



Department
of Agriculture

STATE OF HAWAII

Kahului Airport Pest Risk Assessment

Prepared by:

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SECTION 1 –EXECUTIVE SUMMARY

By conducting seven, three- to four-week inspection blitzes between September 2000 and July 2001, the Plant Quarantine Branch of the Hawaii Department of Agriculture performed a risk assessment on the movement of alien species from the continental United States and foreign areas to the Island of Maui through Kahului Airport. The Kahului Airport Pest Risk Assessment (KARA) involved 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% inspections of agricultural products shipped by air cargo.

A total of 1,897 commercial direct overseas flights, with 399,463 passengers and crew on board, were inspected. Agricultural commodities in baggage or the aircraft cabin were found in 1,539 of the 1,897 flights. While passengers and the aircraft were found to be potential pathways of entry of agricultural commodities and pests into Maui, the risk of pest introduction through these pathways was found to be small. Inspectors examined 4,644 agricultural items recovered from the cabins of aircraft or the carry-on or checked baggage (4,396) of passengers. Passengers declared 3,873 of the 4,644 agricultural products intercepted by inspectors. The remaining 771 agricultural items (16%) were interceptions of items that were not declared on Plant and Animal Declaration Forms distributed on the aircraft prior to landing. Only 11 of the 771 intercepted items were found to be infested with a pest and were confiscated. Forty-two items lacked the necessary documentation to enter the state and were destroyed. (Sections 5.1.1 and 5.1.2)

Detector dog teams monitored 546 flights in the baggage claim area and found 1,747 agricultural products in baggage. Apples, bananas, and oranges were the products commonly intercepted. Only four restricted agricultural commodities were found, three were Florida citrus without proper documentation for entry into Hawaii and one was persimmons heavily infested with insects. All four were confiscated and destroyed. Passengers declared 508 of the 1,747 agricultural items intercepted by the detector dog teams. The remaining 1,239 items (71%) were interceptions that were not declared on Plant and Animal Declaration Forms distributed on the aircraft prior to landing. (Section 5.1.4)

Cargo was identified as a high-risk pathway for the entry of pests into Maui. A total of 480 different agricultural products were identified in cargo shipments and subjected to inspection. Pests were found on 114 different agricultural products: 51% of the products were infested less than 10% of the time; 49% of the commodities were infested more than 10% of the time (Section 5.2.2). A total of 1,401 insect interceptions were made on agricultural commodities. Of the 279 species intercepted, 125 were not known to occur in Hawaii; 103 were established in Hawaii; and 51 were of undetermined status. One hundred fifty-six interceptions involved plant disease organisms, 47 of which were determined to be pathogenic species. (Sections 5.2.3 and 5.2.4)

The species intercepted at Kahului Airport were similar to those found in similar situations at airports throughout the State; however, interception rates were higher in the KARA. A total of 1,401 interceptions were made in the 130-day blitz for an average of 10.8 interceptions per day for the KARA. This compares to an average of 782 interceptions per year (2.1 quarantine pest interceptions per day) on a statewide basis for the years 1995 through 2001. The 30 most frequently infested commodities at Kahului Airport nearly mirrored the ranking order of the same commodities intercepted statewide. (Section 5.2.6)

A biological survey of the Kahului Airport environs (performed by the Hawaii Biological Survey of the Bishop Museum for the Edward K. Noda & Associates, Inc.) established a baseline for arthropods established around the airport; however, the data collected in this pest risk survey of aircraft landing at Kahului Airport showed that very few of the most commonly encountered insects in the air cargo were found in the airport environs. This finding is not unexpected since the general environs of the airport are hot and dry and not hospitable to hitch hiking pests likely to be found on agricultural products entering the state from farming areas under intense management (Section 5.2.8)

Recommendations are made regarding capital improvements and resources to improve plant quarantine services at Kahului Airport, Maui.

SECTION 2 – INTRODUCTION

2.1 Purpose

The following pest risk assessment was undertaken by the Plant Quarantine Branch of the Hawaii Department of Agriculture (PQ, HDOA) to evaluate the risks of the entry of pests and illegal plants and animals into Maui through direct overseas flights landing at Kahului Airport. The pathway risk assessment is a requirement of the Alien Species Action Plan (ASAP) for the Kahului Airport Improvements (Appendix A). The study was funded by the U.S. Federal Aviation Administration (FAA) through an Airport Improvement Program (AIP) Grant awarded to the State of Hawaii, Department of Transportation (HDOT).

2.2 Alien Species Action Plan (ASAP)

Major improvements were planned for the Kahului Airport on Maui to enhance airport services and operational safety. These improvements included lengthening and strengthening of an existing runway, constructing a new, state-of-the-art, cargo handling facility, expanding bulk fuel storage capacity and distribution lines, and improving airport roadways and support facilities. These improvements were to allow Kahului Airport to more efficiently service direct overseas flights to Maui. The existing runway, while adequate for the landing of overseas flights, does not have sufficient strength or length to accommodate takeoff of fully loaded and fueled large aircraft for return flights to the U.S. mainland or other areas.

A joint Federal-State Environmental Impact Statement (EIS) identified alien species introduction as an environmental risk associated with direct overseas flights landing on Maui at Kahului Airport. Because of concerns on the EIS, the U.S. Department of Interior (USDO) asked the U.S. Council on Environmental Quality (CEQ) to undertake a review of the environmental assessment and to make recommendations. CEQ convened working sessions involving the U.S. Departments of Transportation, Interior, and Agriculture, and the State of Hawaii Departments of Transportation, Agriculture, and Land and Natural Resources, to address appropriate mitigation measures. These discussions led to adoption of a Memorandum of Understanding (MOU), dated August 24, 1998, and signed by participating federal and state agencies, for the “Prevention of Alien Species Introduction through the Kahului Airport” (Appendix B). Under the terms of the MOU, the agencies agreed to participate in and to implement a “Federal-State Alien Species Action Plan for the Kahului Airport, Maui”, referred to as the ASAP (Appendix A). Both documents were made a part of the U.S. Department of Transportation, Federal Aviation Administration, Record of Decision (ROD) giving unconditional approval to the Kahului Airport Master Plan.

The MOU describes the ASAP as a “dynamic document” whose measures are “...subject to change based on the risk assessment and monitoring program” established by its terms.

The terms of the ASAP with regards to risk assessments at Kahului Airport are as follows:

- “1. This ASAP is necessarily a dynamic document, and its measures are subject to change based on the ongoing risk assessment and monitoring program described below. The risk assessment and monitoring program will prioritize and re-prioritize ASAP measures over time, based on data and experience, to effectuate appropriate prevention, interdiction and eradication of alien species associated with the Kahului Airport and its operations. Although the ASAP’s measures are thus subject to change, the ASAP’s goal remains constant: preventing the introduction of alien species into Maui via the Kahului Airport to the greatest extent possible.
2. As soon as possible but no later than six months after the issuance of a Record of Decision approving the Kahului Airport Improvements (State Project AM1011-07) by the Federal Aviation Administration, the USDA and HDOA, in cooperation with appropriate agencies and other entities, will conduct an initial management assessment for the Kahului Airport. This assessment will identify weaknesses in the existing alien species prevention effort and will determine the degree of risk of alien species introduction associated with each identified gap. This assessment will cover both the current situation (before any proposed airport improvement project commences) and, if approved, future plans for airport improvement. This assessment will include, but not necessarily be limited to, collecting extensive monitoring data to determine the relative risks associated with passengers, cargo, and the aircraft proper. The scope of this assessment will include all inbound flights.
3. The USDA and HDOA, in cooperation with appropriate agencies and other entities, will conduct additional specific risk assessments as warranted to evaluate potential alien species introductions from particular points of origin. Such risk assessments will be conducted as early as possible (e.g., following notification of proposed flights from new points of origin).
4. As part of the risk assessment process, the USDA and HDOA, in cooperation with appropriate agencies and other entities will also develop a long-term monitoring system and reassessment process to ensure that changes in the introduction of alien species through Kahului Airport will be identified and evaluated quickly enough to effectuate appropriate modifications of the existing ASAP measures. This ongoing monitoring and reassessment will be used to re-evaluate current measures, tracking changing risks, measure progress, and re-prioritize measures.
5. Necessary measures determined through the initial risk assessment and subsequent reassessments will be implemented in a timely manner.”

2.3 Initial Management Assessment

The Initial Management Assessment for Kahului Airport required by the ASAP in point 2 above was prepared by Edward K. Noda and Associates, Inc., an engineering consulting firm. The report dated September 2000 identified various gaps in the existing pest prevention system for Kahului Airport. Foremost was the absence of adequate information to assess the risk of pest entry into Kahului Airport through passengers, baggage, cargo and the aircraft itself. In the absence of adequate time to collect extensive new information, the report relied on the State Plant Quarantine officials' perceptions of risks (see Section 2.4) for identified gaps in the system, with gaps defined to be a weakness (identified or perceived) in the current alien species interdiction system at Kahului Airport. The information compiled was not sufficient to prioritize mitigation measures under the ASAP. Recognizing this, ASAP team members agreed that a pest risk assessment study was required pursuant to the ASAP. HDOT sought federal funding to undertake the study from the U.S. Federal Aviation Administration (FAA). FAA subsequently approved an Airport Improvement Project (AIP) Grant to the HDOT, from which \$300,000 was made available to the HDOA to conduct a Kahului Airport Risk Assessment pursuant to the ASAP.

2.4 Previous Risk Assessments

No prior pest risk assessments had been conducted for the Kahului Airport or for direct overseas flights to Hawaii as a potential pathway for the entry of pests into the state.

However, in 1988, State Plant Quarantine conducted an informal in-house survey of plant quarantine inspectors to rank the importance of various pathways of introduction of insect pests and illegal animals into Hawaii (Report to the Fifteenth Legislature, 1989 Regular Session in Response to Senate Resolution No. 83, S.D.1 and House Resolution No. 198, H.D. 1, and House Concurrent Resolution No. 153, HD.1, S.D.1 of the Fourteenth Legislature, 1988 Regular Session). Replies were based on inspectors' experiences while conducting inspections. Findings were as follows:

1. Airline Passengers (27%): Airline passengers were believed to be the primary source for introduction of illegal animals. Insect pests could also be transported by passengers on undeclared plants that circumvent inspection. These plants and animals were suspected of being hidden primarily in check-in baggage (15%) and carry-on baggage (10%).
2. First Class Mail (23%): Because inspectors are unable to inspect first class mail, it is ranked very high as a pathway, particularly for the introduction of insect pests and plant diseases on propagative plant materials. Other types of express mail service were also believed to account for the introduction of illegal animals as well as insect pests.
3. Cargo (18%): Cargo from scheduled maritime (6%) and airline (9%) shipments, and from private unscheduled companies (3%) was also believed to account for the introduction of insect pests.

