Monster from the Shallows

They may not look scary—especially the inch-long juveniles in the aquarium at Amuseum Naturalis—but tilapia have a host of characteristics that make them fearsome invaders on an island like St. Martin.

Tilapia are a group of fish from the warm parts of Africa and the Middle East. They are diverse, with about 100 species, and most live in fresh water. Some species are popular as food. They are caught wild in the lakes and rivers of Africa and farmed around the world to the tune of over a million tons per year.
The things that made them successful in their native range and popular with fish farmers also make them a very dangerous invasive species. In recent years, they have been introduced around the world where they wreak havoc on freshwater ecosystems, eating and competing with native species.

Why are they so dangerous? For starters, they are omnivorous, so they have the potential to disrupt aquatic plants and animals. They even have two sets of jaws. The pharyngeal bones in their throat have teeth and muscles to help tilapia use them as a second set of jaws. With this adaptation, they are able to eat more things and do so more efficiently.

Tilapia grow quickly and reproduce with gusto. They can’t handle cold temperatures or very salty water—something we see in the Great Salt Pond when increased salinity causes large die-offs of tilapia. Otherwise, in tropical areas like St. Martin, they can be all but unstoppable. They are extremely common in the Great Salt Pond and in many waterways and ponds on the island. We don’t know for sure how they impact native species of fish, shrimp and aquatic life, but it’s probably not good.
To their credit, they do eat mosquito larvae and may eat things that other fish avoid. Perhaps they eat the algae that grows too much when human-introduced nutrients overwhelm ponds. Unfortunately, the cost to the local ecosystem is probably higher than the benefits.

At Amuseum Naturalis in Grand Case, a surprisingly fearsome gang of inch-long tilapia prowl the aquarium eating the roots of the water hyacinth, algae growing on the backs of snails and any guppies small enough to fit in their mouths. They are the first to devour tiny pellets of fish food, and their appetite seems insatiable. It’s easy to see why they are considered one of the most dangerous invasive species on earth.
The Tree of Life

It is easy to love the mango tree for its sweet, juicy fruit or the flamboyant for its showy crown of flowers. Both come from far away, yet have become a part of Caribbean landscapes and cultures. The true native jewel of the Caribbean is a tree that is unfamiliar to many, but without equal in many ways.
The gaïac tree is also known as the lignum vitae, guaiacum or palo santo. It is native to the Caribbean, it is endangered and it has the hardest wood in the world. It is thought of as a small tree, but that’s not really true and it was used as a cure for many diseases, although it probably didn’t work. At one time it was one of the most important trees in the world, and it has always been one of the most beautiful.

As a native species, the gaïac evolved to live in the Caribbean. It grows slowly, but can survive in dry and inhospitable environments. They can live near salty coasts, rooted in limestone with just the slightest hint of soil. Their wood is incredibly hard, making the tree sturdy against storms and high winds.
The hardest wood in the world was also very valuable. Gaïac trees were cut down everywhere they could be found, and fashioned into a great many different objects. Mortars and pestles use to pound arrowroot were made from gaïac, as were billiard balls, police truncheons and clock gears. It was also favored for variety of ship parts, like deadeyes and shaft bearings.
In time, metals, plastics and other materials replaced gaïac wood for most uses, but by then much damage had been done to this tree. The thousand-year-old trees reaching nearly 20 meters into the sky are almost entirely gone now. The hundred-year-old trees that have grown up since then lead us to believe that the gaïac is a small species.

It remains incredibly beautiful, with a thick canopy that changes color with the seasons. Deep green leaves stand out during the dry season when the tree is surrounded by browns and yellows. Blue flowers explode into bloom once or twice a year, creating a flurry of activity by bees and butterflies. Tens of thousands of orange fruit can cover a mature tree, bursting open to reveal the seeds in their bright red coating.
Today the gaïac is resurgent on St. Martin, planted in yards and along roadsides by those familiar with its charms. In a century or two, perhaps it will reclaim its rightful place on the island and in the imagination of those living here.
At last count, there are six different species of gecko on St. Martin. Some of them are tiny, about three centimeters long. The Tropical House Gecko is medium-sized and commonly seen climbing walls and eating insects attracted to porch lights. By comparison, the Spotted Woodslave is a monster—up to 20 centimeters overall—with a stout body and thick tail.

