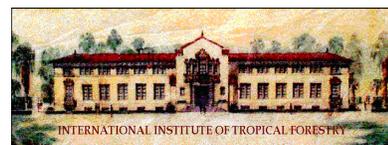


# EXOTIC INVASIVE SPECIES, US VIRGIN ISLANDS

## FACT SHEETS

Vines

Pasture Pests

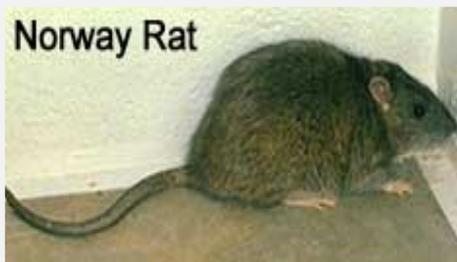


Geographic Consulting

Forest Invaders

Invasive Mammals

Norway Rat



Black Rat



Daley, B., J. Valiulis, & R. Slatton. 2012. Exotic Invasive Species; US Virgin Islands; Species Affecting Forests. Doc. # GS-VIDA-1201. St. Croix, US Virgin Islands

# U.S. Virgin Islands Least EXOTIC INVASIVE SPECIES



**E**ach year invasive exotic species cause both billions of dollars in damage and the extinction of many native species. In the US alone, invasive species cost an estimated \$138 billion annually in economic damage and control costs. Invasive species are considered a major factor in the decline of half of all threatened or endangered species. The Virgin Islands are not immune to the harm caused by invaders. But how do you know if a plant or animal is going to be harmful? The purpose of this publication is to review the problem of invasive species around the world and take a detailed look at how they affect the US Virgin Islands. The introduction defines important terms and concepts. The following pages provide information on the invasive species most affecting Virgin Islands' forests. Species are grouped together based on common characteristics and their preferred habitats (vines, pasture pests, forest invaders and harmful animals).



**U.S. Executive order 13112 defines invasive species as** “alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.”



**E**very species that is an invasive exotic in one place is also a harmless native within its home range. Natural populations of these species are controlled by the other animals and plants in their environment and are also limited by environmental factors such as rainfall or soil type. When a plant or animal is brought to a new environment without a natural predator, they are ‘released’ from that control and their population can explode and spread without check.

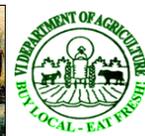
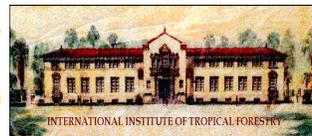
## How Are They Harmful?

**I**nvasive species cause harm to the environment or the economy. They harm native organisms directly by eating or smothering them or indirectly, by out-competing them for natural resources and crowding them out. Some species can completely alter their environment, such as the water hyacinth that blocks out sunlight from reaching lakes and kills native plants and animals living in them. Other plants alter the environment by causing increased frequency of fire and thus killing native organisms that are not adapted to frequent fires.

The National Invasive Species Council estimates that hundreds of millions of dollars are spent each year on invasive species control projects. Billions are lost every year in decreased agricultural production.

## How Are They Introduced?

**E**xotic species are introduced to new regions and habitats by humans both intentionally and accidentally. Many invaders begin as useful agricultural species that eventually escape and become harmful. Goats and pigs, for example, are highly beneficial when raised on farms, but become environmentally destructive when they escape captivity. Many plants have been introduced around the world as ornamentals for their showy blooms, only to escape cultivation and spread out of control in new habitats.



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# EXOTIC INVASIVE SPECIES, US VIRGIN ISLANDS

## A Fact Sheet Series on Species Directly Affecting Forest Health



**How Do They Spread?** Today, international shipping and travel is common and uncounted millions of organisms hitch a ride on the mud flaps of trucks, inside shipping containers and in the ballast of ocean going ships. Humans are by far the world's greatest spreaders of invasive species. The recently arrived and highly invasive lionfish likely came from aquariums and then spread on its own. A great many invasive species are introduced via pet shops and gardeners that neither intend harm, nor realize the true risks in releasing and handling exotic species.



### How Do We Manage Them?

**Prevention**—The cheapest and most effective method of controlling invasive species is to prevent them from being introduced in the first place. This requires carefully inspecting containers and plants upon entering the Virgin Islands, for the presence of invasive species. Education and management are critical tools for effective prevention.

