



**A Field Guide to the
Early Detection
of Invasive
Plants and Animals
on Kaua'i, Hawai'i**

Acknowledgements

Early Detection Field Guide Development

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Quick Reference Guide

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The Need for Your Eyes & Ears



Kaua'i is in the midst of a silent invasion that threatens the islands' environment, economy, and quality of life.

Non-native plants, such as miconia, grow out of control, produce millions of seeds per tree every year, and threaten to take over unique natural areas and watersheds. Non-native animals, like the coqui frog, jeopardize peaceful nights, tourist revenue, and residents' property values. Containing and removing these unwanted visitors costs Kaua'i, the State of Hawai'i, and the federal government millions of dollars each year.

With the increase of traffic to and from the islands, the influx of invasive species is not likely to stop. Therefore, it is important for new species to be detected early and to have a program for rapid response. This is why the early detection reporting system was created. It helps reduce the overall impact of invasive species. The system is designed to connect people who find early detection species with agencies that are tasked with removing these invasive pests.

Here's where you come in. By participating in the Hawai'i Early Detection Network, you will help increase the number of eyes and ears searching for invasive species. Whether you're driving to work, enjoying the beach, hiking, hunting, or just going *holoholo* (cruising or fishing), you can help keep an eye out for unusual plants and animals that don't belong here on Kaua'i.

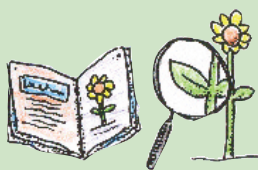
Take some time to learn about plants and animals that are here on Kaua'i so if you come across something unusual and/or new, you'll know what to do. Report-a-pest immediately to **643-PEST** or www.reportapest.org.

How to Use this Field Guide

After you've reviewed the early detection species, here's what to do next:



Investigate It! Take a walk around your neighborhood, drive to a park or just visit a new place. Early detection begins with looking around for species listed within this field guide. In addition, it is also a good practice to keep an eye out for any new species that you recognize as a recent new arrival. It could be the next invader!



Inspect It! Once you've found a plant or animal that looks like an early detection species, compare it to the description and photos within this guide. Does it have a similar size, color, or shape? Don't forget to compare it to the "Look-Alike" section. Sometimes the species can fool you. **(See Page 45)**



Collect It! If you're unsure about what you've found, it's time to collect it. Refer to the "Collect It!" section for ways to collect a specimen without causing harm to yourself or the environment. **(See Page 46)**



Report It! Now you're ready to tell someone about your findings. Use the reporting methods listed in the "Report It!" section to let authorities know about your discovery. **Call 911 immediately if you have a snake sighting. (See page 48)**

What Are We Protecting?

The Hawaiian archipelago's biological wonders are 70 million years in the making. Before the arrival of humans, a single bird, plant, or insect established itself in these islands only once every 35,000 years. As these pioneer species adapted to Hawai'i's lava fields, alpine deserts, and rainforests, they evolved into distinct Hawaiian organisms. Hawaiian honeycreepers and silverswords are spectacular examples of such survival and adaptation and unknown species continue to be discovered. Hawai'i is one of the world's greatest natural biological laboratories with flora, fauna, and invertebrates found nowhere else in the world.

Hawai'i is known as the nation's "extinction capital." We have lost more species to extinction than any other state. With the advent of air travel and globalization, alien species now establish themselves on the islands at an accelerated rate.

What Makes a Species Invasive in Hawai'i?

Because Hawai'i has such a fragile environment, developing in isolation, most native species cannot keep up with foreign invaders. Here are some of the characteristics that makes species invasive:

- Quick growth – it can rapidly mature
- Profuse reproduction – multiplying quickly
- Dormant or delayed offspring – remaining fertile for years
- Easily spread – by water, wind, and/or animals
- Production of "biological toxins" – harmful to plants, animals, and humans
- Spines, thorns, or aggressive behavior – protection against predators
- Large food reserves – ability to store food in roots enabling them to survive in adverse environmental conditions.
- Adapted to diverse habitats – increasing their range
- Large leaves – shading out native plants
- Eats a lot – native species harmed through direct predation, competition, or harboring or transmitting diseases.

Miconia

General

Miconia grows up to 50' tall when mature. It has extremely large oval leaves (averaging 3' long and 1' wide) that are dark green on top and purple on the underside. Each leaf has three prominent leaf veins. Its tiny white to pink flower clusters are very short lived, lasting one day. The berries are dark purple measuring 1/4" in diameter and contain hundreds of seeds.

Impacts: Miconia trees grow quickly and close together, shading out nearly all other forest plants with the large oval leaves. It also has a shallow root system and can cause increased erosion and landslides.

Miconia matures quickly, produces fruit after three to four years, and flowers and fruits several times a year. Plants produce ten to twenty million seeds a year, which can remain viable for twelve years and possibly longer.

Dispersal Mechanism: Humans and animals are key dispersal mechanisms for miconia. Miconia has been used as an ornamental plant in landscape projects. Seeds, about the size of a sand grain, are unintentionally spread by humans and hitchhike on clothes, boots, gear, and animals. Fruit-eating birds feed on miconia; dispersing seeds into pristine native habitat. Contaminated vehicles can also be another vector for the seeds. Hitchhiking seeds have been moved inter-island on hāpu'u fern (*Cibotium* spp.) logs.

Miconia calvescens



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Leaves can be 3' long by 1' wide with a green top and purple underside



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Miconia (continued)

Origin, Distribution, and Habitat: Miconia, a native to Central and South America, was introduced to Tahiti in 1937 and has since overwhelmed two-thirds of Tahiti's native forests. It is responsible for threatening 25% of Tahiti's native forest species with extinction. Miconia was introduced into Hawai'i in the 1960s. On Kaua'i, miconia is currently found only in the Wailua area. **Please report sightings of miconia immediately!**

Cultivation: Miconia was primarily grown as an ornamental plant for nurseries.

Hawai'i State Noxious Weed

Miconia Look-Alike Species

Koster's Curse

Clidemia hirta

Koster's curse is a State noxious weed and widespread across Kaua'i. Leaves are small and covered in stiff hairs. It is shorter than miconia at 5' to 10' tall.



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Koster's curse is much smaller than miconia when mature

Rubber tree leaves are purple on both sides



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Rubber Tree

Ficus elastica

Rubber tree is widespread on Kaua'i. Its leaves are shiny, leathery, purple on both sides, and are without the three prominent veins.

Clerodendrum

Clerodendrum quadriloculare

This plant has green leaves on top and purple on the bottom. It lacks the three prominent veins that miconia has. The leaves are much smaller than miconia leaves.



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The leaves are smaller than miconia and are missing the 3 veins

Fireweed

Senecio madagascariensis

General Description:

Fireweed is a daisy-like herb that grows up to 2' high. The stem is upright and slender with bright green leaves. The leaves are smooth, very narrow (only ¼" wide), have serrated edges, and they reach about 5" long. The small yellow flowers have 13 petals and are about the size of a nickel. The mature flowers turn into white thistle-balls.



Kauai Invasive Species Committee

Fireweed has exactly 13 petals

Mature flowers turn into white thistle balls

Impacts: Fireweed invades pastures, disturbed areas, and roadsides. It is very toxic to cattle, horses and other livestock. When ingested it causes illness, slow overall growth, liver-malfunction and even death in severe cases. In Australia, fireweed costs over \$2 million per year in losses and control.



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Dispersal Mechanism: Each plant can produce up to 30,000 seeds per year that are easily spread by wind, hiking boots, vehicles, and animals. Fireweed is also spread unintentionally as a contaminant seed in hydro-mulch (the method of applying sprouted seeds in a slurry for rapid growth and erosion control) and on equipment.