Many people are not familiar with the Spotted Woodslave. It is rarely seen around homes and it spends its days hiding, coming out at night to hunt. Those daytime hiding spots often include the stone slave walls that crisscross the island and crevices in the bark of old tamarind trees.
The Spotted Woodslave is instantly recognizable. It’s huge, of course, with the sturdy frame of a retired athlete. It also has a generous speckling of black spots on its tan skin. Its legs are draped in loose skin, like long underwear that is a couple sizes too big. Splits in its toe pads make its feet look cartoonishly oversized. It has enormous eyes that stick out on either side of its head like tiny planets.

It is a beautiful lizard, and one that is only found on St. Martin. St. Martiners have known this lizard since people first came to the island, but it was only described as a new species in 2011. Previously, it was considered just a variant of a sister-species, the Turnip-tailed Gecko, which is found in much of the tropical Americas.
Why does St. Martin have its own species of gecko? It’s quite hard to say, because it happened long before anyone was around to watch. Perhaps our Spotted Woodslave lived on more islands at one time, before disappearing everywhere but St. Martin. Perhaps Turnip-tailed Geckos colonized the Caribbean twice: an early group that evolved into our Spotted Woodslave, and then a more recent group that remains the same as the geckos on the mainland.
Whatever its origins, the Spotted Woodslave surely deserves wider recognition as a unique part of St. Martin’s nature. It is also part of local culture. With microscopic hooks on its toes like invisible velcro, it can climb walls. This gave rise to the myth that if a woodslave was on your skin it could only be removed by burning it with a hot iron. That myth’s not true, of course, but it is rooted in observation of this animal’s amazing climbing abilities.
Here Be Monsters

You’ve marveled at them and perhaps been momentarily intimidated by one. It’s the often massive lizard roaming St. Martin: the Green Iguana.
The Green Iguana is named after a color it often outgrows. Freshly-hatched iguanas are a brilliant acid green. As they age, their color fades to darker greens and shades of gray. Male iguanas wear bright orange during the breeding season, most often on their legs and feet. Despite their diverse and splendid range of colors, all the iguanas on St. Martin are the same species.

The iguana is a gentle giant, more or less. They have up to a hundred sharp teeth, but they mostly use them to eat the leaves and fruit that make up their vegetarian diet. They have a row of spines down their back, but just to protect them from predators. They have sharp claws, but they use them to climb the trees where they spend most of their time.
The iguana is most graceful in the water. On land, iguana locomotion ranges from a plodding gait to an awkward, frenetic scramble. If you approach an iguana near a pond, they will usually take a flying leap, legs flailing, into the water. In the instant after splashing down, they are transformed into a sinuous swimming machine, gliding towards the safety of the far bank.
Although they look like primeval caretakers from the island's distant past, the Green Iguana is a surprisingly recent arrival on the island. According to most accounts, a couple crates of iguanas arrived via air freight in the mid-1990s. Originally destined to be pets or perhaps soup, they were never picked up. After a number of days, a sympathetic employee released the forlorn creatures, and for some time they lived primarily in Flamingo Pond.
Flamingo Pond was filled as part of the airport expansion a few years later, and iguanas were brought to other parts of the island. These refugees went on to prosper in their adopted home. Over the next decade, they became increasingly common and they are now found all over St. Martin in large numbers.