**Eradication**—Complete removal of an organism from an area can be extremely difficult, expensive or impossible. It took years of organized, vigilant trapping and monitoring by The National Park Service on Buck Island to eradicate rats completely.

**Control/Containment**—When land managers acknowledge that it is impossible to eradicate a species, the goal is to prevent the population from growing or spreading.

**Biological Control**—Introducing a new organism to attack an invasive is an effective, but also dangerous method of control. There is always the risk the new organism may cause harm of its own, such as the example of the mongoose in the Virgin Islands. On a positive note, pink mealy bug in the US Virgin Islands is successfully controlled with an introduced parasitic wasp.



### Definition of Terms

*These terms are commonly used when discussing species origin. Not all professionals agree on the exact terms and definitions, but the following list is generally considered helpful.*

**Native**—Organisms found within what is considered their natural range.

**Endemic**—Similar to native but refers to a smaller, more specific geographic range.

**Exotic**—Exotic species are any organism taken by humans from their natural range and transported to a new area. It does not include natural migrations like birds or fish that travel great distances.

**Naturalized**—An organism that is able to reproduce itself unassisted in their new habitat is considered naturalized.

**Invasive**—An organism that grows or spreads aggressively in its new environment, causing harm to the environment or economy.

### Exotic Invasive Species in the US Virgin Islands

- **Vines:** Coral, Rubber, (Dodder)
- **Pasture Pests:** Tan-tan, Guinea Grass, (Casha)
- **Forest Invaders:** Neem, Sweet Lime, Genip
- **Harmful Animals:** Rat, Mongoose



## EXOTIC INVASIVE SPECIES, US VIRGIN ISLANDS

### Rubber Vine (*Cryptostegia grandiflora*)

Milkweed Family (Asclepiadaceae) Native Range Madagascar

# Vines

*Vines are plants with a climbing growth habit. They rely on trees or other objects for structural support and can often grow quickly. Most vines produce their own food and are not true parasites, although they can harm other plants. The vines featured here grow so aggressively that they smother other plants by blocking out sunlight and killing them.*

#### Description

Rubber vine has bell shaped, showy purple flowers that are usually produced after heavy rains. It climbs with whip-like shoots that can reach 120 feet tall when supported by a tree, or six feet tall as a unsupported clump in an open field. The leaves are smooth, glossy and thick. Leaves, vines and seed pods exude a toxic white sap when broken. Rigid horn-like seed pods form in pairs and contain 300 to 400 small brown seeds. It is toxic to livestock and is known to kill cattle in Australia and reduce the quality of pastures.



(Rubber Vine Flower)

#### Historical Introduction

Rubber vine has been introduced around the tropical world primarily by gardeners and plant collectors fascinated by its attractive purple blooms. Internet seed companies still sell this plant online, usually only give a passing mention to the aggressive spread and the ecological and economic harm that it can cause. In the Virgin Islands it is still occasionally planted by landscapers

unfamiliar with its aggressive, invasive behavior. Landscape plantings may appear harmless or even attractive, but they are the seed source for a plant invasion, harming forest ecology in the Virgin Islands.

#### Ecological Threat

Rubber vine climbs and smothers plants, killing native vegetation and blanketing areas so other plants cannot grow. The Global Invasive Species Database designated it among "100 of the World's Worst Invasive Alien Species". In Australia, rubber vine has become one of the most invasive plants. The rubber vine invasion has become so harmful that they have created a nationwide weed management plan specifically to deal with rubber vine. It costs millions each year to control it and costs tens of millions more in lost productivity of agricultural land.

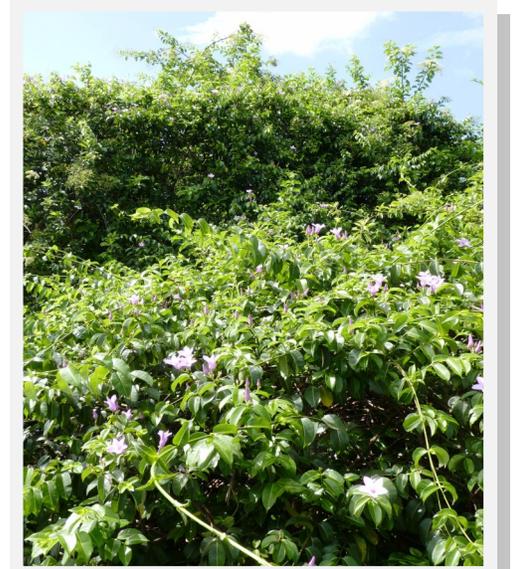
#### Preferred Habitat

Rubber vine prefers rainfall levels between 400 and 1400 mm/yr, which includes most of the Virgin Islands. It thrives in agricultural areas, pastures, riparian zones, forests and wetlands. Roadsides, fence lines, dry forests and disturbed areas are also readily colonized.

