

Activity #4

Where Did They Come From? Where Can They Invade?

Length:

One class period

Prerequisite Activity:

None

Objectives:

- Map the origins of invasive species and indicate possible pathways to Hawai‘i.
- Map which areas on Maui specific invasive species are likely to invade based on climate, elevation, and other factors.

Note: Students will produce species cards that can be used as resources for Unit 1 Act #5 “Invasive Species Jeopardy.”

Vocabulary

Alpine Aeolian

Coastal

Dispersal

Dryland forest

Marine

Mesic Forest

Rain forest

Vector

● ● ● **Class Period One: *Learning About Names***

Materials & Setup

Note: Exercises require access to research materials, Internet, or library. Data and maps for Moloka‘i, Lāna‘i and Koho‘olawe is also provided.

“Maui Hillshade,” “Maui Elevation,” and “Maui Rainfall” (acetates) (pp. 103-105)

For each group of students:

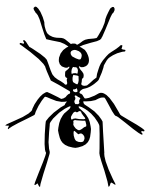
- “Maui Hillshade,” “Maui Elevation,” and “Maui Rainfall” (color copies) (pp. 103-105)
- Species flyers (pp. 117-126)

For each student

- Student Page “Exercise 1: Where Did They Come From?” (p. 127)
- Student Page “Exercise 2: Where Can They Invade?” (pp. 128-131)

Instructions

- 1) Tell students that they will be investigating where invasive species originally come from and what



Activity #4

Invasive Species Unit 1

habitats they can invade once they get to Maui. Students can work individually or in groups.

- 2) Assign students one or more of the species listed in Teacher Background “Exercise 1: Where Did They Come From?” Allow them access to library materials, the Internet, and flyers circulated by various natural resource agencies, such as the Hawai‘i Department of Agriculture, Hawai‘i Department of Land and Natural Resources, and Maui Invasive Species Committee.

Note: If you want to simplify this activity, assign only the seven species highlighted on “Exercise 1: Where Did They Come From?” Flyers describing these species are included in the student pages.

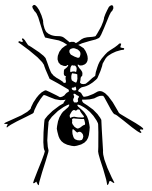
- 3) Tell students to find the natural ranges of the assigned species, based on elevation and rainfall. Have them illustrate each species on a card, list its scientific and common names, where it came from, its preferred climate, and elevation. (These cards are used to play a game: Invasive Species Module Unit 1 Act #5 “Invasive Species Jeopardy.”)
- 4) Assign Student Page “Exercise 1: Where Did They Come From?”(p. 127) Discuss the answers in class.
- 5) Assign Student Pages “Exercise 2: Where Can They Invade?” (pp. 128-131)
- 6) Allow students time to complete their cards. Project Acetate Masters “Maui Hillshade” “Maui Elevation” and “Maui Rainfall” on a chalk or dry erase board. Indicate which side of each island is leeward and which is windward. Have students read the descriptions of each ecosystem aloud.
- 7) When students have completed their cards, let them present their species to the class, and then affix the cards to the appropriate place on the map of Maui.
- 8) Discuss how Maui might change if these species were to dominate the ecosystems they are capable of invading. Remind students that what happens at the top of the mountain continues all the way down, affecting each of the lower ecosystems. For instance, a miconia invasion in the rain forest increases erosion, which could smother coral reefs in sediment.
- 9) To expand this lesson, you can discuss the origin of native Hawaiian species. See Teacher Background “What About the Natives?” (p. 102)

Journal Ideas

- What factors make Hawai‘i especially vulnerable to introduced species?
- What characteristics might make a species more likely to survive in a new environment?
- Why did people bring the invasive species mentioned in this lesson to Hawai‘i? If you don’t know, formulate some reasonable guesses.

Assessment Tools

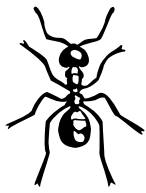
- Participation in class discussion



- Completed worksheets _____
- Journal entries _____

Further Enrichment

- Two maps included in the teacher background show major vegetation types before and after human contact. Use these maps as a springboard for discussion about how human activity has altered the Hawaiian ecosystems. What native Hawaiian plants grew in each vegetation type? What grows there now? Which vegetation types have been the most altered by human contact? Why?



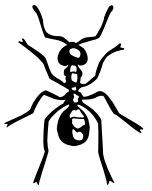
Teacher Background

Exercise 1: Where Did They Come From?

The following is a list of invasive species that have been found on Maui. Assign between one and five of these species to each student or group of students.

Note: Flyers that contain all of the information needed for this lesson are included for the species listed in **bold**. The other species will need to be researched, using library materials, the Internet, and flyers circulated by various natural resource agencies, such as the Hawai'i Department of Agriculture, Hawai'i Department of Land and Natural Resources, and Maui Invasive Species Committee.

- African tulip (*Spathodea campanulata*)
- Argentine ant (*Linepithema humile*)
- Axis deer (*Axis axis*)
- Banana poka (*Passiflora tarminiana*)
- Boar (*Sus scrofa*)
- Bocconia, or plume poppy (*Bocconia frutescens*)
- Clidemia (*Clidemia hirta*)
- Coqui frog (*Eleutherodactylus coqui*)**
- False 'awa (*Piper auritum*)
- Fountain grass (*Cenchrus setaceus*)**
- Giant reed (*Arundo donax*)
- Goat (*Capra hircus*)
- Gorilla ogo (*Gracilaria salicornia*)
- Ironwood (*Casuarina equisetifolia*)
- Ivy gourd (*Coccinia grandis*)**
- Kahili ginger (*Hedychium gardnerianum*)
- Kikuyu grass (*Pennisetum clandestinum*)
- Mexican creeper (*Antigonon leptopus*)
- Miconia (*Miconia calvescens*)**
- Mosquito (*Culex quinquefasciatus*)
- Mullein (*Verbascum thapsus*)
- Pampas grass (*Cortaderia jubata*, *Cortaderia selloana*)**
- Polynesian rat (*Rattus exulans*)
- Rat (*Rattus rattus*)
- Red hook seaweed (*Hypnea musciformis*)
- Roi (*Cephalopholis argus*)
- Rubber vine (*Cryptostegia grandiflora*)**
- Strawberry guava (*Psidium cattleianum*)
- Veiled chameleon (*Chamaeleo calypttratus*)**
- Yellow Himalayan raspberry (*Rubus ellipticus*)
- Yellow jacket (*Vespula pensylvanica*)

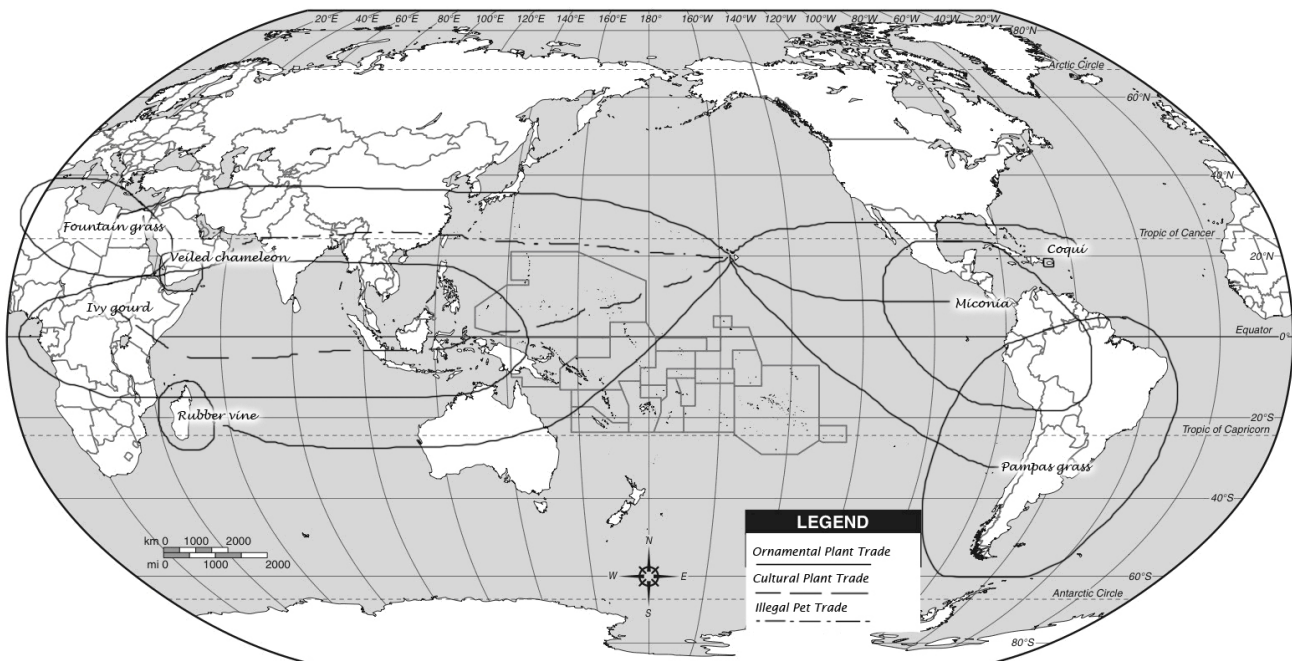


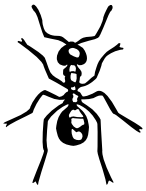
Answer Key

Exercise 1: Where Did They Come From?

Below you'll find a list of invasive species that are now found in Hawai'i. Where did they come from? Do some research to find out. Map their origins below. Draw a line from each plant or animal's place of origin and suggest a possible **vector**, or means of **dispersal**. For instance, do you think miconia seeds blew here on the wind or did someone bring a live plant over on the plane? Create a legend to indicate the various vectors.

Coqui frog (<i>Eleutherodactylus coqui</i>)	_____	Puerto Rico	_____
Fountain grass (<i>Pennisetum setaceum</i>)	_____	North Africa	_____
Ivy gourd (<i>Coccoloba grandis</i>)	_____	Tropical Africa and Asia	_____
Miconia (<i>Miconia calvescens</i>)	_____	Mexico, Central/South America	_____
Pampas grass (<i>Cortaderia jubata</i>)	_____	South America	_____
Rubber vine (<i>Cryptostegia grandiflora</i>)	_____	Madagascar	_____
Veiled chameleon (<i>Chamaeleo calyptratus</i>)	_____	Yemen, Saudi Arabia	_____





Teacher Version

Exercise 2: Where Can They Invade? *Sample Card*



Common Name: Veiled chameleon

Scientific name: Chamaeleo calyptratus

Description: Lizard with shark-fin-like bony shield on head; long, thin legs; fleshy fringe running down belly from under its nose to the base of its tail. Up to two feet in length.

