that end, the department says its Plant Quarantine Branch (PQB) reviews the effectiveness of its inspection program at the State's ports of entry by conducting periodic “enhanced inspections” to assess the risks of all imported agricultural commodities. According to HDOA, based on these assessments, PQB inspectors focus their efforts on high-risk commodities, which enhances the effectiveness of their inspections and interception of invasive species.

The department's definition of biosecurity and general description of its program activities reflect a widely accepted, risk-based approach to biosecurity. The approach recognizes a key reality: Agencies cannot inspect everything that crosses the border and must target their limited resources on the types of cargo and other imports in which pests are most likely to be found. The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service, which conducts agriculture quarantine inspections at the nation's airports, ports, and borders, and its counterparts in New Zealand and the United Kingdom, organize their border inspection activities around the data-driven identification, analysis, and mitigation of the risks associated with invasive species. However, in our review of border inspection activities, we found that in practice PQB does not fulfill this approach.

Contrary to HDOA claims, the branch does not assess the risk of invasive species or the effectiveness of its inspection program using up-to-date data. While the branch conducts enhanced inspections, we found that these are infrequent and inconsistent. More importantly, the data collected during these and other inspections are not used to re-assess risk, re-evaluate inspection efforts, or re-focus branch activities.

Central to PQB's inability to implement a risk-based biosecurity program has been its failed database, Invicta, which the branch has spent more than ten years and close to \$4.2 million to develop. Invicta was intended to be the biosecurity program's integrated, digital hub to guide many of the branch's operations. Instead, it is now considered by staff to be unreliable, out of date, and of little use to current operations. Although inspectors are required to enter inspection and interception data into Invicta, this information is not used to assess risk. As a result, rather than continuously passing along and receiving valuable, up-to-date information and analyses, PQB inspectors operate in a bubble, leaving the State of Hawai'i potentially more vulnerable to the influx of invasive species.

Objectives of the Audit

1. Assess the branch's actions to minimize the risk of invasive species being shipped, transported or otherwise imported to the State (i.e., pre-border actions).
2. Assess the branch's actions to detect and quarantine or destroy invasive species that are on or in cargo arriving from the continental United States and other Hawaiian islands (i.e., port-of-entry or border actions).
3. Assess the branch's actions to detect, control and eradicate invasive species that enter the State; promote local agricultural commodity production to reduce shipments of imported commodities; and educate the public on the negative effects of invasive species (i.e., post-border actions).
4. Make recommendations as appropriate.

Scope and Methodology

We conducted interviews with the board chairperson, deputy to the chairperson, branch managers and staff, and legislators. We performed on-site observations of the inspection processes at various ports of entry and warehouses, examined database system functions and reviewed planning, budget, personnel, and other documents relevant to the branch.

Our audit was performed from June 2016 to February 2017, according to generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence we obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

As previously stated, we recognize that the biosecurity plan involves multiple state, federal, and county agencies and partners. However, our audit was limited to the Plant Quarantine Branch's actions as they pertain to biosecurity.

Summary of Findings

1. PQB lacks data gathering and data analysis functions necessary to actively and continuously assess risks from invasive species. Invicta, the branch's central database, does not perform its core functions and is considered by PQB staff to be unreliable and cumbersome to use.
2. PQB lacks the organizational framework necessary to manage and communicate risks from invasive species.

PEST

As defined by Hawai'i Revised Statutes, Chapter 150A, "any animal, insect, disease agent or other organism in any stage of development that is detrimental or potentially harmful to agriculture, or horticulture, or animal or public health, or natural resources including native biota or has an adverse effect on the environment... ."

— *Hawai'i Interagency Biosecurity Plan 2017–2027*



Coconut rhinoceros beetle

PHOTO: SHIZU WATANABE



RISKY BUSINESS

WHEN IT COMES TO biosecurity, all pests are not equal because their potential impacts are not equal. Some insects are harder to eradicate or trap than others, while others may have longer-term effects. Couple this with the fact that agricultural inspectors can only inspect a fraction of incoming cargo, agencies responsible for biosecurity must carefully pick and choose what they inspect and how they inspect it.

For instance, the USDA's Plant Protection and Quarantine program used to measure the performance of its biosecurity efforts by the number of the insects it intercepted, not the risks it mitigated. According to its *Agricultural Quarantine Inspection Monitoring Handbook*, "Inspection tables were filled with QIM [quarantine inspection monitoring] pests found, justifying a good job performance. The seriousness of the threat posed by the pest was not considered. In other words, effort was based on quantity, not the quality of the risk."

Today, USDA puts quality over quantity, using risk analysis to decide what to inspect and how to inspect it. According to the program, the entry potential of the worst pests is decreased when risk is predicted, pathways are tracked, and inspection work reassigned.

PQB lacks data gathering and data analysis functions necessary to actively and continuously assess risks from invasive species.

Acquiring reliable data is imperative for risk analysis; however, for HDOA, this has been a hurdle it has been unable to clear for more than a decade. In 2003, the department began the development of Invicta, an integrated database system that, according to the *Department of Agriculture Annual Report Pursuant to Act 100, SLH 1999*, "would assess risk of entry of invasive species, evaluate invasive species interdiction techniques, and prioritize activities." Invicta was based on a system of the same name that was first used in 1998 to house and report interception data collected in a federally mandated and financed effort to assess the movement of alien species through Maui's Kahului Airport.

As early as 2007, the year Invicta was rolled out statewide, PQB staff identified numerous technical and operational issues, many of which continue to plague the system today. In 2014, HDOA issued a report that identified numerous operational and technical problems and concluded that Invicta was the result of poor planning and software that was neither adaptable nor flexible. The report identified fundamental tasks that Invicta cannot perform, including searching for interception data by specific pest species.

After more than a decade of development and close to \$4.2 million in new and amended contracts, HDOA has failed to implement a central, integrated database that can perform the core functions outlined in the department's 2003 annual report to the Legislature. Specifically, Invicta does not house important taxonomic data, communicate with other branch databases, or perform e-manifesting (see exhibit on page 7). Because of Invicta's limited capabilities, information collected by inspectors is not shared throughout the branch or integrated with other data sources to assess the risk of entry of invasive species.

Prior to the development of Invicta, PQB inspectors and supervisors recorded pest interception data and other information on various different databases as well as on paper. The branch intended that Invicta would eventually eliminate the need for multiple databases and logs. However, today, supervisors continue to record inspection and interception data in a variety of databases, which now includes Invicta, as well as in paper logs. Therefore, data collection remains a "silo-ed" function. Important information could be shared throughout the branch, but still not be accessible to or otherwise shared with all of the inspectors.

Exhibit 1

E-manifesting vs. E-mailing

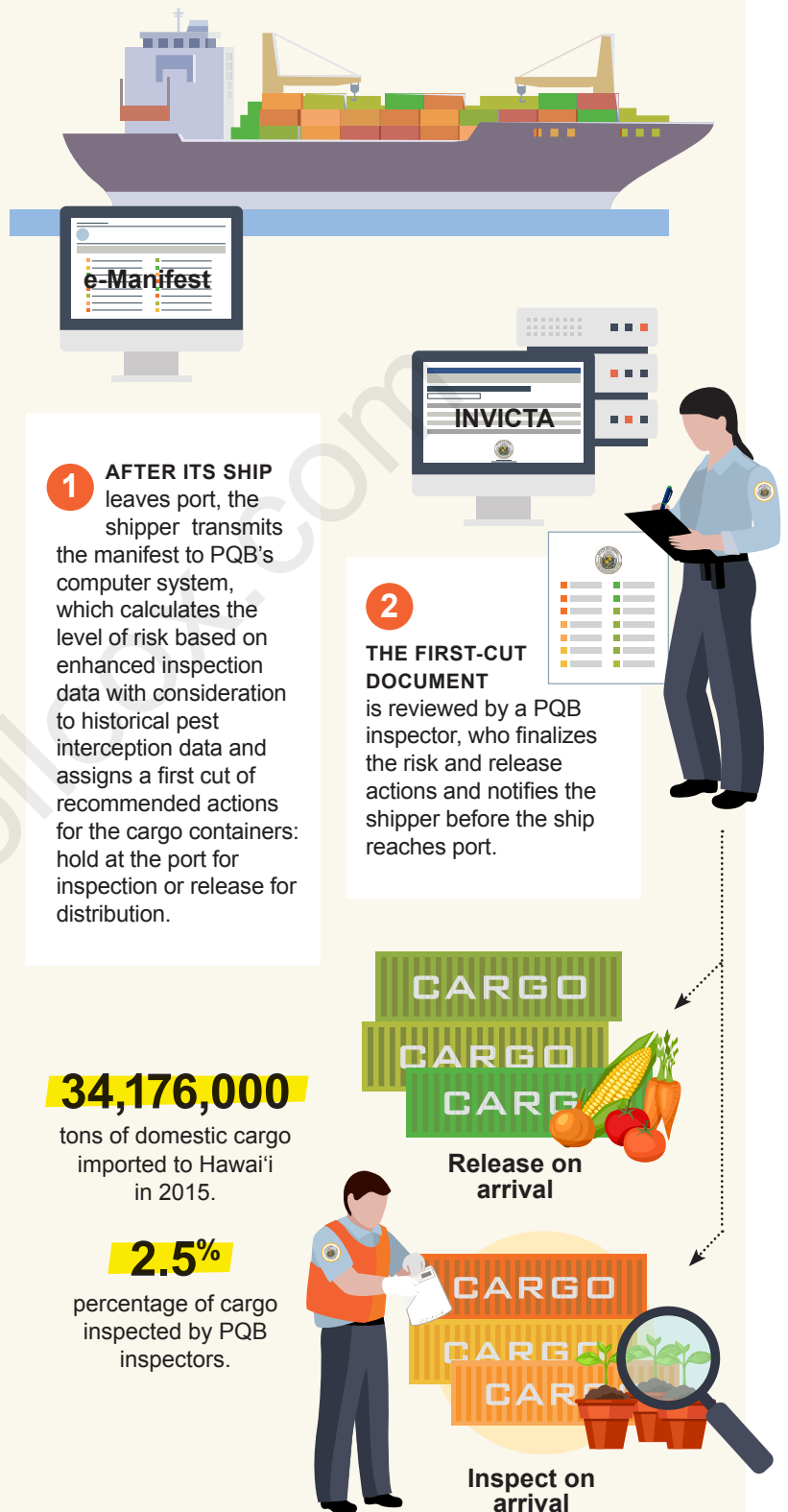
IMPLEMENTED PROPERLY, PQB's proposed **e-manifest system** would allow the branch to screen inbound shipments, schedule inspections of in-coming cargo based on risk, and clear low-risk commodities for immediate distribution. All this would be done before a cargo ship docks or an airliner lands.