#### Dispersal

The climbing vine produces pairs of seed capsules containing hundreds of wind-born seeds. The pods themselves can float in

fresh or salt water for months with viable seeds intact. In St. Croix, a large patch near the Buccaneer Hotel is spreading via flood-water throughout a roadside wetland.

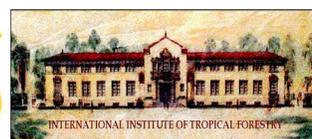


(Rubber Vine Mat Over Tree Canopy)

#### Management Options

Virgin Islanders can help by first removing rubber vine from around their homes. There are four methods of controlling or removing rubber vine; biological controls (introducing a rust disease), herbicides, fire, and mechanical. In the Virgin Islands, physically chopping and pulling out individual plants or clumps is recommended. Do not remove clumps of the vines and discard them directly into the bush, as the vine can root itself and spread. Instead, let the chopped vegetation sit in the direct sun for several days to dry out or burn it on site. Consider planting native species or purple sandpaper vine instead of rubber vine in landscapes.

The VI Department of Agriculture and the USDA are equal opportunity providers and employers.





## EXOTIC INVASIVE SPECIES, US VIRGIN ISLANDS

### Coral Vine (*Antigonon leptopus*)

Buckwheat Family (Polygonaceae) Native Range Mexico



#### Description

Coral vine is a fast growing, climbing vine from Mexico capable of quickly reaching 40 feet tall in the Virgin Islands. It attaches to trees, fences, utility poles or other supportive structures using its coiled tendrils. The leaves are heart shaped and it is known for its large, showy clusters of bright pink flowers (sometimes white). Fruit are small, dry and inconspicuous, containing many black seeds.



(Coral Vine Flowers and Leaves)

#### Historical Introduction

Coral vine is widely cultivated as a landscape plant in the southern United States and throughout the tropics because of its showy pink flowers, fast growth and ability to cover fences and walls. It has been found in the Virgin Islands since before 1960, but in recent years it has spread aggressively in the wild; growing in dense carpets.

#### Ecological Threat

Coral vine grows aggressively, climbing and forming dense blankets that can smother the plants on which it grows. It is considered a Class II Invasive Exotic by the Florida Invasive Plant Council. The plant is not a true parasite because it does not take nutrients from a host, but it can kill by smothering.

#### Preferred Habitat

Coral vine prefers full sun but can also tolerate some shade. In the Virgin Islands, moist habitats are more susceptible to invasion. It tolerates poor soil and periods of drought.

#### Dispersal

One of the challenges in controlling coral vine is that seeds are produced prolifically and are dispersed in a variety of ways. Fruit are eaten and spread by wildlife or can float on water and travel downstream. Underground tuberous roots will vigorously resprout new shoots and leaves when the plant is cut.

#### Management Options

Coral vine is extremely difficult to remove. For home-owners cleaning small areas, the best option is mechanical removal, but will require vigilant cutting and re-cutting of new sprouts. Plants will likely continue to resprout until the underground tubers are removed. There is no proven effective method for removing it from large areas in the Virgin Islands.



#### Dodder Vine—A native vine that is a weed, but not an invasive plant

The dodder vine (*Cuscuta americana*), with its distinct orange tendrils, is not an exotic invasive plant. It is native to the Virgin Islands, although many would rather never see it again. **This plant is a true parasite** and pierces the tissue of a host plant with small suckers and pulls nutrients from the host. It does not produce its own food from photosynthesis and adult dodder vines do not have roots. Scientists recently discovered dodder can “smell” the scent of healthy plants and seek them out as food, as many animals do. Despite all of these unwelcomed behaviors, dodder is a member of the native plant community and does not act or spread like an invasive plant. Infestations are generally seasonal and localized to smaller landscapes. Farmers and home-owners can physically remove the orange vines and pile them up to dry out and die. A widespread eradication plan for this plant *is not necessary*.