Origin: Yemen, Saudi Arabia

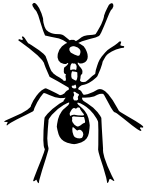
Preferred climate type: wide range

Rainfall: wide range

Elevation: sea level to 10,000 feet

Impacts in Hawai'i: can prey on native plants, birds and insects.

Ecosystems this species can invade in Hawai'i: alpine aeolian, mesic forest, rain forest, dryland forest, and coastal



Answer Key

Exercise 2: Where Can They Invade?

Once a plant or animal species arrives on our shores, it has to settle in suitable habitat in order to survive. It needs the right amount of rain, sunlight and heat, in addition to the adequate food, mates, and/ or pollinators. Below are descriptions of ecosystems found on Maui. Which one(s) can your species invade?

Alpine Aeolian

This high-altitude region of Maui is characterized by sparse vegetation and an extreme climate with widely varying daily temperatures, intense solar radiation, and an average of 30-50 inches of rain per year. Few plants thrive here: the spectacular Haleakalā silversword (*Argyroxiphium sandwicense* subsp. *macrocephalum*), 'ōhelo (*Vaccinium reticulatum*), hinahina (*Artemisia australis*), and kūpa'oa (*Dubautia ciliolata*). This describes the summit of Haleakalā, above 7,500 feet.

Species that can invade this ecosystem include:

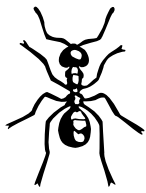
- Argentine ant (*Linepithema humile*)
- Fountain grass (*Pennisetum setaceum*)
- Goat (*Capra hircus*)
- Mullein (*Verbascum thapsus*)
- Pampas grass (*Cortaderia jubata*, *Cortaderia selloana*)
- Polynesian rat (*Rattus exulans*)
- Black rat (*Rattus rattus*)
- Veiled chameleon (*Chamaeleo calyptrotus*)
- Yellow jacket (*Vespula pensylvanica*)

Mesic Forest

Mesic forests occur on both East and West Maui, mostly between 2,500-4,100 feet elevation, with between 40 to 100 inches of rain per year. Before human contact, this was probably the most botanically diverse of all Hawaiian forests. *Koa* (*Acacia koa*), 'ōhi'a (*Metrosideros polymorpha*), and sandalwood (*Santalum haleakalae*) trees are common, in addition to a mixture of plants adapted to both wet and dry areas such as *maile* (*Alyxia stellata*) and *halapepe* (*Pleomele auwahiensis*). Good examples can be found in East Kaupo gap, Kahikinui, upper Auwahi and 'Ulupalakua, Polipoli, and Makawao Forest Reserve.

Species that can invade this ecosystem include:

- Banana poka (*Passiflora mollissima*)
- Boar (*Sus scrofa*)
- Bocconia, or Plume poppy (*Bocconia frutescens*)
- Kikuyu grass (*Pennisetum clandestinum*)
- Pampas grass (*Cortaderia jubata*, *Cortaderia selloana*)
- Polynesian rat (*Rattus exulans*)
- Mosquito (*Culex quinquefasciatus*)
- Black rat (*Rattus rattus*)
- Strawberry guava (*Psidium cattleianum*)



Veiled chameleon (*Chamaeleo calytratus*)
Yellow Himalayan raspberry (*Rubus ellipticus*)
Yellow jacket (*Vespula pensylvanica*)

Rain Forest

These wet, windward areas occur from 1,900 to 6,200 feet. Hawaiian forests get between 80 and 390 inches of rain per year. The native plants that evolve here are used to lots of water: lobelias, ferns, 'ōhia (*Metrosideros polymorpha*), and 'ie'ie (*Freycinetia arborea*). Waikamoi, Olinda, Ha'iku, Huelo, Ke'anae, Nāhiku, Hāna, Kīpahulu, and Upper West Maui Mountains are examples.

Species that can invade this ecosystem include:

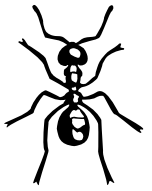
African tulip (*Spathodea campanulata*)
Boar (*Sus scrofa*)
Clidemia (*Clidemia hirta*)
Coqui frog (*Eleutherodactylus coqui*)
Giant reed (*Arundo donax*)
Kahili ginger (*Hedychium gardnerianum*)
Miconia (*Miconia calvescens*) (only up to 3,500 feet)
Mosquito (*Culex quinquefasciatus*)
Polynesian rat (*Rattus exulans*)
Black rat (*Rattus rattus*)
Strawberry guava (*Psidium cattleianum*)
Veiled chameleon (*Chamaeleo calytratus*)
Yellow Himalayan raspberry (*Rubus ellipticus*)

Dryland Forest

Dryland forests occur at low elevation, from sea level to 3,000 feet. These drier areas get less than 20 inches of rain per year. Temperatures are typically warm to hot. Plants adapted to this climate tend to be drought tolerant and stress resistant: wiliwili (*Erythrina sandwichensis*), 'a'ali'i (*Dodonaea viscosa*), pua kala (*Argemone glauca*), 'āwikiwiki (*Canavalia pubescens*). Central and Leeward Maui, Kanaio, Makena, Wailea, Kihei, Mā'alaea, Kahului, Wailuku, Ukumehame, Launiupoko are examples.

Species that can invade this ecosystem include:

Axis deer (*Axis axis*)
Boar (*Sus scrofa*)
Ivy gourd (*Coccinia grandis*)
Fountain grass (*Cenchrus setaceus*)
Giant reed (*Arundo donax*)
Goat (*Capra hircus*)
Mexican creeper (*Antigonon leptopus*)
Mosquito (*Culex quinquefasciatus*)
Polynesian rat (*Rattus exulans*)
Black rat (*Rattus rattus*)
Rubber vine (*Cryptostegia grandiflora*)
Veiled chameleon (*Chamaeleo calytratus*)



Coastal

These areas are close to the ocean so plants must be salt tolerant. Plants that have evolved here tend to be low to the ground due to constant wind. Windward coastal areas may receive up to four times more rain (up to 120 inches per year) than leeward areas, with strong winds being common. Coastal plants such as *hala* (*pandanus tectorius*), *pā'ū o Hi'iaka* (*Jacquemontia sandwicensis*) and *naupaka* (*Scaevola sericea*) grow on substrates that range from old coral colonies to basalt cliffs and boulders, and from sandy beaches to lava and ash. Find this ecosystem in the salt spray zone along the coast of Maui.

Species that can invade this ecosystem include:

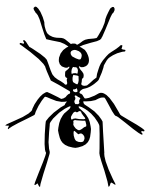
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- Black rat (*Rattus rattus*)
- Veiled chameleon (*Chamaeleo calytratus*)

Marine

Marine habitats include coral reefs of various types, boulder fields, sandy bottoms, areas where the reef drops steeply to great depths, caves, caverns, and lava tubes. Native sea plants such as *limu kala* (*Sargassum echinocarpum*) grow here, along with endemic fish such as the saddle wrasse (*Thalassoma duperrey*). From shallow waters found near shore to deeper waters further offshore surrounding Maui.

Species that can invade this ecosystem include:

- Gorilla ogo (*Gracilaria salicornia*)
- Red hook seaweed (*Hypnea musciformis*)
- Roi (*Cephalopholis argus*)



Teacher Background

What About the Natives?

Native Hawaiian plants and animals descended from species that came from elsewhere. They started out as alien species as well! Over time, they evolved into new forms that we now recognize as uniquely Hawaiian. But where did the original ancestral species come from?

To determine that, biologists look around the world for a native species' closest relative. They compare DNA samples of the native species with that of potential ancestors to piece together their "family trees."

For instance, scientists discovered that the magnificent silversword that grows at the summit of Haleakala belongs to the sunflower family. Eventually they determined that the twenty-eight species of the Hawaiian Silversword Alliance (including plants in the genera *Argyroxiphium*, *Dubautia*, and *Wilkesia*) evolved from a single common ancestor: a tarweed from North America.

The origin of some native species is still a mystery.

The following is a list of native Hawaiian species and the location where biologists believe their ancestral species came from:

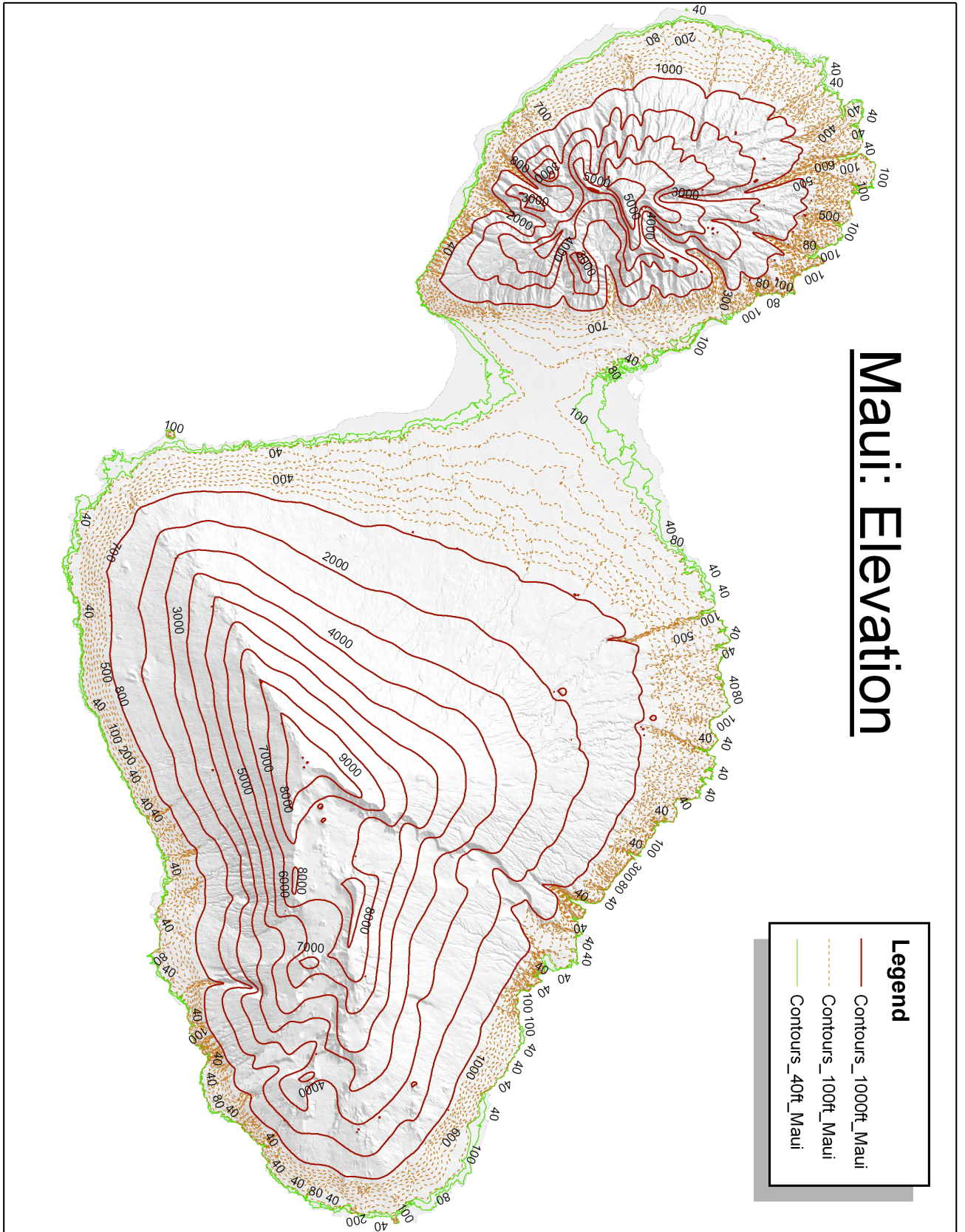
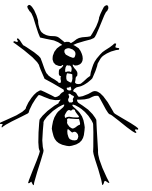
‘Ōhi‘a (*Metrosideros polymorpha*) _____ New Zealand, by way of the Marquesas