According to the department, a fully integrated e-manifest system "ties things together as a whole," which could result in added protections for the State, as well as increased efficiencies for PQB and shippers. For instance, the manifest would be uploaded directly into the branch's database, relieving inspectors of the arduous task of manually inputting cargo inventory. In addition, subsequent release actions and pest interceptions would be added to the electronic file, instead of being recorded on separate, stand-alone databases, as they are now. Most importantly, this aggregated data would be used to calculate future risk assessments, among other uses.

However, if these promised benefits sound too good to be true, they might be. After nearly a decade and \$4.2 million, PQB has been unable to develop an integrated database system that can support e-manifesting or other data-driven functions. The branch is in the early stages of developing a new database in which e-manifesting is a core function and hopes to have the new system up and running in two years.

In the meantime, PQB has developed an e-mail manifest program—sans database or data analysis—in which shippers e-mail their manifest to Honolulu maritime and airport inspectors prior to arrival. The inspectors in turn review the manifests and make risk determinations based on personal experiences and professional judgement, rather than up-to-date data or data analysis. The only electronic component of the system is the manifest's mode of transmission: e-mail. As a result, the current system affords the benefits of pre-clearance to shippers without providing data-backed biosecurity protections to the State.

PQB's proposed e-manifest program



34,176,000

tons of domestic cargo imported to Hawai'i in 2015.

2.5%

percentage of cargo inspected by PQB inspectors.

Source: HDOA, Office of the Auditor

Data collected during enhanced inspections are not used to assess risk of invasive species.

One of the core activities of PQB's risk-based approach to biosecurity is its enhanced inspection program, which comprises periodic, intensified inspections designed to help identify which commodities pose a high risk of introducing invasive pests and diseases into Hawai'i. These inspection "blitzes" are conducted over a one- to two-week period at a selected port of entry by a team of inspectors who examine a higher than normal percentage of incoming cargo. The information gleaned from these inspections is entered into Invicta, and for a time, the prior PQB manager used this data to generate risk ratings that estimated the likelihood that a particular commodity was a pathway for pests.

Risk factors included the number of pests found on a commodity, whether that pest is known to occur in Hawai'i, and whether the pest was destroyed or treated. Together, these factors contributed to commodity risk ratings that identified high- and low-risk commodities. These determinations were not made by Invicta alone. The prior PQB manager worked with a contractor, who did a quantitative analysis of Invicta-outputted data. The prior PQB manager would also make adjustments to the ratings based on her professional judgement. However, PQB ceased analyzing commodity risk levels in 2013, when the prior PQB manager was assigned to other duties in the branch. The Top 10 High Risk Commodities ratings are still available to inspectors for reference, but staff we interviewed consider them unreliable and do not use them.

Baggage Claim: A High Visibility Yet Low-Risk Activity?

FROM SEPTEMBER 2000 through July 2001, PQB conducted the Kahului Airport Risk Assessment, a federally financed effort to evaluate the movement of alien species from the mainland and foreign areas to Maui through Kahului Airport. The risk assessment involved seven three- to four-week inspection "blitzes," which included intensive inspections of checked and carry-on baggage by inspectors and detector dog teams, inspections of aircraft cabins and

cargo holds of mainland flights, and 100 percent inspections of agricultural products shipped by air cargo.

PQB reported that agricultural cargo posed a high risk of importing alien species to Maui. The branch also found that carry-on bags, checked baggage, and the airplane cabin itself were low-risk pathways. Stated differently, the blitzes revealed that very few alien pests were coming into

Maui through carry-on bags and checked baggage. The report also noted that passengers frequently failed to report agricultural products on agricultural declaration forms; however, the commodities they brought into the State were generally items that posed low risk for the importation of alien species. Fruit was the most common undeclared item, typically brought onboard for consumption during flight.

Exhibit 2

Following the Form

Hawai'i law requires all individuals arriving in the State from the Mainland to complete a Department of Agriculture form, declaring agricultural items the traveler is bringing to Hawai'i. Any person who defaces the Plants and Animals Declaration form, gives false information, or fails to declare restricted items may be guilty of a misdemeanor, which could be punishable by a maximum penalty of \$25,000 and/or up to one year imprisonment. Intentionally smuggling a snake or other prohibited or restricted items could result in a maximum penalty of \$200,000 and/or imprisonment of up to five years.

However, in practice, the forms seem to provide limited value, if any at all, to the State's biosecurity activities. The forms, which generally are distributed and collected in-flight by the flight crew, are delivered to the PQB inspectors upon arrival by airline personnel and quickly reviewed for declarations of plants or live animals.

At Daniel K. Inouye International Airport, we observed the inspection duties of one of the three inspectors assigned to the baggage claim terminal. During our visit, the inspector identified only one form on which an incoming passenger had declared items in his or her possession. When there are declared items, the inspector said that she attempts to locate the passenger(s) in the baggage claim area using the contact information on the form. However, we did not observe the inspector identify the passenger who had declared items in the baggage claim area or otherwise make contact with the passenger. She said that she averages about one interception per day from incoming passengers.

With the State's visitor assistance desk vacant at the time, we observed two inspectors spending most of their time helping arriving passengers find their way through the airport and providing directions to nearby hotels.

SPANISH: Debe completar este formulario antes de descender del avión. Si no le es posible hacerlo en inglés, sírvase pedirle al auxiliar de vuelo un formulario en español.
TAGALOG: Ang pormalayong ita ay dapat sagutin bago mag- "landig" ang pasahero. Kung hindi niyo madama ang pormalayong ita, mangyari po lamang na humingi sa "flight attendant" na itang pormalayro sa wikang tagalog.
JAPANESE: 降機なさる前にこの用紙を必ず記入し終えて下さい。この用紙が認めない場合は、乗務員に日本語の用紙を買って下さい。
KOREAN: 착륙하기전에 이 양식에 반드시 기입하셔야 합니다. 이 양식을 읽지 못하면 승무원에게 한국어 양식을 요청하십시오.
CHINESE: 请在下机前填写完毕这份表格。如果您不懂此表, 请向乘务员索取一份中文表格。

STATE OF HAWAII
Department of Agriculture
PLANTS AND ANIMALS DECLARATION FORM
MANDATORY DECLARATION
FOR ALL PASSENGERS, OFFICERS, AND CREW MEMBERS

ALOHA and Welcome to Hawai'i. Many plants and animals from elsewhere in the world can be harmful to our unique environment, agriculture, and communities. Please help to protect Hawai'i by not bringing harmful pests into our state.

YOU ARE REQUIRED BY STATE LAW TO FILL OUT THIS AGRICULTURAL DECLARATION FORM. Any person who defaces this declaration form, gives false information, or fails to declare, prohibited or restricted articles in their possession, including baggage, or fails to declare these items on cargo manifests is in violation of Chapter 150A, Hawaii Revised Statutes, and may be guilty of a misdemeanor punishable, in certain instances, by a maximum penalty of \$25,000 and/or up to one year imprisonment. Intentionally smuggling a snake or other prohibited or restricted article into Hawai'i is, in certain circumstances, a Class C felony punishable by a maximum penalty of **\$200,000 and/or up to five years imprisonment.**

One adult member of a family may complete this declaration for other family members.

A) I HAVE THE FOLLOWING ITEMS IN MY POSSESSION AND/OR BAGGAGE:

| | |
|---|--|
| <input type="checkbox"/> Fresh Fruit & Vegetables | <input type="checkbox"/> Soil, Growing Media, Sand, etc. |
| <input type="checkbox"/> Cut Flowers & Foliage | <input type="checkbox"/> Live Seafood (lobsters, clams, oysters, etc.) |
| <input type="checkbox"/> Rooted Plants & Plant Cuttings, or Algae | <input type="checkbox"/> Cultures of Bacteria, Fungi, Viruses, or Protozoa |
| <input type="checkbox"/> Raw or Propagative Seeds or Bulbs | <input type="checkbox"/> Insects, Live Fishes, Amphibians, etc. |

Please submit all of the above-marked items in your possession and/or baggage for inspection to a Hawai'i Plant Quarantine Inspector in the baggage claims area. The cargo agent will submit cargo for inspection on your behalf.

B) I HAVE THE FOLLOWING ITEMS IN MY POSSESSION AND/OR BAGGAGE:

| | |
|--------------------------------|--|
| <input type="checkbox"/> Dogs | <input type="checkbox"/> Reptiles (Turtles, Lizards, Snakes, etc.) |
| <input type="checkbox"/> Cats | <input type="checkbox"/> Other Animals |
| <input type="checkbox"/> Birds | |

If you are travelling with any LIVE ANIMALS, you must NOTIFY A CABIN ATTENDANT PRIOR TO DEPLANING. All live animals must be turned in to the Honolulu Airport Animal Quarantine Holding Facility by the transportation carrier, not the passenger, upon arrival.

NONE OF THE ABOVE

PLEASE LIST THE SPECIFIC TYPES/NAMES OF THE ITEMS MARKED ABOVE.
(Items meeting State requirements will be inspected and released.)

1 _____ 3 _____
2 _____ 4 _____

Origin (State or Country) of above items _____

Full Name (Print) _____
Home Address _____
City _____ State _____ Zip _____
Hawai'i Address or Name of Hotel/Lodging _____
Island _____ Phone No. _____ No. in Party _____
Name of Airline/Ship _____ Flight No. _____ Date of Arrival _____

Signature _____ Date _____ 24661

HTA Form Rev. 04-23-2013 Printed in U.S.A. See Reverse Side

Source: HDOA

... in practice, the forms seem to provide limited value, if any at all, to the State's biosecurity activities.

Invicta is still capable of generating inspection and interception reports like “Top 10 High Risk Commodities” that could be used to determine commodity risk levels. But the prior PQB manager did not develop clear criteria for defining what constitutes high, moderate, and low risk commodities and did not document how she applied that criteria to the enhanced inspection data to determine the risk level of each commodity before she was given a special assignment. As a result, the prior branch manager’s risk rating calculations are difficult to replicate.

The department has since re-evaluated its commodity risk factors and now says that the previous risk ratings were products of an arbitrary system, which the former Plant Industry Division administrator said was “not science-based.” Management is working on a new risk calculation, which takes additional factors into consideration, including the likelihood of a pest establishing itself in Hawai'i. According to PQB’s acting manager, the branch is not currently equipped to conduct these revised pest risk analyses. Doing so would require a “modern” data collection system that is integrated with an e-manifest program.¹ In addition, PQB’s acting manager said that he would need additional entomologists to analyze insect interception data to properly assess risk. He hypothesized that acquiring such staff would require a branch or division reorganization.

The branch did not conduct any enhanced inspections in FY2015 and could not confirm if it did any in FY2011.

PQB has not conducted enhanced inspections on a regular basis since 2012.

According to HDOA, it assesses the effectiveness of its inspection program by conducting “periodic” enhanced inspections at the State’s ports of entry. To validate this claim, we reviewed PQB’s schedule of enhanced inspections from FY2011 to FY2016 and found that the inspections at the State’s ten ports (airports and harbors) have not been conducted on a regular basis since FY2012. For example, the branch did not conduct *any* enhanced inspections in FY2015 and could not confirm if it did any in FY2011. It did conduct enhanced inspections at five of the ten ports in FY2013 and at just three ports in FY2014. FY2012 was the only year that the branch held enhanced inspections at all of its ports.

¹ Invicta was originally planned to support an e-manifest function; however, e-manifesting was eventually developed for only two vendors. According to Invicta’s contractor, a third and final contract with the State for the development of the database system included enhancements that would enable Invicta to provide e-manifesting to all shippers and importers to Hawai'i. The State and the contractor never came to terms on the contract, and Invicta’s e-manifest system was left unfinished.

Recent enhanced inspections were held on Maui, in Kona, and in Līhu‘e in July, August, and September 2015 (FY2016), respectively. The last known enhanced inspections at the two largest ports in the State—Daniel K. Inouye International Airport and Honolulu Harbor—were conducted in January 2013. (We note that, according to the department, approximately 80 percent of imported cargo flows through O‘ahu’s harbor and airport.) According to the inspector who was in charge of scheduling enhanced inspections for about four years until last September, enhanced inspections are scheduled when staff are available. The frequency—or lack thereof—of enhanced inspections during FY2009 to FY2013 was impacted by the shortage of inspectors caused by a reduction in force in 2009.

Exhibit 3

Plant Quarantine Branch Enhanced Inspection Schedule FY2011–FY2015

| | FY2011 | FY2012 | FY2013 | FY2014 | FY2015 | FY2016 |
|---|---------|---------------|-----------------------|-----------|--------|----------------|
| HNL – Daniel K. Inouye International Airport | unknown | January, June | July, August, January | none | none | none scheduled |
| HIL – Port of Hilo* | unknown | August | none | none | none | none scheduled |
| ITO – Hilo International Airport | unknown | May, August | unknown | unknown | none | none scheduled |
| KOA – Kona International Airport | unknown | Feb-March | August | unknown | none | August |
| KWE- Kona Maritime | unknown | Feb-March | August | August | none | none scheduled |
| LIH – Līhu‘e Airport | unknown | March | unknown | September | none | September |
| MUA – Maui Maritime | unknown | April | unknown | unknown | none | none scheduled |
| NAW-Kauai Maritime, Nāwiliwili Harbor | unknown | March | unknown | September | none | none scheduled |
| OGG – Kahului Airport | unknown | July | September | unknown | none | July |
| O‘ahu PIO – O‘ahu Maritime | unknown | January, June | July, August, January | unknown | none | none scheduled |

* Shipments from the Mainland arrive at the Port of Hilo between 12 a.m.–4 a.m.

Source: HDOA

Data does not support the department's claim that inspectors are focusing their efforts on high-risk commodities.

According to the department, PQB insect interceptions fell from 2,475 in FY2013 to 1,595 in FY2015. The department attributed the decline to more targeted border inspections, which concentrate on high-risk rather than low-risk commodities. But our review found little evidence to support this claim.

HDOA also claims that in 2014, PQB shifted the focus of its inspections from produce, the traditional focal point of PQB inspection activities, to propagated plants. The department claimed to have made this shift in response to the publication of *Pathway Analysis and Dissemination of New Insect and Plant Disease Records in Hawai'i*, a department study that found that live plants were the main pathways used by recently established colonizing insects. According to the study, of the alien terrestrial insect

These low-risk commodities are inspected less frequently. This has allowed the branch to be more effective in its inspections and interceptions of invasive species.

“These numbers are not a failure but actually a testament to the effectiveness of targeting inspections to high risk commodities.”

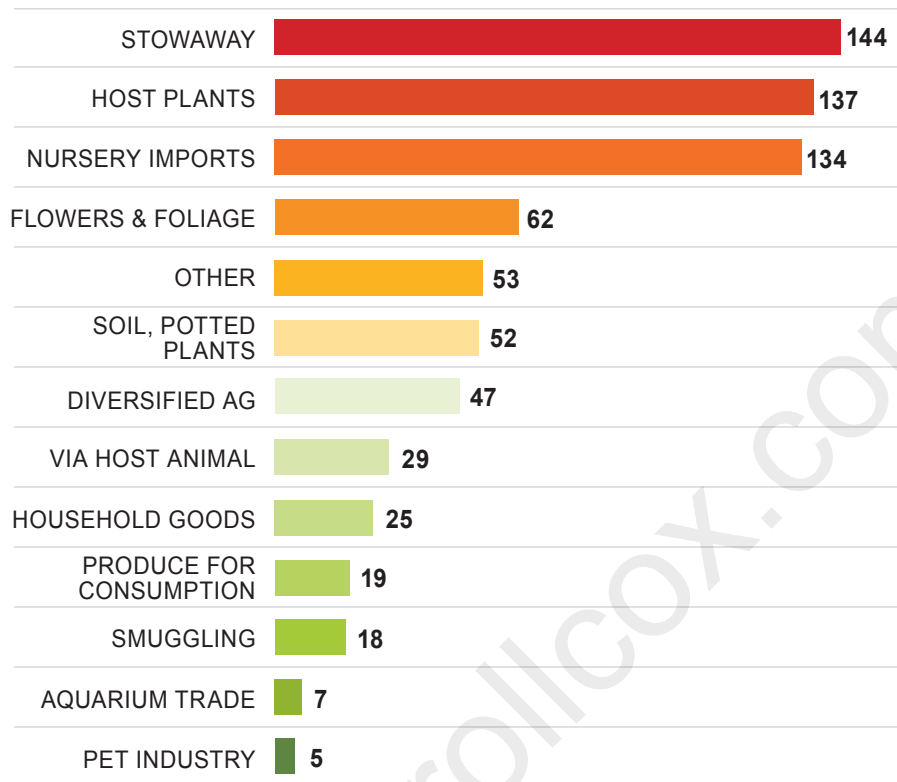
— February 4, 2016, testimony of Chairperson, Board of Agriculture before the House Committee on Agriculture

species that established populations in Hawai'i between 2002 and 2013, only 19 species used produce imported for consumption as a transportation pathway. In contrast, 137 species of insects used host plants and 134 species used nursery imports as pathways to colonization. In addition, soil and potted plants (a combined category) and diversified agriculture products were pathways for 52 and 47 species of insects, respectively.