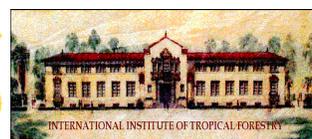


(Dodder Vine Covering Trees)

Fact Sheets Produced by Geographic Consulting on behalf of the Virgin Islands Department of Agriculture, Forestry Division.

For more information please contact the VIDOA at (340)-778-0997. This project made possible through a grant from the USDA Forest Service (Grant # 08-CA-11120107-024)

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## EXOTIC INVASIVE SPECIES, US VIRGIN ISLANDS

### Neem (*Azadirachta indica*) & Sweet Lime (*Triphasia trifolia*)



#### NEEM (*Azadirachta indica*)

Mahogany Family (Meliaceae)

Native Range India, South Asia



Neem is a fast growing tree, generally reaching 50 or 60 feet in the Virgin Islands. Leaves are dark green and compound with serrated edges. Flowers are cream colored, small and very fragrant. Neem copiously produces clusters of bean-sized, yellowish fruit, each containing one seed. Annually, a single neem tree produces between 40,000 and 200,000 seeds!

#### Historical Introduction

Neem has been used for centuries in India to make effective organic pesticides. It has been promoted worldwide as a miracle tree with chemical properties that can be used as insecticide and for healing, in a way that likely overstated the tree's benefits. Touted by many international development agencies as "the tree that could help every person on the planet," such publications overlooked the invasive nature of the tree. Neem was introduced to the Virgin Islands in the 1970s and has quickly spread. Neem trees are erroneously believed to deter mosquitos, probably because neem oil applied to human skin has some effect.

#### Ecological Threat

In the Virgin Islands, dense thickets of neem saplings crowd-out native vegetation, usually near neem trees that have been planted. Forested guts of dry east-ends are frequently invaded by neem. Its prolific seed production and popularity with wildlife results in the rapid spread from one planted tree to invading forest habitat. It outgrows native species in areas

of Africa and Australia, where neem plantations previously existed. These areas have lost much of their forest diversity to neem trees, which continue to dominate the landscape.

#### Preferred Habitat

Neem trees grow well in dry conditions. Once a tree has become established, it can survive for droughts of 6-7 months.

#### Dispersal

Neem produces large amounts of seeds that are primarily dispersed by bats. Birds also eat the seeds for their sweet pulp and the seeds are passed out of the body undigested, germinating at near 100%.

#### Management Options

Neem is difficult to fully remove and the best management is to not plant neem trees in the first place. However, once they are established, mechanical removal is the only option. Mature trees can be cut and seedlings can be pulled manually. Neem coppices readily so follow-up herbicide treatments are also recommended.

#### SWEET LIME (*Triphasia trifolia*)

Citrus Family (Rutacea)

Native Range SE Asia and Malaysia



This evergreen shrub grows to roughly 10 feet tall. Its compound leaves are dark green with three leaflets and are fragrant when crushed. It has pairs of short spines on its branches. The white, cup-shaped flowers are fragrant and attractive. Fruit are dark red, berry-like with a thick skin and a sweet goeoy

fruit surrounding a single ¼" seed. Fruiting and flowering occur throughout the year.

#### Historical Introduction

Sweet lime was originally brought to the Virgin Islands by gardeners to create dense, fragrant hedges. Birds carried away fruits from these hedges, creating wild populations of the aggressive weed. It is now naturalized in the USVI, Barbados and Florida.

#### Ecological Threat/Dispersal

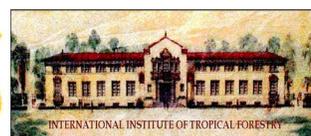
The Florida Exotic Pest Council requested that Florida nursery growers, landscape professionals and garden center retailers voluntarily stop using *T. trifolia* and sweet lime is one of the most problematic and invasive exotic plants in the Virgin Islands. Birds eat the fruit and carry the seeds into the forest, usually near a gut. The seeds grow and form impenetrably dense thickets in the shady understory of secondary forests. Sweet lime spreads and suppresses native plants, out-competing them for light and water.

#### Preferred Habitat

Sweet lime can tolerate shade or full sun. It prefers moister areas of the Virgin Islands, thriving in slopes around guts. The bush adapts well to the frequent and severe pruning required to create a hedge. Sweet lime is also tolerant of inhospitable caliche soil.