Origin, Distribution, and Habitat: Fireweed is native to Madagascar and South Africa. Fireweed was first discovered on the Big Island in the 1900's and is now too widespread for control there. This pest can also be found on Maui and Lāna'i. On Kaua'i, known infestations from hydro-mulched areas near Halfway Bridge and in Kalihiwai

Fireweed (continued)

were controlled by KISC and HDOA. Kaua'i and O'ahu continue to be monitored for new infestation areas. The preferred habitat for this weed is disturbed grasslands, abandoned pastures, and roadsides. Fireweed grows on a wide range of soils in sub-humid to humid subtropical woodland. **Please report any sightings of fireweed!**

Cultivation: There are no references of fireweed being used by humans. It is speculated that fireweed could be cultivated for its ornamental attributes.

Hawai'i State Noxious Weed

Fireweed Look-Alike Species

Spanish needle

Bidens pilosa

Spanish needle is a widespread invasive herb on Kaua'i. It has tiny yellow flower clusters unlike fireweed's daisy-like flowers. Spanish needle also grows much taller; up to 6'.



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Spanish needle has yellow flower clusters unlike fireweed



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The mature flowers turn into needle seeds unlike fireweed's white thistle flowers



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Wedelia flowers are larger than fireweed flowers. About 1" - 2" wide

Wedelia

Wedelia trilobata

Wedelia is another widespread invasive herb on Kaua'i commonly planted as an ornamental ground-cover. It can be distinguished from fireweed by its larger yellow flowers. It also has a variable amount of pedals unlike fireweeds constant 13.

Bingabing

Macaranga mappia

General Description: Bingabing is a large-leaved plant that grows 15' to 30' tall. Its round leaves can be as large as an umbrella, up to 2' to 3' long. The stem attaches to the middle of the leaf. Bingabing flowers do not have petals. Instead, there are noticeable red bracts along the main stem.



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Bingabing has large leaves as big as an umbrella

Impacts: On the island of Hawai'i, bingabing was seeded from airplanes, along with many other weedy forestry species, near Hilo after a fire. Today, it lines roadsides, gulches, and disturbed forests in the vicinity. Its large leaf structure creates a dense growth that can crowd and shade out other vegetation.

Dispersal Mechanism: Long distance dispersal of bingabing is achieved primarily through humans who use the plant in ornamental landscaping or reforestation. This can also be dispersed by birds eating the seeds.

Origin, Distribution, and Habitat: Bingabing is native to the Philippines and is cultivated in tropical regions throughout the world. In Hawai'i, it is known to be naturalized on the islands of O'ahu and Hawaii in low elevation mesic to wet areas and disturbed mesic valleys (sea level to 721'). It was once planted on Kaua'i in 1927 but there are no reports that the pest has become naturalized there.

Please report sightings of this pest!

Cultivation: Bingabing was cultivated in Hawai'i and other tropical regions of the world for ornamental and in reforestation projects.

Bingabing (continued)



The stem attaches to the middle of the leaf

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Red bracts are located along the main stem of bingabing

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Bingabing Look-Alike Species

Parasol Leaf Tree

Macaranga tanarius

This relative of bingabing has already escaped into the wild on Kaua'i. It can be distinguished from bingabing by its smaller leaves (less than 1' long) and pale green to yellowish green calyx. The vein pattern on the leaves are also noticeably different in these two species.



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Parasol leaf tree is already widespread on Kaua'i

Parasol leaf tree flowers are yellow unlike Bingabing red bracts

Cattail

Typha latifolia

General Description: Cattail is a wetland rush with stems that can grow 3' to 6' tall. The long, thick, pale-green leaves are straight on the bottom but slightly twisted and spiral at the top. The flowers are brown and minute, clustering into a cigar shape that is 4" to 7" long.

Impacts: Cattail is among the most common of all aquatic plants. Each flower head can produce 250,000 seeds that are quickly dispersed by wind and are viable in the soil for 100 years. Cattail form dense monocultures that spread rapidly and form dense mats. They can easily take over wetlands and crowd out native plants. The endangered Hawaiian stilt and koloa duck are displaced by cattail. Cattail also threatens the taro industry by invading the lo'i (taro patches). Removal is difficult and often prohibitively costly for small taro producers. In addition, cattail can impede water flow and increase bank erosion and siltation.

Dispersal Mechanism: Seeds are dispersed by wind. Plants are also spread by vegetative matter. Newly established plants spread quickly by rhizome growth and expand rapidly, creating underground runners that form dense mats.

Origin, Distribution, and Habitat:

Cattail is native to many areas of the world in freshwater wetlands, marshes, lakes, coastland, and riparian and estuarine habitats.



Cattail flowers cluster into a cigar shape. The leaves slightly twist at the top



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Cattail (continued)

Cattail is currently found Kaua'i, O'ahu and Maui. On Kaua'i, cattail have been found in shallow waters in Māhā'ulepū, Niumalu, Keālia, Nukoli'i, Puhi, Waimea Valley, Kōloa, and Hanapēpē. The largest population is in Makaweli Valley in taro patches. **Please report any new sightings of cattail so we can stop the spread of this invasive pest!**

Cultivation: Cattail has had many uses. It has been woven into mats, hats or used for stuffing pillows, insulation, or bandages. The pollen is used to make fireworks and torches. Many parts of this plant are consumed. Cattail is also cultivated for its ornamental attributes.

Cattail Look-Alike Species

Japanese mat rush

Juncus effusus

Japanese mat rush is an invasive rush commonly seen on Kaua'i. It has round narrow stems unlike the flat stems of cattail. It also lacks the cigar like flowers of cattail.



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Japanese mat rush has round narrow stems



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False Kava (False 'awa)

Piper auritum

General Description: False kava is a shrub-like plant ranging 3' to 6' tall with upper branches that extend in a noticeably horizontal pattern. The light green leaves of this plant are large and have a pinnate vein pattern with unequally lobed bases. The leaves have a dense margin of short hairs along the edge. When the leaves are crushed there is a root beer or anise-like odor. Some false kava leaves might have a red tint to the main vein. Opposite of the leaves are spikes of tightly-packed flowers in a long, single, arching spike. The flower spike is white to pale green.

Impacts: False kava has thick growth habit and spreading root suckers which displace other plants. Since it can be easily confused with true kava it is sometimes mistakenly interplanted, which then threatens the purity and preservation of true kava, vastly decreasing the value of the crop and the quality of the product. False kava does not have the same medicinal properties as true kava. False kava grows twice as fast as true kava and quickly takes over the habitat.

Dispersal Mechanism: False kava is spread by humans who mistakenly plant it as true kava. Seeds are dispersed by birds and possibly bats. Plants also spread rapidly by suckers. Small pieces



Some false kava stems are red and the leaves have a red tint



False kava tightly-packed flowers form a long, arching spike

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False Kava (False 'awa) (continued)

of root, leaves, and stems can reproduce into new plants, making control difficult.

Origin, Distribution, and Habitat: False kava is native to South and Central America. The plant was introduced to Hawai'i accidentally as true kava. False kava is currently found on Maui, O'ahu, and Kaua'i. The invasion on Kaua'i is limited to two known populations: in Kāhili Mountain Park, Waiakoloa in the Kīlauea area. **Please report any new sightings of this pest to stop its spread!**

Cultivation: In Mexico, false kava is cultivated for its edible attributes; it is used as a seasoning in many dishes.

Hawai'i State Noxious Weed

False Kava Look-Alike Species

True kava, 'awa

Piper methysticum

True kava is in the same family as false kava but has medicinal attributes that false kava lacks. True kava can be distinguished from false kava by its smaller, darker leaves which have equally-lobed bases. True kava also has a palmate vein pattern on the leaves.



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True kava has equally-lobed leaves

True kava (left), False kava (right). True kava has a palmate vein pattern and false kava has a pinnate pattern

Fountain Grass

Pennisetum setaceum

General Description: Fountain grass is a perennial clumping grass that grows erect up to 3' high. The leaves are greenish-grey and have a slender, cylindrical, rolled shape. It has small flowers that are grouped together in upright, long, purple to rose-colored inflorescences that turn white. Each inflorescence averages 6" to 15" long.

Impacts: Originally introduced as an ornamental plant, fountain grass has become an aggressive, habitat-altering invader. It is not a good pasture grass and it degrades the quality of pasture lands, particularly in drier areas. Fountain grass is also fire-adapted and can sustain fires that spread quickly into adjacent areas. Its dried leaves increase the intensity of wildfires. After a fire, it resprouts faster than native plants.

Dispersal Mechanism: Fountain grass is dispersed through the horticultural trade as an ornamental grass. Its seeds are also transported via the wind, water, vehicles, livestock, and humans.

Origin, Distribution, and Habitat: Fountain grass is native to Africa. In Hawai'i, it invades many types of natural areas including bare lava



Fountain grass is a large clumping grass



Long purple inflorescences have hundreds of seeds

Fountain Grass (continued)

flows, grasslands, and rangelands. The worst infestation occurs on the Island of Hawai'i, where fountain grass covers at least 200,000 acres. Fewer than 200 acres of fountain grass occurs on O'ahu. Known fountain grass populations on Kaua'i are in Kalāheo and Hanapēpē. **Please report any new sightings of fountain grass!**

Cultivation: Fountain grass is cultivated for its ornamental attributes.

Hawai'i State Noxious Weed

The dry leaves of fountain grass create a fire hazard



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Fountain Grass Look-Alike Species

Red Fountain Grass

Pennisetum macrostachym
var. *purpureum*

Red fountain grass, an invasive, can be differentiated by red or purple-tinted foliage and seed-heads. It also grows much taller (6' to 8'). This pest should be reported when found.



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Red fountain grass has a deeper red or purple tint to its leaves



Magnus Manske

Feathertop has distinct feathery seed-heads

Feathertop

Pennisetum villosum

Feathertop is another invasive, perennial, clumping grass with a similar growth structure and leaves as fountain grass. Feathertop produces distinctive feathery seed-heads that can grow up to 3' in length. Please report sighting of this pest.

Ivy Gourd

Coccinia grandis

General Description: Ivy gourd is an aggressive vine. Its leaves are 2” to 3” long and heart-shaped. Ivy gourd flowers are white, up to 2” across and have five petals. The cucumber-shaped fruits are green with whitish stripes and turn crimson red when ripe. Ivy gourd is a State noxious weed.

Impacts: Ivy gourd grows aggressively and can climb over trees and shrubs as well as on fences and power lines. It can also cover archaeological sites such as *heiau* (Hawaiian temple). If left unchecked, ivy gourd can form a dense canopy that quickly smothers out its hosts under a solid blanket of vines.

Dispersal Mechanism: Ivy gourd is dispersed long distances by humans who grow the plant for food. This pest can also be dispersed unintentionally by the transport of plant material by humans. Ivy gourd seeds are spread by birds and rodents.

Origin, Distribution, and Habitat: Ivy gourd is native to Africa, India, Asia, and Australia. It has been found on all Hawaiian Islands with the exception of Moloka'i. On Kaua'i, ivy gourd escaped from gardens and can be found in Anahola, Moloa'a, L'hu'e, Shipwrecks, and Kekaha. **Please report any new sightings of ivy gourd to stop the spread of this pest!**



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Ivy gourd has white flowers with red fruit



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Lobed leaves may vary in shape

Ivy Gourd (continued)

Cultivation: Ivy gourd is cultivated for its edible leaves and fruits.

Hawai'i State Noxious Weed



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Ivy gourd smothers anything in its path, including coconut trees and abandoned vehicles



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Ivy Gourd Look-Alike Species

Blue trumpet vine

Thunbergia laurifolia

Blue trumpet vine is a fast-growing vine. It has thin stems and smooth, opposite-growing leaves. It produces blue-violet to white flowers. The leaves are pointed compared to ivy gourd.



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Blue trumpet vine's leaf and flower shape differentiate it from ivy gourd

Jerusalem Thorn

Parkinsonia aculeata

General Description:

Jerusalem thorn is a shrubby, thorny tree that grows 9' to 30' tall. It has a smooth green bark and spines along its branches. Feathery leaves are formed by long flat spine-like stems and it has 22 – 30 pairs of small leaflets measuring 10" to 16" in length. Jerusalem thorn has small 1" yellow flowers with orange spots. The flowers hang in groups. This plant has green pods with brown or purple spots that range from 2" to 8" long.



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Jerusalem thorn grows into a large tree ranging from 9' to 30' tall

Impacts: This pest has spread throughout the world as an ornamental tree and has since escaped from cultivation. Jerusalem thorn is fast-growing, drought tolerant, and able to grow in different soil types. In Australia, Jerusalem thorn can form dense thorny impenetrable thickets along water-courses and drainages.



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Small yellow flowers hang in groups

Dispersal Mechanism:

Jerusalem thorn seeds disperse via water-courses and during flood conditions. It is also dispersed by animals and humans who spread the plant long distances in landscaping.

Origin, Distribution, and Habitat: The full extent of Jerusalem thorn's native range is uncertain. However, it is widely cultivated and is known to have spread from initial plantings in California, Arizona,

Jerusalem Thorn (continued)

Florida, Hawai'i, the West Indies, Australia, and Micronesia. On Kaua'i, this plant is not known to be naturalized. The potential range on Kaua'i is suspected to be extensive, possibly wherever *kiawe* exists. **Please report any sightings of Jerusalem thorn!**

Cultivation: Jerusalem thorn is a hardy species and is valued as an ornamental or shade tree. Its uniquely-shaped leaves, yellow flowers, shrubby weeping-like habit, drought tolerance, and ability to grow in a wide range of soils makes it an appealing ornamental. Jerusalem thorn has also been used in Africa and Pakistan to revegetate desert regions.

Jerusalem Thorn Look-Alike Species

Kiawe

Prosopis pallida

Kiawe is the common, thorny mesquite found in dry and coastal areas of Kaua'i. It grows up to 40' tall, has 1" thorns, and yellow seed pods. Kiawe can be differentiated by its long, yellow to white flowers.



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Kiawe has long, yellow to white flowers (top) and can grow taller than Jerusalem thorn

Pampas Grass

Cortaderia spp.

General Description:

Pampas grass is a giant bunchgrass with long, slender, bright green, saw-toothed leaves. At the plant's base are dried corkscrew-shaped leaves. Pampas grass has large, showy, flower plumes (2' to 3' long) that extend beyond the foliage.

Two species of pampas grass are found in Hawai'i. *C. selloana* grows up to 10' tall and has narrow, blue-green leaves with white fluffy seed heads. It reproduces sexually and flowers August through November. *C. jubata* grows up to 9' tall and has loosely clumped white-purplish seed heads. It can reproduce asexually and flowers July through October.

Impacts: Pampas grass grows rapidly, produces thousands of seeds per flower plume, and can accumulate large clumps of biomass. Seeds can remain viable for at least six years. The plants crowd out native species, impede access, damage grazing lands, and create fire hazards.

Historically, the invasive nature of *C. selloana* was not recognized in Hawai'i because only female plants were cultivated and sold.



Pampas grass flower



Dried corkscrew-shaped leaves



Pampas grass flower plumes hold thousands of seeds that may blow up to twenty miles away

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Pampas Grass (continued)

This species generally requires cross-pollination between male and female plants to produce viable seeds. The introduction and spread of male plants has caused an explosion of this species in California and New Zealand, and Kaua'i is set up for a similar situation.

Dispersal Mechanism: Pampas seeds are spread by wind; traveling up to twenty miles away from the parent plant. Humans also disperse seeds with contaminated gear. Flower plumes are sold for dried flower arrangements.

Origin, Distribution, and Habitat: South American pampas grass was introduced to Hawai'i as an ornamental plant. On Kaua'i, all known populations have been removed. **Please report any sightings of Pampas Grass immediately!**

Cultivation: Pampas grass is used as an ornamental plant for landscapes and its flower plumes are used for decorations.

Hawai'i State Noxious Weed (*C. jubata* only)

Pampas Grass Look-Alike Species

Native Hawaiian sedges

Family Cyperaceae

Some of the native Hawaiian sedges can be confused with young pampas grass. Native Hawaiian sedges do not produce corkscrew leaves, saw-like, sharp leaf edges, tall flowering stalks, or large showy seed plumes like pampas grass.

Native Hawaiian sedges may be confused with young pampas grass plants



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Rubber Vine

Cryptostegia spp.

General Description:

Rubber vine has dark, glossy, green leaves that grow in an opposite-leaf arrangement, averaging 3" to 4" long and 1" to 2" wide. The showy flowers are purple, funnel-shaped and have five petals. The large distinctive seed pods (about 3" long and 1" wide) are triangular, rigid, and grow in an opposite arrangement along the plant's stem. The seed pods can contain up to 450 brown seeds that have white silky hairs.



Forest & Kim Starr (USGS)

Rubber vine is poisonous to humans and livestock



Forest & Kim Starr (USGS)

Flowers are funnel-shaped with five petals



Forest & Kim Starr (USGS)

Seed pods appear wing-like

Impacts: Rubber vine is a notorious invader in Australia. First introduced for ornamental use around 1860, it was later planted for rubber production. The seeds spread rapidly by wind, floodwaters, and mud, sticking to machinery and in the hooves of animals.

In Australia, it forms dense impenetrable thickets by climbing up trees and covering them. It has the ability to choke out native vegetation. In addition, rubber vine is an expensive problem for ranchers in Australia who must control the toxic plant to protect cattle and horses.

This woody, self-supporting vine of the Milkweed family, has toxic properties that are harmful to humans and animals. The milky sap can cause burning rashes and blisters. When dry, a powdery dust emerges and may cause coughing, nasal swelling, and eyelid blisters.

Rubber Vine (continued)

Dispersal Mechanism: Plants are often dispersed long distances by humans. In Australia, plants initially spread along water-courses then spread to pasture land in both open and forested areas. Numerous seeds with tufts of silky hairs help disperse the seeds in the wind.

Origin, Distribution, and Habitat: Rubber vine is native to Madagascar and is found along the western coastal plains, below 1,640'. On Kaua'i, the distribution of rubber vine is still small. **Please report any sightings of this pest!**

Cultivation: Rubber vine has been cultivated in warmer regions of the world as an ornamental and for the production of rubber. It is an attractive vine with shiny, evergreen leaves and attractive pink-purple blooms. In Hawai'i, it is grown as an ornamental and is occasionally observed on Kaua'i in yards along driveways or fronting properties.

Rubber Vine Look-Alike Species

Purple allamanda

Allamanda violacea

This showy vine also produces a milky sap. Purple allamanda can be distinguished from rubber vine by its whorled three to four leaf growth pattern (arranged like spokes on a wheel). It does not have large seed pods.



Forest & Kim Starr (USGS)

Purple allamanda flowers grow in a whorl-like pattern

Brazilian jasmine

Mandevilla sanderi

This sap-producing vine is considered a safe alternative to rubber vine in landscaping. It can be differentiated by its dark pink to red trumpet-shaped flowers.



Forest & Kim Starr (USGS)

M. amabilis is similar to M. sanderi

Giant Reed

Arundo donax

General Description:

Giant reed is a large, clump-forming grass that can grow up to 20' tall. The stiff leaves are elongate, 1" to 2" wide and about 1' to 2' long. The leaves grow in an alternate pattern and have a clasping connection to the hollow stem. It produces many, 2' long flowers on dense plume-like branches.



Kauai Invasive Species Committee

Giant reed growing in a clump

Impacts: Once established, giant reed forms impenetrable thickets that can spread over several acres. The scaly rhizomes (horizontal underground roots) can grow up to 3' thick. Giant reed displaces native plants and eliminates wildlife habitat. This



Kauai Invasive Species Committee

Alternate leaf arrangement



Kauai Invasive Species Committee

Plume of giant reed

grass can trap debris in streams and canals and reduce water flow, causing flooding. Giant reed can also burn while still green, posing a severe fire hazard where it grows in dense stands.

Dispersal Mechanism: Giant reed is one of the fastest growing terrestrial plants, growing up to 4" a day. This grass can reproduce easily from small root and stem fragments. It can be spread unintentionally in this manner as a contaminant on equipment or re-located in infested soil.

Giant Reed (continued)

Origin, Distribution, and Habitat: Giant reed is native to the Mediterranean area and was brought into Hawai'i as an ornamental plant. This plant currently invades O'ahu, Maui, Kaua'i and Moloka'i. There are eight known populations on Kaua'i, most of them on the Westside. Giant reed grows in wetlands, along streams, ditches, rivers, and coastal areas. **Please let us know if you see giant reed on Kaua'i so we can stop the spread of this pest.**

Cultivation: Giant reed is cultivated for many uses. The strong stem is a source-material for a variety of woodwind instruments. The canes contain silica which is used to make paper, fishing rods, and walking sticks. Giant reed is also planted for its ornamental attributes.

Hawai'i State Noxious Weed

Giant Reed Look-Alike Species



Forest & Kim Starr (USGS)

Bamboo's internodes along the stem

Bamboo

Bambusoideae spp.

Bamboo is a perennial grass commonly seen on Kaua'i. It can be distinguished from giant reed by clearly marked internodes along the stem.



Forest & Kim Starr (USGS)

Sugarcane leaves arranged in an opposite pattern

Sugarcane

Saccharum officinarum

Sugarcane is a perennial grass with similar growth structure and leaves as giant reed. It can be distinguished from giant reed by its longer leaves arranged in an opposite pattern and its clearly marked internodes along the stem.

Long-thorn Kiawe

Prosopis juliflora

General Description: Long-thorn kiawe can grow as a rambling shrub or tree ranging from 6' to 30' tall. The thorns are up to 4" long. Its pale yellow flowers are numerous and grow in cylinder-shaped spikes up to 4" long. Mature seed pods are flat, curved, yellowish brown and 3" – 8" long.



Long-thorn kiawe's pale yellow flowers are cylinder-shaped spikes

Forest & Kim Starr (USGS)

Impacts: The long-thorn kiawe thorns are able to pierce entirely through rubber slippers, boots, and car/truck tires. These thorns also have poison-tipped ends that can cause bruises and swelling. The long-thorn kiawe grows in dense thickets that crowd out native coastal plants. It is capable of rendering large areas impassible, preventing beach access.



Long-thorn kiawe has 4" long thorns

Kauai Invasive Species Committee

Dispersal Mechanism: Long-thorn kiawe produces thousands of seeds per year, which are carried long distances by water. The trees easily resprout after damage.



Long-thorn kiawe grows in dense thickets

Kauai Invasive Species Committee

Origin, Distribution, and Habitat:

Long-thorn kiawe is native to Africa and was first noted in Hawai'i in 1978. The introduction history is unknown but it was possibly introduced for agriculture or accidentally. The current, known distribution of this pest is on Kaua'i, O'ahu, and Moloka'i. On Kaua'i, long-thorn kiawe invades beaches of Māhā'ulepū, Mānā, the Pacific Missile Range Facility, Waimea, and Kekaha. The preferred habitat is coastal and dry. This plant can

Long-thorn Kiawe (continued)

withstand drought and is somewhat tolerant of saltwater. **Please report any new sightings of this pest!**

Cultivation: Cultivation is unknown but possibly cultivated for agricultural purposes.

Hawai'i State Noxious Weed

Long-thorn Kiawe Look-Alike Species

Common kiawe

Prosopis pallida

Common kiawe is common invasive plant throughout Hawai'i and can be confused with the long-thorn kiawe. Common kiawe always grows into an upright tree, unlike the rambling growth-form of long-thorn kiawe shrubs or trees. Common kiawe can also be distinguished by its absent thorns or smaller 1" thorns compared to the large 3"-4" thorns of the long-thorn kiawe.



Forest & Kim Starr (USGS)

Common kiawe has yellow to white flowers (right) and small thorns (top)



Forest & Kim Starr (USGS)

Cane Tibouchina

General Description: This shrub is semiwoody and can grow up to 9' tall. The young stems are angled and hairy. The leaves are opposite, 3" long by 1.4" wide, hairy, and have 5-7 prominent veins. The flowers are pink and have 4 petals with bright yellow anthers. The fruit is cup-like and extremely small. The seeds are very small and numerous.

Impacts: This plant is a prolific seeder and spread by birds. It forms dense stands in pastures and can also invade disturbed forest areas, displacing native species.

Dispersal Mechanism: This plant is a prolific seeder that can be spread by birds. It has also been known to be spread by humans who have used the plant in landscaping.

Origin, Distribution, and Habitat: This shrub is native to southern Brazil, Uruguay, and Paraguay. Cane tibouchina has heavy infestations on Maui. It occurs in the northern Ko'olau range on O'ahu, as well as on Moloka'i and Lāna'i, and in Hilo, including lower Saddle Road on Hawai'i. **Please report any sighting of this pest!**

Tibouchina herbacea



Forest & Kim Starr (USGS)

Cane tibouchina's bright flowers



Forest & Kim Starr (USGS)

Seedling cane tibouchina

Cane Tibouchina (continued)

Cultivation: Cane tibouchina has been known to be used in landscaping as an ornamental. This weed has escaped cultivation.

☑ **Hawai'i State Noxious Weed**

Cane Tibouchina Look-Alike Species

Glorybush

Tibouchina urvilleana

Also called princess flower, this is another Melastome species and very invasive. It has larger, purple flowers with five petals and can grow up to 12' tall. This plant can be seen in Koke'e, naturalized along the roadside.



Forest & Kim Starr (USGS)

Glorybush has large purple flowers



Forest & Kim Starr (USGS)

Asian melastome

Melastoma candidum

Melastoma septemnerium

This is a spreading shrub that forms tangled brush between 5' to 15' tall. Each flower usually contains five to six petals, averaging 1" long. This plant is widespread across Kaua'i

Asian melastome 5 or 6 petal flowers

Yellow Himalayan Raspberry *Rubus ellipticus*

General Description: Yellow Himalayan raspberry is a rambling shrub that grows up to 7' tall and is covered with prickles. It is the only raspberry that has light green oval leaves growing in a three-leaflet pattern along the stem. The leaves average 2" to 3" long and have saw-like edges with rounded tips. The white flowers are small (1/8" to 3/8" long) and are covered with prickles. Yellow Himalayan raspberry is also the only raspberry with yellow fruit (1" long).

Impacts: Yellow Himalayan raspberry spreads by vigorous vegetative growth as well as by birds and other mammals that eat the fruit. It is hard to kill once established.

Dispersal Mechanism: In Hawai'i, Yellow Himalayan raspberry is spreading from the island of Hawai'i as contaminants in hāpu'u fern trunks and parts, such as mulch. Humans transport the plant long distances for use as an ornamental or as an edible crop. It can also be spread by birds and mammals that eat the fruit.

Origin, Distribution, and Habitat: Yellow Himalayan raspberry is native to tropical and subtropical India. On Hawai'i Island, this pest is now naturalized in moist to wet, disturbed forests from 2,270' to 5,580' elevation. It is well adapted to open sunny areas and wet shady rainforests. On Kaua'i, there is no known infestation.



Yellow Himalayan raspberry has hundreds of prickles along its stem

Forest & Kim Starr (USGS)



Flowers also have prickles

Forest & Kim Starr (USGS)



The leaves have a saw-like edge and rounded tip

Forest & Kim Starr (USGS)

Yellow Himalayan Raspberry (continued)

Cultivation: This pest is widely cultivated as an ornamental in warm regions.

Hawai'i State Noxious Weed

Please report any new sightings of any of these berries to stop the spread of these invasive pests!

Other Reportable Berries

Florida Blackberry

Rubus argutus

This invasive berry can be found on Kaua'i in Koke'e. It can be distinguished from Yellow Himalayan raspberry by its white flowers and pointed leaves. If you find blackberry on Kaua'i outside of Koke'e, please report it.

Blackberry has pointed leaves



Forest & Kim Starr (USGS)

Molucca raspberry has irregularly toothed leaves



Kaua'i Invasive Species Committee

Molucca Raspberry

Rubus sieboldii

This invasive berry has not naturalized on Kaua'i. It can be distinguished from Yellow Himalayan raspberry and blackberry by its irregularly-toothed edges.



Kaua'i Invasive Species Committee

Little Fire Ant

Wasmannia auropunctata

General Description: The little fire ant (LFA) is a very slow-moving ant, averaging 1/12" in size. It gets its name from its powerful sting that can feel fire-like to the person or animal on the receiving end. Many people will develop large red welts that last hours, even days, followed by an intense itching sensation. An individual ant can deliver multiple stings, and often several ants attack at once. Little fire ants do not have big heads.

Impacts: The speck-sized ant invades agricultural areas and nurseries putting coffee growers and flower pickers at risk of being stung. Some farm owners have had difficulties retaining workers who fear the fire ant bite. Besides being a serious nuisance to humans, this ant has been known to attack the eyes of domestic animals and blind them.

Dispersal Mechanism: LFA will find their way into the nooks and crannies of potted plants, flowers, clumps of grass, and leaf litter. To the dismay of Big Islands residents, LFA have been known to enter Big Island homes getting into clothes, beds, furniture and food.

Origin, Distribution, and Habitat: Originally from Central and South America, LFA have been found on the Island of Hawai'i. Only one known population exists on Kaua'i in Kalhiwai. **Please report any sightings of this ant immediately!**



LFA average 2 mm in size

April Noble



LFA on a chopstick

Eileen Van Gelder, USGS

Ant Look-Alike Species

Tropical Fire Ant

Solenopsis geminata

Tropical fire ant is common throughout Hawai'i. It can be distinguished from LFA by its larger size (1/8" to 1/4") and the presence of "big headed" workers. This ant is restricted to dry coastal areas, nests in the soil, and does not construct mounds.



E. M. Sarnat

Red Imported Fire Ant

Solenopsis invicta

General Description: Red imported fire ants (RIFA) are aggressive, biting ants not known to occur anywhere in Hawai'i. They average 1/8" to 1/4" in length and have an opaque, shiny black abdomen. RIFA do not have "big-headed" workers. RIFA build dome-shaped mounds of soil.



Alex Wild

Impacts: RIFA pose a serious threat to human health. Large numbers of ants will rapidly swarm on and relentlessly sting anything unfortunate enough to disturb them. In the U.S., hundreds of people are stung each year. RIFA stings cause blisters filled with white pus which lasts for several days. In infested areas they may cause injury or death to livestock, pets, and wildlife; damage crops, ornamental plants, electrical equipment, and irrigation systems; and cause serious declines in biodiversity.



USDA

Red Imported Fire Ant

Skin reaction

Dispersal Mechanism: RIFA are primarily dispersed via human activities such as cargo and nursery plant shipments.

Origin, Distribution, and Habitat: Native to Brazil, RIFA were introduced to the United States in the 1930s. They have invaded over 300 million acres across the southern U.S. Though this ant has not yet established itself in Hawai'i, it established a foothold in California in 1998. With the enormous quantity of cargo and people arriving in Hawai'i from California, the risk of this ant becoming the next major severe pest invasion in Hawai'i is high. **Please report any sightings of this ant immediately!**

Ant Look-Alike Species

There are over 40 types of ants in Hawai'i. Most of these ants are black to pale brown and slightly transparent. Most other ants build mounds that will have a visible opening or be surrounded by an area that is stripped of vegetation. No other ant in Hawai'i will aggressively swarm like the red imported fire ant.

Stinging Nettle Caterpillar *Darna pallivitta*

General

Description:

The stinging nettle caterpillar is the 1st larval form of an Asian moth. It is covered with rows of poisonous spines. The coloration is variable, ranging from white to light grey, with a dark stripe running down the length of the back.



Hawaii Dept. of Agriculture

Stinging nettle caterpillars have a spiny body

Impacts: This caterpillar produces a painful sting filled with a burning, itching sensation and may cause an allergic reaction. The skin will swell and create a welt that may last for days followed by a persistent rash that may last for weeks. In the nursery industry, stinging nettle caterpillars feed upon and damage crops.



Hawaii Dept. of Agriculture

Male nettle moth

Dispersal Mechanism: Stinging nettle caterpillars are often distributed through cargo and nursery shipments.

Origin, Distribution, and Habitat: Originally from Southeast Asia, stinging nettle caterpillars were first found on the Big Island in 2001. They continue to have a large presence on the Big Island and are not known to be on Kaua'i. The nettle caterpillar can be found on over 30 plant species including palms, pasture and ornamental grasses, weeds and foliage plants.

Stinging Nettle Caterpillar



Hawai'i Dept. of Agriculture

Stinging nettle caterpillars damage nursery crops

Stinging Nettle Caterpillar Look-Alike Species

Nymphalid butterflies

Family: Nymphalidae

Some of the caterpillars from the Nymphalidae family also are covered in spines but do not sting. Butterflies in this family include the Kamehameha butterfly (*Vanessa tameiameia*), painted lady (*Vanessa cardui*), red admiral (*Vanessa atlanta*), American lady (*Vanessa virginiensis*), and California tortoiseshell (*Nymphalis californica*).



Mau Invasive Species Committee

The Nymphalid family of caterpillars have bodies covered in dark spines. They are often found on passion vine plants and do not sting

Additional Insect Alerts

Alien insect pests can hide in fruit, vegetables, flowers and soil, costing everyone money in diseased crops, higher consumer prices, and sometimes posing human health risks. **If you find unusual insects, report them to the Hawai'i Dept. of Agriculture at 274-3072!**

Coqui Frog

Eleutherodactylus coqui

General Description:

Adult coqui frogs average 1" long, similar in size to a quarter. Their color ranges from light brown, dark brown, and red and may have a line running down their back. They have a broad, rounded snout and obvious toe pads.



S Chun and AH Hara (UH CTAHR)

Coqui frogs are about the size of a quarter

Impacts: These small tree frogs are known for the male's loud "ko-kee" mating call which can reach up to 90 decibels, interrupting the evening peace for residents and visitors. Coqui have no natural predators in Hawai'i and can reach population densities of up to 10,000 frogs per acre. They have a voracious



S Chun and AH Hara (UH CTAHR)

Coqui (Female left, male right) are larger than greenhouse frogs (far right)

appetite and feed on a large amount of insects, including native insects, possibly affecting food supplies for native insect-eating birds. Coqui have caused economic harm to real estate sales on Hawai'i Island where home sellers must disclose that coqui are in the area.

Dispersal Mechanism: Coqui frogs do not travel very far on their own, but when given the chance to hop on a nursery plant, flowers, or vehicle, they can quickly spread. Most coqui arrive on Kaua'i through infested nursery plants and flowers. Coqui travel intra-island by the movement of plants and frogs may hitch a ride on vehicles.

Coqui Frog (continued)

Origin, Distribution, and Habitat: Coqui frogs are originally from Puerto Rico and made their way to the islands via plant shipments. They were first introduced to Maui in 1988 and were detected on Hawai'i Island in 1997. Today, Hawai'i Island has the largest population statewide with over 200 population centers. Moloka'i and Lāna'i are coqui-free. Kaua'i only has one naturalized population in Lāwa'i that is close to eradication. New introductions can, and do, happen anytime.

Coqui are primarily nocturnal, seeking shelter during the day in moist leaf matter and emerge at dusk where they can be found anywhere from high in the trees, in brush on the ground, wedged between leaves, and in PVC pipes. They prefer environments that are similar to their Puerto Rico home which is hot, humid and moist. **Please report any possible sightings of coqui immediately to stop the spread of this pest!**

Coqui Frog Look-Alike Species

Greenhouse frog

Eleutherodactylus planirostris

The invasive greenhouse frog is widespread on Kaua'i. Adult greenhouse frogs are about the size of a dime whereas coqui frogs are larger, about the size of a quarter. They also have a different



Greenhouse frogs (left) have more claw-like toes compared to coqui frogs (right)

vocalization which sounds similar to a cricket. Greenhouse frogs have a narrower snout and less distinct toe pads. Greenhouse frogs are found on the ground and up to about 3' high in shrubs and trees.

Mongoose

Herpestes javanicus

General Description: The mongoose is a weasel-like animal totaling about 26" in length with a long, brownish body, short legs and a tail as long as its body. They have small rounded ears and a pointed nose. The mongoose is active during the day and generally sleeps in dens at night.



oldcar

Mongoose have weasel-like long bodies

Impacts: Mongooses are opportunistic feeders that will eat birds, small mammals, reptiles, insects, fruits, and plants. They prey on the eggs and hatchlings of native ground nesting birds and endangered sea turtles. The small Indian mongoose has been blamed with the extinction of ground-nesting birds in Jamaica and Fiji and commonly eat/predate several endangered Hawaiian birds, such as shearwaters and nene. It is estimated that mongoose cause \$50 million in damages to Hawai'i and Puerto Rico annually.



Arpit meomurari

Mongoose tails are as long as their body

Dispersal Mechanism: Mongooses hitchhike between islands on cargo shipments or are illegally-released pets. Mongooses have a rapid reproduction rate; females produce an average of 6 offspring a year.

Origin, Distribution, and Habitat: The mongooses found in Hawai'i are native to India and were originally introduced to Hawai'i Island in

Mongoose (continued)

1883. Mongooses were imported by the sugar industry to control rats in sugarcane fields on Maui, Moloka'i and O'ahu. This attempt failed because rats are primarily night-active while mongooses are day-active. On Kaua'i, one female, lactating mongoose was found as a road-kill in 1976 and in subsequent years there have been numerous, credible sightings all over the island. KISC is working on verifying if there are reproducing populations on Kaua'i. Mongooses can live in both wet and dry conditions including gardens, grasslands, and forests. **Please report all suspected mongoose sightings on Kaua'i!**

Mongoose Look-Alike Species

Cats, rats, and occasionally fleeing pheasants have been mistaken for mongooses. Cats have a rounder head, pointed ears, longer legs, a flat nose, and usually have a jumping pounce. Large rats run low to the ground, like mongooses, but are usually spotted at night (unlike mongooses). Pheasants also run with a low profile and since sighting them lasts only seconds, they can easily be mistaken.



Ray Hamblett

Rats do not have hair on the tail like mongoose



Jammilich

Cats have pointed ears, flat noses, and long legs (unlike mongoose)

Veiled Chameleon

Chamaeleo calyptrotus

General Description:

Veiled chameleons have a casque or sharkfin-like shield ranging from 3" to 4" long on their heads. A fleshy fringe runs from under the chin of each animal down the middle line of the body towards the base of the tail. The legs and tail are long and thin. They are usually light green with vertical bands of contrasting colors. Veiled chameleons can grow up to 2' in length. Juveniles are usually light green with a small but visible casque on their head, but can also be light brown.



Orchi

Veiled chameleons have a large sharkfin-like shield on their head

Impacts: Veiled chameleons are able to live in a wide range of habitats which poses a threat to Kaua'i's native birds, insects and vegetation. Fully-grown veiled chameleons may be capable of eating small birds, such as the native 'apapane.

Dispersal Mechanism: Veiled chameleons may enter the state through the illegal pet trade. They are invasive and illegal in Hawai'i. It is against the law to import, breed, keep as pets, sell, release, or export veiled chameleons. Penalties can include a fine of up to \$200,000 and a possible prison sentence. The Hawai'i Department of Agriculture has an amnesty program allowing a person to turn in an illegal animal without prosecution.

Veiled Chameleon (continued)

Origin, Distribution, and Habitat: Veiled chameleons are originally from Yemen and Saudi Arabia. They tolerate tropical and sub-tropical climates, and occupy mountainous regions, plateaus and valleys. They are found at altitudes ranging from 1,700 to 9,500 feet in their native habitat. Chameleons are not native to Hawai'i and do not belong here.

They were first found on Maui in March 2002. Since then, over 200 veiled chameleons have been captured on Maui. The discovery of pregnant females, mature males, and juveniles indicates that veiled chameleons have established a breeding population on Maui. This pest is not known to be on Kaua'i. **Please report any sighting of the Veiled chameleon immediately!**

Jackson's Chameleon

Jackson's chameleon

Chamaeleo jacksonii

Jackson's chameleons grow up to 10" in length. Adult males have three horns on the top of their heads. Juveniles and females often have a blotchy color. This look-alike is considered invasive on Kaua'i. **Please report sighting of the Jackson's chameleon immediately!**



Female Jackson's chameleons do not have a sharkfin-like shield on their head

Maui Invasive Species Committee



Male Jackson's have three horns on their head

J. Ward, DLNR

Snakes: Call 911

Snakes are not native to Hawai'i and are illegal. Should a brown treesnake or other snake enter Hawai'i and establish a breeding population, our island's economy, ecology, and way of life will be irretrievably altered. Illegal pets can be turned in, no questions asked, by calling the Pest Hotline at 643-PEST. **If you EVER see a snake, call 911 immediately!**



Brown tree snake

L. Oberholzer, USDA APHIS

Any Unusual Animal

Mystery animals, such as **big cats, iguanas, and monitor lizards** are occasionally reported on Kaua'i. These exotic alien species do not belong on Kaua'i and are an immediate threat. **If you EVER see an unusual animal, call 643-PEST immediately!**



Paw prints

Unknown

Birds

Mitred conures and other parrots invade seabirds' nests, damage agricultural crops, and can potentially spread invasive plant seeds such as miconia.

Bulbuls are not known to occur on Kaua'i and are a serious agricultural pest. They feed on bananas, papayas, flower nectar, insects, and have been known to eat orchid buds. Bulbuls are on the State Injurious Species list, which makes it illegal to release or transport them to other parts of the state or to export them without a permit.



Red-vented Bulbul

Kim Bridges

Report mitred conures, parrots, and bulbuls to the Kaua'i Invasive Species Committee at 821-1490!

Aquatic Invaders

Aquatic invasive seaweeds, corals, invertebrates, and fish are affecting Kaua'i's freshwater and marine environments. They reproduce quickly and out-compete native species for space and food. Aquatic species are spread by the dumping of unwanted aquarium pets into streams, the careless spread of seaweeds attached to diving gear, and by ballast water of ships. On Kaua'i, keep an eye out for Gorilla ogo, a seaweed that has been found on other islands, but not in large quantities on Kaua'i. Snowflake coral invades the waters of the Hawaiian Islands. Snowflake coral is limited on Kaua'i. **Report aquatic invasive species to the Division of Aquatic Resources at 274-3344!**



Gorilla ogo



Snowflake coral

www.hawaiiinvasivespecies.org/cgaps

Kim Bridges

Diseases

West Nile virus, malaria, and dengue fever are diseases spread by the bite of infected mosquitoes. They may be transmitted to humans, horses, birds and other animals. Those who are infected may have either no symptoms or mild symptoms. On rare occasions, humans may experience severe and fatal illnesses.

These diseases are not currently found in Hawai'i. One of the first indicators are dead birds that have died from an infected mosquito's bite. **Please report freshly-dead native birds immediately!**



Hawai'i Dept. of Health

What You Can Do to Protect Kauaʻi

Don't plant a pest

- Avoid planting any plant that may potentially become invasive.
- Carefully inspect plants before purchasing to ensure they are free from unwanted pests.
- Remove invasive plants and animals on your property.

Don't buy a pest

- Do not import, plant, sell, or move invasive plants and animals in, around, or off island.
- Report locations where invasive species are growing or for sale.
- Use non-invasive and native plants in your landscape.

Protect Hawaiʻi

- Clean your hiking boots, equipment and vehicles before you go into a native area and after hikes in infested areas.

Keep pets contained

- Do not release pets into the wild - keep parrots and rabbits caged.
- Don't dump aquarium pets or plants.
- Turn in unwanted aquarium pets or plants to a pet store.

Spread the word

- Share what you learn with your friends and neighbors.

Support KISC activities

- Allow the Kauaʻi Invasive Species Committee access to your property to control an invasive species.
- Tell your county and state legislators to support funding proposals and bills related to the prevention and control of invasive species in Hawaiʻi.

Inspect it!



Take a look at the species that you've found. Compare it to the pictures and description within this guide.

If you find a snake or large reptile, this is an emergency situation and requires immediate action.

Use the "Report-a-Pest Form for Snakes and Reptiles" at the back of this field guide to record important information. **Call 911 immediately if you have a snake sighting!**

If you think it's an early detection species, then record the following information on the Report-a-Pest Form found at the back of this book:

- **Date of Pest Sighting**
- **Name of Pest**
- **Description of Pest**
 - For plants, note the following information: size, flower color, scent, orientation, foliage color, fruit color, description of its habitat.
 - For animals, note the following information: size, color, plant or host that the animal was found on or nearby, description of its habitat.
- **Location**
Include information such as the street address, cross streets, mile markers, place name, any easily identifiable structure that will help others find the species.