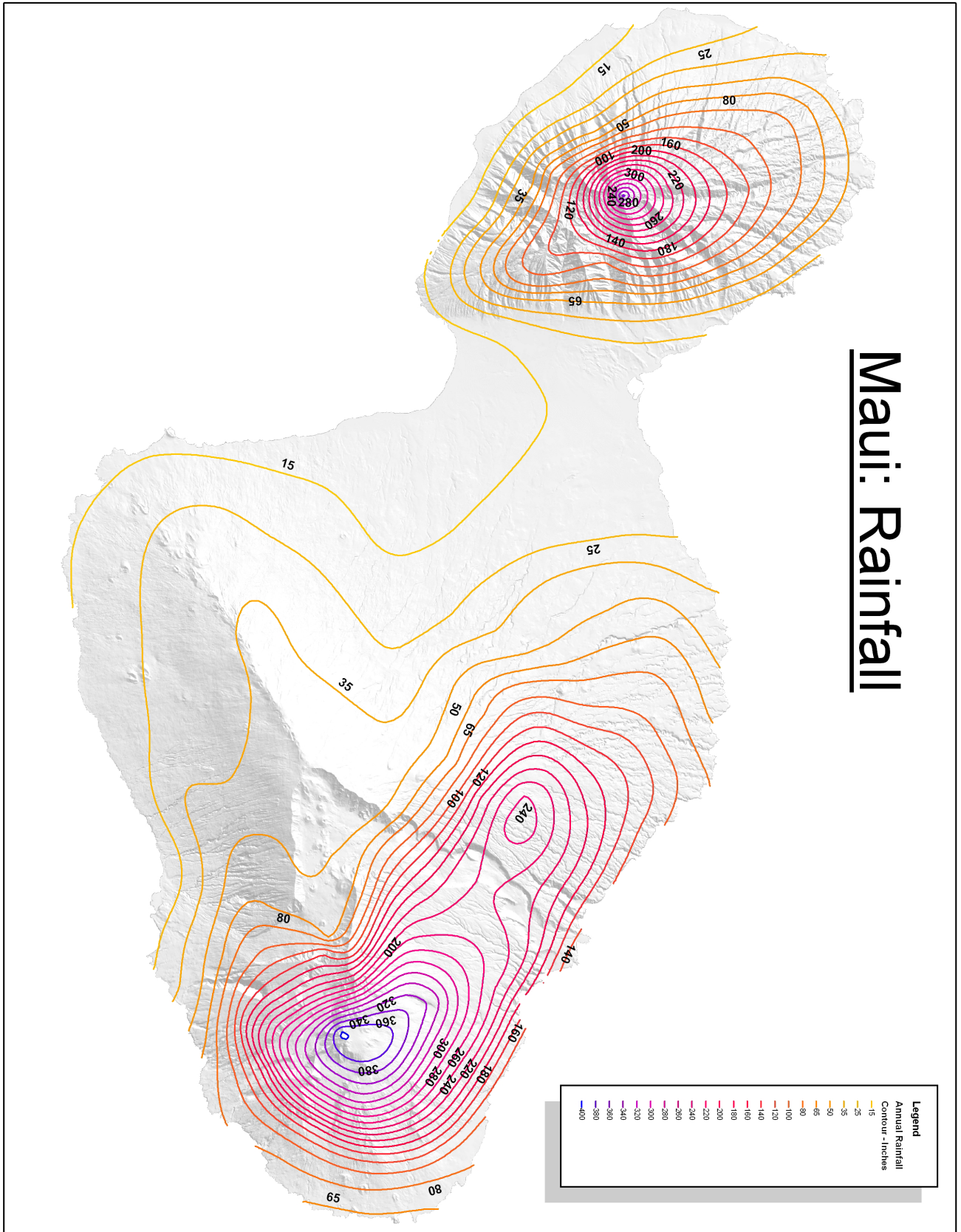
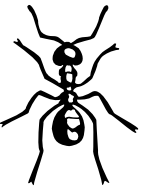
‘Āhinahina, or silversword _____ North America (California)
(*Argyroxiphium sandwicense*)

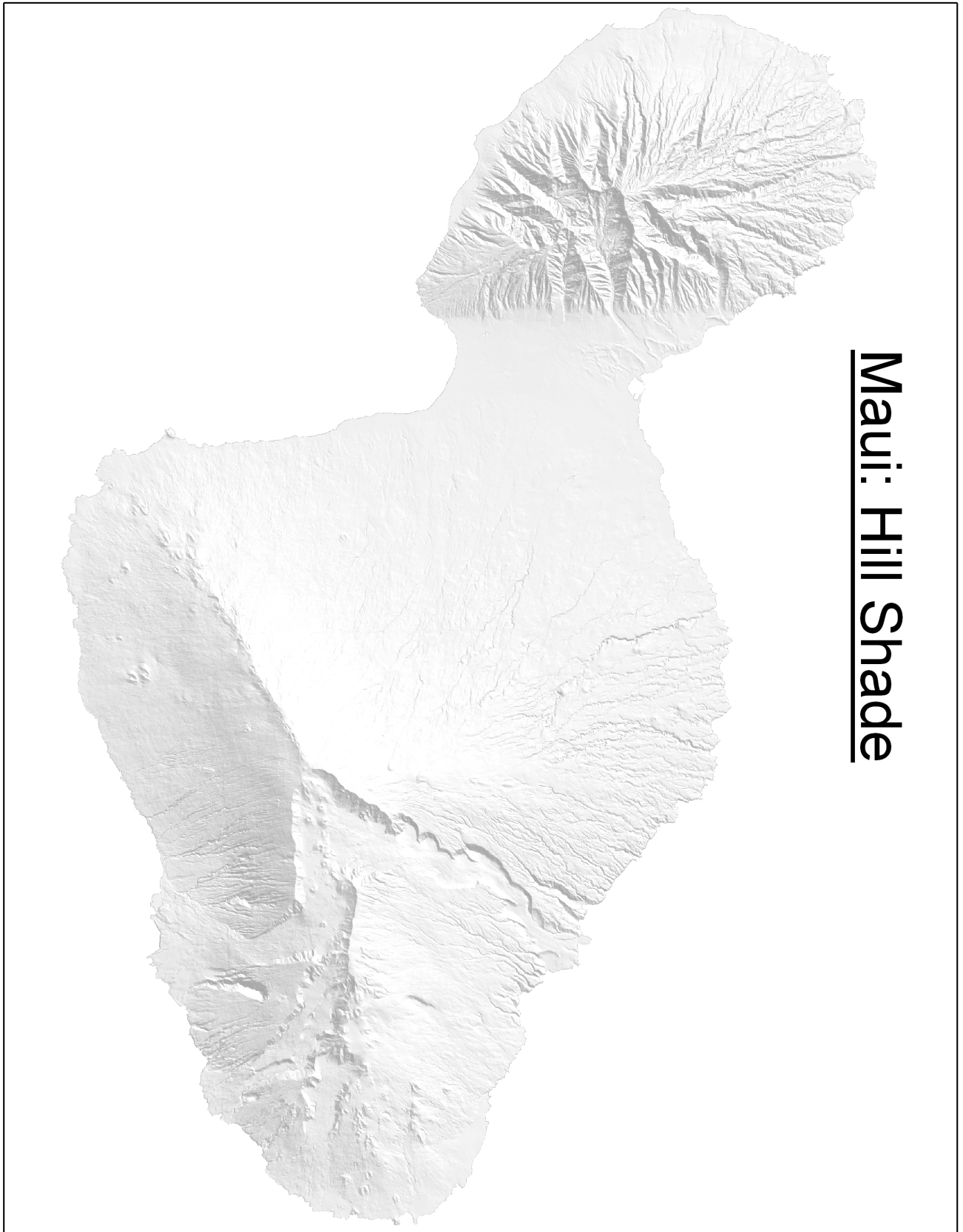
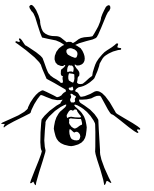
Koa (*Acacia koa*) _____ Mostly likely Australia