4. Military (13%): The military was thought to account for the introduction of illegal animals via passengers (5%) and baggage (5%); and both illegal animals and insect pests arriving as hitchhikers on military carriers (3%).
5. Foreign Inspection (13%): Federal quarantine officials enforce USDA plant regulations during inspection of foreign arrivals and carriers. These regulations may differ from Hawaii's. This is believed to be another source of entry for illegal animals and insect pests, because of the inability of State inspectors to be available (because of staff shortages) at Customs and other foreign inspection areas, to address State concerns during these inspections.
6. Private Yachts and Airplanes (6%): Private yachts, ships, and airplanes were believed to be the means of other pest introduction into the State.

Dr. Russell C. McGregor provides an excellent discussion of Hawaii's vulnerability to alien species colonization in his report to USDA, APHIS, entitled, "The Emigrant Pest". (Appendix F)

2.5 Operating Assumptions

The following operating assumptions guided the planning and execution of the pathway risk assessment for Kahului Airport:

- The pest risk assessment should be based on new data collection, if at all possible, since existing interception databases are incomplete and not quality controlled to assure consistency between ports-of-entry or inspectors.
- Kahului Airport offers a unique opportunity for a risk assessment study. The airport receives a significant number of direct overseas flights. Yet, the number of flights in the course of a day is not so great as to be beyond the resources of State Plant Quarantine to thoroughly inspect in a blitz program.
- Flights received at Kahului Airport (OGG) are in all likelihood representative of direct overseas flights received at other primary State airports, including Honolulu International Airport (HNL) on Oahu; Lihue Airport (LIH) on Kauai; and Keahole Airport (KOA) at Kona, Hawaii. Information gleaned at Kahului Airport will be useful in estimating risk at these other locations.
- Cargo inspection at Kahului Airport offers a unique opportunity to conduct a 100% blitz of incoming agricultural products. Containers are delivered by carriers to a single clearance point at the airport for inspection and disposition rather than to sites dedicated to particular carriers throughout a large airport system as at HNL. The importer generally removes the commodities from air containers at the airport for transfer to trucks or other vehicles that will take them off site. This presented the opportunity for thorough inspection, given sufficient personnel.
- Passengers deplaning at Kahului Airport move to a single baggage claim area, facilitating inspection by officers and a canine team. Those

passengers with only carry-on luggage can skip baggage claim, but those passengers with suspicious carry-on items can be subject to visual inspection in a secured area prior to departure from the airport.

- The biological baseline survey of the airport environs conducted under contract to the HDOT is an opportunity to reconcile interceptions of non-native species in and around the grounds with suspected pathways of entry of these pests into Maui through Kahului Airport.
- Pests entering Maui through Kahului Airport can be specifically targeted for pest risk mitigation through pre- and post-entry quarantine measures.
- The database established in this study will be useful in estimating the costs of quarantine coverage at Kahului Airport, seven days a week, 365 days a year for a comparable level of protection provided by a blitz inspection program of known resource requirements and costs.
- The pest risk assessment at Kahului Airport is an opportunity for more precise program planning to maximize use of currently available resources and to plan for expanded program services as additional program resources become available to the HDOA.

2.6 Development of a Draft Scope of Work

No specific guidelines were provided in the ASAP for conducting a pest risk assessment for Kahului Airport.

To define an appropriate scope of work, HDOA, PQ, consulted various stakeholder groups and individuals with specific areas of expertise relevant to a pest risk assessment for Hawaii. Most notable of the experts consulted was Dr. John Beardsley, Professor Emeritus, Department of Entomology, University of Hawaii. Dr. Beardsley was Hawaii's foremost expert on the state's native and alien insect species. His untimely death shortly after the initiation of this pest risk study was a major loss to this effort and to Hawaii.

The Kahului Airport Pest Risk Assessment (KARA) study was initiated according to the following draft scope of work between the HDOT and HDOA:

“Scope of Work Initial Risk Assessment

PREFACE

HDOA will conduct the initial risk assessment in accordance and in observance with all applicable laws, rules, regulations and agreements. The HDOA will use such methods and procedures as deemed appropriate to carry out the risk assessment, including but not limited to use of detector dogs, search and inspection techniques.

OBJECTIVES

HDOA shall use increase manpower and resources to gather data to determine the risk of perceived pathways through which alien species may be introduced to the island of Maui, such as arriving passengers, baggage, and cargo through

Kahului Airport. The scope of work may vary during the process, depending on the data collected and risk assessment. It is envisioned that the risk assessments will be completed for each season (two weeks per season) to determine seasonality and to monitor variations in the commodity origination points.

- *Inspectors shall inspect all incoming domestic flights. HDOA will meet the aircraft, collect declaration forms and meeting passengers with declared items, monitoring incoming passengers, board aircraft to perform walk-through of the cabin, and monitoring baggage claim.*
- *HDOA will inspect cargo offloading. Agricultural commodities will be inspected 100 percent. Non-agricultural commodities will be sampled for the presence of undeclared agricultural items and hitchhiking pests.*
- *Detector dog teams (as available) will assist in the passenger baggage claim.*
- *As possible, HDOA will monitor interisland arrivals and cargo.*

DELIVERABLES

Provide documentation that details and summarizes the finding and recommendations of the initial risk assessments. The documentation should provide a discussion:

- *For recommended changes to the ASAP.*
- *Of a methodology to perform future risk assessments, long term monitoring and developing the Quality Control program (similar to AQIM); and*
- *Of problems, if any, in inspection of passengers, baggage, and cargo, including to the extent possible delays or impacts on the airline and airport operations.”*

Specific operational activities for the draft scope of work were detailed in a discussion paper prepared by Dr. Stephen Miller of the U.S. Fish and Wildlife Service:

“The Kahului Airport Risk Assessment (KARA) will establish a clearly documented procedure for evaluating the effectiveness of the alien species inspection and interception program at Kahului Airport. In preparing the KARA document, a complete evaluation of this program will be conducted. The KARA document will include recommendations for improving the inspection and interception program at Kahului Airport.

The program evaluation and the resulting documentation shall address:

1. *All significant pathways that may be used to enter the island of Maui through Kahului Airport; (Pathways should include the aircraft passenger cabin, cargo hold, and other spaces such as wheel wells, etc; the cargo and cargo containers; passenger baggage*

- checked with the carrier; hand carried baggage; and passengers and crew as well as any other pathways.)*
2. *All types of organisms that pose a significant threat to public health, tourism, agriculture, native species, and natural resources. This will include current critical invasive alien species such as fire ants, smuggled birds, snakes, and other vertebrates, etc.*
 3. *All types of commodities and products that may serve as transport materials for non-native species.*

In addition to the above, the KARA document shall include an evaluation of all currently available data on pathways used by non-native organisms or on types of organisms. The methods used to evaluate these data shall be clearly documented along with procedures and recommendations for future data collection and analyses. Finally, point-of-origin of pathways, non-native species, and commodities shall be indicated and evaluated for future potential impacts.

For all aspects of this risk assessment, the following shall be addressed:

- *What are the current procedures used to detect and stop the movement of non-native species into Hawaii via Kahului Airport?*
- *How effective are these procedures? If this cannot be determined, what needs to be done to allow for an assessment of the effectiveness of these procedures?*
- *What are the current levels of inspection used to detect and stop the movement of non-native species into Hawaii via Kahului Airport?*
- *Are these levels of inspection adequate to intercept non-native species? (What is the level of interception and is this acceptable?) If this cannot be determined, what needs to be done to allow for an assessment of the rate or level of interception?*
- *What changes in procedures, equipment, personnel, and levels of inspection are needed in order to improve the interception of invasive alien species to a level that will protect public health, tourism, agriculture, native species, and natural resources?*
- *The federal AQIM shall be applied and evaluated in carrying out the Kahului Airport risk assessment.*
- *To what degree will any recommended changes affect airline operations and passenger movement at Kahului Airport?*

The final report shall include:

- *A concise report written in non-technical language that communicates the current state of inspection and interception of non-native species at Kahului Airport along with recommendations for improvements and future assessments.*
- *Technical appendices that clearly present all information used in the assessment."*

Alan Holt (The Nature Conservancy) and Dr. Fred Kraus (Alien Species Coordinator, Department of Land and Natural Resources) provided additional

comments to the draft scope of work for the risk assessment. These are presented in Appendices C and D, respectively.

In addition to the above, the ASAP Team and HDOT invited Mr. Bill L. Callison, Assistant Director for Plant Health and Pest Prevention Services, California Department of Food and Agriculture, to Hawaii to meet with state and federal officials and other stakeholders involved with various aspects of the planned Kahului Airport improvements. Mr. Callison noted that principles of pest risk analysis and risk communication are well established, however, it is the practice of those principles that becomes a problem. Mr. Callison shared a report presented by Dr. Conrad Brunk at the 1999 North American Plant Protection Organization Annual Meeting, on the “Principles and Practices of Pest Risk Management” and suggested that Dr. Brunk’s outline could be followed to accomplish the review and analysis of alien species in Hawaii statewide. Mr. Callison’s specific recommendations are attached as Appendix E.

A report by Dr. Russell C. McGregor, “The Emigrant Pests”, dated, May 1973 was also reviewed in preparation of a draft scope of work. The USDA, APHIS, commissioned that study to address agency concerns regarding exotic pests and diseases of plants and animals for:

- An analysis of the threat they pose to the environment and the agriculture of the United States;
- An evaluation of the inspection and quarantine programs of the U.S. Department of Agriculture;
- A proposal for increasing the supply of protection on a global basis.

Key conclusions of that report are discussed in the Conclusions Section of this report in light of the findings and recommendations of the present study. The full text of the McGregor report is attached for reference as Appendix F.

A report entitled, “Generic Non-Indigenous Pest Risk Assessment Process”, by Richard L. Orr, Susan D. Cohen, and Robert L. Griffin, Planning and Risk Analysis Systems, Policy and Program Development, APHIS, USDA, November 22, 1993, was also reviewed for general guidelines for conducting a pest risk assessment. The report notes that the pest risk assessment should be:

- Comprehensive – The assessment should review the subject in detail and identify sources of uncertainty in data extrapolation and measurement errors. The assessment should evaluate the quality of its own conclusions. The assessment should be flexible to accommodate new information.
- Logically Sound – The risk assessment should be up-to-date and rational, reliable, justifiable, unbiased, and sensitive to different aspects of the problem.

- Practical – A risk assessment should be commensurate with the available resources.
- Conducive to Learning – The risk assessment should have a broad enough scope to have carry-over value for similar assessments.
- Open to Evaluation – The risk assessment should be recorded in sufficient detail and be transparent enough in its approach that it can be reviewed and challenged by qualified independent reviewers.

SECTION 3 – PLANT QUARANTINE BRANCH (PQB) OVERVIEW

3.1 PQB Statewide Operations

Plant Quarantine administers Hawaii’s plant and non-domestic animal quarantine program by preventing the introduction of harmful pests and diseases into the State and by facilitating plant exports. This is done through: (1) permit reviews; (2) air and sea ports-of-entry inspections, (3) interisland inspections, (4) investigating and enforcing State quarantine laws and regulations, (5) educating travelers and the public, and (6) inspecting and certifying plants for export. The program budget is approximately three million dollars a year. Roughly 80% of the program efforts are focused on imports in pre-entry and post-entry activities to prevent the entry of pests into the State.

Work is conducted out of six offices, which include Honolulu International Airport (Oahu), Honolulu Plant Inspection Office (Oahu), Kahului Airport (Maui), Keahole Airport (Kona, island of Hawaii), Hilo Plant Inspection Office (island of Hawaii), and Lihue Plant Inspection Office (Kauai). There are 56 inspectors statewide, including port supervisors, master journeymen, specialists, canine handlers, and inspectors. Within the last decade, the program has lost ten staff positions due to budget reductions. In the meantime (FY 1991 to FY 2001), aircraft arrivals have increased from over 25,000 to 29,000 while agricultural parcels inspected has increased from over 5.5 million to 6.8 million annually (Table 1). As a consequence of covering more flights with fewer inspectors, interceptions were steadily decreasing. From September 2000 to July 2001, due to the 100% inspections, the Kahului Airport Pest Risk Assessment increased levels of interceptions not only on Maui, but also statewide as pest detection levels increased among participating inspectors.

Table 1. Arrival and Interception Statistics for 1999/2000/2001

	Maui			Statewide		
	1999	2000	2001	1999	2000	2001
Year	1999	2000	2001	1999	2000	2001
Aircraft Arrivals	4,801	5,057	5,919	25,441	26,976	29,749
Passengers	1,020,070	1,066,984	1,103,843	5,047,787	5,322,913	5,359,991
Baggage, Cargo	372,696	443,755	433,194	5,565,051	5,678,804	6,867,996
Insect Interceptions (not incl. KARA)	115	65	225	725	335	556
NKO Insects (not incl. KARA)	26	16	76	302	99	182

3.2 PQB Kahului Airport Operations

On the island of Maui, there are seven full-time inspectors including one supervisor, one airport section supervisor (master journeyman) and five inspectors. A maximum of five of the seven inspectors are available each day depending on scheduled days of rest, sick leave and vacation. The supervisor and one inspector work out of the plant inspection office to perform maritime duties, resulting in three or four inspectors at Kahului Airport. Because of the small number of inspectors at Kahului Airport, the maritime inspector is expected to inquire daily and report to the Airport when there is insufficient personnel to provide adequate coverage. If the maritime inspector is busy and cannot leave his duties, the supervisor will provide temporary coverage at the Airport and the Plant Inspection office closes until either one returns. (Exhibit 4 in Section 10)

MAUI'S PLANT QUARANTINE STAFF WORK SCHEDULE (Daylight Savings)

INSPECTOR	29-Apr	30-Apr	1-May	2-May	3-May	4-May	5-May
	SUN	MON	TUE	WED	THUR	FRI	SAT
A. SHISHIDO	8:00AM	8:00AM	VAC	VAC	OFF	OFF+	8:00AM
1 B. FUJIOKA	OFF	VAC	7:45AM/AP	7:45AM/AP	7:45AM/AP	7:45AM/AP	OFF
2 S. SHINYAMA	9:00AM	9:00AM	9:00AM	9:00AM	8:30AM	OFF	OFF
3 K. YAGI	VAC	9:00AM	9:00AM	9:00AMX	OFF	8:30AM	9:00AM
4 L. LELEPALI	10:00A/1:00	1:00PM	OFF+	OFF+	9:00AM	9:00AM	9:00AM
5 T. SUDA	OFF	OFF+	1:00PM	1:00PM	1:00PM	1:00PM	10:00A/1:00

Figure 1. Kahului Airport Work Schedule. The Airport section supervisor starts at 8:00 a.m. The Maritime inspector starts at 7:45 a.m. and works Monday through Friday. The night shift inspector starts at either 10:00 a.m. or 1:00 p.m. depending on personnel and does not leave until the last flight at night.

Plant Quarantine Inspectors meet all domestic flights arriving directly from the continental United States. Inspectors also monitor, as time and personnel permit, flights that disembark in Honolulu with Kahului Airport as the final destination, flights arriving directly from Canada, and private jets. Inspectors work shifts so that maximum coverage is available during the peak of flight arrival times. Usually, there is one airport section supervisor (five days a week) and one or two inspectors during the day shift and one inspector is scheduled later in the work shifts so that maximum coverage is available during the peak of flight arrival times. Usually, there is one airport section supervisor (five days a week) and one or two inspectors during the day shift and one inspector is scheduled later in the day to the last flight at night.

Table 2. Daily Flight Arrivals at Kahului Airport

CARRIER	FLT	ORIGIN	ETA	CARGO	EQUIP	SUN	MON	TUE	WED	THU	FRI	SAT
RY	7 13	SFO	940	BOTH	DC10	X	X			X		X
TZ	671	SFO	1000	CONT	L10	X	X	X	X	X	X	X
ROYAL	172	YVR	1010	CONT	AIRBUS310	X						
TZ	709	LAX	1025	CONT	L10	X	X	X	X	X	X	X
RY	101	LAX	1035	BOTH	DC10	X	X			X		
UA	45	LAX	1047	BOTH	B767	X	X	X	X	X	X	X
UA	47	SFO	1106	BOTH	B777	X	X	X	X	X	X	X
AQ	473	OAK	1135	BULK	B737	X	X	X	X	X	X	X
TZ	743	LAX	1210	BOTH	L10							X
HA	5	LAX	1220	BOTH	DC10	X	X	X	X	X	X	X
TZ	579	PHX	1247	BULK	B757		X					X
UA	899	SFO	1253	BULK	B757	X						X
UA	37	LAX	1331	BULK	B757	X	X	X	X	X	X	X
DL	1565	LAX	1425	BOTH	L10	X	X	X	X	X	X	X
TW	3	STL	1547	BOTH	B767	X	X	X	X	X	X	X
AA	161	LAX	1829	BULK	B757	X	X	X	X	X	X	X
DL	1579	LAX/HNL	1858	BOTH	L10	X	X	X	X	X	X	X
CMM	735	YVR	1910	BULK	B757						X	
UA	39	LAX	2017	BOTH	B767	X	X	X	X	X	X	X
UA	49	SFO	2041	BULK	B757	X	X	X	X	X	X	X
AC	23	YVR	2246	CONT	B767							X

No. Flights: 17 16 13 13 15 14 18

During the assessment, 11 airlines had 13 to 18 scheduled direct overseas flights daily to Maui from the continental United States and Vancouver, Canada (Table 2). Five flights per day (UA45, UA47, HA5, UA39, and UA49) transport the majority of air cargo containers carrying agricultural products. Air cargo containers with produce are primarily LD3 containers. All inspections were visual, with inspectors focusing on disembarking passengers and their baggage and on agricultural cargo at the freight offices.



Figure 2. As flights arrive, the Inspector meets the aircraft through the jet bridge stairs.

The first priority of the quarantine inspection program at Kahului Airport is for the Plant Quarantine Inspector to meet domestic overseas flights at the gate at the time of arrival to collect the State of Hawaii Department of Agriculture Plants and Animals Declaration Form. (Exhibit 3 in Section 10)

State of Hawaii
Department of Agriculture

PLANTS AND ANIMALS DECLARATION FORM
MANDATORY DECLARATION
FOR ALL PASSENGERS, OFFICERS, AND CREW MEMBERS

ALONG! Welcome to the 50th State. Many plants and animals, found nowhere else in the world, have survived in our islands because of Hawaii's mild climate and marine isolation in the Pacific. Other plants, animals, and diseases - that commonly occur in other states and countries - could be harmful to our community, agriculture, and unique environment. We ask for your help in keeping Hawaii safe and beautiful by keeping out harmful pests and diseases. You are required by state law to fill out this declaration form. (Print clearly only)

• This declaration may include your spouse and any children under 18 years of age accompanying you.

A) I HAVE THE FOLLOWING ITEMS ON THIS TRIP:

- Fresh Fruits & Vegetables
- Old Fingers & Potage
- Potted Plants & Plant Cuttings, or Algae
- Plan or Propagative Seeds or Bulbs
- Soil, Growing Media, Sand, etc.
- Live Seaweed (sea-weed, clams, oysters, etc.)
- Cultures of Bacteria, Fungi, Viruses, or Protozoa
- Insects, Parasites, Amphibians, etc.

B) I HAVE THE FOLLOWING ITEMS ON THIS TRIP:

- Dogs
- Cats
- Birds
- Reptiles (Turtles, Lizards, Snakes, etc.)
- Other Animals

If you are traveling with any of the above live animals, you must notify a cabin attendant prior to departing.

Submit all above marked items for inspection to the Hawaii Plant Quarantine Inspector in the baggage claim area.

NONE OF THE ABOVE

* Fill out name and address, sign, and return declaration to cabin attendant.
PLEASE LIST SPECIFIC NAME AND QUANTITY OF ABOVE MARKED ITEMS.
(Past-free items that are not prohibited will be inspected & released.)