Collect it!



If you can't determine if you've found an early detection species, you may want to bring a sample to one of the walk-in pest reporting locations to help identify the pest. Here's how to collect a plant, insect, or animal sample.

Plant Collection - Using Photography

- Submit an image for identification to reportapest-kauai@lists.hawaii.edu or via the online report form at www.reportapest.org.
- Whenever possible, include a ruler, penny, pencil, etc. for size reference.
- Include the growing-tip end of the stem with seeds, leaves, and flowers in your image.
- Images of flowers should face the center of the flower.

Plant Collection – Submitting a Sample

- Submit a physical sample to a walk-in location.
- Whenever possible, provide a 6" to 10" sample of the growing tip end of the stem with seeds, leaves, and flowers if available.
- Place the sample flat between a few layers of dry newspaper or paper towels. Avoid excessive folding of the leaves and place flowers so that you are looking into the center of the flower. Do this while the sample is fresh!
- Pack the wrapped bundle in plastic, preferably with a cardboard to keep the sample flat.
- Or, place fresh terrestrial plant samples directly into a plastic bag and refrigerate until they are taken to a reporting facility.
- Aquatic weed samples can be placed in a plastic bag without newspaper.
- Wrap whole fruit in paper and store in a crush-proof container.
- Ensure that the package is well sealed. Don't spread the weed!

Collect it! (continued)

Insect Collection – Using Photography

- Submit an image for identification to reportapest-kauai@lists.hawaii.edu or via the online report form at www.reportapest.org.
- Whenever possible, include a ruler, penny, pencil, etc. for size reference.

Insect Collection – Submitting a Sample

- Include damaged plant material if associated with insects.
- Place insects in a non-crushable container such as a small medicine bottle or film canister.
- Tiny and/or soft-bodied specimens should be preserved in a small leak-proof bottle or vial of rubbing alcohol or frozen in a Ziploc bag. Do not submit insects in water or formaldehyde.
- Hard-bodied specimens can be submitted dry in a crush-proof container. Do not tape insects to paper or place them loose in envelopes.

Animal Collection – Submitting a Sample

- Contain the animal in a sturdy container/box.
- Submit your sample to the Hawai'i Dept. of Agriculture or the Kaua'i Invasive Species Committee.

Animal Collection – Using Photography

- Submit an image for identification to reportapest-kauai@lists.hawaii.edu or via the online report form.
- Whenever possible, include a ruler, penny, pencil, etc. for size reference.

Submit an Image for Identification

- Submit an image for identification to the Bishop Museum's "Ask a Scientist" website at <http://ask.bishopmuseum.org/> or via the online form at www.reportapest.org.

Report it!



Now that you've found a possible pest, it's time to report it.

First, record the location. Clearly mark the area with flagging tape, etc. This will assist researchers in finding the site in the future. Then, use one of the following methods to notify authorities:

- **Report-a-Pest online:** Visit www.reportapest.org. Here, you will find an online form that you can fill out. Your submitted information will be forwarded to the correct agency.
- **Report-a-Pest by phone:** Call in your report to one of the following locations:
 - Kaua'i Invasive Species Committee (KISC):
(808) 821-1490
 - Hawai'i Department of Agriculture Pest Hotline:
643-PEST (7378)
 - **If you see a snake, call 911 immediately!**
- **Walk-in locations:** Below are locations where you can report a pest in person. Prior to bringing in a sample, see the previous "Collect It!" section on how to collect a specimen.
 - Kaua'i Invasive Species Committee (KISC)
7370K Kuamo'o Road, Kapaa
Hours: 7:30 a.m. to 4 p.m., 821-1490 (call first!)
 - Hawai'i Department of Agriculture - Kaua'i
4398 Pua Loke Street, Lihue
Hours: 7:45 a.m. to 4:30 p.m., 274-3072 (call first!)

What Happens Next?

The help that you provide increases the eyes and ears of Kaua'i and allows agencies to increase the area being searched. Now that you've reported a possible pest, authorities will collaborate on the next best step. This may include monitoring, controlling or investigating new populations. Thank you for your participation!

Stop! It's Against the Law

It is unlawful to transport designated noxious weeds into the state or into areas within the State that are free, or relatively free, of that noxious weed (Chapter 152, HRS). There are also limitations on the types of animals that can be imported into the state. The state's Injurious Species list makes it illegal to release or transport listed species to other parts of the state or to export them without a permit. For more information, visit the Hawai'i Dept. of Agriculture's website at www.hawaii.gov/hdoa.

Emergency Situations: Act Now!

Certain animals such as snakes, iguanas, giant lizards, or stinging ants require immediate emergency response. If you come across these or other unusual animals, act immediately. **Call 643-PEST (7378). For snake sightings, call 911**

Additional Resources

Coordinating Group on Alien Pest Species
www.hawaiiinvasivespecies.org/cgaps

Global Compendium of Weeds
www.hear.org/gcw

Hawai'i Department of Agriculture
www.hawaii.gov/hdoa

Hawai'i Ecosystems at Risk
www.hear.org

Hawai'i Invasive Species Council and Committees
www.hawaiiinvasivespecies.org

Hawai'i's Most Invasive Horticultural Plants
www.state.hi.us/dlnr/dofaw/hortweeds

Kaua'i Invasive Species Committee
www.kauaiisc.org

Pacific Island Ecosystems at Risk
www.hear.org/pier

Report-a-Pest Form (Sample for Plants and Insects)

Name: _____ Date of pest sighting: _____

E-mail: _____

(Including your e-mail will allow us to let you know what happened with your report.)

Phone: _____

Name of pest that you are reporting: _____

Description: _____

(**Plant:** size, flower color, scent, orientation, foliage color, orientation, fruit color, habitat found in, etc. **Insect/animal:** size, color, plant/host found on or nearby, habitat)

Location: _____

(Street address, cross streets, mile marker, place name)

Drawing of specimen:

Additional Comments:

Send completed information to
KISC: P.O. Box 1998, Lihue, HI 96766
 Phone: (808) 821-1490 Fax: (808) 821-1492
 or submit online at www.reportapest.org

Report-a-Pest Form (Sample for Animals)

Name: _____ Date of pest sighting: _____

E-mail: _____

(Including your e-mail will allow us to let you know what happened with your report.)

Phone: _____

Address: _____

Location: _____

(Street address, cross streets, mile marker, place name)

Last seen where and when: _____

Habitat: _____

Description of behaviors/actions: _____

Number of animals observed: _____ Alive _____ Dead _____

Length: _____ Diameter: _____

Size of eyes: _____ Shape of head: _____

Color and pattern(s): _____

Tail Description: _____

Did you collect it? Yes _____ No _____

If yes, where is the animal located now?: _____

Additional Comments:

To Report a Snake call: **911**

All other animals call: **KISC** (808) 821-1490 or **Pest Hotline** 643-PEST
or submit online at **www.reportapest.org**

Contact Information

**Emergency Situations/Snake Reports:
911**

**Hawai'i Early Detection Network website:
www.reportapest.org**

Pest Hotline: 643-PEST (7378)

- Kaua'i Invasive Species Committee
7370K Kuamo'o Road., Kapaa, HI 96746
821-1490
- Hawai'i Department of Agriculture
4398 Pua Loke Street, Lihue HI 96766
274-3072
- Dept. of Land & Natural Resources
 - Division of Forestry & Wildlife
3060 Elwa Street, RM 306
Lihue, HI 96766
274-3433
 - Division of Aquatic Resources
3060 Elwa Street, RM 306
Lihue, HI 96766
274-3344