Lobeliads (bellflower family, *Campanulaceae*) _____ Asia

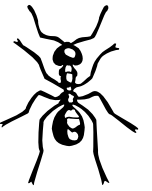
Hawaiian honeycreepers _____ Asia



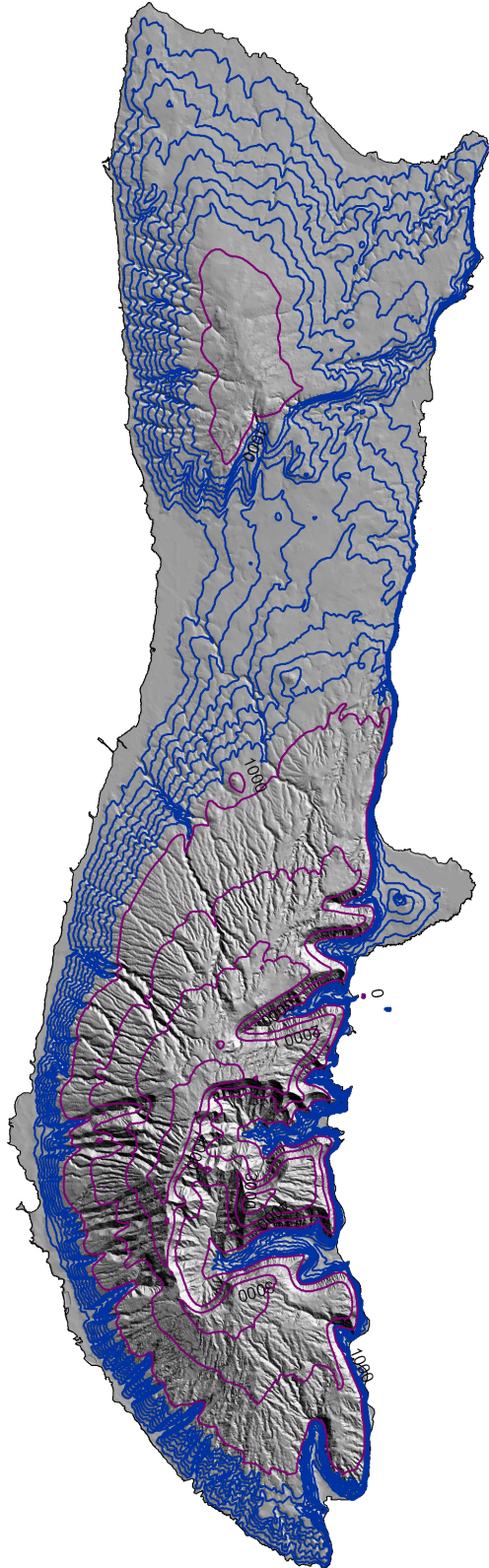




Maui: Hill Shade

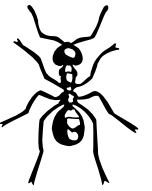


Moloka'i: Elevation

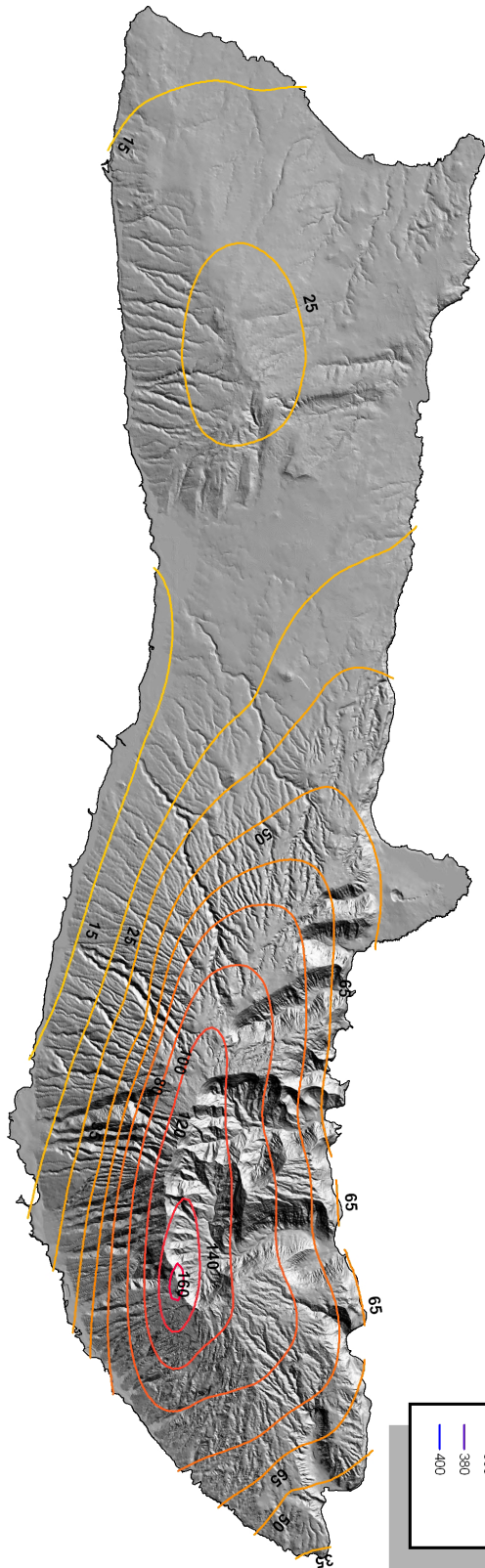


Legend

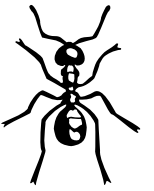
- Elevation Contours 1000ft
- Elevation Contours 100ft



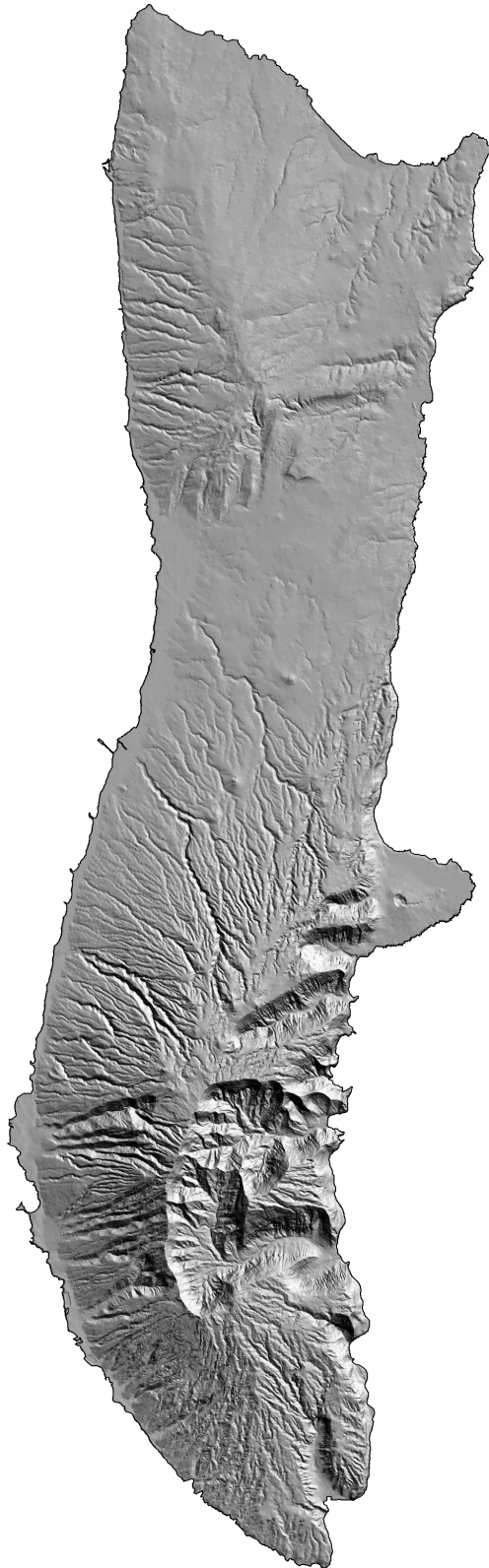
Moloka'i: Rainfall

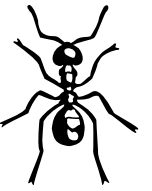


Annual Rainfall Contour - Inches
15
25
35
50
65
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400

