

July 2011



▶ **Newsletter 2/2011**

STENAPA Update

Developments in St Eustatius



Work begins on the dingy and dive dock in Lower Town. Ruins have been partially recovered and stored for integration in a later phase of the project.

2011 is turning out to be the year of change and development for our little island here in paradise. There are currently three major areas of development or investment that are either underway or in their planning stage.

The first one of these is the harbour expansion project that has started on the bay in Lower Town. There is a brand new area being constructed opposite the fisheries building, this area will have a dingy dock, an area for dive boats to use and a concrete slipway for improving boat hauling practices. In addition to this, improvements are being made to the Ro-Ro pier in the harbour itself to improve operating procedures. This work is

scheduled to be completed by December 2011.

Secondly, there is the proposed NuStar expansion in The Farm area. The plans as they lie now include a tank storage area in the Cul De Sac of the hills building up the 30m height contour. The plans also include a power and water generating facility for the proposed new complex. In addition to this a 1700 meter (in total) long jetty is proposed in the very northern end of the Lower Town bay providing accommodation for four berthing tankers.

Plans of the proposed tank and jetty sites are still being developed before submission of permit requests to the Executive Council for consideration.

This permit request is expected to be submitted in September 2011.

Finally, there is keen investment interest in the Lower Town area with a group of resort investors making repeat visits to Statia to examine the potential that the bay has to offer. The Executive Council has established a working group to examine infrastructure issues on the bay such as beach nourishment, heavy traffic and public parking issues and to look for potential working solutions.

STENAPA in our capacity as an environmental organisation is fully involved with all three of these development issues. Each of the developments impacts on the Statia National Marine Park and the sea life within, the proposed NuStar expansion will also impact on the terrestrial ecology of the area. STENAPA is providing a role to advise the development teams of all projects on best practices for moving forward to minimise the effect on the natural environment, highlight sensitive areas to be avoided as well as making recommendations to mitigate against damage.

STENAPA seeks to provide these projects with sound objective advice based on the facts that can be

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Don't forget...

Guided Hikes: Available for groups of 2 or more

Botanical Garden: Open from sunrise to sunset. Great for family picnics and BBQs

Congo Preserve: The eco-friendly camp site on island. Call for information and rates.

gathered and to provide feasible recommendations.

We have to date been successful in obtaining additional requirements to the harbour development permits to avoid damage to the marine park.

We are also working with the environmental consultants contracted by NuStar to ensure that all environmental concerns are covered and investigated for consideration in their planning.

STENAPA are also involved in the plans to potentially restore the beach in Lower Town and will be working to ensure that the plans fit in with the natural cycle of the sand on the island and to offer advice on best environmental practices

STENAPA's Monitoring Programs

The St Eustatius National Parks Foundation carries out regular monitoring activities on a range of key species and habitats both terrestrial and marine. We wanted to take this opportunity to showcase to you some of these monitoring programs and pass along some of the interesting stories about the nature that

emerges from these programs.

Without good sound monitoring programs in place, it is impossible to make good management decisions. The data that the rangers collect is vital in ensuring that we are doing our job and



Visiting expert Adrian Delnevo and Marine Park Manager Jessica Berkeley mist netting Yellow Warblers during a bird ecology field course.



Fisheries baseline monitoring in the Statia National Marine Park

doing it well. The results of long term monitoring programs help to shape the way that your National Parks are management and regulated.

would welcome volunteers who would like to come along and help out during any of these programs which run throughout the year. For more information or to arrange to volunteer please visit our offices in Lower Town or email us at manager@statiapark.org.

