

Invasive Species Workshop on St. Eustatius

By Hannah Madden (CNSI)

Twenty-five participants attended an informative workshop on invasive species on November 28th and 29th 2017. The Caribbean Netherlands Science Institute (CNSI) hosted the workshop on St. Eustatius under the Nature Awareness project, which is funded by the Ministry of Agriculture, Nature and Food Quality (LNV) (formerly Ministry of Economic Affairs). The workshop was facilitated by three marine and terrestrial biologists from Naturalis Biodiversity Center in the Netherlands (Dr. Bert Hoeksema, Dr. André van Proosdij, and MSc. Niels Schrieken). Participants included staff and students from STENAPA and CNSI as well as relevant government sectors such as Public Health, Agriculture & Fisheries, and Harbor.

Beginning with an overview of terminology on Day 1, the differences between indigenous, cryptogenic, exotic, introduced, and invasive species were explained, with examples of vectors for introduction such as boats, planes, and the pet & ornamental plant trade. Islands are particularly vulnerable to invasive species because many islands are relatively small and isolated. Yet, islands represent the greatest concentration of

biodiversity and species extinctions (40% of fauna at risk of extinction; 80% known extinctions since 1500).

Once an invasive species arrives on an island, early detection is crucial to avoid excessive eradication costs and negative side-effects once it becomes established. Actions that can be implemented include species alert lists, action plans, effective border controls, public awareness, invasive species management teams, government policy (and enforcement), and quarantine import documents.

Botanist Dr. André van Proosdij led an afternoon field excursion on land species (plants) during which the group visited areas affected by non-native/invasive flora and compared differences between the sites. Participants used skills developed in the workshop to determine to what extent an area is impacted by invasive flora at present and to predict how it could look in the future if no effort is made to control these. Mexican Creeper, also known as Corallita (*Antigonon leptopus*), is one of the most pervasive invasive terrestrial plant species on St. Eustatius, covering around one-third of the island and

smothering native vegetation in its path. There is no known effective control of this plant, and even free-roaming goats and sheep do not find it palatable. In the sea, the invasive seagrass species *Halophila stipulacea* has become notorious for aggressively replacing local seagrass species. Because this happens out of sight, most people are not aware of it.

Dr. Bert Hoeksema kicked off Day 2 with an overview of St. Eustatius's non-indigenous terrestrial animals and potential new arrivals. He highlighted the dangers of existing invasive species such as the giant African land snail (*Achatina fulica*), which led to an interactive discussion by the stakeholders who are already working to combat this species. Also discussed were the threats of potential invasive species – which may exist on other islands but have not yet reached St. Eustatius – and how to prevent these crossing borders. These include species such as the vervet monkey (*Chlorocebus pygerythrus*), Cuban tree frog (*Osteopilus septentrionalis*), red palm mite (*Raoiella indica*), green mussel (*Perna viridis*), and much more.



Top: Mexican Creeper. Photo by: © Tatiana Gerus (CC BY 2.0)

Bottom: Giant African Snail. Photo by: © John de Freitas

Dr. Bert Hoeksema also gave a similar presentation on marine animals recorded from St. Eustatius and other areas in the Caribbean and the West Atlantic. The lionfish (*Pterois volitans* and *P. miles*) is well known but not many workshop participants were aware of the orange cup coral (*Tubastraea coccinea*) that entered the Caribbean in the 1930s by vessels and appears to thrive well on artificial substrates.

Invasive fauna species can impact human health, native wildlife and ecosystems, and the local economy. The green iguana (*Iguana iguana*) is a perfect example of an invasive species that has spiraled out of control on many Caribbean islands. On Grand Cayman in the Cayman Islands, for example, green iguanas make their homes in trees and buildings located close to water. Roadkill, damage to crops, flowers and plants, and lizards taking a dip in pools are taking their toll on residents. In 2015, scientists estimated the population to be around 152,000; when farmers killed up to 20,000 green iguanas, the population rebounded within about one week. Without adequate control, numbers could soon exceed 1 million.

STENAPA gave an insight into the efforts being made locally to combat the invasive green iguana and lionfish

on St. Eustatius. The arrival of the green iguana is terrible news for islands that house the regionally endemic lesser Antillean iguana (*Iguana delicatissima*), and unfortunately, St. Eustatius has recently fallen victim to this. Following the discovery of an adult female green iguana in 2016, six hybrids were captured during intensive search efforts. This is an ongoing cause for concern on the island. In 2000, the first lionfish were spotted in Bermuda and have since spread across the Caribbean Region. With their voracious appetites and rapid reproductive rates, lionfish pose a severe threat to native fish species. On St. Eustatius they are harpooned and brought back to shore where their stomach contents are analyzed, and the flesh can safely be eaten once the poisonous spines are cut off.