1 _____ 3 _____
2 _____ 4 _____

Origin (State or Country) of above items _____

Full Name (Print) _____ No. in Party _____

Home Address _____
(If not Address, apt. No.) _____

Hawaii Address _____
(If not Hawaii Address - Write "State or Country" of Current Residence)

Phone No. _____

Name of Airline/Ship _____ Flight No. _____ Date of Arrival _____

After visiting any coffee, nutmegs, banana or other farms while traveling overseas, wash all clothing, footwear and persons thoroughly before entering Hawaii to prevent the spread of plant diseases.

Any person who defaces the declaration form, gives false information, or fails to declare restricted articles in their possession, baggage, or cargo manifest shall be in violation of Chapter 150A of the Hawaii Revised Statutes and may be guilty of a misdemeanor punishable by a maximum penalty of \$25,000 and/or one year imprisonment.

Signature _____ Date _____
(See Reverse Side)

DOA/MSD Form Rev. April 1997

Figure 3. Plants and Animal Declaration Form

State of Hawaii Plant Quarantine Law (Chapter 150A, Plants and Animals Quarantine, Hawaii Revised Statutes) requires all passengers (i.e., each passenger, officer and crew member on the flight, or by one member of a traveling family) to complete this form. Passengers in possession of a regulated item, such as a live animal or fresh fruit or vegetable, must declare the item.

Failure to do so is a violation of State law and a misdemeanor punishable by a maximum penalty of \$25,000 and/or one year imprisonment. Typically, inspectors board the arriving aircraft and quickly review the declaration forms given to them by the aircraft crew. Prior to landing or disembarkation, flight crews will alert passengers to report to the inspector in the jet bridge if any are in possession of a regulated item. (If the regulated item is in check-on baggage, the inspector will meet the passenger in baggage claim for the inspection.)



Figure 4. The Inspector reviews the declaration forms and monitors the passengers as they disembark. The Inspector then proceeds to the restricted area behind the baggage claim to monitor baggage.

In the jet bridge, the inspector monitors the hand-carried baggage being taken off by the passengers and then proceeds to the restricted area in back of the baggage claim to monitor the checked-in baggage being off-loaded. Generally inspectors are not present in the baggage claim area unless prior arrangements are made at the gate to meet with a passenger for the inspection of a declared item. The inspector will board the next flight or, if time is available between flights, proceed to the cargo receiving area to inspect cargo from the same or earlier flights.

Maui is a limited port-of-entry, which means that the Board of Agriculture has determined that only plants, plant materials, and seafood can be cleared in Maui. In contrast, Honolulu is a full port-of-entry allowing plants, plant materials, seafood, non-domestic animals, and microorganisms to be cleared. As such, there is greater emphasis by inspectors on Maui to board arriving aircraft to prevent the introduction of illegal animals and microorganisms compared to Honolulu. In addition, because the airline crews must not allow the passengers to disembark until the inspector is given the declaration forms, the inspector is encouraged to be present when the aircraft arrives to prevent inconvenience. Consequently, cargo inspection at Kahului Airport has traditionally been cleared only after passengers from flights have been inspected. If there are back-to-back flights, cargo not yet inspected goes into refrigeration until the next convenient inspection time, which could be the following morning for late evening flights.

Maui Plant Quarantine has operated with a single detector dog and handler since 1991 with the canine handler detailed from the general inspection staff. During the assessment study, the canine handler transferred out of Plant Quarantine to another position in the department and the dog which he had handled for ten years was retired due to age and health concerns. The canine handler position was subsequently reassigned back to the general inspection staff. Although Plant Quarantine on Maui does not have a canine team, a vacant canine position funded by the State Department of Transportation has been posted for recruitment.

With the shortage of staff and heavy workload at Kahului Airport (regular hours, plus pre-shift, post-shift, and/or overtime), Plant Quarantine on Maui has had difficulty retaining staff. Sick leave hours, generally higher on Maui compared to other ports, have contributed to increased workload for the remaining inspectors.

SECTION 4 – PROJECT DESCRIPTION

4.1 Project Development

4.1.1 Definition of a Quarantine Pest

The risk assessment for Kahului Airport was developed consistent with accepted international definitions of quarantine pest: “a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled” (FAO, 1966; NAPPO, 1996). The first step in identifying quarantine pests is to present a comprehensive pest list of potential quarantine pests known to occur in the country or region from which the pathway is of origin. In this study, the pathway for the movement of pests is overseas flights landing at Kahului Airport. The pathway consists of passengers, baggage and cargo, from throughout the United States, as well as other points of departure. Compiling a potential pest list for these flights is impractical. Instead, the risk assessment is based on pests intercepted in the pathway and a determination of the potential economic importance that those pests may pose should they become established in Hawaii.

The definition of a pest, as defined in Chapter 150A, Hawaii Revised Statutes, was used to determine pest status of the intercepted organisms during the KARA. A pest is defined as “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” in Chapter 150A, HRS.



Figure 5. Inspector examining carton of leaf lettuce. Close-up photo of frisee lettuce.

Plant Quarantine inspectors monitored all domestic flights during the KARA for pests as defined in Chapter 150A and confiscated any pests found.

PQ's standard operating procedure and branch policies were followed for the inspection and disposition of all allowable agricultural commodities. That is, if any commodity was found infested with an insect or disease known to be present in Hawaii, it was allowed entry into the State if the level of infestation was light and the commodity could be "cleaned and released." If the commodity was moderately or heavily infested with the insect or disease, the inspector ordered the destruction or treatment of the commodity or ordered the return of the commodity to the shipper. State Plant Quarantine must officially identify all intercepted diseases or insects that result in regulatory action.

PQ-17-80

INSPECTOR'S INSECT INTERCEPTION REPORT

(P91)

INTERCEPTIONS: Port Maui Inspection Date 12/4/00

Ship UA 45 Arrival Date 12/4/00 Permit No. _____

Origin of Shipment LAX Inspector GI

Consignor _____ Consignee _____

Address LAX, CA 90045 Address Puuuene, Maui

Air
 Cargo
 Mail
 Baggage
 Air Express
 Express
 Stores
 Others


No.	Pest Found	Host	Part Attacked	Shipment Size	Life Stage	In On With	Dead	Alive	Amount Ex.	Amount Inf.	Disposition	Inspector and/or Entomologist Identification
628	Diptera <i>(Syrphidae)</i> - immature - can't ID	Frisee	Leaves	2 ctn	Immature	on		X	1 ctn	1 only	T/D	California
629	Acarina <i>(Anystidae)</i> <i>Anystis</i> sp. - ?	"	ctn	"	Adult	in		X	"	2	"	"
630	Aranidae <i>(Salticidae)</i>	"	"	"	Adult	in		X	"	1	"	"
631	Aphididae <i>Aphis gossypii</i> - in HV	"	"	"	Adult	in		X	"	5	"	"
632	<i>(Frankliniella)</i> Thripidae <i>Frankliniella occidentalis</i> - in HV	"	"	"	Adult	in		X	"	1	"	"
633	Cicadellidae <i>Balclutha</i> sp. - NKO	"	"	"	Adult	in		X	"	1	"	"

Remarks: Ctrs printed "Fauvat Ranch, Watsonville, CA"
 Note: Also, refer to micro interception # 637

120900
MR

Figure 6. One of three resulting insect/micro interception reports for this interception.

After identification of the pest(s), the Inspector notified the shipper of the disposition of the infested commodity in a rejection notice. The Rejection or Violation Notice form contains information on the date, means of conveyance, quantity of infested cartons, disposition of the shipment, commodity, shipper, importer, reason for disposition, and pest found in the shipment.



State of Hawaii
Department of Agriculture
PLANT QUARANTINE BRANCH
701 Ilalo Street, Honolulu, HI 96813

No. 00-439 PQ-21 (02/00)
Date: 4 Dec 00
AWB/
Tracking No. 5039-8110

REJECTION OR VIOLATION NOTICE

The commodity described below was introduced in Hawaii by UA 45 in contravention of Chapter HRS 150A Hawaii Revised Statutes and Chapter _____, Hawaii Administrative Rules of the Division of Plant Industry, Department of Agriculture.

The prohibited commodity has been removed.
 The unprohibited material has been released.
 2 Cartons/Pieces have been destroyed.
 _____ (No.)
 _____ Cartons/Pieces has to be/has been returned to the place of origin.
 _____ (No.)

The following conditions must be met or the introduction will be refused entry or destroyed.

- Application to be submitted in writing to Chief Plant Inspector (Application Form enclosed to importer).
- _____
- _____

COMMODITY (0) lot (2) ctns. 3# frisee infested with insects & infected with microorganism
 SHIPPER _____ Los Angeles, CA 90045
 IMPORTER _____ Piunene, Maui

* Prohibits the introduction of any insect or microorganism which may be detrimental to agriculture, horticulture or native biota.

cc: () Consignee Pest Found Insect # 622-636 / Micro # 637
 () Shipper () Supt. of Mails
 () Inquiry Window () _____
 () Origin Dept. Of Agriculture

Authorized by _____ (Owner or Agent) _____
Chief Plant Inspector
4 Dec 00
(Date)

Figure 7. Rejection or Violation Notice

4.1.2 Initial Scope of Work for Pest Risk Assessment

The initial plan to assess the risk of movement of pests into Maui through Kahului Airport was to double the personnel at Kahului Airport in order to conduct 100% inspections of cargo, and to increase inspections of other suspected pathways.

Five senior program staff (Plant Quarantine Program Manager, two Plant Quarantine specialists, the Honolulu International Airport supervisor, and the detector dog trainer) visited Kahului Airport during the last week of October 2000 to evaluate flight schedules and inspection requirements, collect preliminary data, and to design an inspection protocol for the Kahului Airport Risk Assessment.

It became apparent during the weeklong visit that a blitz inspection program on Maui would require additional staff and that staging personnel on Maui for daily work assignments would require close coordination with other ports-of-entry that would be tapped for inspectors for the risk assessment. It was also evident that senior plant quarantine officers would need to be involved on the ground at all times to assure consistency in the inspections and enforcement actions taken. At the outset of the initial blitz it became apparent that the inspection of cargo would be the priority and the target of the most intensive inspection effort.

Air cargo inspections were conducted at the air cargo building at Kahului Airport where Aloha Airlines, Hawaiian Airlines, American Airlines and United Airlines have small cargo offices to receive incoming as well as outgoing cargo. All cargo inspections were conducted in the parking lot fronting the individual cargo offices. The inspection location was the only non-Airport Operation Area (AOA) accessible to importers where LD3 cargo containers could be unloaded for inspection prior to removal from the airport. For security reasons, unauthorized persons are not allowed to enter AOA areas. The parking lot had minimal overhead coverage and no shelter from wind, rain, or other elements. There were limited refrigerated storage areas available at the cargo facilities to hold infested commodities until identification of the pest(s) and final disposition was determined.

4.2 Inspection Protocol

4.2.1 General Plan

The blitz inspection program required four inspectors, usually one from the Hilo port and a minimum of three from Honolulu, to work at Kahului Airport. The inspectors would be scheduled to arrive approximately 30 minutes prior to the first flight at Kahului Airport and be back on their respective island within their normal workday. Some inspectors stayed multiple days, which helped to minimize costs. Overnight inspectors provided additional coverage to the Maui inspector working the night shift. Additionally, the following morning before the first flight arrived, they inspected any cargo left from the night before. (Exhibit 5 in Section 10)

In the beginning of KARA, baggage and cargo coverage were given equal staffing. Additional inspectors were assigned to board aircraft and monitor baggage in the restricted and baggage claim areas as well as inspect incoming cargo. However, after one week of data collection, it became apparent that more personnel was needed in cargo inspection in order to adequately intercept and record the number of pests coming through air cargo. The additional inspectors primarily performed cargo inspection and recorded cargo data. (Exhibits 1 and 2 in Section 10) They only boarded aircraft and performed baggage inspections during off-cargo times or when Maui personnel could not adequately cover aircraft and baggage inspection. The main function of the Maui personnel was to conduct aircraft and baggage inspection and perform regular duties.

4.2.2 Inspection at the Gate

Inspectors inspected all domestic flights. The inspector assigned to the flight boarded the aircraft, obtained and screened Agricultural Declaration Forms for declared items, observed the disembarkation of passengers for suspicious hand carried items, performed a walk-through of the cabin, checked the cargo hold and wheel wells, and proceeded to the baggage claim area to monitor passenger baggage. Additional inspectors, when available, were stationed in the rear of the

baggage claim area (AOA restricted area). They monitored luggage, boxes and coolers before these were placed on the carousel. They then monitored these items in the baggage claim area.



Figure 8. Inspector queries the flight crew and inspects the aircraft after the passengers have disembarked.

The interaction of the inspector with the flight crew to determine the presence of agricultural commodities in the cabin was an important function of boarding the aircraft. As normal procedure, the inspector inquired if there were any plants or animals on board. The airline representative made an announcement to the passengers to present agricultural commodities to the Agricultural Inspector in the jet way. The inspector received the declaration forms from the flight attendant, set aside those that listed a declared item, monitored the deplaning passengers, and inspected hand-carried items such as coolers, boxes, packages that may have contained regulated items; applied a “passed” sticker to items inspected and allowed entry. After passengers deplaned, the inspector conducted a walk through of the passenger cabin for agricultural products and other items that may harbor pests or contraband items (e.g., boxes, packages, and the like.) Then the inspector went to the baggage claim area.

The aircraft tail number, date and block time (arrival), passenger and crew count (PAX), number of declaration forms, number of declaration forms that listed agricultural products, and number of intercepted agricultural commodities were included in the data recorded.

Cargo holds and wheel wells of aircraft were subjected to inspection when time permitted. The generally quick turn around of aircraft, ramp areas congested with machinery and flight crews in a high level of activity after the arrival of flights, inspecting these areas of the aircraft was difficult and dangerous in the limited time available.



Figure 9. Inspection of baggage in the restricted area (AOA) and of passengers in the baggage claim area.

4.2.3 Inspection at Baggage Claim

The inspector monitored the baggage off-loaded from carts onto the carousel belt in the AOA restricted section and tagged parcels for physical inspection in the baggage claim area. In the baggage claim area, the inspector monitored passengers and baggage and conducted physical inspection of tagged parcels with the consent of the owner. Passengers with agricultural commodities were asked to present their commodities to the inspector at the agricultural counter. For flights covered by a canine team in the baggage claim area, inspectors went directly to the cargo area after finishing inspection of the baggage in the restricted AOA area.

4.2.4 Canine Coverage

The detector dog teams were assigned to baggage claim to inspect incoming domestic passengers and baggage for declared and undeclared agricultural items and smuggled contraband (e.g., snakes, lizards, etc.).



Figure 10. Canine team patrols the baggage claim area and dog sniffs out agricultural commodities in baggage.

Maui Plant Quarantine had one detector dog and handler. A second detector dog was placed on Maui to assist with the inspections. Two canine handlers on

Oahu were rotated onto Maui to work the dog two to four days per week, inspection schedule on Oahu permitting. The canine trainer for Plant Quarantine monitored the work performance of the dogs and handlers during each of the blitzes. (Exhibit 5 in Section 10)

Canine inspections were conducted primarily during morning and early afternoon hours when the bulk of the domestic overseas flights arrived on Maui. Dog handlers were instructed to be as thorough as possible in the inspection of baggage for agricultural products and contraband for the purpose of assessing risk of movement of products through the pathway. Since passengers were often unaware of the reporting requirements for agricultural products, no enforcement action was generally considered when a canine team made an interception. The passenger was notified of the requirement; the item was inspected and if free of pests and not otherwise prohibited entry into Hawaii was returned to the passenger. Items prohibited entry into Hawaii or infested with a pest were confiscated and destroyed.

4.2.5 Cargo Inspection

Teams inspected cargo when off-loaded by the consignee or cargo personnel at the air cargo building. Generally, all agricultural commodities underwent 100% inspection. Non-agricultural commodities were sampled for the presence of undeclared agricultural items and hitchhiking pests.

One hundred percent inspection of agricultural commodities was possible when containers from a single flight were received at air cargo at one time. When cargo from multiple flights was received, 100% inspection was limited to high-risk commodities if time did not permit more thorough inspection of all items in the containers. Other commodities were sampled at the rate of one carton per product.



Figure 11. Inspector requests the removal of specific commodities from the LD3 and the commodity is thoroughly inspected for the presence of pests.

Air cargo containers were generally LD3s that contained a single commodity or a mixture of boxes of various commodities. During the initial planning and setup of

the assessment, each box in the containers underwent 100% inspection. The protocol was modified thereafter based on the findings of inspections of the various commodities. Subsequently, inspectors checked airway bills to highlight those commodities deemed to pose the highest risk of having insect pests or disease, and ordered the removal of those boxes from the container by the importer. Each of these boxes underwent 100% inspection of the contents. For lower risk products, 10% to 50% of the boxes in the shipment were subject to 100% inspection. As containers were cleared, boxes of produce from the containers were generally staged on pallets at the sites for removal from the airport by the importer.

Agricultural commodities found in inter-island cargo were inspected. Non-agricultural commodities on overseas and interisland flights were inspected when time permitted. No agricultural items or pests were found in these cargo shipments.

4.3 Project Costs

The Federal Aviation Administration (FAA) appropriated \$300,000 to fund the risk assessment. The money was funneled to HDOA through HDOT. As of December 31, 2001, \$249,204.79 had been spent. The majority of the monies, \$159,064.43 (63.8%), were spent on overtime and travel-related costs to send off-island inspectors to perform inspections on Maui. Equipment and supplies cost \$61,028.20 (24.5%). The remainder, \$29,112.16 (11.7%), was spent on overtime and related costs for identification of pests, bookkeeping, data processing, and preparation of the report. The list of expenditures for the project is in Exhibit 6 in Section 10.

4.3.1 Personnel Costs

Plant Quarantine inspectors were brought over to Maui from Oahu and Hawaii to carryout the inspections for the KARA. Approximately half of the inspectors used during the risk assessment were assigned to Maui on regular time, while the other half were working on an overtime basis. (Exhibit 5 in Section 10) This minimized expenditures to 'stretch out' the funding so that inspections could cover different seasons of the year. Likewise, approximately half of the non-inspection work relating to identification of pests, travel arrangements, bookkeeping, data processing, and report preparation were done during regular work time, and therefore, costs were absorbed by the Branch. Plant Quarantine dog teams participated when time and resources permitted. Work hours generally began one hour before the first domestic flights arrived in the morning and ended when the final night flights were cleared (approximately 11:00 p.m.). Cargo held overnight for inspection was cleared prior to the morning flight arrivals.

4.3.2 Equipment Costs

In 2000-2001, acquisitions included microscopes for the identification of pests, and computers and computer-related equipment and supplies (Exhibits 7 and 8 in Section 10). Prior to the risk assessment, Plant Quarantine had obsolete computer systems that were inadequate for the development of effective databases and other requirements for the production of a meaningful risk assessment (Exhibit 9 in Section 10).

In 2002-2003, acquisitions will include equipment and support articles needed to electronically link Plant Quarantine at Kahului Airport to the main offices of Plant Quarantine in Honolulu. Inspectors in Maui will have the ability to access staff support and technical resources not available on Maui. HDOA is in the process of installing a computer imaging system at Kahului Airport, Honolulu International Airport, and at the Plant Inspection Office in Honolulu, where identification of pests is performed. Aspects of this system are currently in place. The new system will allow images of insect specimens and disease pathogens to be electronically transmitted between the three locations.

SECTION 5 - FINDINGS

5.1 Passenger and Baggage Inspection

A total of 1,897 flights were monitored under KARA, with 399,463 passengers and crew on board (Table 3). Of the 1,897 flights, 1,539 (81%) had agricultural commodities in baggage or in the cabin.

Table 3. Baggage Statistics – Commercial Flights

	Flights	Pax	# Decs	Dec Items	Flowers		Plants		Produce		Seafood		Non-Ag		R/D	
					Lot	Ctn	Lot	Ctn	Lot	Ctn	Lot	Ctn	Lot	Ctn	Lot	Ctn
Sep 23-30	100	21,434	11,163	217	5	5	4	4	218	226	0	0	105	109	2	2
Oct 1-22	272	62,424	32,790	614	86	87	11	67	582	594	2	4	289	295	4	4
Nov 5-30	328	67,865	35,108	747	62	64	9	10	774	834	1	1	373	373	16	16
Dec 1-15	198	36,975	19,049	407	48	48	11	11	426	482	1	1	219	222	10	10
Jan 29- Feb 17	290	59,504	30,727	577	43	46	3	4	586	596	0	0	118	120	10	10
Apr 22- May 12	329	65,065	34,648	620	23	32	9	54	621	699	4	4	229	231	4	4
Jul 8-28	380	86,196	38,807	691	57	59	11	12	676	698	2	2	340	346	7	7
Total	1897	399,463	202,292	3873	324	341	58	162	3883	4129	10	12	1673	1696	53	53

Decs = Declaration Form

Dec Items = Number of declared items

Non-Ag = personal effects or processed foods

Pax = passengers + crew

R/D = Restricted/Destroyed

5.1.1 Inspection of Carry-on and Checked Baggage

Inspectors monitored carry-on and checked baggage in the jet bridge and the baggage claim area. They opened suspect cartons, such as coolers, that would likely hold agricultural commodities. A total of 5,948 lots were suspected of containing agricultural commodities and were inspected.