The study also found that plant material and stowaways accounted for about 75 percent of the risk of introducing invasive pests to the State. The data implicate the plant nursery and floral industries as major sources of alien species imports. The study pointed out that the risk of insect introduction and establishment is a function of the number of individuals introduced, their physiological condition, the degree to which their environmental requirements match the newly invaded area, and the condition of the imported material. The study pointed out that these conditions are met by plant nursery imports.

Exhibit 4

Insects Use a Variety of Pathways to Establish Themselves in Hawai'i



Source: HDOA, 2002-2013

According to the acting PQB manager, the branch's statistics on the overall number of inspections conducted by inspection staff are not accurate or suitable for analysis. Consequently, to test the department's claims that the decrease in the number of insect interceptions reflects a shift to inspections of high-risk commodities, we reviewed FY2014–FY2016 insect interception data from Invicta, along with data collected by PQB's entomologist. We reasoned that the branch's recent effort to target high-risk pathways could be reflected in an increase in the rate of insect interceptions on plants. However, we found no evidence of this relationship and little correlation between the decreased number of insect interceptions and PQB's targeting of high-risk commodities (plants).

In FY2014, PQB made 1,748 insect interceptions, of which 282, or about 16 percent, were found on plants. The following year, the branch reported 686 insect interceptions, of which 129, or 19 percent, were found on plants. However, in FY2016, the percentage of insect interceptions on plants fell to just 8 percent of the 800 insect interceptions made that year.



PATHWAY

The means by which an invasive species is transported from one location to another. Movement of species can be via natural pathways, which include wind, water, or attachment to animals, or via pathways enhanced or created by human activity.

— *Hawai'i Interagency Biosecurity Plan 2017–2027*

Meanwhile, the percentage of insect interceptions made on fruits and vegetables, which are low-risk pathways, remained consistently high throughout the three-year period: 78 percent (1,358) of the 1,748 insect interceptions in FY2014, 73 percent (504) of the 686 interceptions in FY2015, and 73 percent (584) of the 800 insect interceptions in FY2016. Insect interceptions on “Other” pathways comprised 6 percent (108) of interceptions in FY2014, 8 percent (53) in FY2015, and jumped to 19 percent (149) in FY2016.

Exhibit 5

Little Change in Interceptions

Even though the HDOA says it's been focusing more on high-risk categories, including imported plants, the percentage of those high-risk interceptions has remained relatively the same over a three-year period, while fruit/vegetable interceptions, a low-risk category, have remained steady as well, the vast majority of interceptions.



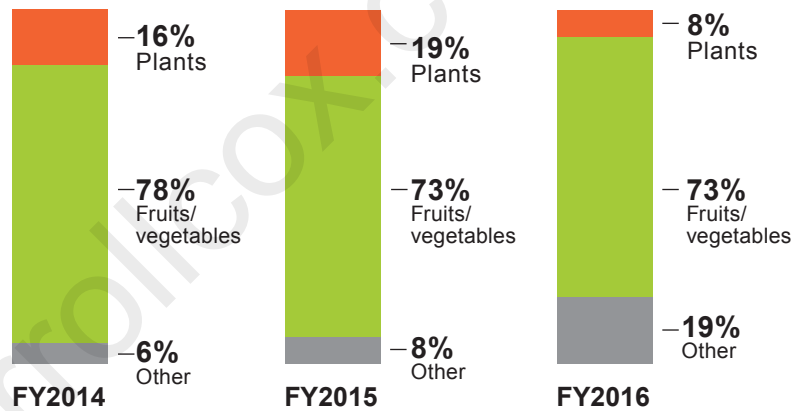
Little Fire Ant

INVASIVE SPECIES

An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

— Hawai'i Interagency Biosecurity Plan 2017–2027

PHOTO: ELI SARNAT



Source: HDOA, 2014-2016

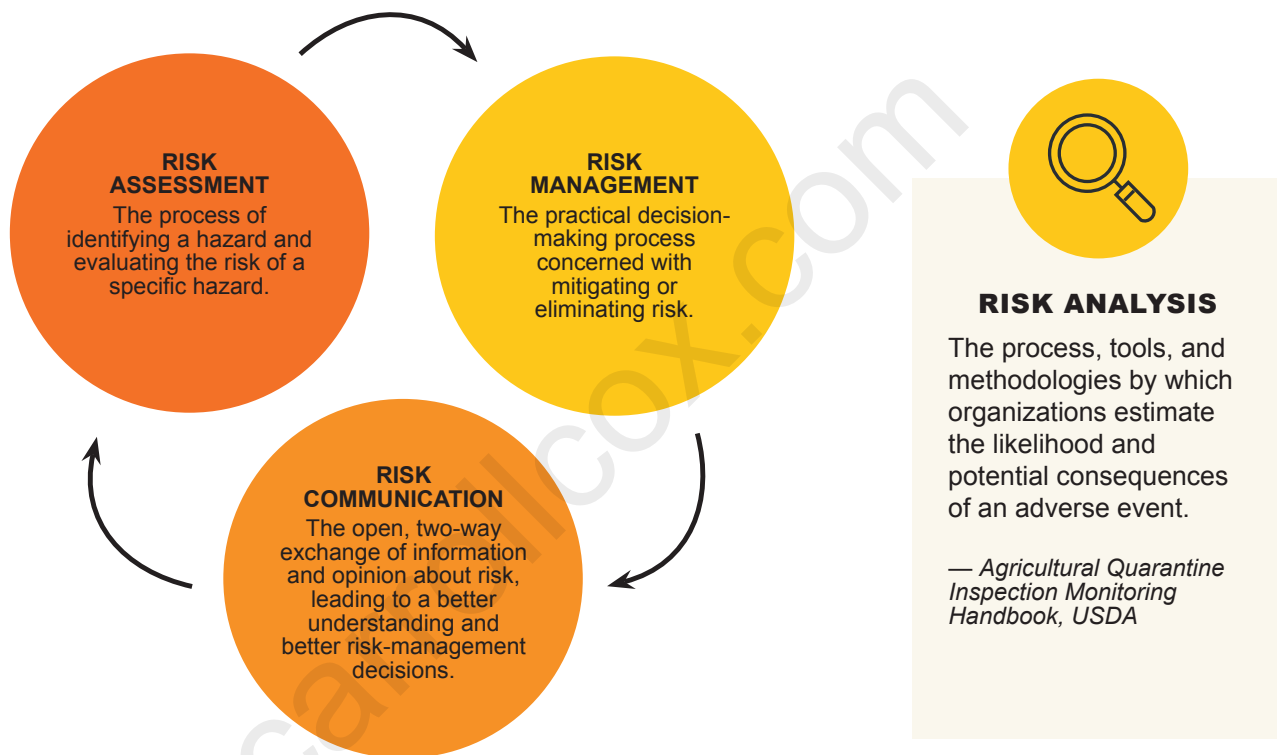
PQB lacks the organizational framework necessary to manage and communicate risks from invasive species.

According to the USDA, its Animal and Plant Health Inspection Service used to view the establishment of all pests as equally unacceptable. As a result, it responded to risk issues on a “historical knowledge basis,” which means they made judgments and decisions about the potential threat posed by various commodities through observation and experience. However, since some pests may be harder to eradicate than others, and some may be more difficult to trap or have more long-term effects, the USDA now uses risk analysis to give greater specificity to the relative threat levels.

To facilitate this type of decision-making, the USDA uses a risk analysis process to define and respond to threats. The process, which provides an organizational framework for its inspection activities, comprises risk assessment, risk management, and risk communication. Risk assessment estimates the probability and magnitude of the risk and informs the development and selection of options for mitigation.

Exhibit 6

Model of a Risk Analysis Process



Source: *Agricultural Quarantine Inspection Monitoring Handbook, USDA*

Risk management is the practical decision-making process concerned with mitigating or eliminating risk. In turn, information and opinion about risk is communicated with stakeholders to ensure program goals are met and results improve. This biosecurity continuum is a constant flow of information, assessment, and re-adjustment of activities, a type of feedback loop.