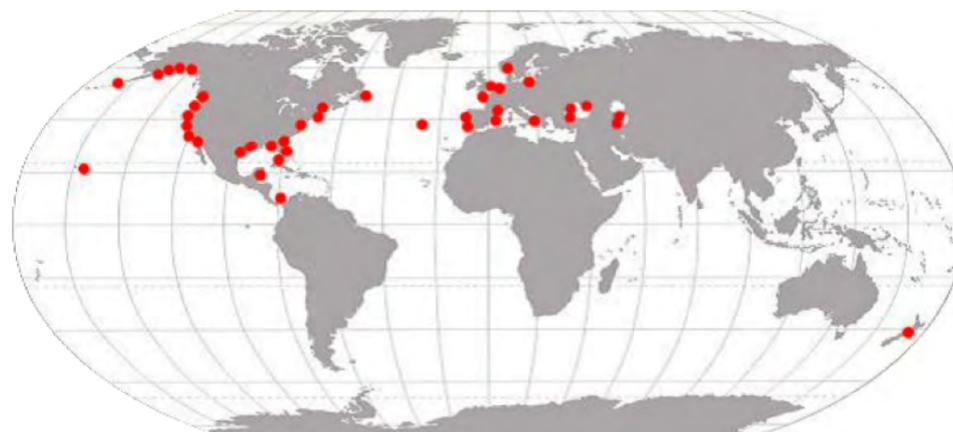
Biologist MSc. Niels Schrieken led the afternoon field session on marine species with a focus on the settlement plate (SETL) project, whereby PVC plates are hung at a depth of one meter below the surface and checked quarterly to inspect the marine species that attach to them. Introduced marine species can easily be detected thanks to this globally applied method, especially in the proximity of harbors. Three SETL plates were installed along Oranje Bay, and the data collected will be submitted to a global database.

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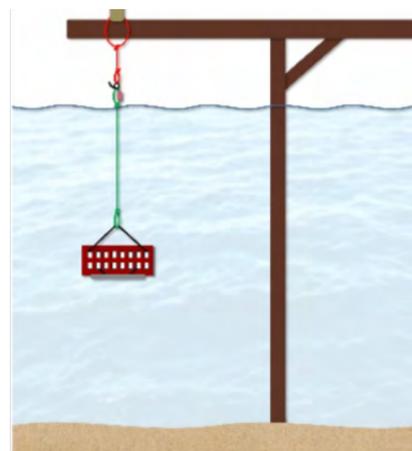


SETL project

The SETL-project is a community study which monitors the diversity of species living on a hard surface. This project was launched in 2006 in the Netherlands by GiMaRIS, in close collaboration with the Smithsonian Marine Invasions Laboratory, and is still run by them. The SETL-project is also run locally in the USA by the Salem Sound Coastwatch and is project-based in other European countries and throughout the Ponto-Caspian region (see figure). The plate design has been deployed along both coastlines of northern America and in Hawaii to facilitate comprehensive comparisons. Within the Caribbean Basin, there are sites in Central America but none on the Atlantic side. St. Eustatius could become the first SETL-location for the Caribbean Basin on the Atlantic side.

SETL Methodology

Around 150 SETL plates are deployed each year in The Netherlands at about 12-15 sites, mostly in pleasure craft harbors and ports. A SETL-plate consists of a 14x14x0.5 cm grey PVC plate attached to a brick to keep it horizontal, hanging from a plastic line with a metal core in the water column. It is deployed at a depth of 1 meter under the water line if attached to a floating object, and 1 meter under the low water line in tidal areas if fastened to non-floating structures. Monitoring the plates is best done repetitively. Collected plates can be taken back to the lab for further analyses. When photographed in the field they can be redeployed after photographing. Pictures taken of the plates are divided on an overview photo into 25 grids, and the presence of species is scored for each grid.



Using SETL data

In the Netherlands, 133 species have been documented on SETL plates over the years. A new species was recorded in the Wadden Sea immediately after the SETL-project started in 2006, which illustrates the project's potential as an early detection method for species. The SETL-plate is easy to retrieve, making it user-friendly and a great way to make life underwater more visible for the local population and in student projects.

Workshop follow-up

The workshop encompassed interactive sessions and discussions that led to extensive knowledge sharing and development at all levels. A recommendation/discussion document has been created based on particular issues flagged for importance, including inspections/border control, customs, and capacity-building.

CNSI will organize a follow-up session to promote further discussion and to formalize specific action points between key island stakeholders. It will encourage those who could not attend the workshop to become involved and will focus on the creation of a task force and/or training if necessary. The responsibility of various stakeholders for e.g. detection of invasive species will also be discussed.

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