#### Management Options

The flexible hard wood makes sweet lime a challenge to chop with a machete or remove by hand. Wasps or Jack Spaniards build their nests in the thorny shrubs, creating a further challenge. Individual bushes can be chopped up and then a few drops of concentrated herbicide applied to the freshly cut, white wood. Once a thicket is established it is difficult to remove them without heavy machinery because it re-sprouts from stumps and roots, similar to tan-tan. Removal sites usually have to be re-treated.





## EXOTIC INVASIVE SPECIES; US VIRGIN ISLANDS

### Genip (*Meliococcus bijugatus*)

Soapberry Family (Sapindaceae) Native Range South America

## Forest Invaders

There are a number of plant species that are invasive in Virgin Islands' forests, but the three presented here are among the most ubiquitous and most damaging. "Forest invaders" share several characteristics that make them successful invaders: shade tolerant, prolific, fast growing, quick to produce seeds, and their seeds are easily transported by wildlife. Many invasive species depend on disturbances, but these species can invade healthy forests.

#### Description

Genip trees can grow up to 100 feet tall, but adults in the Virgin Islands usually reach 60 feet. They are distinctive trees, characterized by long pinnate leaves with a winged midrib, and clusters of green edible fruits, about 1 inch in diameter. They have smooth, grayish bark on trunks that can grow to be very wide with old age. Flowers are very small, growing in clusters on long narrow stalks.

#### Historical Introduction

The exact date of genip introduction to the Virgin Islands is not known, but they were likely brought to the Virgin Islands by pre-Columbian Amerindians for their abundant, tasty fruit. They have been introduced throughout the Caribbean, in Central America, Mexico, Africa and in parts of the Pacific.

#### Ecological Threat

The sheer numbers of genip trees and their wide range of ecological tolerance have made

them one of the most successful invaders of native forest. Once introduced they can quickly convert a diverse native forest into a homogeneous stand of genip trees, crowding out all other vegetation.

#### Preferred Habitat

Although genip grows best in full sun and well-drained soil, it also tolerates a variety of conditions including shade, salt, wind and drought. On St. Croix, genip trees can be found in dry east-end pastures and grow larger in the moist forest of the west end. Their broad range of habitat tolerances make them an especially dangerous invasive plant.

#### Dispersal

Seeds are primarily dispersed by wildlife, especially birds and bats, but also by people who consume the fruits and then discard the seeds, often tossing them out of the window of their cars on to the roadsides. A recent inventory of the roadside trees on St. Croix found that genip



Photo by Garden of Delights, <http://gardenofdelights.com/>

was by far the most common tree species, accounting for one out of every three trees along the roadside.

#### Management Options

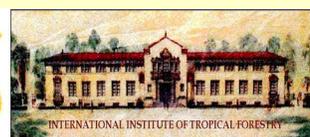
Genip is very difficult to control, given the number of seeds each tree produces and the popularity of the fruit as a snack for wildlife and humans alike. Individual trees can be mechanically removed and then treated with herbicide. Seeds may continue to germinate for several weeks and require follow-up treatments.



(Native orange manjack flowers)

#### Replacement Species

Both neem and sweet lime are popular landscaping plants that have escaped from cultivation to wreak havoc on the native forest. Sweet lime is popular for its utility as a thorny, but attractive hedge. An alternative to sweet lime is **bread and cheese** (*Pithecolobium unguis-cati*), an attractive native plant that is easily grown into a dense hedge and has short spines that are a deterrent, but are not dangerous to a gardener's hands. The young leaves begin red and turn green, making for a colorful hedge and the cork-screw shaped fruit open to reveal black seeds in a red flesh. Neem is popular because it grows well in harsh conditions, such as the dry east end of St. Croix. There are many beautiful native trees that also do well in these conditions. Jamaica caper (*Capparis jamaicensis*) and lignum vitae (*Guaiacum officinale*) are small drought tolerant trees perfect for smaller spaces around utility lines and roadsides. Jamaica caper is a smallish tree that profusely produces showy white, brush-like flowers that turn purple with age. Orange manjack (*Cordia rickseckeri*) produces bright orange flowers that are attractive to wildlife such as bananaquits and hummingbirds. Native plants are adapted to local climate and soil conditions and do not pose ecological threats.





## EXOTIC INVASIVE SPECIES, US VIRGIN ISLANDS

### Tan-Tan (*Leucaena leucocephala*)

Bean Family (Fabaceae) **Native Range** Central America

## Pasture Pests

Pasture pests are plants that thrive under the extremely challenging environmental conditions in both active and abandoned pastures. Full sun, extreme temperature, prolonged drought, compacted soil and grazing by large mammals are just some of the challenges pastures present that few native plants are adapted to handle. In fertile soil with ample water, pasture pests are usually outcompeted by surrounding vegetation, but they dominate under harsh conditions.