As we noted earlier, HDOA defines biosecurity as the set of measures taken to manage risk from invasive species, but PQB does not have a reliable source of data from which it can analyze risk. Consequently, in our review of the branch’s port inspection operations, we found little evidence of the other components of a risk analysis process: risk

management or risk communication. For example, PQB provides little guidance to its inspectors regarding the prioritization of pest and invasive species risk. In addition, the department does not monitor, evaluate, adjust or improve inspection activities based on current data. Although inspectors are required to enter inspection and interception data into Invicta, this information is not used to assess risk. As a result, rather than being a part of a feedback loop, passing along and receiving valuable, up-to-date information, PQB inspectors operate in a bubble.

PQB inspection activities vary from inspector to inspector, based on the individual's experience as well as the word-of-mouth suggestions of others.

During our audit, we observed border inspection activities at Honolulu Harbor, Daniel K. Inouye International Airport, two express mail facilities, and an O'ahu retail site, as well as at Maui's Kahului Airport, and two express mail facilities on that island. On a visit to an O'ahu retail warehouse location, we observed two inspectors examining the contents of a vegetable shipment. As produce was being off-loaded, one inspector visually scanned the shipping invoice to determine what commodities to inspect. He looked for prohibited items on the shipping invoice, such as radishes, corn, and passion fruit. He told us that his decisions on which commodities to inspect were based on his 13 years of experience and word-of-mouth suggestions from other inspectors. The inspector said each PQB inspector conducts inspections in that inspector's own particular way.

We also observed the other inspector on site, who had two years of on-the-job experience, inspect lettuce. She told us she was sampling 5 percent of each commodity type according to their place of origin; however, despite her stated methodology, her selection of items for inspection was based on personal judgement. At the Honolulu Harbor and Daniel K. Inouye International Airport ports we visited, we observed inspection methods that varied by individual. We were repeatedly told of the reliance on personal experience and word-of-mouth advice.

The little guidance inspectors receive from the department is outdated or infrequently updated.

According to the port supervisors we interviewed, inspectors develop an understanding of which commodities are more likely to be harboring pests based on their day-to-day experience and information shared by other inspectors. The only official guidance inspectors receive from the department consists of PQB's manual of standard operating procedures,

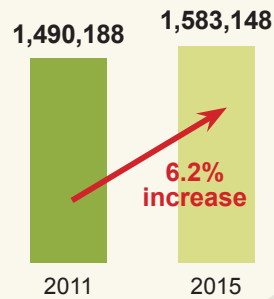
Exhibit 7

Population and Imports on the Rise

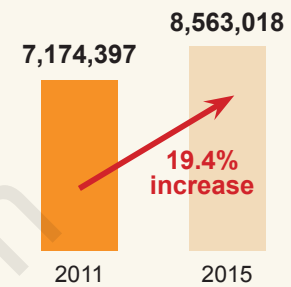
HAWAII'S GROWING RELIANCE on imports highlights the importance of the Plant Quarantine Branch. Estimates of how much food Hawaii imports vary, but the main point is undeniable: Hawaii does not come close to feeding itself with food produced in the Islands. In 2007, the Rocky Mountain Institute¹ estimated that just 15 percent of what Hawaii spends on food is produced locally, while a Hawaii Economic Development Task Force Report to the Legislature² in 2011 estimated 90 percent of beef, 67 percent of fresh vegetables, 65 percent of fruits and more than 80 percent of milk are imported. With those imports come the risk of invasive species.

The increasing level of imports is likely a result of the State's growing population, which increased 6.2 percent between 2011 and 2015. In addition, visitor arrivals jumped 19.4 percent during that same period, adding to the demand for food and other imported goods. In our review of food and farm product domestic cargo shipments data for Honolulu Harbor, we found a 5.5 percent increase between 2011 and 2014. Air cargo to Daniel K. Inouye International Airport saw an increase of 19.2 percent between 2011 and 2015.

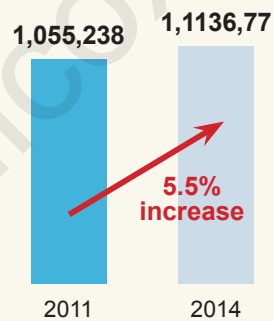
Hawaii De Facto Population³ – residents, military, visitors (July 1 each year)



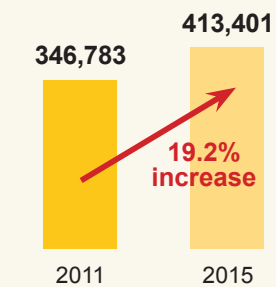
Visitor Arrivals⁴



Food and Farm Product Shipments to Honolulu Harbor (tons)⁵



Air Cargo to Daniel K. Inouye International Airport (tons)⁶



¹ Rocky Mountain Institute Island of Hawaii Whole System Project Phase I Report (March 2007), Figure 6, page 23 http://kohalacenter.org/pdf/hi_wsp_2.pdf

² Hawaii Economic Development Task Force, Page 5, <http://files.hawaii.gov/dbedt/annuals/2011/2011-hedtf-act73.pdf>.

³ DBEDT State Data Book Table 1.09 – De Facto Population, <http://files.hawaii.gov/dbedt/economic/databook/2015-individual/01/010915.xls>

⁴ DBEDT State Data Book Table 7.03 – Visitor Arrivals and Average Daily Visitor Census, <http://files.hawaii.gov/dbedt/economic/databook/2015-individual/07/070315.xls>

⁵ Waterborne Commerce – Statistics for the Port of Honolulu, Food and Farm Products Domestic Receipts, Sheet 18 (Domestic Receipts for row 60) http://www.navigationdatacenter.us/wcsc/webpub14/Part4_Ports_tonsbyTT_Dr_Yr_comm2014-2010.htm

⁶ DOT Airports Planning Office, Airport Activity Statistics by Calendar Year, Annual Air Traffic Statistics – Honolulu International Airport <http://hidot.hawaii.gov/airports/files/2013/01/annual-air-traffic-statistics.pdf>

which the branch has not fully updated since 1989, and the Hawai'i Revised Statutes that are relevant to the job.

Most other guidance is provided during the initial training given to newly hired inspectors, which largely entails shadowing senior inspectors and observing their practices. According to one port supervisor, all learning is done “caveman style”: Information is “handed down from one generation to the next.”

According to one port supervisor, all learning is done “caveman style”: Information is “handed down from one generation to the next.”

We also found that the department has not established policies and procedures to guide enhanced inspection activities. According to the acting branch manager, enhanced inspections are similar to regular inspections, so no additional guidance is necessary. The inspector who was in charge of scheduling enhanced inspections for about four years until last September 2016, told us that staff learn how to conduct enhanced inspections by observing and working with the Maui PQB staff, which has a longer history of performing these inspections. He himself learned how to do enhanced inspections in that manner.

Lack of monitoring of port inspection activities by department

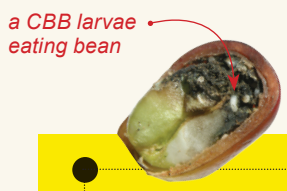
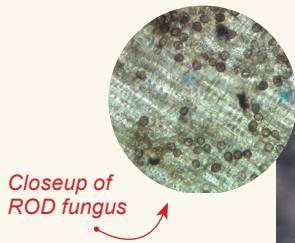
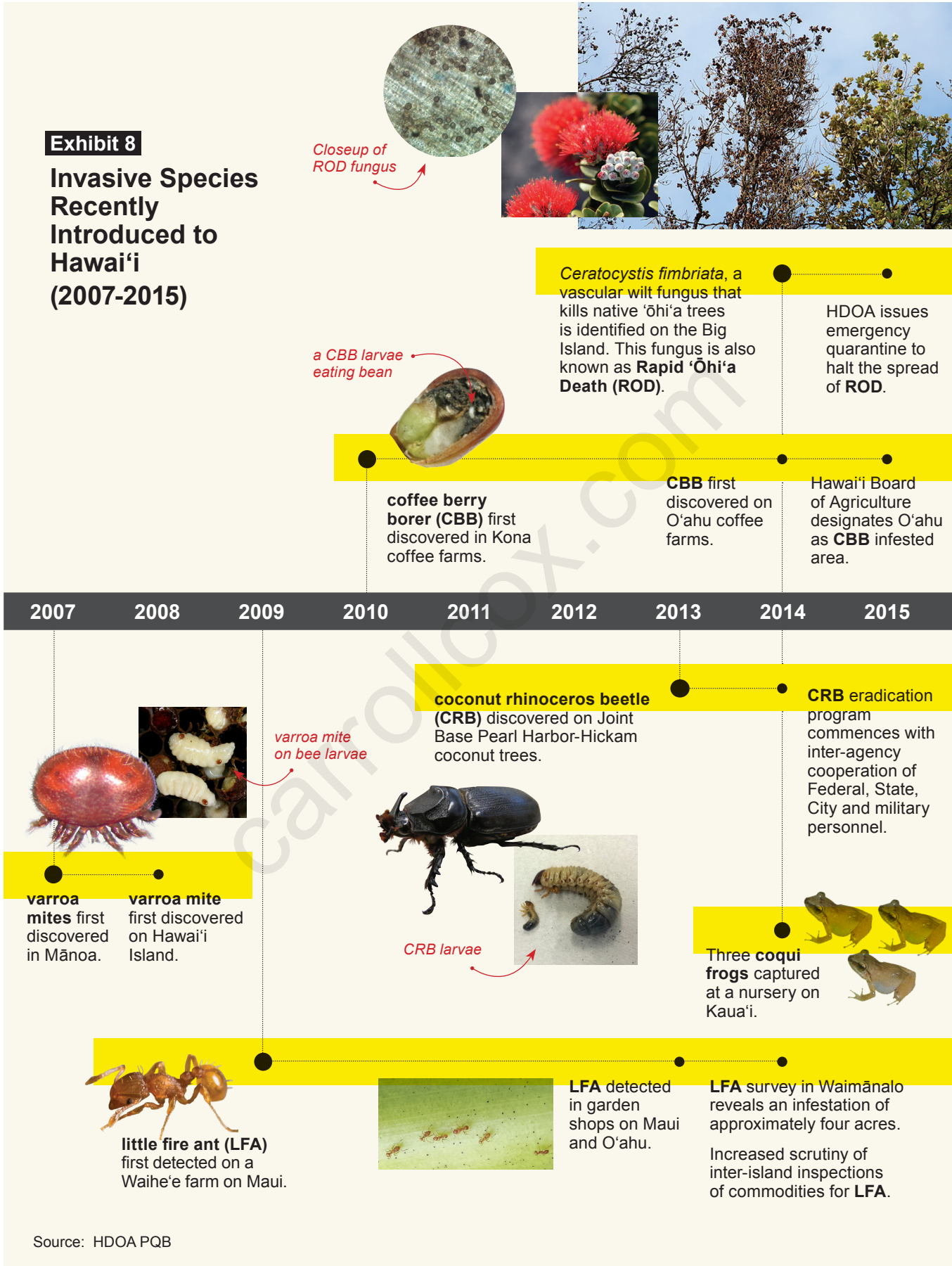
Port supervisors are required to submit annual port activity reports to provide information to the Legislature; however, management does not provide a standard template or instruction on what to include in the port supervisors' annual reports. In addition, an acting port supervisor noted that management has yet to provide feedback on whether his reports are sufficient.