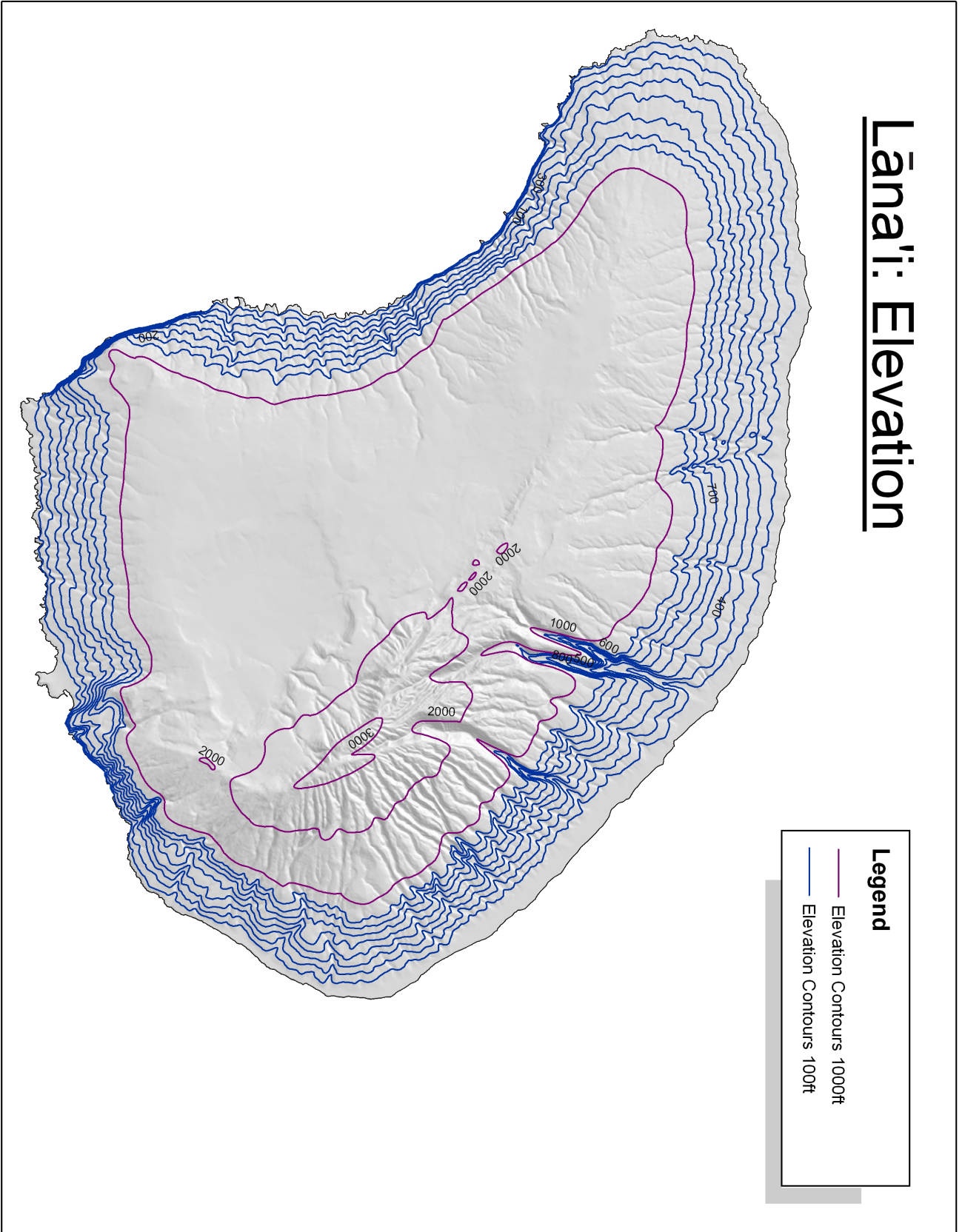


Moloka'i: Hill Shade



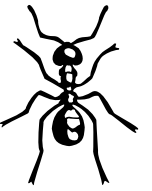


Lāna'i: Elevation

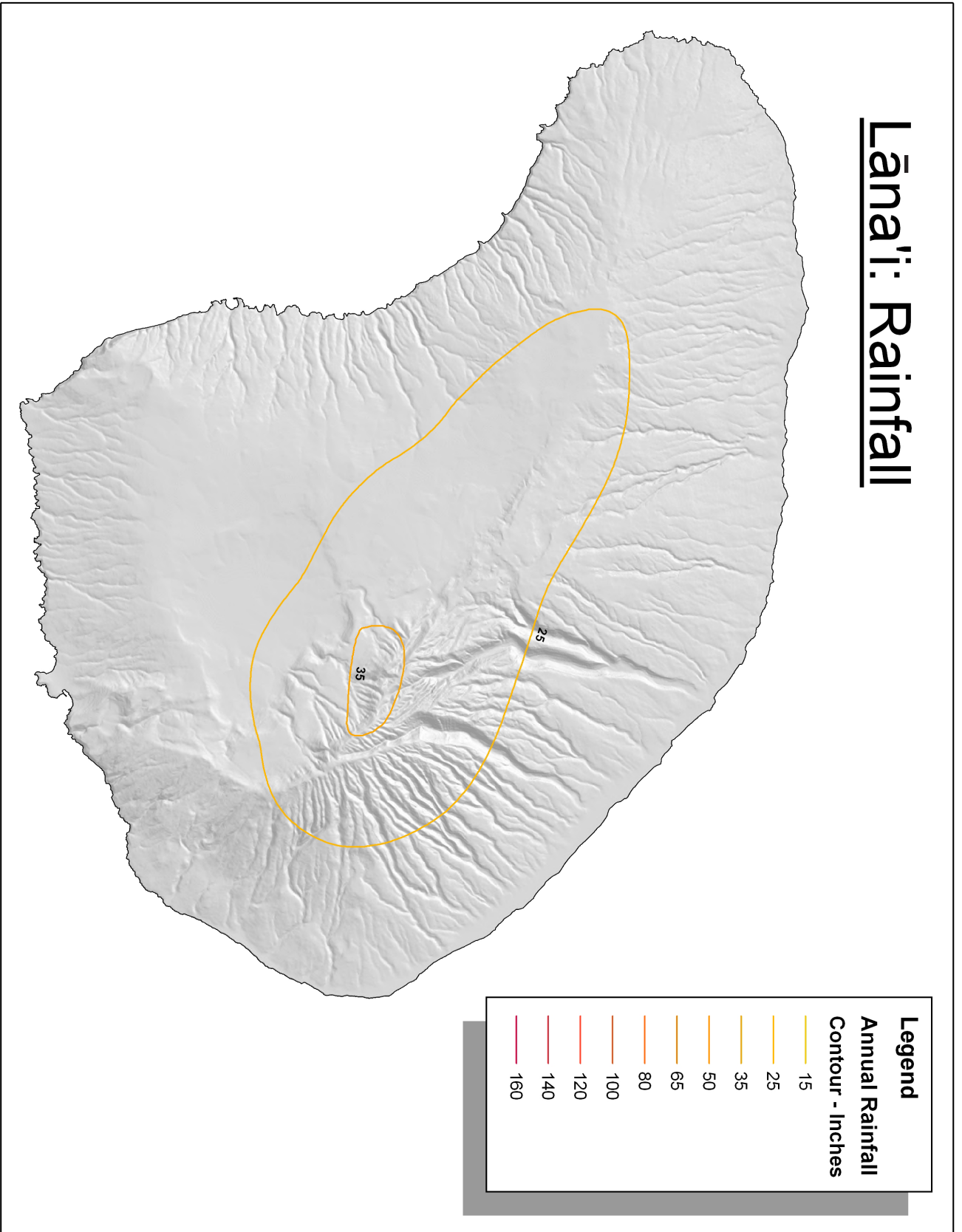


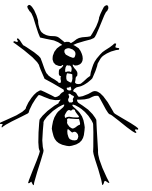
Legend

- Elevation Contours 1000ft
- Elevation Contours 100ft

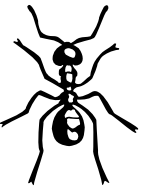


Lāna'i: Rainfall