### Description

*Leucaena leucocephala* is known in the Virgin Islands as tan-tan or guinea tamarind. Native to Central America, it is an erect woody plant that grows as a shrub or tree. It tends to have a single central trunk, without major side branching. In the Virgin Islands it usually reaches between 15-20 feet tall. The large leaves are twice compound, with small leaflets. It produces white flowers year round in dense, round 'heads' or balls. These result in large quantities of seed which begin in soft, green, flat pods but turn brown and peel open at maturity, releasing 15-30 hard, flat brown seeds.



(Green and mature seed pods on a tan-tan)

### Historical Introduction

Tan-tan was intentionally introduced throughout the tropical world to improve pasture forage, especially in the seasonally dry tropics. Many agricultural varieties have been developed. The Virgin Islands has the

most common type, from coastal Mexico. In pastures, the fast-growing, deep-rooted legume is resistant to prolonged drought, light fires and high stocking densities. The forage is high in protein and all parts of the plant are consumed.

### Ecological Threat

Tan tan harms the local environment by displacing native vegetation. The US Forest Service found tan tan to be the single most common plant in the US Virgin islands. A stand of tan tan often has few other species interspersed within it and provides low quality wildlife habitat, largely because the flower and fruit are not food for wildlife.

### Preferred Habitat

Tan tan is an exotic invasive plant and its presence is closely linked with the land use history of an area. The fast growing pioneer thrives in freshly disturbed sites that have been cleared of vegetation. Tan tan seeds can persist in the soil for years, germinating when conditions are right. It thrives in agricultural areas, pastures, riparian zones, disturbed forests and wetlands. Roadsides, fence lines, dry forests and disturbed areas are also readily colonized. Importantly, tan tan is not tolerant of shade and does not invade healthy forests. A true pioneer, it needs a disturbance to become established.



(Green and mature flower heads on a tan tan)

### Dispersal

Seeds are produced from an early age and in massive quantities. Seed pods dry and release the seeds by gravity to the soil where they can remain viable for years. Many people believe that hurricane winds move the seeds, but there is no published evidence that this occurs.

### Management Options

Virgin Islanders have several control options, depending on the size of the area to be treated. Individual trees can be pulled out with a root puller tool. Stems can be chopped to ground level and treated with a few drops of concentrated herbicide. Larger areas have been successfully restored into forest by mowing and planting native trees. To restore multiple acres, we recommend a gap planting method that establishes clusters of tall growing native trees that shade-out the tan tan over time.

Daley, B., J. Valiulis, & R. Slatton. 2012. Exotic Invasive Species; US Virgin Islands; Species Affecting Forests. Doc. # GS-VIDA-1201. St. Croix, US Virgin Islands



## EXOTIC INVASIVE SPECIES, US VIRGIN ISLANDS

### Guinea Grass (*Urochloa maxima*) syn. (*Panicum maximum*)

Grass Family (Poaceae) Native Range Africa

## Pasture Pests

### Description

Guinea grass is a large bunch grass native to Africa. This fast growing species forms clumps from deep growing roots, and has long, wide, flat blades that taper to a point. Leaves/blades have soft hairs, stiffer at the base. It can reach over 6 feet tall in the Virgin Islands. Flowers and seeds are born in large clusters at the end of long shoots throughout the year.



(Guinea grass flowers and seed grow on large, erect panicles)

### Historical Introduction

Guinea grass has been intentionally introduced throughout the moist and dry tropics and sub tropics in order to improve pastures for livestock. It is nutritious fodder and is high in protein. Guinea grass grows quick-

ly, tolerates heavy stocking/grazing, some burning and resists drought well. Once established, guinea grass produces large volumes of seeds and can perpetuate itself indefinitely. The plant has also been promoted for control of soil erosion.

### Ecological Threat

Guinea grass displaces native species by dominating areas and preventing other plants from growing. It is commonly seen growing in stands with only tan tan in the overstory and pure guinea grass below (photo at right). The same characteristics that make guinea grass desirable in pastures also make it harmful from an ecological perspective. It quickly spreads seeds to the surrounding area, along roadsides and other open habitats. It also builds large fuel loads that encourage fires that kill overstory trees.