We hope you find this work interesting and we

Annual Bird Monitoring

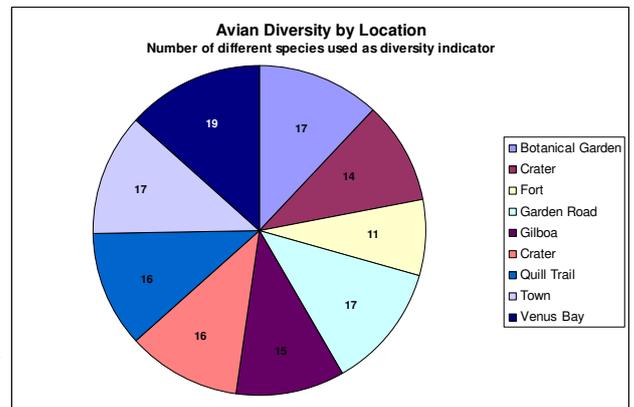
We have been collecting data on bird species of the island since 2004, with changes and more structure to the program being introduced in 2009.

important species (species whose range is restricted within the Caribbean).

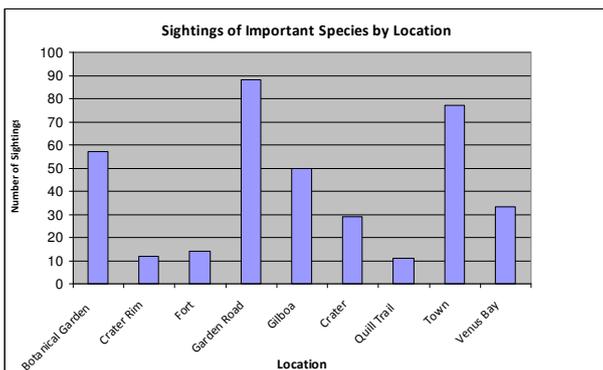
Monitoring is carried out twice a year—January and June—to account for the different seasons and the species variation this brings.

In addition to this, the data collected over the years has been used to assess the diversity of our bird populations across the island. We are looking for areas where the diversity of bird species found is of particular importance which helps us form

From the graphs displayed it can be seen that of our nine study sites across the island, the Botanical Garden, the road to the garden and the town area are where we see most of our six



Pie chart showing number of different species found at study sites over time



Important bird sightings at study sites over time

management decisions and advise decision-makers in industry.

The pie chart above shows that over the years the diversity of bird species (number of different species recorded) at each of our study sites, does not vary greatly between sites, indicating that we have a healthy and strong ecosystem across the island

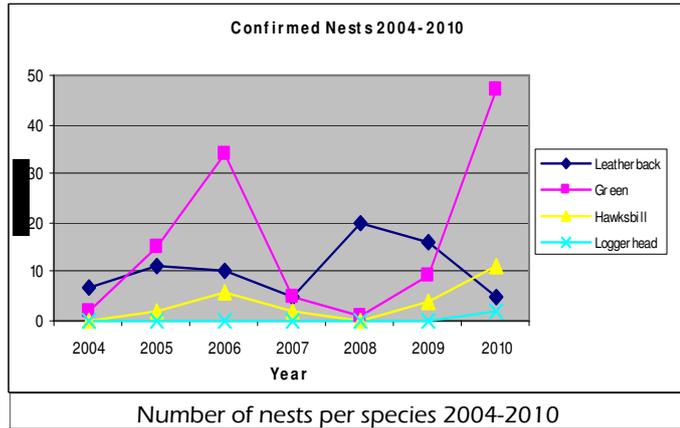
which supports a wide variety of bird life.

The data collected up to 2011 proves very encouraging and indicates to us that bird life is supported well throughout our ecosystems. Using this information we are able to have a baseline to monitor for changes through development and highlight concerns in particular locations should our bird surveys reflect a deterioration in the health of particular ecosystems.

2010 Turtle Nesting Season

The 2010 turtle nesting season proved to be a bumper year for Greens and Hawksbills with more nests being recorded than in the history of the monitoring program.

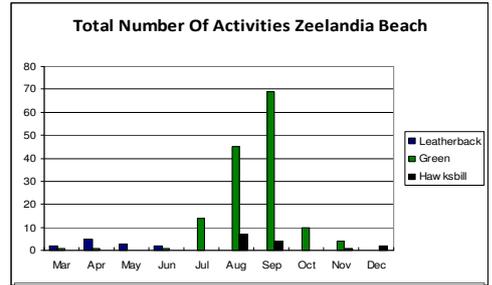
The graph below tells the story of the number of confirmed nests that have



been observed on St Eustatius from 2004 to 2010. It is known that turtles do not nest every year, we expect them

to nest every 2 to 4 years which means that we would expect to see a 2 to 4 year cycle in the nesting activities. The information in the graph indicates that this is the case. In general, confirmed nests peaked in 2006 for all species and 2010 for three of the species. The 2006 peak year was followed by a crash in nesting numbers in 2007 and we are experiencing this same effect during the 2011 seasons where nest numbers are predicted to be very low. Following this we would expect numbers to again increase to reach another peak in 2014.

The bar graph to the right shows the peak time of activity on the beaches for the 2010 season. In this instance, the greatest amount of activity for the Green and



Nesting activities for 2010 season by species

Hawksbill turtles was between July and September, with Leatherback activity peaking in April.

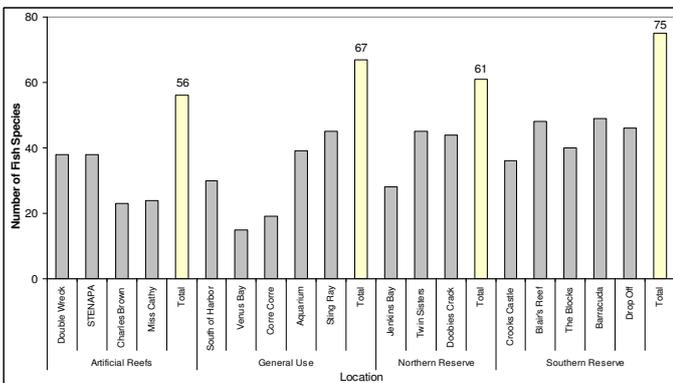
With this type of information we are able to make management decisions regarding patrolling efforts of our volunteers and also are able to best estimate when illegal activities on the beaches such as driving and sand mining are at the greatest risk of disturbing the nesting turtles.

It is only through collecting data that we are able to manage the protection of the nesting sea turtles and also raise awareness within the community of the importance of these animals.

Fish Monitoring Results

Each year STENAPA carries out a variety of fish surveys looking at a range of factors such as the diversity of species in an area, the biomass of the fish stocks for certain reefs, the differences between fish stocks inside and outside of the 'no-take' reserves to determine how successful management measures of the marine park are and how this effects the health of the marine life.

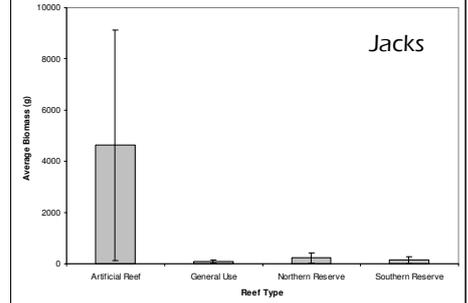
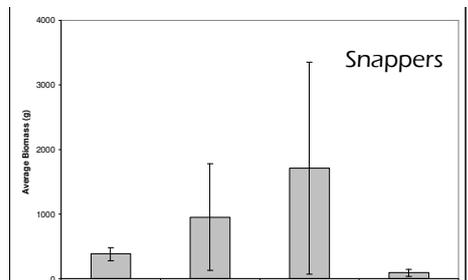
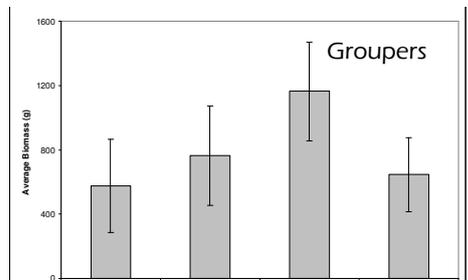
The first graph illustrates the diversity of fish species, ie. how many different types



of species are there in different areas of the park. This graph tells us that the southern marine reserve is the most diverse area with 75 different types of

fish being identified, next comes the general use area, then the northern marine reserve and finally the artificial reefs (such as the wrecks) as being the least diverse.

In addition to this we also look at large predatory fish as a measure of the balance of the ecosystem. A reef system with large natural predators is one that is perfectly balanced in nature and an indication of a healthy reef. In this instance, the graphs to the right show that in terms of large predators (grouper, snapper and jacks) the northern marine reserve has the largest of the groupers and snappers, while the artificial reefs play host to the large jacks. In fact, the natural reef areas do not host many jacks at all, they seem to prefer the habitat provided by the ships that have been sunk over the years.



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STENAPA is an environmental not-for-profit foundation on St Eustatius and was established in 1988. The objectives of STENAPA are to upkeep the natural environment, to preserve and protect endangered or endemic species (flora and fauna) and to educate the community about the importance of the protection of the natural environment.

Areas of responsibility include management of the marine park, the national parks and the Miriam Schmidt Botanical Gardens. STENAPA is legally delegated by the Island Council to manage these protected areas.

President: Ronnie Courtar
Vice President: Ira Walker
Treasurer: Ruth Pandt
Secretary: Vacant

www.statiapark.org

Orchids

[excerpt from "the History of the Orchid Monitoring Project on Statia by Hannah Madden"]

STENAPA's orchid monitoring program was started in 2008 following contacts



B. cucullata (H.Madden)

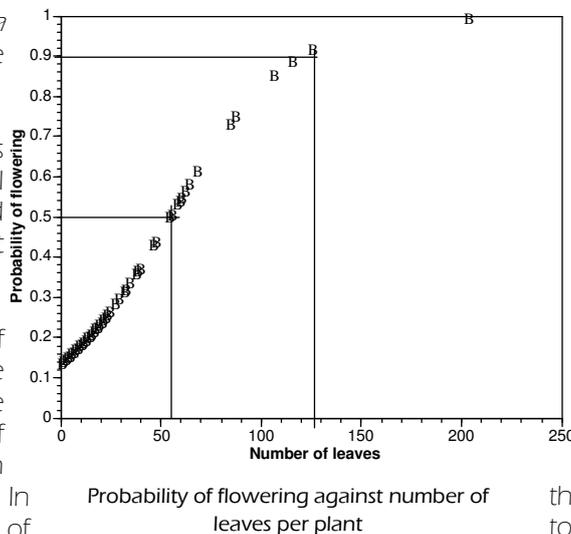
between STENAPA and the University of Puerto Rico (UPR). The first intensive monitoring program focuses on the *Brassavola cucullata* species which is found in both the Quill and Boven.

Working with UPR, STENAPA has been able to identify several interesting features of our orchid populations in a relatively short period of time.

The distribution of the number of leaves is the same for both the Quill and Boven leading to the assumption that (if number of leaves is an indicator of age,) both populations are the same age. In addition to this, only about 20% of the *B. cucullata* produce flowers in both the Quill and Boven

populations giving them an equal rate of productivity.

The relationship between probability of flowering and the number of leaves is such that (as indicated in the graph below) the higher the number of leaves, the higher the probability of flowering. The studies of *Statia* populations indicated that in order to have a 50% chance of flowering, the plants need 55 leaves, a 90% chance increases this to 120 leaves.



While this monitoring project is still in its early stages, some interesting research-based questions are being generated. For example, Dr Raymond Tremblay of UPR notes that we are not coming across any new recruits (small plants) to the population and based on our data so far, there are fewer small plants than we would expect to see. This raises important issues about the long term viability of the *B. cucullata* population on the island.

Dr James Ackerman of UPR also notes this feature of *Statia's* orchid population and hints at this being a possible problem with pollination of the flowering plants. There is the possibility that there is a decline in the insects which pollinate the orchids in the Quill and Boven. Further investigations are needed into this issue, STENAPA is now taking steps to answer some of these questions. We have been donated infrared cameras to put in place near the orchids and try and photograph which species are pollinating them. Once we gather this information then we can take steps to monitor these pollinators and look for problems in their populations, with the long term goal being the preservation of *Statia's* orchid species.

Biogeography of Caribbean Arachnids

A couple of newsletters ago we published a brief overview of the results of our preliminary arachnid inventory. As a result of this Dr. Ingi Agnarsson, Assistant Professor at the University of Puerto Rico and taxonomic expert on Theridiidae, informed us about a Caribbean Biogeography project on arachnids and asked if we were interested in participating. The answer was, of course, yes. This huge project is being funded by the National Science Foundation and will take place over the next five years, with collaborators from across the region and mainland USA. The aim of the project is to test hypotheses about how the age and dispersal ability of lineages and the geological history of islands interplay to generate biodiversity hotspots.

scorpions (Amblypygi), and pseudoscorpions (Pseudoscorpiones). We collected approximately 46 species of our focal taxa, and probably well over 100 species of other taxa.



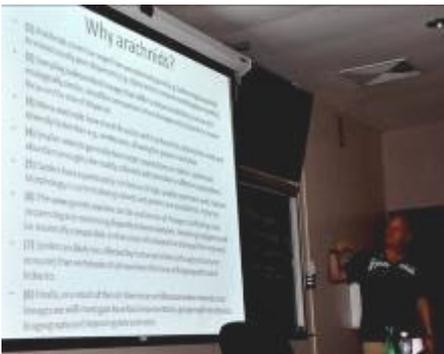
Day 1: Fresh faces at El Verde research station, El Yunque



Pitfall traps in the forest



A tailless whip scorpion (Phrynus spp.) in the Amblypygi family



Dr. Agnarsson explains why arachnids were chosen during the workshop

National Park Ranger/Education Officer Hannah Madden flew to Puerto Rico in July to attend the one-day workshop held at UPR. The following day the team headed to El Yunque National Forest for collecting. Various collection methods were used: beating (hitting plants with a stick and holding a sheet underneath to catch what falls); Berlese funnels (a large flexible funnel with a mesh at the top to allow small litter particles and fauna to drop through); pitfall traps (plastic containers dug into the soil, into which unsuspecting creatures fall); and visual collection.

After collecting for three days (and nights) at El Yunque, approximately 5000 arachnid specimens were counted representing approximately 20 spider (Araneae) families, in addition to a diversity of scorpions (Scorpiones), harvestmen (Opiliones), tailless whip



How to use a Berlese funnel



A tiny jumping spider (fam. Salticidae)



Heating the litter so that any creatures will head for darkness and fall into the ethanol below



Tarantula (species undetermined)

Arachnid Biogeography (cont)



Family *Deinopidae*, a stick-like elongate spider that builds unusual webs which they suspend between their front legs. When prey approaches, the spider will stretch the net to two or three times its relaxed size and propel itself onto the prey, entangling it in the web.



Tiny recluse spider (Loxosceles spp.) in the family *Sicariidae*. Species within the family are known for their necrotic venom, such as the brown recluse spider which is responsible for a very painful bite. The venom attacks tissue and can lead to large open sores which in extreme cases may require a skin graft.



Tetragnathidae elyunquensis, a species of spider endemic to El Yunque National Forest

Following El Yunque the team moved to Guanica dry forest Biosphere Reserve. A similar number and diversity of arachnids was found in Guanica, with very little overlap in species diversity with El Yunque. The order of Camel Spiders (Solifugae) was added to the list, and likely over 100 species of arachnids.

As a result of participating in this workshop, STENAPA will begin collecting specimens all of arachnids from across the island which will be sent to UPR. STENAPA also looks forward to welcoming members of the team to Statia in the near future. For more information on this project you can visit <http://www.islandbiogeography.org/>.



Scorpion in the family *Diplocentridae*



Centruroides spp. scorpion in the family *Buthidae* glowing under an ultra-violet light

Photos by Hannah Madden

For more photos visit our Facebook page:

<http://www.facebook.com/pages/Stenapa-St-Eustatius/203334299688441>