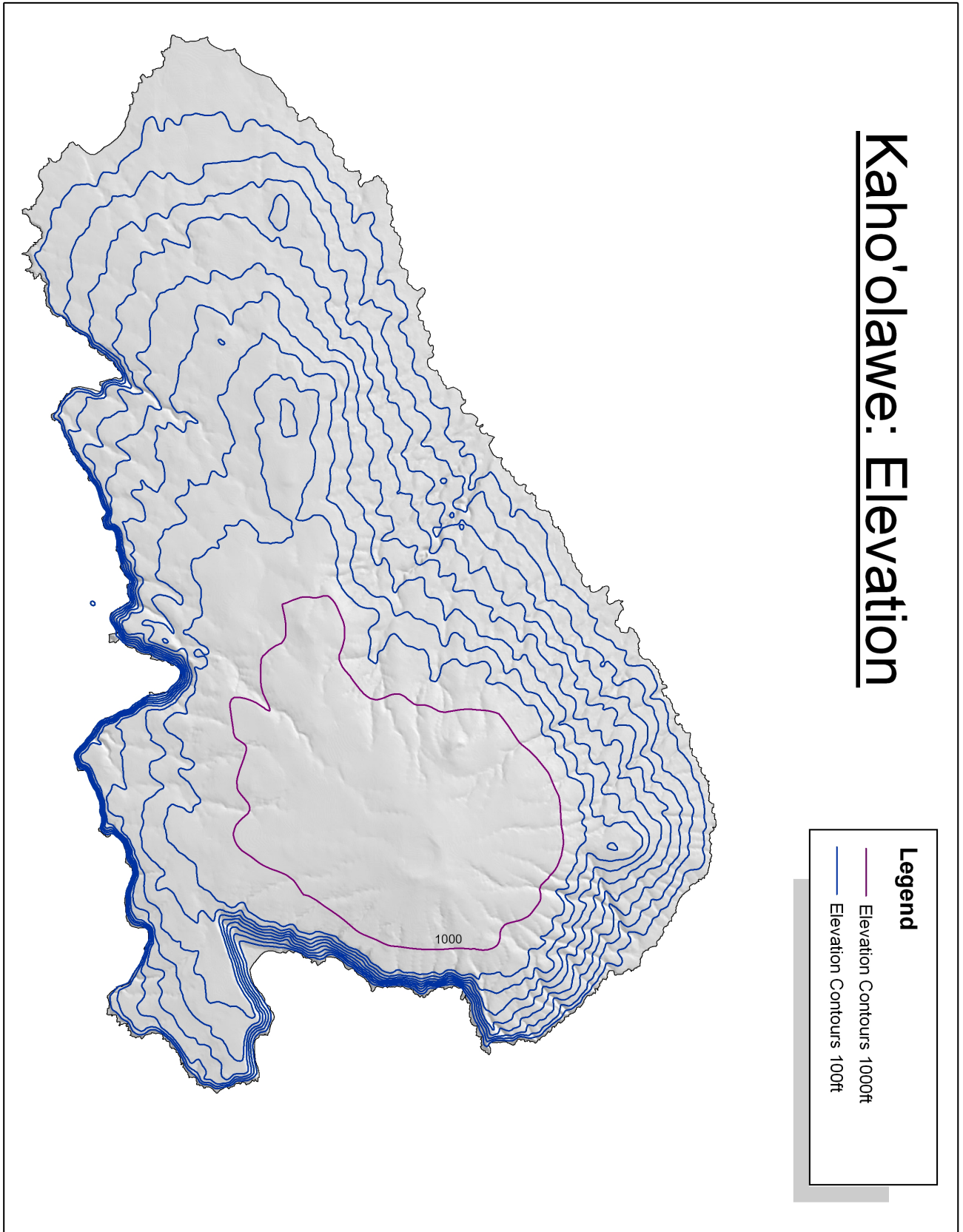


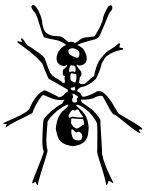


Lānaʻi: Hill Shade

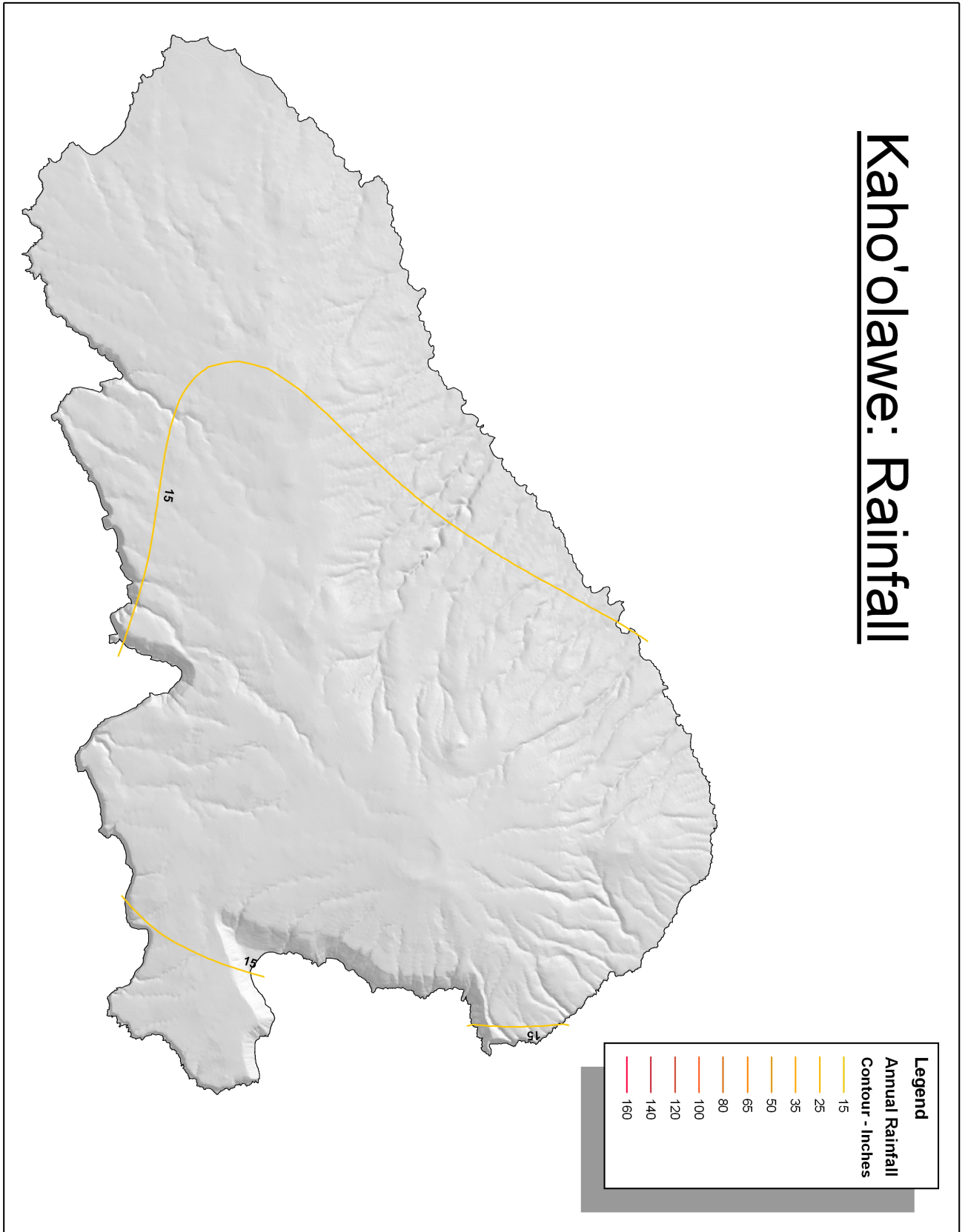


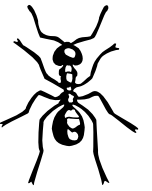
Kaho'olawe: Elevation



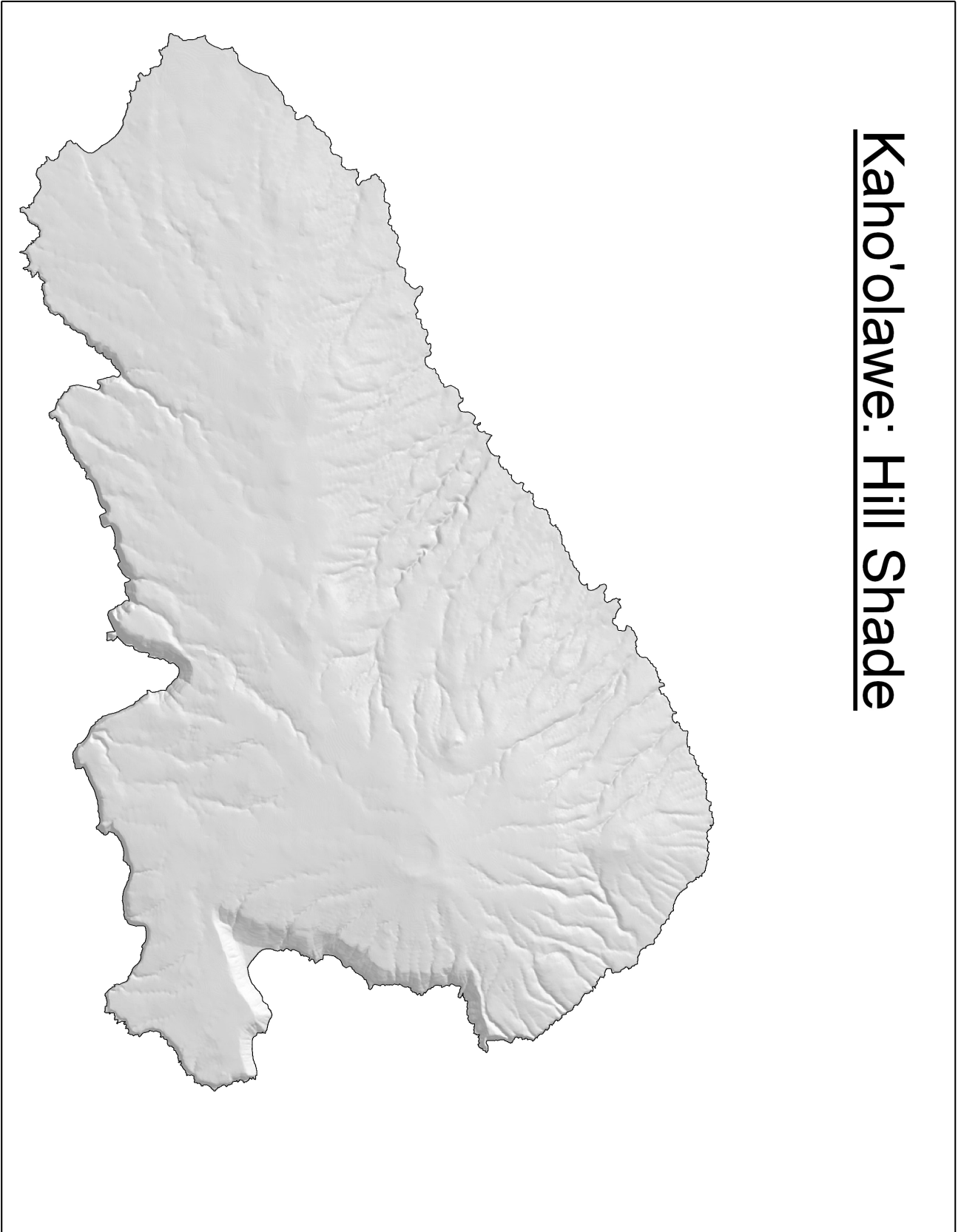


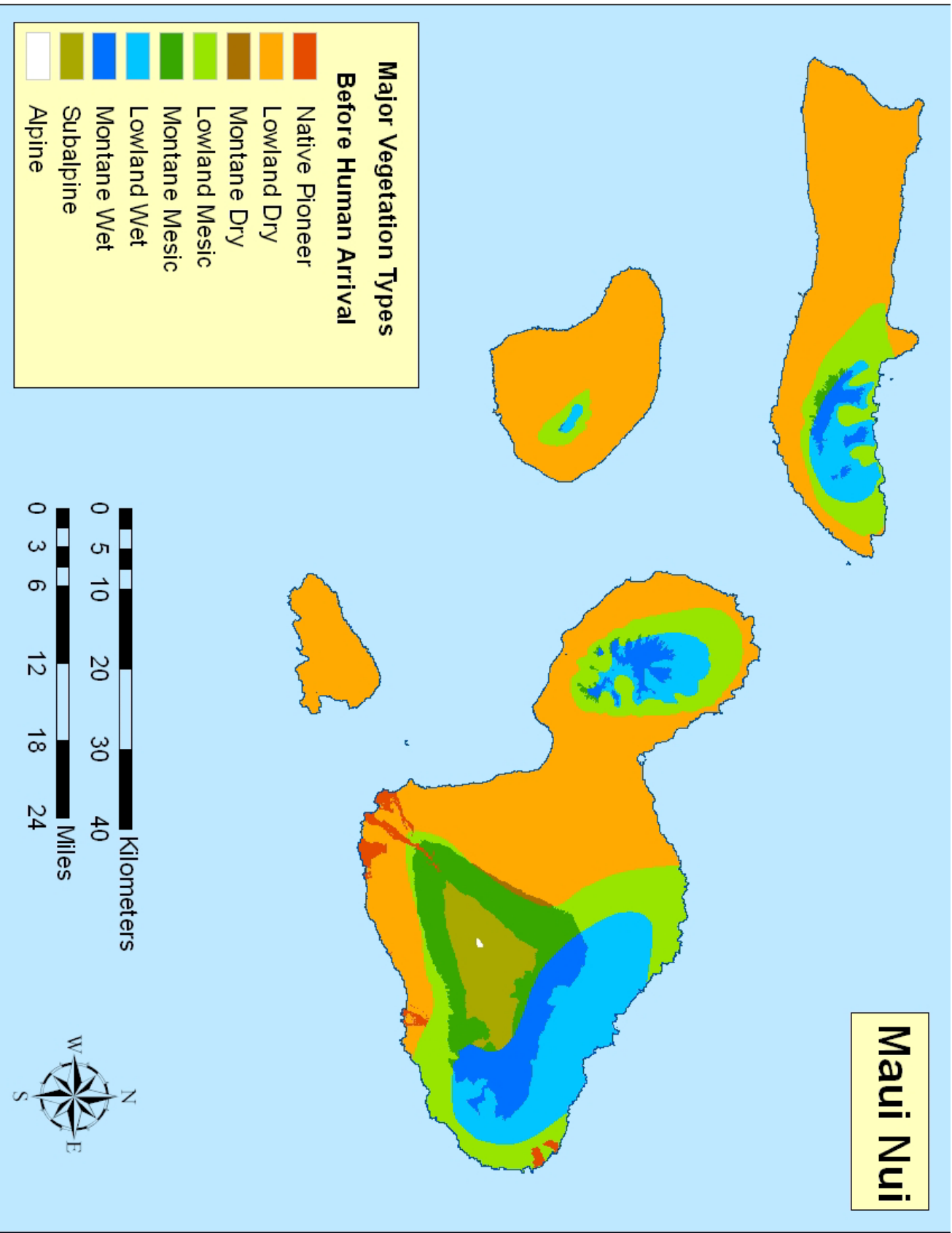
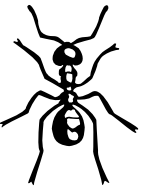
Kaho'olawe: Rainfall