### Preferred Habitat

Guinea grass prefers full sun and deep soils in areas receiving over 900 mm rain/year. Like many invasive species, it thrives in pastures and roadsides. It is deep rooted and tolerates prolonged drought and fires better than most plants.

### Dispersal

Tiny guinea grass seeds are easily transport-



A dense patch of guinea grass grows below a stand of tan tan

ed by wind, animals, vehicles, hay production and normal farming activity. Seeds germinate and grow rapidly when moisture is available.

### Management Options

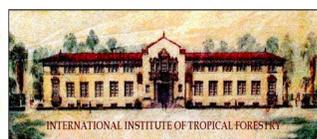
Homeowners can eliminate guinea grass from a yard by repeatedly cutting/mowing before it sets seeds. It requires repeated cutting at first, but becomes easier over time. Shade slows guinea grass growth, so planting trees also helps with control. Over larger areas, such as forest restoration projects, “wet-blade” methods with a tractor mower and herbicide application are effective .

### Casha Bush— (*Acacia macracantha* and *A. tortuosa*)

These two plants are generally called casha bush. They are notorious for their long spines that can tear clothes, skin and even puncture vehicle tires. The plant, however, is native and does not behave like an invasive species. Most people consider the plants a nuisance and want to remove them from their property, but it does not spread across a landscape, does not harm the environment and does not require a program to control it. Casha is unusual because it is adapted to handle the harsh conditions present in pastures (*A. macracantha*) or the driest of dry sites (*A. tortuosa*) where other plants struggle to survive. The heavily thorned tree canopy is a safe, preferred nesting



(Casha flowers and its infamous thorns)





## EXOTIC INVASIVE SPECIES; US VIRGIN ISLANDS

Ship Rat, Black Rat (*Rattus rattus*) Native Range—India

Norway Rat (*Rattus norvegicus*) Native Range—South China

## HARMFUL ANIMALS

*Introduced mammals have had a profound and sustained effect on the health of Virgin Islands' forests. Rats gnaw on the tasty new growth of trees and shrubs, and eat the seeds that are required to produce the next generation of trees. Mongoose prey upon many of the pollinators and seed dispersers that are required for tree reproduction and also supplement their diets with the seeds themselves.*

### Description

There are two rat species found in the Virgin Islands. The Norway rat has brown fur on its back and a pale grey belly. They have small ears and the tail is shorter than the combined head and body length. The black rat or ship rat is slender with hairless small variably colored ears. The uniformly colored tail is longer than the head and body length combined.

### Historical Introduction

Rats are presumed to have arrived in the Virgin Islands on the earliest wooden sailboats. They abound in the main US Virgin Islands initially spreading in association with human settlement, but eventually inhabiting all parts of the islands. Today they are also found on many of the offshore cays.

### Ecological Threat

Rats are considered one of the 10 worst invaders worldwide. They cost hundreds of millions of dollars in damages and control costs to industry, utilities and native habitats throughout the world. Rats will eat leaves, seeds, flowers, bark and stems of many plant species, some of which are in danger of extinction due to their isolation on island ecosystems and lack of adaptations to

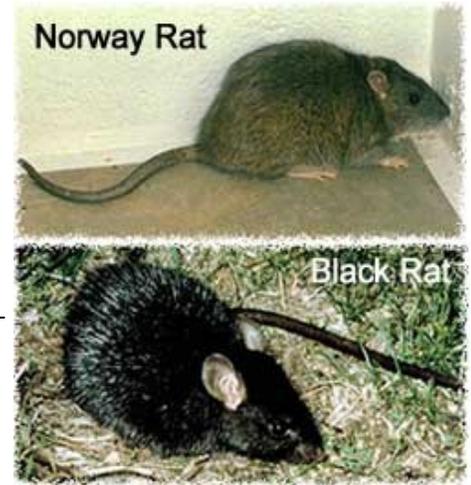
the new predator. Rats have been observed attacking and eating birds, especially eggs and chicks in the nest. They are responsible for the extinction of multiple species of mammals, birds, reptiles, invertebrates and plants and are particularly damaging to the flora and fauna of islands. Rats also spread disease and cause extensive damage to utilities by gnawing through transmission lines.

### Preferred Habitat

Rats are found in just about every habitat, from mature forests to urban areas, beaches, agricultural areas and wetlands. Norway rats prefer to live near water and can swim for up to 2 km in open water, while ship rats prefer drier areas and generally avoid swimming. They can live in trees or on the ground, indoors or outdoors.