We reviewed sample reports from Honolulu Harbor, Daniel K. Inouye International Airport, Kahului Harbor, and Kahului Airport and found that the reports mostly contained metrics of general port activity. For instance, all the reports we reviewed contained totals for the following:

- Imports (i.e., domestic arrivals, passenger arrivals, disposition of inspected items, different types of interceptions, import permits issued);
- Interisland activities (i.e., ship/barge arrivals and departures, aircraft/flight arrivals and departures, baggage and cargo inspections, disposition of inspected items);
- Fee revenues; and
- Citations issued.

Exhibit 8

Invasive Species Recently Introduced to Hawai'i (2007-2015)



Ceratocystis fimbriata, a vascular wilt fungus that kills native 'ōhi'a trees is identified on the Big Island. This fungus is also known as Rapid 'Ōhi'a Death (ROD).

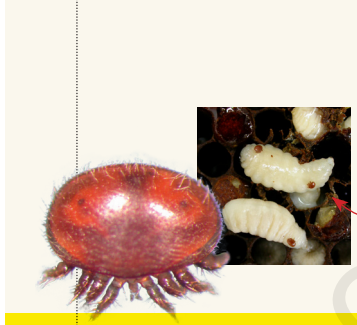
HDOA issues emergency quarantine to halt the spread of ROD.

coffee berry borer (CBB) first discovered in Kona coffee farms.

CBB first discovered on O'ahu coffee farms.

Hawai'i Board of Agriculture designates O'ahu as CBB infested area.

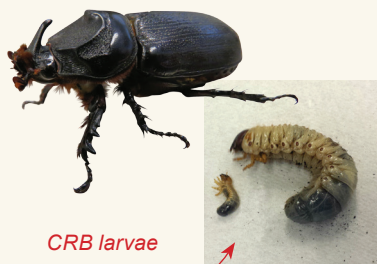
2007 2008 2009 2010 2011 2012 2013 2014 2015



varroa mites first discovered in Mānoa.

varroa mite first discovered on Hawai'i Island.

varroa mite on bee larvae



coconut rhinoceros beetle (CRB) discovered on Joint Base Pearl Harbor-Hickam coconut trees.

CRB eradication program commences with inter-agency cooperation of Federal, State, City and military personnel.



little fire ant (LFA) first detected on a Waihe'e farm on Maui.



LFA detected in garden shops on Maui and O'ahu.

LFA survey in Waimānalo reveals an infestation of approximately four acres.

Increased scrutiny of inter-island inspections of commodities for LFA.

Source: HDOA PQB

PHOTOS: VARROA MITES: WALTER NAGAMINE / HDOA; LITTLE FIRE ANT: ELI SARNAT, HDOA STAFF; COFFEE BERRY BORER: HDOA STAFF; COCONUT RHINOCEROS BEETLE: SHIZU WATANABE; RAPID OHIA DEATH: LISA KEITH; THINKSTOCK.COM; JB FRIDAY; COQUI FROG: J. SANEISHI / HDOA

Other information included in the reports varied from port to port. Some of the information did relate to various aspects of pathway inspections and invasive species interceptions. For example, Daniel K. Inouye International Airport reported on Little Fire Ant rejections on inter-island cargo, amnesty bin deposits, and Brown Tree Snake activities. Maui's ports reported on plants and produce inspected, treated, and certified; phytosanitary certificates issued; and nursery inspections and certifications, among other activities. However, none of the reports specifically addressed the assessment or mitigation of invasive species risk.

Port supervisors previously were required to submit weekly reports highlighting interceptions and import violations, as well as counts of items destroyed, quarantined, or refused entry to the PQB manager, until a former acting PQB manager ended that requirement. One port supervisor said he does not require any reports from his inspectors on a regular basis, since management does not require such reporting from him. But another supervisor told us he uses the information for Invicta-generated reports and a manual log to track pests and notify his inspectors of what to look out for.

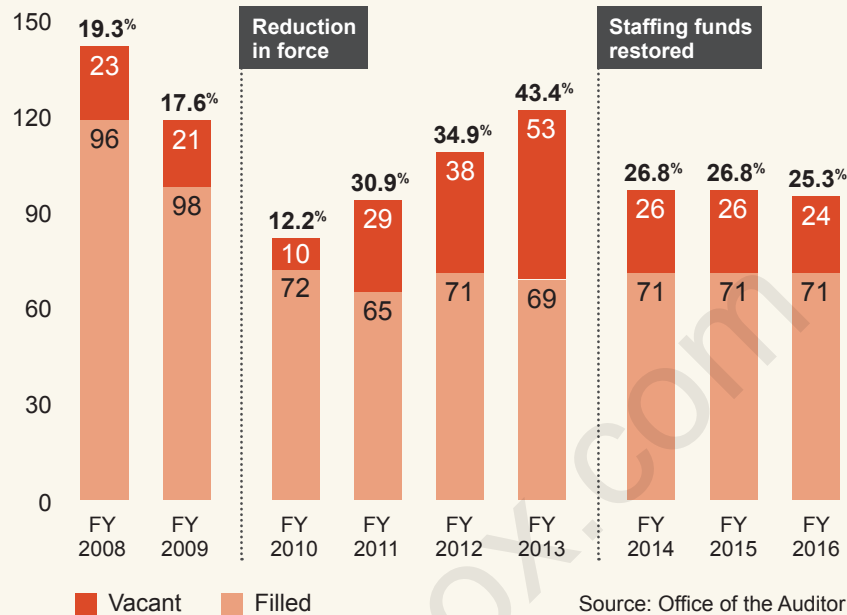
Limited communication between department and inspection staff

We also found that PQB has few formal means of communicating information to staff. The branch does not distribute commodity risk ratings to the ports and considers its own risk ratings outdated and unreliable in any case. In addition, a list of commonly intercepted pests is no longer distributed. Neither the ports nor the branch as a whole have regularly scheduled meetings. As of the close of our fieldwork, the last branch meeting was held in April 2016.

As noted earlier, the department claims that in 2014 it shifted the focus of its inspections from produce, which it now considers a low-risk pathway, to higher-risk live plants. However, the department could not provide documentation of this change in policy or any form of communication that informed PQB or department staff of the re-targeting of border inspection efforts. The department did provide us with an e-mail from the former Plant Industry Division head that acknowledged a draft of *Pathway Analysis and Dissemination of New Insect and Plant Disease Records in Hawai'i* and its finding that plants are one of the main pathways for colonizing insects; however, the e-mail gave no indication of a forthcoming change in PQB inspection policy.

Exhibit 9

PQB Position Counts and Vacancy Rates, FY2008–2016



Staffing Vacancies Persist

WHILE FOOD AND FARM product imports continue to rise, PQB staffing levels have remained relatively flat. In fact, staffing has still not recovered from a 2009 reduction-in-force that cut authorized positions by 31 percent (or 37 positions) with the biggest cuts to Inspector I-III positions. The authorized positions lost in the reduction-in-force were restored by FY2013; however, the department has not filled these positions, with FY2016 staffing (71) at the same level as FY2012. Exhibit 9 shows PQB's position counts and vacancies.