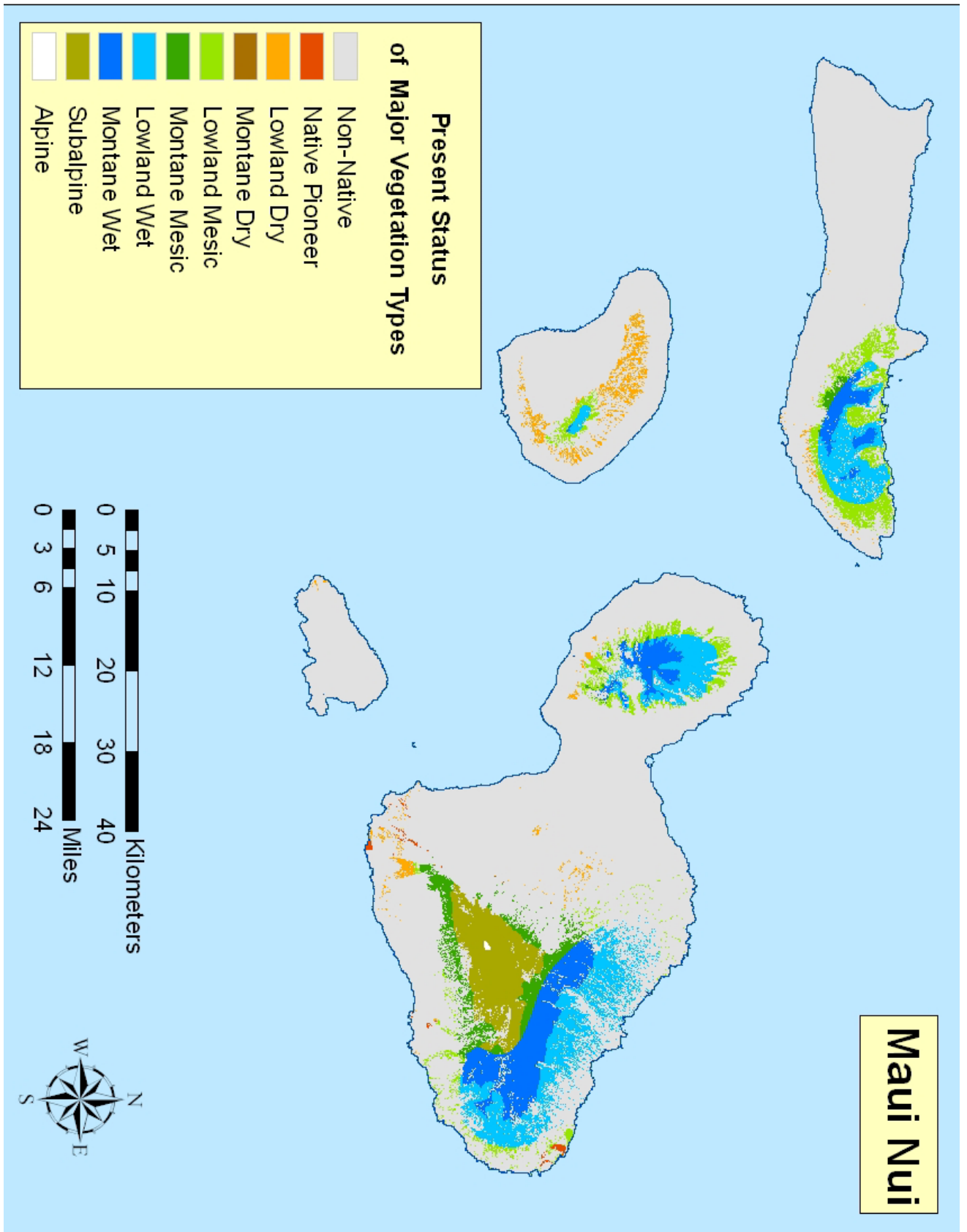
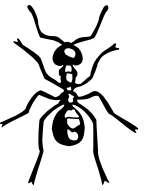


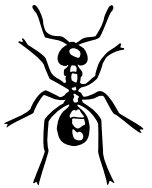


Kaho'olawe: Hill Shade









Target Plant Species of the Maui Invasive Species Committee





The Maui Invasive Species Committee (MISC) is a federal-state-private partnership fighting to protect Maui County from invasive plants and animals that threaten our environment, economy, and quality of life. MISC works to:

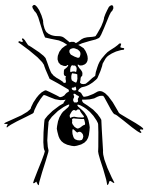
PREVENT invasive species from becoming established on Maui.

CONTROL invasive species on private and public property free of charge.

EDUCATE people about invasive species and how to protect Maui.



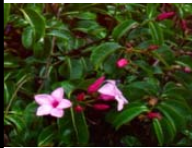

If you encounter any of MISC's Target Species, please call us at 573-MISC.

	What is it?	How can I identify it?	Why is it a problem?	Where is it found?	Is it on the State Noxious Weed List?
<p>Ivy Gourd (<i>Coccinia grandis</i>)</p> 	<p>Invasive vine from Asia, Africa, and India</p>	<ul style="list-style-type: none"> • 2-3 inch heart-shaped leaves • White flowers with 5 petals, up to 2 inches across. • Fruits are red and shaped like cucumbers. 	<ul style="list-style-type: none"> • Ivy gourd attacks shrubs, trees, fences, and telephone poles. • If left unchecked, ivy gourd can form a dense canopy that quickly smothers out its hosts under a solid blanket of vines. • Birds eat the fruits and scatter the seeds, contributing to the rapid spread of the vine. • It can grow up to 4 inches a day. 	<p>Ivy Gourd is found in dry to moist areas up to 800' elevation.</p>	<p>Yes</p>
<p>Fountain Grass (<i>Pennisetum setaceum</i>)</p>  	<p>Bunch-grass from Africa</p>	<ul style="list-style-type: none"> • Leaves are gray-green and cylindrical • Grows in a dense clump • Flowers grow in a spike and are purplish when young and white when dry. • Grows up to 3 feet tall 	<ul style="list-style-type: none"> • Fountain grass is drought and fire resistant. Seeds are spread by the wind, animals, vehicles, and people. • Fountain grass spreads wild-fires and rapidly regrows, damaging dry forest plants not adapted to fire. • It threatens agricultural and natural areas. 	<p>Fountain Grass is found in dry areas from sea-level to 6,500' elevation.</p>	<p>Yes</p>
<p>Giant reed (<i>Arundo donax</i>)</p>  <p><small>John M. Randall, photographer, The Nature Conservancy.</small></p>	<p>Tall, sugar-cane-like grass from India</p>	<ul style="list-style-type: none"> • Leaves are 1-2 inches wide and a foot long • Has many flowers on 2-ft long, dense, plume-like branches • Grows rapidly to over 20 feet in height and spreads quickly • Forms large, root masses 	<ul style="list-style-type: none"> • Giant reed spreads quickly by root pieces in dirt or waterways. • It traps sediments and blocks stream flow, leading to erosion and flooding. • Once established, giant reed forms dense stands that choke out native plants and can alter waterbird habitat. • It catches on fire easily, spreading wildfires that threaten homes and property. 	<p>Giant reed grows in moist areas and in a wide variety of conditions.</p>	<p>No</p>



Target Plant Species of the Maui Invasive Species Committee

If you encounter any of MISC's Target Species, please call us at 573-MISC.

	What is it?	How can I identify it?	Why is it a problem?	Where is it found?	Is it on the State Noxious Weed List?
<p>Pampas grass (<i>Cortaderia sp.</i>)</p>  <p><small><i>Cortaderia jubata</i> The Nature Conservancy.</small></p>	<p>Giant bunchgrass from South Africa</p>	<ul style="list-style-type: none"> Leaves have sharp, serrated edges Has white to purple flower plumes Grows over 13 feet tall 	<ul style="list-style-type: none"> Pampas grass forms dense monotypic stands. Seeds spread rapidly by the wind and can be viable for at least 6 years. Once established, pampas grass can crowd out native plants, damage grazing lands, and create a fire hazard. 	<p>Pampas grass is found from sea level to 9,000' elevation.</p>	<p>Yes</p>
<p>Rubber vine (<i>Cryptostegia grandiflora</i>)</p>   <p><small>Photo by USGS-BRD.</small></p>	<p>Fast-growing climbing plant from Madagascar</p>	<ul style="list-style-type: none"> Leaves are shiny, dark green and 2-4 inches long The 2 inch white to lilac flowers have a broad funnel-shaped tube and five lobes. Seeds form triangular pods in wing-like pairs 4-5 inches long. 	<ul style="list-style-type: none"> It smothers and restricts other plants from growing by winding around trunks, stems and branches. Rubber vine is poisonous. When eaten, it interferes with heart operation in humans and animals. It also causes stomach and intestinal upset. The milky sap can cause burning rashes and blisters. When dry, a powdery dust emerges and can cause coughing, nose swelling and eyelid blisters. 	<p>Rubber vine grows in both dry and moist areas at low elevations. It can reach 50' high.</p>	<p>No</p>
<p>Miconia (<i>Miconia calvescens</i>)</p> 	<p>Tree from South and Central America</p>	<ul style="list-style-type: none"> The large eye-shaped leaves with 3 obvious leaf veins and purple undersides Small flowers last for less than a day Grows over 50 feet tall. 	<ul style="list-style-type: none"> Miconia shades out and kills other plants trying to grow beneath it. If left unchecked, miconia will create a monotypic forest, destroying rain forests, pastures, and farmlands, and increased erosion and degradation of Maui's healthy watersheds. A single plant produces millions of sand-grain sized seeds each year that remain viable for at least 10 years. 	<p>Miconia is found in wet forests below 2,300' elevation.</p>	<p>Yes</p>



