HACCP Plan

Survey and Control of
Miconia calvescens

Kaua`i Invasive Species Committee
Kaua`i, Hawai`i

HACCP Step 1 – Activity Description

Activity Description	
Facility: **Kaua`i Invasive Species Committee Headquarter, Lihue, HI**	Site: **Kauai, Hawaii**
Project Coordinator: **Keren Gundersen**	Activity: **Survey and control of *Miconia calvescens* within the Wailua Game Management Area and Halelea Forest Preserve without tracking Miconia seeds and transporting other invasive species in/ or out of the infested area.**
Site Manager: **Larry Kaneholani**	
Address: **PO Box 1998 Lihue, HI 96766**	
Phone: **808-246-0684**	

Project Description i.e. Who; What; Where; When; How; Why
The Kauai Invasive Species Committee and conservation partnership agencies will systematically survey and control for Miconia calvescens. Surveys will take place in the Wailua Game Management area and Halelea Forest Preserve on the island of Kauai. Crews will survey weekly, weather permitting. **Field crew will travel from the KISC base yard in Lihue, Kauai, to an appropriate site where the vehicle will be parked. The crew will hike on a public trail to a designated area and then change into dedicated personal protective equipment (PPE) before conducting transects where miconia is suspected.** **The crew will then survey the area and control miconia, if present. Control of plants will include hand-pulling immature plants and cutting with machetes larger plants and treating stumps using a 50% Garlon 4 and 50% Forest crop oil. The survey and treatment locations are stored on GPS.** **After the survey and control work is done for the day, the crew will then hike out of infested area, change out of dedicated gear, place all gear and PPE in plastic bags or dedicated bins. Crew will then hike on public trails to return to the vehicle, stow all gear, and drive back to the base yard. At the base yard, the crew will launder the PPE, clean all footwear and gear.** **Survey and control work is to detect, control, and eradicate Miconia calvescens and other targeted invasive species in order to protect Kauai's watershed.**

HACCP Step 2 – Identify Potential Hazards

Hazards: Species Which May Potentially Be Moved/Introduced
Vertebrates: **Hunters, dogs, other hikers, pigs, game birds, and crew**
Invertebrates: **Insects, worms, spiders, centipedes**
Plants: **Miconia seeds**, **Guava seeds, Australian tree ferns, clidemia, and all other invasive and non invasive seeds**
Other Biologics (e.g. disease, pathogen, parasite): **Ohia Rust, fungi, spores, and pollens.**
Others (e.g. construction materials, etc.): **Herbicide spills, lunch debris, and seed-laden human feces**

HACCP Step 3 – Flow Diagram

Flow Diagram Outlining Sequential Tasks to Complete Activity/Project
Described in HACCP Step 1 – Activity Description

Task 1	**Prepare dedicated equipment and personnel in base yard in Lihue, Kauai.**
⇓	
Task 2	**Drive to site, park vehicle, and hike to dedicated trail head. Change into PPE.**
⇓	
Task 3	**Conduct transects and control plants (e.g., include hand-pulling immature plants and cutting with machetes larger plants and treating stumps using a 50% Garlon 4 and 50% Forest crop oil.) when possible. Take GPS points and map progress.**
⇓	
Task 4	**Hike out of infested area and change out of dedicated PPE at same location as was used to change into PPE when accessing location from pathway. Hike to vehicle carrying PPE that is secured in bags.**
⇓	
Task 5	**Drive back to base yard and decontaminate PPE and gear (e.g. launder PPE and sanitize all gear).**
⇓	
Task 6	
⇓	
Task 7	
⇓	
Task 8	
⇓	
Task 9	
⇓	
Task 10	

HACCP Step 4 - Hazard Analysis Worksheet

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards probable? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (yes/no)
Task 1 **Prepare dedicated equipment and personnel**	Vertebrates	**YES**	Unknown contaminants may be on regular field clothing. Insects/pollen/fungi may have attached themselves to previously cleaned gear.	Visually check	**NO**
	Invertebrates	**YES**			
	Plants	**YES**			
	Other biologics	**YES**			
	Others	**YES**			
Task 2 **Drive to site and hike to dedicated trail head. Change into PPE.**	Vertebrates	**NO**			
	Invertebrates	**NO**			
	Plants **Weed seeds**	**YES**	Transporting weed seeds on clothing & boots	Scrub boots before leaving truck. Wear clean field gear	**NO**
	Other biologics **Ohia Rust, other fungus**	**YES**			**NO**
	Others **Snack debris**	**YES**	Carelessness by crew while hiking. Falling or losing things out of pack	Bag trash. Check area	**NO**

Hazard Analysis Worksheet (continued)

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards probable? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (yes/no)
Task 3 **Conduct transects and control plants when possible. Take GPS points and map progress**	Vertebrates **Hunters, dogs, other hikers, pigs, game birds**	**YES**	By cutting new trails, may provide access for others	Try to conceal new trails. Put up informative signs and boot scrubber at trail head.	**YES**
	Invertebrates **Insects**	**NO**			**NO**
	Plants **Seeds, weed seeds, spores, pollen**	**YES**	The crew can spread things unbeknownst to them	Take plenty GPS points and visually monitor area for follow ups	**NO**
	Other biologics **Fungi**	**YES**			**NO**
	Others **Lunch/snack trash, gear, garlon on clothes, human feces, lost gear**	**YES**	Garlon can spill on pack or clothing, debris cam be left behind, human feces can harbor weed seeds, gear can be lost.	Check packs occasionally for spills, use caution when applying herbicide. Police for rubbish, check area after spills, Etc.	**NO**
Task 4 **Hike out of infested area and change out of dedicated PPE. Hike to vehicle.**	Vertebrates **Hunters, dogs, other hikers, pigs, game birds**	**YES**	Cutting new trails could provide access to others.	Try to conceal new trails.	**NO**
	Invertebrates **Insects**	**NO**			
	Plants **Weed seeds**	**YES**	Invasive laden soil could be on crew clothing or gear	Take off dedicated PPE and gear and place into bags. Visually inspect one another and remove loose debris and mud. Place bags in container in truck.	**NO**
	Other biologics **Fungi**	**YES**	Could get on crew clothing or gear		**NO**
	Others **Trash and gear**	**NO**			