Agricultural commodities were found in 4,275 (72%) of the lots inspected. The remaining 1,673 (28%) lots were found to contain personal effects or processed food and were logged as non-agricultural and released. Inspectors took action on only 53 lots of which 46 were destroyed. Of these 53 lots, 11 were infested with pests and the remaining were restricted commodities, which lacked the

necessary documentation to enter the State. The other 4,275 lots of agricultural items were allowable commodities and were free of injurious pests.

5.1.2 Cabin Walk-Through

Inspectors walked through 831 cabins on commercial aircraft and found 166 different agricultural commodities (297 lots).

Table 4. Walk-through Inspections on Commercial Aircraft at Kahului Airport

Lots	Parcels	Restricted?	Item	Disposition
65	65	N	Cut flowers	IR
1	1	N	Cut foliage	IR
1	1	Y	Florida citrus	Destroy
1	1	Y	Pineapple	Destroy
1	1	N	Processed food	IR
227	233	N	Produce	IR
1	1	Y	Spider	Destroy

Three lots were restricted commodities (pineapple, Florida citrus, and radish) and were confiscated and destroyed by Plant Quarantine. Inspectors also boarded 75 private aircraft and found 82 different agricultural commodities (92 lots), of which 12 were destroyed for being restricted commodities. A list of the agricultural products intercepted and destroyed is given below.

Table 5. Walk-through Inspections on Private Aircraft at Kahului Airport

Lots	Parcels	Restricted?	Item	Disposition
1	1	Y	Radish	Destroy
10	11	N	Cut flowers	IR
11	11	Y	Pineapple	Destroy
17	23	N	Processed food	IR
53	77	N	Produce	IR

5.1.3 Detector Dog Teams in Baggage Area

Detector dog teams patrolled the baggage carrousel in the baggage claim area. The detector dog teams monitored 546 flights with 122,745 passengers and intercepted 1,747 agricultural commodities, 71% of which were not declared by passengers. Commonly found items were apples, bananas, and oranges. These items are typically found on domestic flights as passengers often carry these types of items as snacks on long flights. Three restricted agricultural products (all Florida citrus), prohibited entry into Hawaii without proper documentation, were intercepted and destroyed. One parcel of persimmons, which was heavily infested with mealybugs, was also destroyed. Of these four destroyed commodities, three of them were declared and one was not. No

passengers were intercepted attempting to smuggle prohibited insects or vertebrate animals into Maui.

Table 6. Detector Dog Team Statistics of Declared Agricultural Commodities

Commodity	Flights	Lots	Parcels
Cut Flowers	13	15	15
Plants	3	3	3
Produce	279	482	487
Total	295	503	508

Table 7. Detector Dog Team Statistics of Undeclared Agricultural Commodities

Commodity	Flights	Lots	Parcels
Cut Flowers	87	131	131
Plants	1	1	1
Produce	474	1103	1106
Total	562	1236	1239

Passengers' reaction to canine teams in baggage claim was overwhelmingly positive. Passengers were generally supportive of the State's use of dogs to keep agricultural contraband and alien species out of Hawaii.

5.2 Cargo Inspection

5.2.1 Summary of Insect Pest Interceptions

The KARA cargo inspections involved the inspection of 1,495 shipments containing 168,351 cases of various agricultural commodities. Visual inspections of the entire contents of the cases (i.e., 100% inspection) were conducted on 29,607 cases. The other cases in the shipments were inspected but to a lesser degree. Pests were found in 2,903 cases or 9.8% of the cases that underwent the 100% inspection. If a pest was found in one case of a lot of many cases, the whole lot underwent the same disposition. Therefore, although 2,903 cases were found infested, 7,125 cases were actually treated as infested.

5.2.2 High-Risk Commodities

Initially, all cases of agricultural products were subject to 100% inspection but due to limited resources, the 100% inspections were eventually restricted to commodities that were determined to be of higher risk. Risk determination was

based on data from prior inspections. High-risk commodities were those that had pest infestations in 10% or more of the cases, had infestations of pests that were not known to occur in Hawaii, or had moderate to heavy infestations of pests. A total of 107 commodities met these criteria (Table 8 in Section 8).

A total of 480 different agricultural commodities were shipped during the risk assessment. No pests were found on 366 commodities. For the other 114 commodities, one or more lots were infested; 51% of these had pest infestations less than 10% of the time. The remaining 56 commodities were found infested with pests 10% or more of the time (Table 8 in Section 8).

5.2.3 Insect Interceptions on Commodities

There were 1,401 interceptions of insects involving 279 different species (Table 9 in Section 8). An interception is the finding of an insect or disease on a commodity within a shipment. Each shipment has a unique waybill number. For example a shipment may contain 15 commodities. If three different species of insects are found in the shipment then this is logged as three interceptions. There may be one or many individuals of each of the three species but they are logged as only three interceptions. These three insects may be on the same commodity or on different commodities within the shipment. If the same insects were found in a different shipment on the same day, they would be logged as three separate interceptions.

Each of these 1,401 potential pest interceptions was identified as closely as possible to the species level. On the bases of this identification, the status of the species in Hawaii was determined. The insects were either not known to occur in Hawaii (NKO), known to be established in Hawaii, or of an undetermined status (Table 9 in Section 8) based on the Bishop Museum “Hawaiian Terrestrial Arthropod Database, 3rd Edition.” Of the 279 species, 125 were NKO, 103 were established in Hawaii, and 51 were of undetermined status. The disposition of the commodity was based on whether or not the pest was established in Hawaii.

Table 10. Disposition of Insect Infested Commodities

Disposition	Established in Hawaii		
	?	Y	N
I/R	38	397	0
R/R	189	225	234
RE	10	27	19
T/D	42	110	80
T/R	11	10	9

I/R = inspected and released commodity
R/R = removed pest and released commodity
RE = refused entry of commodity
T/D = treated and destroyed commodity
T/R = treated and released commodity

Insects were considered high risk if they were NKO or were found at either moderate or heavy infestation levels in the commodity. Commodities infested with high-risk insects were either treated and destroyed (T/D), refused entry to the State (RE), treated and released (T/R), or the insect removed and the commodity released (R/R) (Table 10). Therefore, commodities with moderate to heavy infestations of insects that were established in Hawaii still received a T/D, RE, T/R, or R/R disposition. These insects were considered high-risk because at these higher densities they have a greater probability of bringing new genetic material into the State to add to existing populations of the pest. (Exhibit 10 in Section 10)

Interestingly, based on records kept since 1995, 31 of the 125 NKO insects intercepted during the KARA were intercepted for the first time (Table 11 in Section 8). This demonstrates that the inspectors are intercepting unique insects and that the inspectors are not always finding the same insect species during their inspection activities. Most of these NKO insects were only found once and typically only one or a few individuals were encountered. The exception was a citrus peel-mining moth, *Marmara gulosa*, which was undergoing an outbreak in California during the KARA. Most of the insect species frequently intercepted and in high densities were common agricultural crop pests that were already established in Hawaii.



Figure 12. Citrus Peelminer, *Marmara gulosa*, infests both fruit and vegetable crops as well as ornamentals belonging to 31 different families of plants.

5.2.4 Disease Interceptions on Commodities

There were 212 interceptions of commodities held for identification of disease-causing organisms. Of these interceptions, 37 were determined to be symptoms caused by factors other than a disease-causing organism, and 19 could not be identified. The remaining 156 interceptions were for disease symptoms caused by plant pathogens (Table 12 in Section 8).

Hawaii Department of Agriculture and University of Hawaii plant pathologists identified 47 species of plant disease organisms, 16 NKO, 21 established in Hawaii, and 10 of unknown status. (Exhibit 11 in Section 10) The disposition of commodities infested with these organisms is listed below (Table 13).

Table 13. Dispositions of Disease-infested Commodities

Disposition	Established in Hawaii		
	?	Y	N
I/R	8	35	0
R/R	3	5	8
RE	1	5	15
T/D	1	7	67

I/R = inspected and released commodity
R/R = removed pest and released commodity
RE = refused entry of commodity
T/D = treated and destroyed commodity

Typically, disease interceptions were much fewer and harder to attain than insect interceptions. For insects, the inspector was looking for the presence of an insect or a stage of development, such as an egg, larval or pupal stage. For diseases, the presence of a pathogen was much more difficult to detect visually and symptoms could be confused with chemical or insect damage, nutrient deficiencies or toxicities, or damage from cultivation practices. However despite these impediments, the interceptions of disease pathogens increased during KARA and because of heightened awareness amongst the inspectors had a beneficial impact on statewide interceptions.

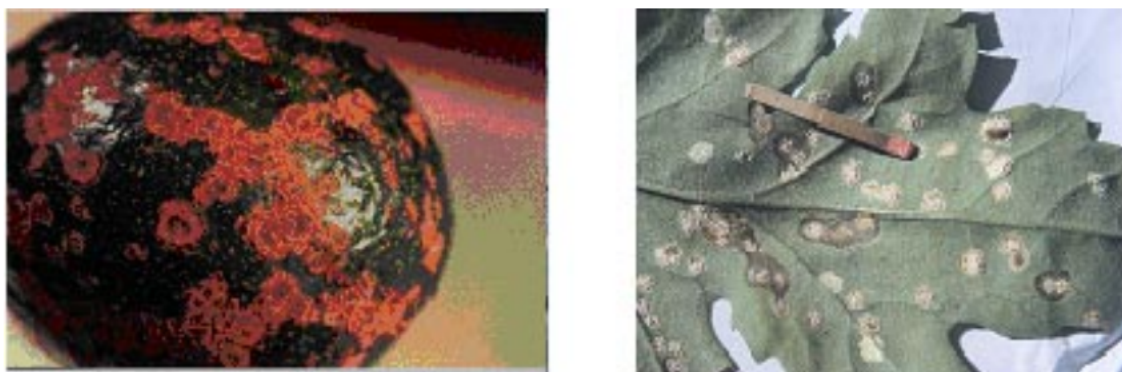


Figure 13. Disease interceptions included avocado scab disease and chrysanthemum white rust. The interceptions of these diseases were new state records.