In addition, we found that the use of PQB temporary assignments (inspectors temporarily assigned to specialist and managerial posts), reduced the number of staff available for inspections and created a problem for long-term planning, consistency issues, and staff morale. One-third (seven of 21) of the PQB vacant (non-administrator) positions in June 2016 were filled with temporarily assigned personnel. These included four specialist positions and a maritime supervisor post that were temporarily filled. All of these positions (specialist and maritime supervisor) had been without

a permanent hire for at least 16 months, and some for as long as 45 months. In addition, the department recently filled the vacant Inspection and Compliance Section chief position; however, the new chief is also the acting branch manager.

PQB's upper management has also been subject to frequent turnover in recent years. Since 2013, there have been four Plant Industry Division administrators, three of whom served on a temporary basis. PQB has had four managers since 2013, three of whom filled the role in an acting capacity.

As noted earlier, the acting PQB manager position is currently occupied by the new Inspection and Compliance Section chief. The department is not seeking to fill the PQB manager position with a permanent hire, because the current PQB manager has been given a special assignment and thus the position is not technically vacant. PQB's acting branch manager noted that having three different PQB managers in the last three years has been a problem because each manager has slightly different goals and operational styles.

...staffing has still not recovered from a 2009 reduction-in-force that cut authorized positions by 31 percent...

Early efforts to develop Invicta and the biosecurity program illustrate the need for risk management and risk communication to guide program development and activities.

Invicta's problems are myriad, and many of the issues behind its troubled development are complex and technical. The scope of our audit precluded us from examining these technical issues in depth; however, we found that some of the database's most significant and fundamental problems are not attributable to faulty technology. Instead, they were the result of poor planning and management by the department and branch.

During the planning and implementation of the new Invicta database, the branch did not fully consider the complexity of the new database's new scope of duties ... and the larger pool of data that it would be drawing from

As noted earlier, the Invicta system was an expansion of an existing database system, also named Invicta, which was designed to report on inspection information collected by a federally mandated and financed program to assess the risk of invasive species introduction through Kahului Airport. During the planning and implementation of the new Invicta database, the branch did not fully consider the complexity of the database's new scope of duties (to provide risk assessment data that would enable the department to prioritize inspection activities and staffing allocations) and the larger pool of data it would be drawing from (all State ports instead of just Kahului Airport). For example, inspectors are required to enter detailed information into Invicta on interceptions as well as the results of their inspections of regulated items as a whole. In other words, inspectors must not only report on the pests they found and the commodities they found them on, but they must also enter information on the commodities that cleared inspection. For Kahului Airport, these data-entry tasks were not an issue because it had a significantly lower cargo volume than O'ahu. However, for Honolulu's ports, this reporting requirement quickly became very time consuming.

Unfortunately, PQB management's solution to this time-management challenge has undermined the effectiveness of Invicta. With inspectors spending more time entering data into Invicta and less time inspecting, PQB management allowed inspectors to categorize various commodities that were inspected and released as "assorted produce" or a similar generic description. While the change in policy relieved inspectors of a burdensome data-entry task, it has compromised the integrity of the data and hampers Invicta's ability to assess risk. According to the acting branch manager, having an itemized list of the commodities that passed inspection provides an important baseline from which risk can be assessed. For example, he pointed out that intercepting 100 boxes of insect-infested roses out of a lot of 200 indicates a high-risk pathway, but 100 boxes of roses out of 10 million boxes represents a low risk. Using risk analysis could allow PQB to deploy personnel to

inspect imports with higher risk of importing invasive pests. However, since Invicta does not have consistent and reliable inventory data, management cannot do this seemingly straightforward analysis.

Compounding this data quality issue has been the department's failure to designate official, standardized descriptions for the various commodities that are imported. Inspectors are free to add their own descriptions. As a result, Invicta's drop-down menu of commodity descriptions is long and in some cases redundant. Descriptions vary from generic designations such as "Assorted Produce," "Fruits and Vegetables," and "Citrus" to general terms such as "Citrus, Orange" and "Citrus, Tangerine" to specific descriptions such as "Citrus, Blood Orange" or "Honey Tangerine (FL)." The pull-down menus also contain duplicate terms, which cannot be deleted during data entry.

Exhibit 10

Invicta's Drop-Down Menu of Commodity Descriptions

The screenshot displays a software interface with a long, scrollable list of commodity descriptions on the left. The list includes items such as "Citrus", "Citrus limes", "Citrus pummelo", "Citrus, Blood Orange", "Citrus, grapefruit", "Citrus, Lemon", "Citrus, limes", "Citrus, orange", and "Citrus, tangerine". A red arrow points from a text box on the right to this list. The text box contains the following text: "Entries are repetitive and unorganized, which leads to confusion in analyzing data." The interface also shows a table with columns "Weight" and "Count", and a value of "270" in the "Count" column. Below the table, there are checkboxes for "Insect", "Plant", and "Micro", and radio buttons for "Lot" and "Parcel". The source is identified as "HDOA".

The plethora of commodity choices and the potential for poor classification make it difficult to ensure that PQB inspection and interception data are accurately analyzed.

The issue of multiple descriptions for the same commodity was highlighted in the *Invicta Management System Problem Identification 2014* report, and PQB management intends on addressing this issue as it plans its new database. However, PQB continues to require its

inspectors to enter inspection and interception data into Invicta without adjustments to the system.

The department told us that, in preparation for the new database, it hired additional inspectors in 2015 and focused on increasing the number of inspections in 2016. They did not want to change how inspectors were doing things because they wanted the body of data contained in Invicta to be consistent. The department intends to compare that data with the data it will be collecting with the new, improved database system it is developing. We reiterate that Invicta's data has limited value and application to current PQB operations. Part of this may be the result of the aforementioned data-entry flaws. By proceeding without further evaluation and adjustment, the department ensures that the data it is collecting today will continue to be flawed and have little value to current and future operations.

Conclusion

HDOA does not have the biosecurity program it purports to have. It does not monitor, evaluate, adjust, or improve inspection activities based on up-to-date data. Although PQB inspectors are required to enter inspection and interception data into Invicta, this information is not used to assess risk. This means that, rather than being an integral part of a feedback loop—passing along and receiving valuable, up-to-date information—inspectors operate in a bubble, conducting inspections that are based on their past experiences and the experiences of those who they work with.

Central to the department's inability to implement a risk analysis-based biosecurity program is the failed database, Invicta. HDOA is in the early stages of developing a new, improved database system to replace Invicta, and management is aware of the myriad issues that need to be addressed. Some of these significant problems are the result of poor planning, communication, and management. As the department proceeds with the development of the new database, we are concerned that the technology is being looked upon as a tool that will enhance branch operations, rather than a part of an integrated risk analysis process. Since the risks of invasive species introduction to Hawai'i are ever changing, this process, which includes risk management and risk communication, must continually adjust how and what PQB inspects.

Recommendations

1. The Hawai'i Department of Agriculture should:
 - a. Plan and implement a risk analysis process to define and respond to threats of invasive species introduction, incorporating data-driven elements to monitor, evaluate, adjust, and improve inspection activities. This would include developing and implementing policies and procedures for data collection and verification, including establishing standards for data entry, which will ensure the completeness and accuracy of the data recorded.
 - b. Plan, implement, and operate an up-to-date database system that houses important taxonomic data, communicates with other databases, and supports an e-manifest program, among other functions.
 - c. Determine the personnel necessary to implement and operate a data-driven biosecurity program, ensuring that PQB is sufficiently staffed and supported to carry out these complex and specialized duties.
 - d. Ensure timely recruitment of vacant PQB positions, paying particular attention to filling vacant managerial positions with permanent hires.
2. The Plant Quarantine Branch should:
 - a. Develop appropriate policies and procedures to ensure that its inspectors carry out the branch's biosecurity plan.
 - b. Provide staff with the appropriate training to carry out this new approach.
 - c. Periodically review and update policies and procedures to ensure continued relevance.

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Office of the Auditor's Comments on the Affected Agency's Response

WE TRANSMITTED A DRAFT of this report to the Hawai'i Department of Agriculture (HDOA) on June 16, 2017, and met with the Chairperson and other members of his staff, including the Plant Industry Division administrator, on June 21, 2017, to discuss the draft. HDOA's response, dated July 5, 2017, is included as Attachment 1.

Our audit examines one facet of the Plant Quarantine Branch's statutory mission: to detect invasive species that are on or in cargo arriving from the continental United States and other Hawaiian Islands. We report that the branch does not use a data-driven, risk-based process to identify the types of cargo that pose the highest risk of being a "pathway" for invasive species into the State and, instead, relies primarily on inspectors' individual experiences to guide their inspection efforts. We found that Invicta, the database the branch has spent over a decade and over \$4.2 million to develop and which is intended to be the critical piece of the branch's inspection efforts, is incapable of performing basic functions necessary to support a modern, robust biosecurity program. We also found that the pest interception data inputted into Invicta is inconsistent, inaccurate, and not used by the branch to assess the risk of specific invasive species entering the State.