What is the impact of the Green Iguana? It’s hard to say exactly, but they have the potential to damage or kill trees in spots where there are too many of them. They are also known to eat bird eggs on occasion. Perhaps the biggest danger is the possibility of Green Iguanas from St. Martin making their way to nearby islands with endangered native iguana populations. Competition with Green Iguanas and interbreeding with them are a huge threat to native iguanas in the Caribbean.
The Cuban Treefrog is native to Cuba, the Bahamas and the Cayman Islands, but humans have brought it to many other places. It now lives in Florida, Hawaii and many Caribbean islands. Although it needed the help of humans to get to new lands—probably as a stowaway with shipments of plants or other materials—it is very adept at colonizing new places once it arrives.
St. Martin poses a number of challenges for the Cuban Treefrog. For starters, there simply isn’t much fresh water. Most of the ponds on the island are salty or brackish, which is not good if you have permeable skin that can absorb salt. There are no real rivers, and most of the fresh water in guts and roadside ditches is swarming with guppies and other fish that would love to eat young tadpoles.

What’s a frog to do then? For starters, they lay a lot of eggs: 100 to 1,000 at a time. Also, they can hop to water that fish can’t reach, like livestock ponds, wells and even puddles. Of course, this means they have to grow up fast before their puddle disappears. They start by eating algae, which is the primary food for Cuban Treefrog tadpoles, but as their home gets smaller, things take a turn towards the sinister.
In the race against time, the tadpoles will often eat their brothers and sisters. This provides the best chance for at least a few to survive and transform into frogs before their water runs out. It may seem unpleasant, but for the survival of the species, it is much better than all of the tadpoles dying when their puddle evaporates.
While their ability to thrive on a relatively dry island is impressive, it isn’t necessarily a good thing for native animals. Like all invasive species, the Cuban Treefrog can upset the delicate balance of life on an island. Animals like our native lizards—including species found only on St. Martin—are potential prey for the Cuban Treefrog.
Mini Maestro of the Mangroves

Our salt ponds and mangrove wetlands are a complex ecosystem. Many kinds of plants and animals interact in harmony to keep St. Martin’s shores from eroding and preserve our clear waters and coral reefs. One tiny animal in particular plays a big role in holding it all together.
Fiddler crabs are small, a couple inches wide at most. On St. Martin, they are most common on the edges of our salt ponds, on sandy flats and beneath mangrove trees. Male fiddler crabs are easy to recognize because they have one enormous claw, sometimes almost as big as the rest of their body.

Why are these little crabs so important? Consider one role of our ponds and mangroves: they trap organic material and soil before it gets swept out to sea. This process counteracts erosion and also keeps the sea clean and clear, something that corals need to survive. Fiddler crabs help, bite by bite. They use their small claw to put sand in their mouth and filter out tiny bits of food from it.
Fiddler crabs also help maintain healthy mangroves by digging tunnels in the sand. The crabs dig the holes so they have a place to hide from hungry birds, but the holes also loosen and aerate the sandy ground where they live, which is good for the mangroves. The crabs also bring buried organic matter to the surface when tunneling, so it can be eaten. In some cases, other animals use the tunnels as hiding places, too.
Fiddler crabs are also an important source of food for many wetland animals, particularly wading birds and herons. These crabs sustain our year-round resident birds as well as migratory species that travel thousands of miles to winter here. The energy the crabs unlock from filtering wet sand is provided to these birds in bite-sized packages.
It is hard to imagine what our island would be like without the fiddler crab. Our wetlands would be quite different. Familiar birds would probably be less common or gone altogether. The island could be smaller, our shorelines eroded with less protection from mangroves. Our coral reefs could be overwhelmed by algae. Rotting material trapped in the sand could even make the island smell worse. Thank goodness for our fiddler friends!
This ebook was created by Mark Yokoyama based on articles published in *The Daily Herald’s Weekender* section, which is edited by Lisa Davis Burnett. Each article highlights a species featured at Amuseum Naturalis, St. Martin’s first natural history museum. Amuseum Naturalis is a free, public pop-up museum of the natural history of St. Martin and the Caribbean, created by Les Fruits de Mer and made possible by the generous sponsorship of Delta Petroleum. Visit the Amuseum for free on Tuesdays and Thursdays from 4-8pm at 96 Boulevard de Grand Case in Grand Case or online at http://amuseumnaturalis.com.