Two of the more significant diseases found during KARA were the avocado scab disease and the chrysanthemum white rust. The significance of avocado scab

disease was based on the number of interceptions (32 interceptions). *Chrysanthemum white rust*, *Puccinia horiana*, is a federal quarantine pest. The interception of the rust in Hawaii caused the shipping state's agricultural officials to require that the grower destroy the crop and to control the disease outbreak in his operation.

Table 14. KARA Disease Interceptions - New State Records

PATHOGEN	HOST	NKO Y/N?	INTERCEPTIONS
Alternaria alternata	pepper, red bell	Y	1
Alternaria sp.	bupleurum	Y	1
Avocado scab disease	avocado	Y	32
Cladosporium sp.	pepper, red bell	Y	1
Colletotrichum gloeosporioides	aglaonema	Y	1
Eggplant scab disease	eggplant	Y	2
Leveillula taurica	carrot	Y	1
Oidium sp.	delphinium	Y	1
Peronospora parasitica	stock flower	Y	1
Phyllosticta ixorae	ixora	Y	1
Puccinia horiana	chrysanthemum	Y	1

NKO' = Not Known to Occur in Hawaii

New State Record: First record of a disease pathogen to be found in Hawaii on a specific host.

5.2.5 Organic vs. Commercial Commodities

During the data collection phase of this study, Plant Quarantine inspectors felt that organic commodities, which are produce grown and labeled as 'organic', were at a higher risk of pest infestation than non-organic commodities. The interception record supports this perception (Table 15 in Section 8). In general, a higher percentage of organic produce was infested with pests when compared with the same commercial commodity. The extreme was with strawberries. We found 62% of the cases of organic strawberries infested with pests compared to 27% of the cases of non-organic strawberries.

An analysis of the pests found on produce, in general, showed no differences in the species of pests on organic versus non-organic produce. In other words, the same species were found, but the organic produce was infested more often than non-organic and often had higher densities of pests on the infested fruits and vegetables.

PQ-17-80
INSPECTOR'S INSECT INTERCEPTION REPORT

INTERCEPTIONS: Port Maui Inspection Date 12/5/00 Ar Cargo
 Ship UA 45 Arrival Date 12/5/00 Permit No. _____ Mail
 Origin of Shipment LAX Inspector GI _____ Baggage
 Consignor _____ Consignee _____ _____ Air Express
 Address LAX, CA Address OGG _____ Stores
 _____ Others
WB# 5041 9121

No.	Pest Found	Host	Part Affected	Shipment Size	Life Stage	In On With	Dead	Alive	Amount Ex.	Amount Inf.	Disposition	Inspector and/or Entomologist Identification
647	Coleoptera <i>(Chrysomelidae)</i>	Red leaf lett. <i>Diabrotica</i>	leaves	1 ctn 30 lbs 12/5/00	adult	rn		X	1 ctn	(0)only	T/D	California
648	Aphididae (blk)	"	"	"	Var	"		X	"	imm	"	"
		<i>Aphis gossypii</i> - in HI										
649	Aphididae (grn)	"	"	"	Var	"		X	"	heavy	"	"
		<i>Macrosiphum euphorbiae</i> - in HI										
650	Aphididae (blk)	"	"	"	Var	"		X	"	mod	"	"
		<i>Nasonovia ribisnigri</i> - in HI										
651	Diptera <i>(Syrphidae)</i>	"	"	"	imm	"		X	"	(0)only	"	"
		<i>adult 1D larvae</i>										
652	Formicidae	"	"	"	adult	"		X	"	(0)only	"	"
		<i>Linepithema humile</i> - in HI										

Remarks: Note: all insects collected off a single head of lettuce
 Reg# 00-447 - Frozen
 ctn printed: "ORGANICALLY GROWN IN ACCORDANCE WITH CALIFORNIA ORGANIC FOOD ACT OF 1990
 PRODUCE OF U.S.A., GROWN, PACKED AND SHIPPED BY NOJODWIN FARMS, BUELLTON, CA 93427"
 "CERTIFIED ORGANIC VEGETABLES"


12-08-00 

Figure 14. Insects intercepted off a single head of organic red leaf lettuce. Not all organic commodities were infested to this level, but this interception serves as an example showing higher densities of pests.

5.2.6 KARA Interceptions vs. Non-KARA Interceptions

KARA data collection consisted of seven multi-week blitzes over a one-year period, as described previously. It was hoped that this would allow for the interception of seasonal pests that would not show up in a one-time only blitz. The similarity or dissimilarity of pests found during the KARA with PQ statewide interception records were also of interest.

5.2.6.1 Number of Insect Interceptions

There were a total of 1,401 interceptions during 130 inspection days for an average of 10.8 interceptions per day for the KARA. This compares to an average of 782 interceptions per year (2.1 per day) on a statewide basis for the years 1995 through 2001. The differences in daily interceptions between KARA data and typical statewide data are due to the concerted effort put into the inspections during the KARA. Produce entering the State does not typically undergo 100% inspection of all contents in the boxes as was performed during the KARA. Plant Quarantine does not have the staffing to undergo such an intensive inspection effort. In fact, despite assigning extra personnel to Kahului Airport to conduct cargo inspections during the KARA, the 100% inspections were eventually

restricted to high-risk commodities rather than all commodities. PQ would have needed to double their staffing to continue the 100% inspections of all commodities.

5.2.6.2 Species Intercepted

Even though much higher numbers of interceptions were made at Kahului Airport during the KARA, the species compositions were similar between KARA and regular PQ interceptions (Table 16 in Section 8). Similar species were found during KARA compared to statewide interceptions from 1995 to 2001. Thirty of the 50 most frequently intercepted species on a statewide basis were picked up in the KARA.

Fewer species were found during the KARA compared to regular PQ statewide interceptions. However, the percentage of NKO species found during KARA was similar to regular PQ statewide interceptions (Table 17). Differences existed in the percentage of species that were known to occur in Hawaii. This was mainly due to the higher number of immature stages such as syrphid fly larvae turned in for identification for KARA. This stage is rarely turned in during regular PQ inspections because the inspectors know that identification cannot be done. Instead they would remove the larvae at the site and release the commodity without turning in any samples.

Table 17. Comparisons between KARA and Statewide Interceptions

No. (%)	NKO	In HI	?
KARA (130days) (279 species)	125 (44.8)	103 (36.9)	51 (18.3)
Normal (7 yrs) (943 species)	447 (47.4)	521 (55.2)	41 (4.3)

5.2.6.3 Host Comparisons

Comparing the rankings of 30 most frequently infested commodities at Kahului with the same commodities statewide (using 1995-2001 data) showed similar rankings (Table 18). Fifteen and 22 of the Maui top 30 were in the top 30 and 50, respectively, statewide. Commodities ranked in the top 30 statewide but not at Kahului were corn, carnations, sunflowers, and bananas (ranked 57, 87, 36, and 76 at Kahului, respectively). Orchids, feed, bromeliads, bamboo, and grass were also in the top 30 interceptions on a statewide basis but were not intercepted at all at Kahului. Feed is not shipped by air to Kahului. The other commodities are all restricted and must either undergo a quarantine period or are ordered to office (orchids and bromeliads) for 100% inspection and would not be encountered in Kahului Airport cargo.

5.2.7 Origin of Agricultural Products

The majority of the shipments from domestic ports were from California with a few arriving from other states such as Florida, Oregon, Texas, and Washington. Foreign shipments primarily came from Mexico, New Zealand, Australia, Ecuador, Guatemala, and Holland. Compositions of established pests were not strikingly different between foreign and domestic shipments. Infested foreign shipments were composed of 33% NKO, 52% established, and 15% unknown status pests compared to 45% NKO, 37% established, and 7% unknown status pests for domestic shipments.

Table 18. Ranking of 30 most commonly infested commodities in Kahului air cargo compared to statewide infestation ranking (1995-2001)

Commodity	Maui Rank	Statewide Rank	Commodity	Maui Rank	Statewide Rank
Strawberry	1	2	Raspberry	16	26
Lettuce, red	2	11	Lettuce, frisee	17	49
Lettuce, iceberg	3	1	Avocado	18	109
Lettuce, romaine	4	19	Pea	19	119
Lettuce, green	5	13	Cabbage, collards	20	111
Cabbage, kale	6	25	Watercress	21	3
Cabbage	7	5	Flower, chrysanthemum	22	24
Pepper, bell	9	44	Flower, gypsophila	23	24
Onion, green	10	89	Mint	24	18
Flower, wax	11	213	Parsley	25	75
Citrus, orange	12	17	Flower, edible	26	39
Persimmon	13	4	Cauliflower	27	45
Spinach	14	12	Asparagus	28	108
Cabbage, bok choy	15	22	Flower, solidago	30	362

5.2.8 KARA Interceptions Compared to Baseline Survey

A comparison of the 50 most frequently intercepted insects with the Bishop Museum baseline survey of the Kahului airport environs is shown in Table 13. Entries with a "+" were found in air cargo and in the baseline survey. Those with a "-" were not found in the baseline survey and those with a "?" were not identified to species level and could not be definitively determined. For example, Syrphidae larvae were the most commonly intercepted insects on various hosts in air cargo. Adult syrphids were collected in the baseline survey but may be different species from the larvae collected on the produce. The larvae would need to be reared to adults in order to state with certainty that these were the same species.

The results show that very few of the most commonly encountered insects in the air cargo are found in the airport environs. This is not surprising in that these insects tend to be fairly host specific to the produce being brought in to the State. Most escapees at the airport are not likely to become established near the airport. Of greater risk for establishment would be insects coming in on propagative plant material. These insects are moved from the airport on their host plant to areas where their hosts are being cultured.

5.2.9 KARA Interceptions Compared to New State Reports

During the past 22 years (1980-2002), 266 insects and other arthropods were recorded as new state records for Hawaii (Appendix G). This averages to 12 new arthropods established per year. Most of these are not pests or are of minor significance. Some were purposely introduced to control other pests. Of these 266 insects and other arthropods, 46 (Table 19 in Section 8) are considered moderate to serious pests by the Hawaii Department of Agriculture. Twenty-five of these 46 pests are of foreign origin and would not have entered on commodities inspected by HDOA. USDA inspects commodities arriving directly from foreign sources. The other 21 pests are known to occur on the mainland and could have entered on commodities inspected by HDOA (Table 19 in Section 8).

Based on these records, approximately two new moderate-to-serious pests have entered the State each year over the last 22 years. None of these 46 pests were intercepted on incoming agricultural commodities during the KARA. However, 125 species of pest insects and 16 plant diseases not known to occur in Hawaii were intercepted at Kahului during the 130 days of KARA inspections. It appears that although pests are bypassing quarantine and entering the State, the vast majority of species intercepted by Plant Quarantine either do not become established in Hawaii or are not pestiferous or prominent species after establishment.

SECTION 6 - RECOMMENDATIONS

The findings demonstrated that aircraft, passenger carry-on, and checked baggage were low risk for the importation of alien species into Maui. The highest risk was with agricultural commodities imported as cargo. HDOA should consider cargo as the highest priority for inspections. The aircraft, passengers, and passenger baggage should be of lower priority.

Passengers frequently failed to report agricultural products on Plant and Animal Declaration Forms handed out by airline crews; however, the commodities brought in by passengers were generally low risk for alien species importation. Fruit was the most common undeclared item. These were typically bought in a market on the mainland for consumption during flight.

These findings of the low risk of aircraft passenger and cargo areas do not support the proposal that these areas should be prophylactically sprayed with insecticides.

Number of inspectors. Kahului airport inspections are handled by five inspectors working various shifts to cover all flights during the day. This is not sufficient to cover all required activities. In addition, this does not take into account inspectors taking sick or vacation leave. The other inspectors then cover these shifts on an overtime basis. The result is that these five inspectors typically work six or seven days a week with shifts longer than eight hours. The consequence is rapid "burnout" of the inspectors among other problems. Based on the results of the risk assessment, a minimum of 14 inspectors (11 inspectors and three inspector/dog handlers) and three dogs are needed at Kahului Airport to cover all required activities. This is a minimum number. The 14 inspectors would still need to work some overtime in order to maintain the same level of inspection that was done during the KARA. A more realistic number of 19 inspectors are needed to sustain this level of inspection, account for sick and vacation leave, and not require overtime work. The KARA functioned by adding an additional three inspectors to the Kahului crew each day, resulting in eight inspectors working each day, with some working more than eight-hour shifts. These figures compare to USDA/PPQ covering the departure of these same flights with 11 full time inspectors and 60 part-time inspectors. The USDA staff inspects checked and hand-carried baggage and cargo for interline and direct flights to the mainland. (Exhibit 13 in Section 10)

Temporary positions for inspectors. There are currently two temporary inspector positions for Maui. It has been difficult to hire and retain employees in temporary positions. Applicants either don't accept the position after interviewing or they move out of the position into permanent State positions as soon as those become available. In order to retain employees, all new positions should be permanent positions.

Cargo inspection facility. There is currently no cargo inspection facility. A cargo inspection facility is essential to minimize the risk of escape of alien species from arriving cargo during inspection as well as to allow for proper lighting and conditions for inspection of the cargo. Currently, inspections are conducted in the open, often under windy conditions. Cargo arriving at night is not inspected until the following day due to inadequate lighting. At a minimum, cargo inspections should be conducted within an enclosed area. Additionally, the inspection area should be well lit. The cargo inspection area should also not be in a restricted AOA area so that the importer can unload the cargo from the containers for inspection.

Storage for cargo waiting disposition. Inspected cargo found infested with pests often needed to be stored until determination of the pest could be made. This often took from hours to a few days. Perishable cargo needed to be kept refrigerated. HDOA does not have the capacity to store this infested cargo and airlines only had limited space in their cargo facilities. A 40-foot refrigerated container kept by HDOA or HDOT near the cargo inspection area is needed to temporarily store perishable cargo.

Ability to destroy cargo. Cargo found infested with NKO pests or with heavy infestations of pests needed to be destroyed or returned to the shipper. (Exhibit 12 in Section 10) Destruction was carried out by freezing, grinding (garbage disposal), or incineration. HDOA did not have the capacity to freeze or incinerate. Cargo was frozen in either the United Airlines' or the Hawaiian Airlines' freezer, when they had room. A 40-foot refrigerated container kept by HDOA or HDOT near the cargo inspection area is needed to freeze infested cargo. This is in addition to the storage container. There are no incineration facilities on Maui and this mode of destruction may not be an option.

Ability to refuse entry of cargo. Cargo that cannot be treated or destroyed on Maui will need to be returned to the shipper. There were some disagreements as to who was responsible for the costs. This needs to be addressed by the Office of Attorney General and amendments to the State statutes need to be implemented, if necessary.

Use of dog teams in baggage area. The majority (71%) of the items found by the dog teams in baggage claim were undeclared produce. These were almost exclusively low risk items such as apples, bananas, and other fruit carried on the aircraft for snacks. Therefore, the dog teams working in the baggage claim area do not have as great an impact as they do in other inspection activities. They are, in contrast, very effective in package and mail inspections in Honolulu. The advantage of dog teams in baggage claim is the public relations value. Their high visibility, sniffing baggage in baggage claim, assures and alerts passengers that baggage is being inspected by the Department of Agriculture, even though the most effective inspections occur "behind the scenes" by PQ inspectors and other dog teams.

Use of X-ray to Detect Contraband in luggage. The general experience of State Plant Quarantine, based on previous trials, has been that x-ray systems are not likely to improve the efficiency of inspection programs to a significant extent. X-ray units require two to three officers to staff and a strategic location in baggage receiving for the processing of luggage and other check-on items through the unit. Plant Quarantine does not have the resources to staff x-ray units at the present time and is not likely to have the necessary resources in the foreseeable future. Given the relatively low risk of luggage as a pathway of entry of pests into the State, the use of this technology (other than for quality control purposes) does not appear to be warranted at this time.

Inspection of Passengers Prior to Baggage Claim. The Kahului Airport is an open airport— arriving overseas domestic passengers can depart the airport without passing through baggage claim. As a result, individual passengers can leave the airport without inspection of carry-on baggage. For the majority of passengers this would not appear to be a serious concern given that passengers are generally low risk with respect to agricultural contraband and pest entry. The current airport layout and Plant Quarantine inspection program provide little deterrent and little interception capabilities against passengers intent on smuggling alien species (e.g., lizards, snakes and the like) into Maui.

SECTION 7 - CONCLUSIONS

Individual pest risks assessments have not yet been conducted for the insects, other arthropods and diseases intercepted in the Kahului Airport inspections. As noted above, an intercepted organism is a pest of quarantine concern if it is associated with plant damage or crop loss and is not already present or widely distributed and being officially controlled. Organisms not known to exist in Hawaii are assumed to be “of potential economic importance” to Hawaii and the commodity containing this pest can be rejected. This policy of State Plant Quarantine is not likely to be changed in the foreseeable future in the absence of more complete pest risk information for species NKO in Hawaii. This would appear to be a prudent position for Hawaii to take in light of the uncertainties that are encountered with respect to pest invasion, establishment and harm that may be caused.

The following discussion from “Generic Non-Indigenous Pest Risk Assessment Process” by Richard L. Orr, Susan D. Cohen, and Robert L. Griffin, Planning and Risk Analysis Systems, Policy and Program Development, APHIS, USDA, November 22, 1993, states the uncertainties:

“B. What Risk Assessments cannot do:

Numerous attempts have been made in the past to produce a process that measures the risk of pest introduction associated with importing commodities (McGregor, 1973; USDA, 1978, 1982, 1986 and Kahn, 1989). The goals of some of these processes reflected what was wanted, not what was possible. Goals that cannot be obtained from a risk assessment are:

2.2.4.1 A risk assessment cannot determine the acceptable risk level. What risk, or how much risk, is acceptable depends on how a person, or agency, perceives that risk. Risk levels are value judgments that are characterized by variables beyond the systematic evaluation of information.

- 3 It is not possible to determine precisely whether, when, or how a particular introduced organism will become established. It is equally impossible to determine what specific impact an introduced organism will have. This has been stressed by ecologists (Crawley, 1987; Kogan, 1990 and Drake, 1993) and by agricultural pest scientists (Catley, 1990; McGregor, 1973; Sailer, 1978; and USDA, 1983). The best that can be achieved is to estimate the likelihood that a pest may be introduced and estimate its potential to do damage under favorable host/environmental conditions.”*

Russell McGregor’s summary of Hawaii’s experience is telling in turn:

“The experience of Hawaii in attempting to keep foreign pest invaders at bay may be significant in appraising the effectiveness of quarantines. These climatically favored islands have never been connected to any continental land mass and were geographically isolated from world biota prior to the arrival of Europeans in the 18th Century. Over the past 250 years, the native fauna has been, in good part, displaced as a result of the actions of nonindigenous man. Over 1,000 species of insects and mites have been recorded as immigrant to Hawaii, and in the 1942-72 period, the rate of colonization per 1,000 square miles was 40 species, 500 times the rate for the continental U.S. This, despite a quarantine effort more intensive than that for the contiguous U.S. Conclusion: It is not the deterrent effect of quarantine inspection but some ecological difference that accounts for the disproportionately low immigrant fauna present in the contiguous States. (Conversely, for the disproportionately high immigrant fauna present in the Hawaiian Islands.)”

McGregor goes on to state:

“Chapter 3 – Defining the Threat

There are perhaps 2,500,000 insect species not present in the U.S. About 800,000 of these have been identified and 6,000 of them are known to be damaging in foreign areas having ecological equivalents of the U.S. It may be that the low predictability for pest behavior among insects precludes compilation of a list of injurious exotic species, which would provide reasonable basis for program decisions. However, since we cannot protect ourselves against everything, it is useful to have some ordering of the potential invaders that provides an opportunity to make choices, however uncertain, in the use of program resources.”

To this end, the State Plant Quarantine sees the KARA as a fortuitous starting point for more effective program planning for the best use of available resources today and for use of additional resources in the future. While passengers may pose a low risk of entry of pests into the islands, passengers are undoubtedly the high-risk component or pathway for smuggling. The KARA provides no insight into the significance of this particular concern and threat to the islands. Therefore, presence of inspectors at the gate and at baggage receiving with canine support remains a valuable part of the overall effort of the State quarantine program. This report is a summary of findings to date in a program of review that is on going in an effort to improve quarantine services to Kahului Airport and at the ports-of-entry into the state in general.