The department's response does not disagree with or otherwise directly address our audit findings. Rather than acknowledge Invicta's shortcomings, the department asserts that the report fails to include "both financial and political context," which the department implies may explain the weaknesses in the branch's biosecurity efforts that we found. However, the "financial and political context" noted by the department are immaterial to the audit findings, and for that reason, we do not believe that any substantive revision to the report is warranted.

To avoid confusion or uncertainty about our review of the branch's biosecurity efforts, we address some of the specific issues raised by the department below.

The department states that our report does not provide the financial context in which the branch has operated because we did not perform the financial audit requested in Act 243, Session Laws of Hawai'i 2016, which was the

impetus for the audit.¹ However, the department's financial information, which include the Plant Quarantine Branch's, is audited, annually, as part of the State's financial report, called the Comprehensive Annual Financial Report or CAFR. More importantly, a financial audit assesses whether an agency's financial statements are presented fairly in accordance with generally accepted accounting principles, based on the independent auditor's review of a sampling of the agency's financial transactions. A financial audit would not necessarily report "the financial realities" of the Plant Quarantine Branch, as the department apparently believes.

The department explains its difficulty in hiring inspectors. As part of our audit, we did not examine the State's hiring process or the pay or other benefits for the inspector positions, to which the department attributes the high position vacancy. Those concerns are more appropriately addressed to the Department of Human Resource Development or the Legislature. However, we observe that 37 established and temporary positions (or 31 percent) were eliminated in 2009, but those positions were restored in 2013; yet, the department had not filled the majority of those positions at the time of our audit. We further note the high number of temporary assigned personnel filling many key management positions. While we do not dispute that the position vacancies have challenged the branch, we suggest that the department's inability to fill positions confirms the importance of our recommendation that the branch adopt a data-driven, risk-based approach to guide its inspections as soon as possible. Complete and accurate inspection data, along with permitting and e-manifesting, will allow the branch to assign its limited number of inspectors to cargo with a high-risk of transporting invasive species that are harmful to Hawai'i, rather than having them inspect boxes of produce with little likelihood of carrying harmful pests.

In its response, the department reports that it is taking actions to address certain areas identified in our audit: It intends to issue a Request of Proposals for a new database to replace Invicta "within the next few months;" it has hired a number of inspectors and is recruiting for other inspectors; and it and others are working towards legislation to create the Hawai'i Invasive Species Authority, which will serve as the primary entity responsible for the State's biosecurity.

¹ After discussing the intent of the audit with key legislators, they agreed that a financial audit would not provide the information about the branch's operations that they were interested in understanding. We informed the department during our pre-audit meeting that we did not intend to contract for a financial audit of the branch. Until its response to the report, the department had not expressed any concern that a financial audit was necessary. However, as noted herein, a financial audit would not provide any additional "context" to our report.

Because our audit is based on a “snapshot in time” of the branch’s activities from June 2016 to February 2017, we have not revised our report to reflect the efforts reported by the department that may address certain of our findings. However, we will assess the branch’s progress in implementing the report’s recommendations in a follow-up report to be issued in or shortly after 2019.

DAVID Y. IGE
Governor

SHAN S. TSUTSUI
Lt. Governor



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SCOTT E. ENRIGHT
Chairperson, Board of Agriculture

PHYLLIS SHIMABUKURO-GEISER
Deputy to the Chairperson

July 5, 2017

TO: Mr. Les Kondo, State Auditor
Office of the Auditor

FROM: Scott Enright, Chairperson
Board of Agriculture

A handwritten signature in black ink, appearing to read "Scott E. Enright".

SUBJECT: Response to Plant Quarantine Branch Draft Audit

The Hawaii Department of Agriculture (HDOA) would like to thank the Office of the Auditor for the opportunity to comment on the final draft of the Plant Quarantine Branch audit and offers the following comments.

Act 243, SLH 2016 allots funds for the auditor to conduct a financial and performance audit of Plant Quarantine Branch (PQB). This audit does not contain a financial aspect as stated in Act 243, SLH 2016 that would help set context for the performance described in this PQB audit by the Office of the Auditor. By not addressing the mandated financial audit, the Auditor has devalued the final report as one will not understand PQB performance without seeing the fiscal realities. The Auditor also fails to mention the history of the INVICTA database as it relates to multiple leadership turnovers. As stated in this report, INVICTA planning and efforts to transition a Department of Transportation system into an HDOA platform began in 2003 and rolled out in 2007. INVICTA's lifespan stretches through three (3) State administration's, Lingle, Abercrombie, and Ige. With each new administration comes leadership change and new direction and has undoubtedly affected the INVICTA system development and review process. The Auditor fails to set both financial and political context in this report thus diminishing the overall PQB performance described in this audit.

New Database

Since early 2014, HDOA reviewed and identified performance issues with the INVICTA system. During 2014-2016 changes in the Administration influenced which platform would be supported by the State Office of Information Management and Technology and later the Office of Enterprise Technology Services, and impacted the progress of the PQB database project. In 2015, HDOA started the work on permitting and e-



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manifest scope of work, and assessing whether to modify or replace INVICTA. In 2016, HDOA decided to expand and include systems modules on inspections and certification in addition to permitting and e-manifesting. Under the current administration, HDOA has approval by the IT Project Advisory Council for the new PQB database Request for Proposals (RFP) which will be posted within the next few months.

Recruitment and Vacancies

The nature of PQB Compliance and Inspection personnel is that positions require a formal education and knowledge in biology, entomology, microbiology, and plant sciences with a minimum of a Bachelor's degree in biologically based science. Unfortunately, candidates are often few and far between to fill these positions in the State. Moreover, State positions are not offered competitive wages which leads to high turnover and attrition rates as federal agencies and private companies can provide employment with higher pay and benefits. Additionally, the speed at which the State hires new employees creates a distinct disadvantage to attracting top candidates. In many cases, it takes more than two (2) months from the time that a prospective employee submits an application, is interviewed, and is offered a position. By that time those who were looking for a job will have found employment elsewhere. Despite these challenges, the department has filled in 2017 to-date, four Master Journeyman PQ Inspector IV positions (two on Oahu; one on Maui and one at Hilo) and one PQ Inspector I position in Hilo. Recruitment is underway to interview and fill seven PQ Inspector I/II positions for Oahu and Maui.

Updated Standard Operating Procedures (SOPs)

The preliminary audit report issued in December 2016 recommended that the SOPs for PQB be updated. The Plant Industry Administrator worked with the PQB management to update and complete the SOPs before the final draft of this PQB audit was issued.

Biosecurity Players, the Hawaii Invasive Species Authority

The PQB and its biosecurity program is the subject of this audit; however, the audit suggests that PQB is the only player addressing biosecurity in the State of Hawaii. Responsibility to address invasive species in the State does not lie solely with the PQB, but in fact with various players in the public, private and federal sectors. HDOA partners with various State agencies, such as Department of Land and Natural Resources, Department of Transportation, the Department of Health, and the University of Hawaii to research and control invasive pests. This interagency cooperation can be seen with the State's efforts to address Rapid Ohia Death and Dengue Fever. HDOA PQB and the USDA work closely to address all borders and ports of entry to mitigate any invasive pest entry into and out of the State. HDOA PQB works with non-profits and community organizations to educate and advise the public on invasive pest

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species. HDOA has worked with its State partners to promote a Hawaii Invasive Species Authority (HISA) which will look to close the gaps that exist among so many different players when addressing biosecurity. HISA would have its own budget, dedicated staff, and Board of Directors. HISA would serve as the primary entity when addressing invasive species, similar to the way that this audit singles out PQB as the entity that addresses invasive pest species interception and responsibility for keeping Hawaii's borders protected from new alien and invasive plant, animal, and microbial agents. That said, Hawaii biosecurity efforts encompass many different players, and PQB plays just one of the roles in that work. Although HDOA has not received approval for creation of HISA for the last two legislative sessions and despite HISA being identified by State stakeholders as the number one priority of the 2016 Hawaii Interagency Biosecurity Plan, HDOA intends to pursue HISA in the upcoming Legislative session as biosecurity efforts need to be centralized to provide for collaboration amongst all partners.

Closing Remarks

The Department takes issue with framing this audit as "Bio-in-security" and with the editorial style found in the audit's formatting and use of pull-quotes. Although audits point out shortfalls, there is a lot of important work being done by PQB with biosecurity. Some examples include collaboration with Oregon and Washington Departments of Agriculture to address movement of pests on Christmas trees, collaboration with USDA Wildlife Services and Guam to train PQ inspectors in Brown Tree Snake response and inspections, the re-instatement of the Dog Detector program, CRB task force, LFA response, ROD quarantine program, Inspections of biotechnology crops, and multiple Board of Agriculture submissions to address risk of imports of aquatic species, dangerous animals, microorganisms, biocontrol imports, etc. This audit lacks a balanced portrayal of biosecurity issues in Hawaii and the role that HDOA PQB plays in that work.