### Management Options

Trapping rats is effective on a small scale, but most populations contain a few trap-shy individuals that cannot be eliminated. These few individuals can quickly repopulate an area to pre-trapping levels. It is unlikely that rats can be eliminated from the main

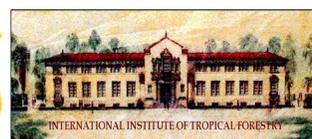


(Photo: AAAnimal Control, Orlando, FL)

lands of St. Croix, St. Thomas and St. John, however managers have been successful in eliminating them from the offshore cays. Rats cause a disproportionate amount of damage to the native flora and fauna of these small uninhabited islands. The use of poison is almost always necessary to eliminate all rats from an island, but the use of poison near sensitive ecosystems requires extensive application and approvals. Locally, The US National Park Service eliminated rats from Buck Island in 2000. Before rats were eliminated, most of the flower buds and ripening green fruit from the trees and cacti on Buck Island were usually obviously eaten by rats, but this stopped as soon as the rats were eliminated. Reforestation accelerated because the seeds that fall to the forest floor could finally germinate into the next generation of forest trees.

[www.vifresh.com/forestry.php](http://www.vifresh.com/forestry.php)

[www.geographicconsulting.com/services/invasive-species/](http://www.geographicconsulting.com/services/invasive-species/)





### Small Asian Mongoose (*Herpestes javanicus*)

#### Description

Mongoose are ground dwelling mammals with elongated brown bodies and long tails. They are often seen darting across Virgin Islands' roads. Although they resemble weasels in appearance, they are more closely related to cats and hyenas.

#### Historical Introduction

Mongoose were intentionally introduced to a number of islands in the Caribbean to control rats in sugar cane fields, not to get rid of snakes, as many people believe. According to the Invasive Species Specialist Group (ISSG) mongoose were introduced to St. Croix and St. John in 1884 and St. Thomas in 1900. The introduction initially severely depleted the rat population on St. Croix. However the rats adapted by escaping to the trees and because mongoose could not climb and the rat population quickly recovered.

Mongoose were then forced to find other food sources and turned to eating anything and everything they were able to catch, including birds (both chickens and wild birds), lizards, insects, plants, snakes, and even seeds, nuts and fruits.

On St. Croix, the mongoose is responsible for the extinction of an endemic snake and the elimination of the St. Croix ground lizard from the main island of St. Croix.

**Native Range** Northern Saudi Arabia, Iran, Iraq, Afghanistan, Pakistan, India, Nepal, Bangladesh, Burma, Thailand, Malaysia, Laos, Vietnam, and southern China

#### Preferred Habitat

In their introduced range, mongoose are found in just about every habitat, although they prefer secondary forest, coastal areas (especially coastal forest), shrublands, and near human habitation. They tend to prefer edge habitat.



(Photo: by Virgin Islands Division of Fish and Wildlife)

#### Management Options

Mongoose are very difficult to control and probably impossible to eradicate from the main US Virgin Islands of St. Croix, St. Thomas and St. John. Trapping is a common method of control and can be successful in the short term in a limited area, but eventually other mongoose will fill in the vacancies created by the trapped individual. They reproduce several times a year with litters of two to four pups each time, so they can fill "open" habitat very quickly. Sustained trapping projects have successfully removed mongoose from Buck Island and several smaller cays. Ongoing monitoring is required

#### Ecological Threat

Experts consider mongoose to be one of the top 100 worst invaders in the world (ISSG) and a high threat to any ecosystem that they invade. The cost of their damage to Hawaii and Puerto Rico combined is about \$50 million every year. Although they are primarily carnivores, they will eat just about anything, plants included. They are well adapted to living with humans and thrive in human-altered habitats, especially forest edges.

Mongoose have had a marked effect on the flora and fauna of every habitat they inhabit. Because they eat just about any animal they can catch, they quickly deplete the animals that forests depend on for seed dispersal and pollination.

*Species Notes: There is some disagreement among experts as to which species of mongoose is actually found in the Virgin Islands. Many believe it is the small Indian mongoose (*Herpestes auropunctatus*) rather than the Javan mongoose.*

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## Additional Reading and Cited Resources

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[Invasive Species Specialist Group: www.issg.org](http://www.issg.org)

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