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05/07

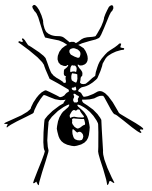



Photo: MISC

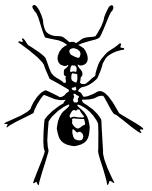
<u>Description</u>	<u>Problem</u>	<u>Prevention</u>	<u>Control</u>	<u>Report</u>
<p>Coqui frogs (<i>Eleutherodactylus coqui</i>) are native to Puerto Rico and have been invading Maui since 1997.</p> <p>Frogs are round, about the size of a quarter and may grow up to 2" long.</p> <p>Brown or gray-brown with variable patterns, including a light stripe down the middle of its back.</p> <p>Found in all types of vegetation from sea-level to 4,000'.</p> <p>Coqui frogs hide in leaf litter during the day and emerge to elevated perches at night.</p> <p>Males emit loud two-note mating calls (90 - 100 decibels) at night which can be equivalent to a lawnmower running all night long!</p>	<p>There are no natural predators to keep populations in check.</p> <p>Populations can reach densities of 22,000 individuals per acre.</p> <p>The coqui's loud call destroys the peace and tranquility of the Maui night. Residents and visitors have a difficult time sleeping.</p> <p>Coqui frogs consume huge quantities of insects, but rarely mosquitoes, disrupting the balance of Maui's vulnerable native ecosystems.</p> <p>Coqui frogs are a potential food source for snakes and other invasive predators.</p> <p>Some economic impacts are unhappy tourists decreased local and export plant sales, lower property values, and increased disclosure requirements for property sales.</p>	<p>Ask if plants are coqui-free before you buy or landscape.</p> <p>Eliminate excess yard debris and ground cover. You can limit frog habitat by removing dead leaves, pruning and thinning shrubs, and raking up debris. Disposing of green waste, fixing leaky faucets and emptying containers that catch rainwater may also decrease chances for frog establishment.</p> <p>Visit www.hear.org/frogs or www.ctahr.hawaii.edu/coqui to recognize the coqui frog's call.</p> <p>Organize community frog squads and night walks to listen for the sound of coqui.</p> <p>Notify MISC and neighbors of infested areas and offer to help control them.</p>	<p>If you have a few coqui, follow the calls at night and collect the frogs.</p> <p>If you have a coqui chorus, spray 12% citric acid (1.0 lbs. per gallon of water) in the area where they are heard. Put water in the sprayer first, then mix in citric acid. Spray must come in contact with the frog's skin to be effective.</p> <p>MISC will control coqui frogs. Please call 573-6472.</p>	<p>Report any sightings or calls to the Maui Invasive Species Committee (MISC) at 573-6472. We want to know:</p> <ul style="list-style-type: none"> - Frog's Location - Number of frogs - Any action taken <p><u>Note:</u> Coqui are illegal to import, breed, keep as pets, sell or export in Hawai'i.</p> <p><u>Note:</u> Use of brand names or companies does not imply an endorsement of the product or company. MISC assumes no liability for damage to non-target plants or animals or for any human contact with products mentioned here within.</p>



MISC
MAUI INVASIVE SPECIES COMMITTEE

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11/09



Fountain Grass Call 573-MISC



What is it?

- Fountain grass (*Pennisetum setaceum*) is a bunchgrass from Africa that is invading Hawai‘i.
- The gray-green leaves are cylindrical and grow in a dense clump.
- The flowers grow in a spike and are purplish when young and white when dry.
- It grows up to 3 ft tall.
- On Maui, fountain grass is typically found in dry areas from sea-level to 6,500’ elevation.

Why is it a problem in Hawai‘i?

- Fountain grass is drought and fire resistant. Seeds are spread by the wind, animals, vehicles, and people.
- Fountain grass spreads wildfires and rapidly regrows, damaging dry forest plants that are not adapted to fire.
- It threatens agricultural and natural areas.
- Fountain grass is on the State noxious weed list.

What is MISC doing?

- The Maui Invasive Species Committee is a partnership fighting to protect Maui County from invasive plants and animals that threaten our environment, economy, and quality of life.
- MISC works to prevent invasive species from becoming established on Maui.
- MISC controls invasive species on private and public property free of charge.
- MISC educates people about invasive species and how to protect Maui.

What can you do?

- Never import or plant fountain grass.
- If you have fountain grass, call MISC and give us permission to control it on your property.
- If you see fountain grass growing or for sale, call MISC.
- Encourage your friends not to buy this or other pest plants so nurseries will stop selling them.
- Learn more. Visit the website <http://www.hear.org/AlienSpeciesInHawaii/>

Together we can keep “Maui Nō Ka ‘Oī!”

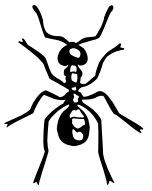


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10/06



WANTED

Giant Reed Call 573-MISC



John M. Randall, photographer,
The Nature Conservancy.



Ann Murray, illustrator,
University of Florida.



Leaf sheaths,
John M.
Randall,
photographer,
The Nature
Conservancy.

What is it?

- Giant reed (*Arundo donax*) is a tall, sugar-cane-like grass from India that is invading Hawai'i.
- The leaves are 1-2 inches wide and a foot long.
- It has many flowers on 2-ft long, dense, plume-like branches.
- This plant grows rapidly and spreads quickly. It can reach heights greater than 20 feet. It forms large, continuous root masses.
- Giant reed grows in moist areas and in a wide variety of conditions.

Why is it a problem in Hawai'i?

- It spreads quickly by root pieces in dirt or waterways.
- Giant reed traps sediments and blocks stream flow, leading to erosion and flooding.
- Once established, giant reed forms dense stands that choke out native plants and can alter waterbird habitat.
- It catches on fire easily, spreading wildfires that threaten homes and properties.

What is MISC doing?

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What can you do?

- Never import or plant giant reed.
- If you have giant reed, call MISC and give us permission to control it on your property.
- If you see giant reed growing or for sale, call MISC.
- Encourage your friends not to buy this or other pest plants so nurseries will stop selling them.
- Learn more. Visit the website <http://www.hear.org/AlienSpeciesInHawaii/>

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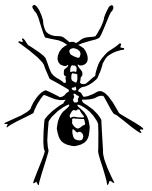


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10/06



WANTED

Ivy Gourd Call 573-MISC



What is it?

- Ivy gourd (*Coccinia grandis*) is a vine from Asia, Africa, and India that is invading Hawai'i.
- The 2-3 inch leaves are heart shaped.
- The white flowers have 5 petals, up to 2 inches across.
- The fruits are red and shaped like cucumbers.
- Ivy gourd is a State noxious weed.
- It is found in dry to moist areas up to 800' elevation.

Why is it a problem in Hawai'i?

- Ivy gourd attacks shrubs, trees, fences, and telephone poles.
- If left unchecked, ivy gourd can form a dense canopy that quickly smothers out its hosts under a solid blanket of vines.
- Birds eat the fruits and scatter the seeds, contributing to the rapid spread of the vine. It can grow up to 4 inches a day.

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What can you do?

- Never import or plant ivy gourd.
- If you have ivy gourd, call MISC and give us permission to control it on your property.
- If you see ivy gourd growing or for sale, call MISC.
- Encourage your friends not to buy this or other pest plants so nurseries will stop selling them.
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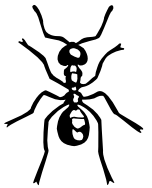


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10/06



Miconia

Call 573-MISC



What is it?

- Miconia (*Miconia calvescens*) is a tree from South and Central America that is invading Hawai'i.
- The large eye-shaped leaves have 3 obvious leaf veins with purple undersides.
- The small flowers last for less than a day.
- This plant grows to over 50 feet tall.
- Miconia is a State noxious weed.
- It is found in wet forests below 2,300' elevation.

Why is it a problem in Hawai'i?

- Miconia shades out and kills other plants trying to grow beneath it.
- If left unchecked, miconia will create a monotypic forest, destroying rain forests, pastures, and farmlands, and causing increased erosion and degradation of Maui's healthy watersheds.
- A single plant produces millions of sand-grain sized seeds each year that remain viable for at least 10 years.

What is MISC doing?

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What can you do?

- Never import or plant miconia.
- If you have miconia, call MISC and give us permission to control it on your property.
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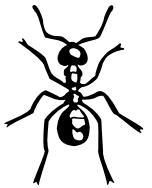


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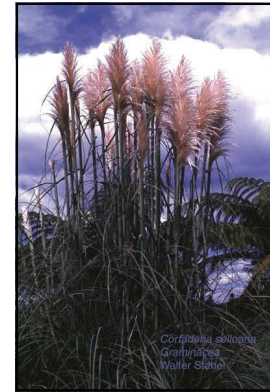


WANTED

Pampas Grass Call 573-MISC



Cortaderia jubata



Cortaderia selloana

What is it?

- Pampas grass (*Cortaderia sp.*) is a giant bunchgrass from South America that is invading Hawai‘i.
- The narrow leaves have sharp, serrated edges.
- It has white to purple flower plumes.
- This plant grows to over 13 feet tall.
- Seeds are spread by the wind and can be viable for at least 6 years.
- *Cortaderia jubata* is on the State noxious weed list.

Why is it a problem in Hawai‘i?

- Pampas grass forms dense monotypic stands.
- Spreads rapidly.
- Seeds are dispersed by wind up to 20 miles away.
- Once established, pampas grass can crowd out native plants, damage grazing lands, and create a fire hazard.

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What can you do?

- Never import or plant pampas grass.
- If you have pampas grass, call MISC and give us permission to control it on your property.
- If you see pampas grass growing or for sale, call MISC.
- Encourage your friends not to buy this or other pest plants so nurseries will stop selling them.
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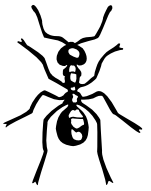


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10/06



WANTED

Rubber Vine Call 573-MISC



Photo by USGS-BRD.



Flower, seed pods, and leaves.

What is it?

- Rubber vine (*Cryptostegia grandiflora*) is a fast-growing climbing plant from Madagascar that is invading Hawai'i.
- The shiny, dark green leaves are 2-4 inches long.
- The 2 inch white to lilac flowers have a broad funnel-shaped tube and five lobes.
- Seeds form in triangular pods in wing-like pairs 4-5 inches long.
- Rubber vine grows in both dry and moist areas at low elevations. It can reach 50 feet high. Seeds spread by wind and water.

Why is it a problem in Hawai'i?

- It smothers and restricts other plants from growing by winding around trunks, stems and branches.
- Rubber vine is poisonous. When eaten, it interferes with heart operation in humans and animals. It also causes stomach and intestinal upset. The milky sap can cause burning rashes and blisters. When dry, a powdery dust emerges and can cause coughing, nose swelling and eyelid blisters.

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- MISC educates people about invasive species and how to protect Maui.

What can you do?

- Never import or plant rubber vine.
- If you have rubber vine, call MISC and give us permission to control it on your property.
- If you see rubber vine growing or for sale, call MISC.
- Encourage your friends not to buy this or other pest plants so nurseries will stop selling them.
- Learn more. Visit the website <http://www.hear.org/AlienSpeciesInHawaii/>

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