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Task 5 **Drive back to base yard and decontaminate PPE and gear.**	Vertebrates **Crew**	**YES**	Could have seeds in hair or under nails	Visually inspect. Wash hands thoroughly	**YES**
	Invertebrates **Insects**	**YES**	Could be on clothing	Wash PPE and backpacks in dedicated washer and dryer**†**. Scrub shoes with dedicated scrubber and Simple Green*****. Store PPE and gear in dedicated containers and separate cabinet from other field equipment.	**YES**
	Plants **Seeds, weed seeds, spores, pollen**	**YES**	Could be on clothing or shoes		**YES**
	Other biologics **Fungi**	**YES**	Same as above		**YES**
	Others **Vehicles**	**YES**	Seeds, insects, or fungi could be on tires	Visually inspect and monitor roadsides.	**YES**

† Clothes and backpacks are washed in a machine with a cycle that lasts 14 minutes. Laundry detergent and 10% Bleach (9 parts water per 1 part bleach) are used. Water temperature is 130°.

***** Rinse dirt and debris from tabis (spiked shoes). Submerse tabis in Simple Green® solution for a minimum of 10 minutes. Rinse clean and thoroughly dry.

HACCP Step 5 – HACCP Plan Form

HACCP Plan Form								
			Monitoring					
Critical Control Point (CCP)	**Significant Hazard(s)**	**Limits for each Control Measure**	**What**	**How**	**Frequency**	**Who**	**Evaluation & Corrective Action(s) (if needed)**	**Supporting Documentation (if any)**
Task 3: Conduct transects and control plants when possible. Take GPS points and map progress	Cutting new trails may provide access through infested areas by dogs, pigs, hunters, other hikers, and game birds which could spread targeted weed.	100% (spreading of targeted weed is not acceptable)	All primary and secondary trail systems. Boot-scrubber that is provided and installed at the trailhead.	Visual inspection and removal of any found targeted plants along the trails. Collect and bag collected weeds & remove from site. Boot scrubber has removable tray that holds debris from boots. Contents will be bagged and removed.	Every Miconia day. Trails monitored will be prioritized by frequency of targets found. Boot scrubber tray is emptied 1x month.	KISC Field crew. KISC staff, field crew, and/or students monitoring this site.	Field data regarding targets along trails will be analyzed after every work trip. Trails with abundant targets will be prioritized for weed control. Boot-scrubber debris trays will be examined and periodically kept for propagation to evaluate for targeted weed sprouts. Informational signage will be added to trailhead scrubbing station to alert hikers and hunters of possible trail contamination.	• Photos included of informational trailhead signage • Photos included of boot-scrubber
Task 5: Drive back to base yard and decontaminate PPE and gear.	Weed seeds, fungi, and/or insects sticking on crew, clothes, gear, and vehicle could be moved from Wailua Game Management Area and Halelea Forest Preserve to the base yard (e.g., plants, invertebrates, biologics and other non biologics)	100% (no non-target is acceptable)	Cleaning crew, gear, clothing, and vehicle interior.	Miconia cleaning check-list will be utilized at every cleaning. Stiff broom will be used to remove seeds found during visual monitoring. Hot water temperature will be monitored to maintain 130 degrees with thermometer.	Every Miconia field day.	Field crew supervisor will oversee check-list (attached). Field Operations Leader will check on water temperature.	If any insects or seeds survive washer cycle or fungi are present, the water temperature will be increased by 10 degrees and re-washed until no longer viable.	• Decontamination Protocol to Reduce the Risk of Spreading Infectious Amphibian Diseases in Freshwater Systems (http://ccadc.us/docs/DeconForProfessionals.pdf) • Considerations and Protocol For Miconia Field Crew (http://www.hear.org/micoiainhawaii/MiconiaFieldProtocol.htm) • Disinfection Protocol for Bat Field Studies (http://www.fws.gov/midwest/Endangered/mammals/BatDisinfectionProtocol.html)

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Address: **PO Box 1998, Lihue, HI 96766**	
Signature:  **HACCP Plan was followed.**	**Date:** **September 26, 2008**

KISC MICONIA DECONTAMINATION CHECKLIST

100% Compliance is expected when decontaminating PPE, gear, tools, containers. Hot water, bleach, and Simple Green will be used to help sterilize any items that can be gotten wet.

Date _____ Supervisor _____

- ☐ Clean all shirts, pants, socks, and backpacks in dedicated washer/dryer
- ☐ Wash tabis with scrub brush to remove all soil, seeds, and debris
- ☐ Air-dry tabis to ensure thorough drying
- ☐ Empty all plastic bags of dirt and debris into designated bucket
- ☐ Wash all containers where PPE and tools were stowed
- ☐ Hose dirt and debris from vehicle
- ☐ Sweep interior of vehicle of all dirt and debris
- ☐ Clean all tools and gear (including camera, gps)
- ☐ Stow all cleaned gear in miconia cabinet

Comments: