

St Eustatius Sea Turtle Monitoring Programme

Annual Report, 2003



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Cover Photo: Zeelandia Beach with Quill National Park in the background

Summary

- St Eustatius National Parks Foundation (STENAPA) is the only environmental non-governmental organization on St Eustatius. In 1996, the Island Government gave legal mandate to STENAPA to manage a new marine park.
- The Marine Park maintains dive and yacht moorings and conducts many programs such as the Snorkel Club, the Junior Ranger club, surveys of marine life, school educational activities and since 2002, the conservation of sea turtles on St Eustatius.
- Until present, three species of marine turtles are nesting on the St Eustatius beaches: the Leatherback (*Dermochelys coriacea*), the Green Turtle (*Chelonia mydas*) and the Hawksbill (*Eretmochelys imbricata*).
- STENAPA's second annual turtle monitoring program started on April 17, 2003. In June 2003, Nicole Esteban (STENAPA Manager) was appointed country coordinator for WIDECAST to replace the previous manager.
- STENAPA has four permanent staff and is able to undertake projects such as the sea turtle conservation thanks to two international volunteer programs that started in 2001 and 2003.
- Methodology for the 2003 programme included:
 - Volunteers participating in the programme receive a theoretical and practical training on the sea turtle monitoring programme.
 - When a sea turtle is observed nesting on Zeelandia Beach, the turtle width and length is measured, location of the nest is recorded and measured and the turtle is tagged by trained personnel who are in charge of nightly patrols.
 - STENAPA conducted video interviews of two elderly Statians in June 2003, to document historical information about the number and species of turtles. Information is now known about turtle nesting and hunting as early as the 1920's.
 - Hatchling emergence from the nest is monitored and nests are inventoried.
 - In 2003, staff used GPS mapping to monitor beach erosion, sand movement and to identify nest location of sea turtles.
 - In 2003, STENAPA arranged a series of beach clean ups, schools and businesses presentations.
- Results for the 2002 and 2003 Sea Turtle Monitoring Programme are as follows:
 - A minimum of 3 Greens and 1 Hawksbill nested in 2002.
 - A minimum of between 3-10 Leatherbacks, 2-3 Greens, 2-5 Hawksbills came and nested in 2003.

- In 2003, two measurements on two Hawksbill turtles were taken, and in 2002 two measurements on two Green turtles were collected.
- In 2003 one Hawksbill was tagged twice on the front right and the front left flipper. In 2002, three Greens were tagged on the front flippers.
- A total number of 41 hatchlings were rescued in 2003.
- Recommendations for the 2004 programme include:
 - Increased supervision of Working Abroad night crew members: either the Sea Turtle Programme Coordinator or Marine Park Interns (Marine Biologists) will be in charge of night patrols.
 - Purchase of additional equipment to facilitate night patrols.
 - Training of staff at international meetings.
 - Monitoring of sunset emergence as soon as a dedicated truck for the turtle programme can be purchased.
 - Beach mapping to be conducted regularly to monitor changes and map turtles.
 - Continuation with the community education programme at schools and local businesses.
- It is expected that, with a full time programme coordinator, improved monitoring and increased number of volunteers, there will be increased numbers of turtles monitored in 2004.

Introduction

The purpose of the St Eustatius Marine Park Sea Turtle Conservation Project is as follows:

- To increase the nesting populations of Sea Turtle on St Eustatius
- To increase hatchling survival rates
- To obtain data on the sea turtle nesting population of St Eustatius
- To obtain data on observed hatchling population of St Eustatius
- To fully protect turtle nesting habitats
- To monitor turtle foraging habitats
- To apply international and national treaties and conventions (CITES, SPAW, IAC)
- To create an ongoing database of nesting and foraging marine turtles to be shared regionally (WIDECast) and worldwide
- To educate local residents and tourists about the sea turtle conservation programme
- To encourage research about sea turtle populations to improve conservation on St Eustatius.

The St Eustatius Sea Turtle Conservation Programme started in 2001. Until present, three species of marine turtles are nesting on the St Eustatius beaches; the Leatherback (*Dermochelys coriacea*), the Green Turtle (*Chelonia mydas*), the Hawksbill (*Eretmochelys imbricata*). It is possible that the Loggerhead (*Caretta caretta*) nests on St Eustatius as this has been recorded on other Antillean islands (Sybesma, 1992). STENAPA started the programme by raising awareness on Sea Turtle protection and their habitats. In October 2001, the St Eustatius Government closed Zeelandia beach to sand miners following advice from STENAPA (Annex 4). Since 2002, STENAPA has been patrolling this (and other) beaches and collecting data. In 2003, STENAPA additionally started to monitor hatchlings and also to record in water sighting by divers, snorkellers and bathers. To help with its conservation programme STENAPA uses assistance from international volunteers. For the 2004 sea turtle conservation programme, STENAPA obtained funding through Wider Caribbean Sea Turtle Conservation Network (WIDECast), World Turtle Trust (WTT), KNAP Fonds Netherlands Antilles and IdeaWild. Additionally, the Working Abroad volunteer programme contributes funding to STENAPA as part as the volunteer project expenses costs (Annex 6).

With this report we hope to:

- Provide information locally and internationally about the STENAPA sea turtle monitoring programme.
- Maintain a database summary for the programme, to be analyzed each year.
- Produce a progress report for the Island Government and local/international volunteers.
- Outline all activities of the sea turtle monitoring programme.
- Outline all positive and negative points encountered by the programme.
- Review activities in the past year, and suggest recommendation for 2004.

Participating organisations

St Eustatius National Parks Foundation

St Eustatius National Parks Foundation (STENAPA) is the only environmental non-governmental organization on St Eustatius. In 1996, the island government gave legal mandate to STENAPA to manage a new marine park and in 1998 established two National Parks to be also managed by STENAPA. STENAPA also manages the Miriam C. Schmidt Botanical Garden. The marine park, surrounds the island of St Eustatius from the high water mark to the 30 meter depth contour. Within the marine park are two marine reserves, which are designated no-take zones and are in place to protect marine life habitats and to reduce fishing pressure. The marine park maintains dive and yacht moorings and conducts many programs such as the snorkel club, the Junior Ranger club, surveys of marine life, school educational activities and since 2002, the conservation of sea turtles on St Eustatius. STENAPA is a not-for-profit Foundation with no permanent government subsidies, relying on grants and minimal income from divers and yachts to carry out projects. STENAPA has four permanent staff and is able to carry on with projects such as the sea turtle conservation thanks to two international volunteer programs: the STENAPA Internship programme and Working Abroad programme started in 2001 and 2003 respectively.

STENAPA internship programme

This programme started in September 2001, since then, over 20 interns have helped STENAPA accomplishing projects at the botanical gardens, in the national park, in the marine park, and also with educational programmes in the local schools and community. Interns are often finishing a degree within the fields of biology, conservation or park management. Interns are responsible for overseeing and accomplishing specific assignments and overseeing volunteers from the Working Abroad programme in specific projects.

Interns stay on St Eustatius for periods of up to six months at a time. STENAPA is able to supply living quarters, drinking water, a truck and fuel, but is unable to cover costs for a salary or travel. STENAPA's internships allow students and professionals to gain good practical experiences in the field of their study.

Without dedicated volunteers, STENAPA would not be able to carry out many of its projects since it is impossible for the Foundation to afford such manpower and expertise.

Working Abroad programme

Working Abroad is an international networking service for volunteers, workers and travelers on volunteer projects in over 150 countries worldwide. STENAPA started its collaboration with Working Abroad programme in January 2003.

To participate in the programme, volunteers pay to STENAPA US\$ 1267 each which covers food and water, lodging, a truck, fuel, and a project expenses fee (this does not include traveling costs). In 2003, a total of 34 volunteers were recruited through the Working Abroad organization in the UK. Teams of up to eight volunteers stay for two months at a time on St Eustatius and assist in the following projects: development of the

botanical gardens, national park trail maintenance and, during turtle season, all volunteers participate in day and night patrols.

Monitoring methodology

In 2003, the monitoring of nesting sea turtles and their hatchlings took place at Zeelandia beach, located on the northeast side of the island of St Eustatius and is exposed to strong wind and waves of the Atlantic Ocean (Figure 1). For this report the monitoring is divided into two phases. This was due to the fact that in the middle of the nesting season the STENAPA Foundation changed management. This change in management brought a review of the monitoring methodology and hence the division into phase 1 and phase 2. Additionally the length of the patrolled area was reduced for safety of the crew. During high sea levels in phase 2, cliff erosion and collapsing prevented patrol crews from monitoring the full length of the beach and the monitoring area was revised.

Monitoring location

- From April 14 to May 2, 2003 (phase 1) the area of beach patrolled extended from the northernmost area of Zeelandia to Smith's Gut. This area of beach measures approximately 1km in length (Figure 2)
- From June 23 to August 23, 2003 (phase 2) the area monitored extended from the northernmost part of Zeelandia beach to north of Smith's Gut (0.8 km south only).



Figure 1 Location map of St Eustatius in the Eastern Caribbean

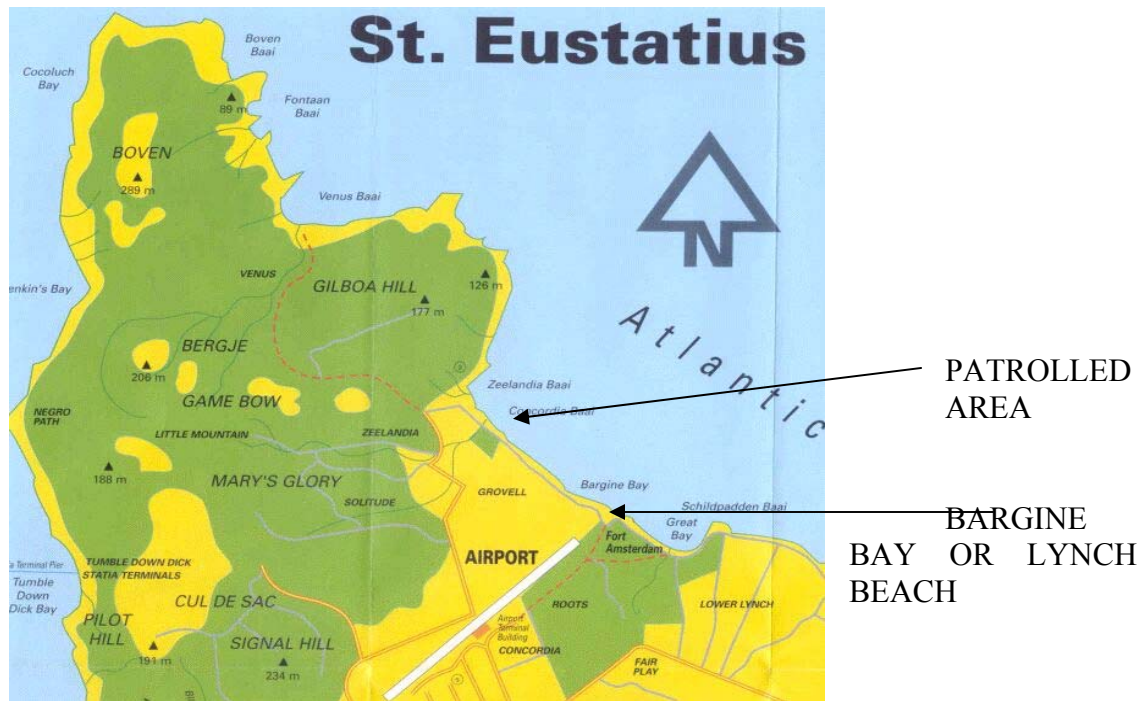


Figure 2 Location map of St Eustatius in the Eastern Caribbean

Monitoring dates

First phase (April 14 - May 2, 2003)

The first night patrols were conducted with assistance from Working Abroad programme and started with the second Working Abroad crew of eight arriving in St Eustatius in April 2003. Night patrols began on April 17 with crews of four volunteers along with STENAPA interns and staff. Night beach patrols were carried out 5 nights per week. Each night 6 people were split up into three groups of two. Each group took turn in patrolling the beach constantly for two hours intervals. This pattern was followed from 2000hrs to 0500hrs. At the time, Parks manager Kay Lynn Plummer was the only trained person able to tag and monitor nesting turtles. When not patrolling, Kay Lynn Plummer was on radio contact with night crew in the event that a turtle was observed nesting at the beach.

Second phase (June 2-October 24,2003)

Night patrol resumed on June 2 with Working Abroad crew II. STENAPA interns and staff were additionally helping with patrolling as needed. Patrol crews were on radio contact with parks manager Nicole Esteban at all time. A change in patrol schedules was made. The volunteers were split into two people crews. Each night a different crew would patrol the beach from 2100hrs to 0400hrs. Monitoring was also changed to four nights a week. The same two persons were on patrol all night. This solution worked better for the crew well being and work schedule as well as the logistics of monitoring. This patrol technique has become standard for STENAPA sea turtle monitoring programme. Additional, weekly night patrols were conducted randomly between Working Abroad

crew changes. In this instance, STENAPA was helped by local volunteers such as dive shop staff. At all times when night patrols were not conducted, a daily patrol was scheduled.

Training

Staff training

In May 2003, the management of STENAPA changed hands and Nicole Esteban was hired as the new parks manager for the foundation. Although Nicole Esteban is a marine biologist, she has not participated in a sea turtle monitoring programme before. With Kay Lynn Plummer leaving, there was no one left with trained skills to tag and monitor sea turtles. Nicole Esteban immediately obtained funding from WIDECAST, with assistance from Dr Karen Eckert, and was able to participate in a Leatherback monitoring training in St Croix. Additionally, staff Rozenn le Scao participated in this training, (funded by STENAPA). The training took place from May 19 – 23 in Sandy Point Refuge, St Croix (Annex 1).

Volunteer training

Upon their return to St Eustatius from training in St Croix, STENAPA staff drafted a theoretical and practical training course for volunteers. This training includes a 30 minutes Microsoft Power Point presentation on nesting sea turtles of St Eustatius and on the monitoring programme, a video footage of tagging and monitoring leatherback and their nests (taken at St Croix refuge during STENAPA staff training), practical knowledge and handling of monitoring equipment, data sheet introduction and visit of Zeelandia beach monitoring site. The first theoretical training took place on May 30 and it was followed by two more training courses on June 25 and on September 11. Training courses are not aimed at STENAPA volunteers alone but also local residents eager to learn about sea turtles and help with monitoring. Training will be applied in the same manner for the 2004 nesting season.

Quantitative and qualitative data collection

Patrol Activities

Tagging methods

STENAPA uses metal flipper tags donated by Caribbean Sea Turtle Conservation Network. All tag applicators are inspected and cleaned on a routine basis and discarded when they cease to function properly.

STENAPA uses the same tagging method as St Croix, USVI. Tags are applied to the fleshy skin located between the back flippers and the tail of nesting Leatherbacks, and on the proximal part of the front flipper of Green, Hawksbill where the swimming stroke will cause minimal up-and-down movement (Eckert *et al.*, 1999). The turtle is tagged whilst tamping and covering her nest right after she has finished laying. This is done so that the turtle is not disturbed while preparing for laying and during laying. Two metal tags are

attached to each turtle to minimize the effect of tag loss. For Leatherbacks only, two different sorts of metal tags, one small one large to ascertain which tag size was optimum for tagging. Only trained persons are allowed to tag turtles.

Carapace measurements

Length and width of shell of a nesting sea turtle are taken using a metric measure. Measurements of the shell width and length are done using flexible metal tape (curved measurement).

Greens, Hawksbill and Loggerhead:

The carapace length measurement used by STENAPA is the curves carapace length notch to tip (CCLn-t) (Eckert *et al.*, 1999).

The tape is stretched from the most anterior medial notch of the carapace in a straight line to the most posterior medial notch.

The carapace width measurement performed by STENAPA is the curves carapace width (CCW) (Eckert *et al.*, 1999). In this instance the tape is stretched from the widest point of each side of the carapace in a straight line.

Leatherback:

Flexible tape is used to measure the length of the shell (CCL) and the width (CCW) in the following manner:

Length: from the nuchal notch at the midline straight to the most posterior tip of the caudal peduncle (Eckert, *et al.* 1999).

Width: from the ridge crest to the ridge crest at the widest point (Eckert *et al.*, 1999).

Track measurements

Tracks are measured from one outer flipper edge mark to the opposite outer flipper edge mark in a straight line. For each turtle track found, three different width measurements are taken (phase 2 only). Upon entering the data in the spreadsheet the average of the three measurements is computed. This technique allows for fewer mistakes in measurement. Note that during phase 2, some tracks may not show three measurements as a result of track loss.

Nest measurements

In June 2003 (phase 2), 40 recycled marker stakes were placed along at 20 meter intervals on the highest part of the beach, for a distance of 0.8 km (the patrolling distance). Stakes were numbered from 1 to 40, numbering starting from the northernmost part of the beach at GPS 17°30'480" N and 62°58'893" W.

When a turtle, a nest and/or tracks were recorded the stake number(s) were also recorded.

The nest location was measured in the following way:

- Triangulation measurements are taken from stakes located nearest to the center of the nest and/or area suspected to be a nest if a track only were sighted
- Distance of center of nest and/or track from vegetation
- Distance of center of nest and/or track from the high water line.
- GPS marker of nest or track is recorded.

Note: Records from April 29 to May 29 do not show GPS marker on recorded track/turtle nests since the GPS was lost during a surprise tropical storm during a night beach patrol.

Data sheets

The data sheets used for our research are based on the St Croix Leatherback monitoring programme data sheet. Data is immediately entered in Microsoft Access the day after patrols are conducted and hard copies of data are kept in file. This year regular printing paper was used for data sheets. (Annex 2)

Nests success rate

The content of each excavated nest (minimum 24 hrs after first emergence) was categorized using existing protocol (Eckert *et al.*, 1999) and categories from St Croix Leatherback monitoring programme. Live hatchlings were released to sea and all together to minimize predation effects.

Table 1 Code for nest data

Code	Detail
E = Emerged	Hatchling leaving or departed from nest
S = Shell	Number of empty shells counted (>50% complete)
L ¹ = Live in nest	Live hatchlings left among shells
D = Dead in nest	Dead hatchlings that have left their shells
UD= Undeveloped	Unhatched eggs with no obvious embryo
UH = Unhatched	Unhatched eggs with obvious embryo (excluding UHT)
UHT= Unhatched term	Unhatched apparently full term embryo in egg shell or pipped (with a small amount of external yolk material)

Beach mapping

Beach mapping is important for the programme in the following ways:

- Monitoring beach erosion
- Monitoring sand movement
- Identifying nest locations

In 2003 (phase 2), STENAPA conducted beach measurements (Annex 3). Two mappings of the beach were conducted, data were compiled in Microsoft Excel and simple maps were created using Microsoft Excel as well. The technique used for mapping is as follows. A team minimum of two person records coordinates along the beach, at both the high water line and the vegetation line intervals of five meters.

Education

STENAPA Foundation believes that educating local residents and tourists about sea turtle monitoring and sea turtle conservation is key to the success of safeguarding marine

¹ Alive in nest includes hatchlings found in the nest chamber and the neck of the nest.

turtles and their habitats. Part of STENAPA's education curriculum includes the following:

Beach clean ups

This year STENAPA sponsored a series of beach clean ups. Volunteers from the island and abroad participated in the clean ups. The trash found on the beach ranges from plastic debris, boat moorings line, fishing lines, boat foam filling, glass bottles, cans, syringes (with needles) clothes and more. Some originated from the sea and the rest from land. Removing the debris from sand helps turtles from getting injured whilst nesting and also prevents hatchlings from being trapped and dying before reaching the sea.



Figure 3 Beach clean up, December 2003

Lobbying

STENAPA have approached the Island Government a number of times to increase their awareness of sea turtle conservation and the need to protect the beaches, particularly Zeelandia Beach. In 2003, the amount of joy riding increased (due to local residents and visiting medical students) and STENAPA requested that the Government approve for a sign to be made to notify drivers that driving was not permitted, and to give explanation reasons for this. In mid 2003, permission was granted to erect a sign saying Do not drive on the beach.



Figure 4 New sign to warn drivers not to drive on Zeelandia Beach

School presentations

At the end of every month, STENAPA gives presentations in all five island schools. To give the presentations a power point projector and laptop are used. The presentation topics differ each month and are based on programmes conducted by STENAPA on St Eustatius. The presentations are created and given by staff and volunteers. This year two different presentations on sea turtle conservation and biology were given to four local schools.

Presentation at local company

In August 2003, STENAPA organized a series of four presentations on sea turtle monitoring at Statia Terminals the largest local company employing over 100 island residents. To give the presentations a power point projector and laptop are used. 2003 was the first year that STENAPA reached out to a local business. This programme was a success and a lot of positive responses arose from the lectures. (Annex 4).

Broadreach (semester at sea students)

Every year, St Eustatius is visited by groups of US students of age range 14-18 years from an educational programme call Broadreach. Part of the curriculum included in their programme is community service. In 2003, 4 groups (of up to 16 students) helped with clearing up Zeelandia beach and removing of debris endangering nesting sea turtles and hatchlings. Visiting students were given lectures on the STENAPA monitoring and conservation programme and track identification. As they removed debris from the sand, students were asked to patrol for hatchling emergence and to look for possible dead hatchlings and turtle tracks.

Nest monitoring 2003 (phase 2)

When nests were recorded, STENAPA staff monitored nests five days prior to expected emergence. Once an emergence is recorded, hatchlings are counted. 24hrs after the first emergence is recorded the nest is excavated, trapped hatchlings are rescued, and a nest inventory is conducted

During the season, three different reports of dead hatchlings observed on the beach were brought to STENAPA staff's attention. Staff did not see the hatchlings each time that they were reported and observers were not able to identify the species of hatchlings found on the beach. However, sightings of (minimum four) dead Leatherback hatchlings occurred early July and it is suspected that these hatchlings emerged in early morning and became dehydrated in the sun (since the night patrol the previous night did not observe any tracks).

Underwater survey

In December 2003, STENAPA started underwater sea turtle monitoring. Each of the three dive shops of St Eustatius were given a form to complete for each sighting of marine turtles by staff or customers. Data are collected and entered on a database. This will be an additional reporting section in the next Annual Report.

Local wisdom (phase 2)

Knowledge of local wisdom is important to understand history of sea turtles on the island. STENAPA conducted two video interviews in June 2003. Mr Johaness Schrewhardt and Mr Clifford Gibbs Senior (both in their eighties) were asked information about nesting turtle species on Statia and turtle hunting. Both men used to catch turtles in their youth and also know a lot about nesting sea turtles.

Mr Schrewhardt recalled seeing the following turtles hunted:

- the Green back or Green turtle
- the Leatherback
- the Hawksbill

Apparently in the 1920s and 1930s, a French man from St Barthelemy used to hunt turtles at sea around St Eustatius. He would then sell turtles on Statia and abroad.

Nesting turtles were hunted along Lynch Beach until what is called the governors pool located at Zeelandia beach. Additionally, turtle were captured at Corre Corre Bay. According to Mr Schrewhardt all turtle species were hunted equally. Mr Schrewhardt mentioned catching white and yellow eggs which could mean yolked and yolkless eggs from the Leatherback turtle.

Mr Gibbs explained the cloud like track figure that poachers looked for in the sky. The tracks signaled that a turtle would nest that same night and also the direction of the clouds would give the direction of the area where the turtle would be laying. Mr Gibbs mentioned that no more poaching has been performed (for over 10 years now) partly

because the shell of the hawksbill is not marketable like in the past. He also added that the Green turtle, Leatherback and Hawksbill were hunted for the meat.

Neither man had ever seen a Loggerhead, although nesting Loggerhead turtles have been recorded nesting in the Caribbean (Sybesma, 1992). According to Mr Gibbs, not much poaching occurred in the past. He also added that some turtles were caught in fishermen nets on the bay front whilst fishing for jacks. It appears that more turtles were found at sea and nesting in the early 20th Century than at present and that numbers have decreased.

Results

This section includes results from the 2002-2003 nesting season due to the fact that there was limited information in the 2002 Annual Report about the turtle programme.

Turtle sightings

The first nesting Leatherback was spotted returning to sea on April 24, 2003 (phase 1). This was the first record ever of a Leatherback nesting on St Eustatius beaches by STENAPA. Although, evidence of nesting Leatherbacks are mentioned in the literature (Sybesma,1992). In addition to the Leatherback, the Green and Hawksbill nested on Statia in 2003 (phase 2). The first Green turtle nested on the night of June 7-8 and same for the Hawksbill only. This year staff was able to successfully tag one hawksbill. Unfortunately the majority of turtles appeared to nest between hourly patrols or at weekends

Fund raising

STENAPA staff could not be on patrol at all time in 2003 since a lot of fundraising had to be done from May to December 2003 due to the financial problems of STENAPA. One objective was to gain funding to ensure future activities of the sea turtle monitoring programme. STENAPA was able to secure funding for 2004 monitoring, and has an application pending for 2005-6. The turtle programme coordinator's salary is now funded for 2004. This work will include overseeing 80 % of the night patrols and implementing regular patrols. Equipment included in the grants are a GPS, additional radios, water proof bags, a pit tagging kit, waterproof paper for data sheets, flashlights, etc. (Annex 6).

Patrol records

Table 2 highlights the patrols scheduled in 2003 for phase 1 and phase 2. This table shows that more patrol hours were conducted with respect to the number of personnel involved (during phase 2) after adopting the patrol method from Sandy Point Refuge Leatherback Monitoring Programme in St Croix. No details of patrols were available for 2002 nesting season.

Table 2 Patrol records in 2003

Working Abroad crew (phase 1) dd/mm	No. of personnel on patrols	Date of patrols dd/mm	No. of night patrols (8hr patrols)	No of day patrols (1 hr patrols)	Total hrs
WA crew II (9/04–10/04)	12	17/04 – 05/06	8		64
		14/04 –30/04		11	11
Total	12		8	11	75
No morning and night patrols conducted between May 1-12					
Working Abroad crew (phase 2) dd/mm	No of personnel on patrols	Date of patrols dd/mm	No of night patrols (7 hr patrols)	No of day patrols (1 hr patrols)	Total hrs
WA crew III (23 /06-23 /08)	12	30/06- 23/08	39		273
				16	16
WA crew IV (10/09-5 /11)	6	13/09 – 24/10	16		112
				80	80
Random patrols between WA crew change	8	08/06 – 29/06	5		35
				16	16
Total	26		60	112	532

Carapace measurements and tagging results

In 2003, two measurements on Hawksbill turtles were taken, and in 2002 two measurements on Green turtles were collected. In 2003 one Hawksbill was tagged twice on the front right and the front left flipper. In 2002, three Greens were tagged on the front flippers but no location of the tagging was recorded. STENAPA realizes that these results are low, the programme is young and a list of recommendations for 2004 nesting season is provided with this report. It is the goal of STENAPA to increase these results in the future years.

Table 3 Hawksbill Carapace measurements and tagging, 2003

Date (dd/mm)	Length (m)	Width (m)	Flipper tag RF ²	Flipper tag LF ³
05/07 – 06/07	0.78	0.81	W21	WE8
08/06 - 09/06	-	0.90	-	-

Table 4 Green Carapace measurement and tagging, 2002

Date (dd/mm)	Length (m)	Width (m)	Flipper tag
21/08	1.12	0.60	WE4
21/08	1.23	0.63	WE2
07/08	-	-	WE25

Track measurements

Firstly, it is important to note that we know that a greater number of turtles nested than is shown by track measurement records. This is because nests emergence happened at places where tracks had not been observed. Minimum numbers of individuals have been assessed by calculating the nesting date intervals.

Based on results shown in Table 5, it could be said that a minimum of between 3-10 Leatherbacks came and nested in 2003.

Table 5 Track measurements 2003, Leatherback turtles

Leatherback	Date (dd/mm) ⁴	Width (m)	Width (m)	Width (m)	Average (m)
1	22/06-23/06	1.80	1.84	-	1.82
2	14/06-15/06	1.80	1.72	1.78	1.76
3	01/06-02/06	1.60	-	-	1.60
4	29/05	1.92	-	-	1.92
5	24/05	1.84	-	-	1.84
6	19/05	1.93	-	-	1.93
7	13/05	1.73	-	-	1.73
8	30/04	1.95	-	-	1.95
9	29/04	1.79	-	-	1.79
10	24/04	-	-	-	-

Data shown in Tables 5, 6 and 7 demonstrate that a minimum of 7-18 individuals from three different species came and nested on Zeelandia beach in 2003.

² RF = Right front

³ LF = Left front

⁴ The system of recording date changed in phase 2. Dates in April and May refer to the date of the first half of the night patrol.

Table 6 shows that 2-3 Greens nested. From Table 7, it is clear that at least 2-5 hawksbills nested in 2003.

Table 6 Track measurements 2003, Green turtles

Green	Date (dd/mm)	Width 1 (m)	Width 2 (m)	Width 3 (m)	Average (m)
1	29/06-30/06	1.60	1.55	1.20	1.45
2	24/06-25/06	0.90	-	-	0.90
3	08/06-09/06	1.07	1.01	1.09	1.056

Table 7 Track measurements 2003, Hawksbill turtles

Hawksbill	Date (dd/mm)	Width 1 (m)	Width 2 (m)	Width 3 (m)	Average (m)
1	07/10	0.65	0.65	0.61	0.636
2	14/09 15/09	0.80	-	-	0.80
3	08/09 09/09	0.73	-	-	0.73
4	05/07 06/07	-	-	-	-
5	08/06 09/06	0.70	0.67	-	0.685

Tables 8, 9 and 10 show data for turtles nesting on Zeelandia beach in 2002. Table 8 reveals that a minimum of 3 Greens nested on Zeelandia.

Table 8 Track observation 2002, Green turtles

Green	Date dd/mm
1	21/08
2	21/08
3	13/08
4	09/08
5	07/08
6	07/08

Table 9 documents that 1 Hawksbill nested in 2002. Table 10 lists unidentified track results. No estimate of nesting turtles has been evaluated with this report since many of the species of the nesting turtles are unknown.

Table 9 Track observation 2002, Hawksbill turtles

Hawksbill	Date dd/mm
1	21/08

Table 10 Track observation 2002, unidentified turtles

Unknown	Date
1	01/08
2	05/08
3	05/08
4	06/08
5	06/08
6	06/08
7	08/08
8	13/08
9	26/07

Nesting species on Zeelandia beach 2002-2003

This section provides an overview of nesting data for 2002-3 and is based on results presented in Table 3-8. Table 11 demonstrates that in 2003 STENAPA personnel were able to identify all species of sea turtles that nested on the beach. Table 11 also shows that three nesting species of marine turtle are using St Eustatius beaches as a nesting ground. In 2002 however, STENAPA was able to identify two species of nesting sea turtle the Green and the Hawksbill. It is suspected that many nests/tracks for Green and Hawksbill were not observed in 2003. This is due to the fact that most Greens and Hawksbills nested in the area of the cliff landslide in 2002.

Table 11 Nesting species in 2003, Zeelandia beach

Species	Turtle sighting	Tracks	Nests/ probable lay	First turtle/track observed (dd/mm)	Last turtle/ track observed (dd/mm)
Leatherback	2	9	10	24/04	23/06
Green	-	3	3	8/06	29/06
Hawksbill	2	3	4	8/06	3/09
Loggerhead	-	-	-	-	-

Table 12 Nesting species in 2002, Zeelandia beach

Species	Turtle sighting	Tracks	Nests/ probable lay	First turtle/data observed (dd/mm)	Date of last track/ turtle observed (dd/mm)
Leatherback	-	-	-	-	-
Green	1	5	-	07/08	21/08
Hawksbill	1		-	21/08	21/08
Loggerhead	-	-	-	-	-
Unknown	-	9	-	26/07	13/08

Nest monitoring 2003

Table 13 shows that a total number of 41 hatchlings were rescued in 2003 (Figure 5). These were hatchlings that were still within the nest cavity 24 hours after first emergence. Many were stuck below large rocks. On July 30, (after hurricane waves passed) STENAPA relocated 9 rescued (partially) hatched eggs and monitored the relocated nests. On August 6 2003, 9 emergence tracks were recorded from the relocated nest of nine to the sea. As the programme progresses staff are getting acquainted with eroding zones and hope to limit nest wash out in years to come.



Figure 5 Rescued Hawksbill hatchling, August 2003.

Table 13 Nest monitoring 2003, Zeelandia beach

Species	Recorded nests	Recorded hatching emergence	Nb of rescued hatchlings	Relocated nests
Leatherback	10	5	31	-
Green	3	-	1	-
Hawksbill	4	2	9	1
Unknown	-	6	-	-

Table 14 shows that personnel were able to inventory 5 Leatherback nests and 1 Green nest. In 2003, neither the Green nor the Leatherback turtles were tagged therefore it is impossible to link these nests with a particular turtle. Based on nests inventoried and from the hatching dates (Table 14), it is possible to deduct that as few as two individual Leatherback turtles nested on Zeelandia. Figure 6 shows emerging Leatherback hatchlings and also the dark colour of the volcanic sand on Zeelandia Beach. It is difficult to spot hatchlings emerging most nights (except for full moon) and, for this reason, funding is sought for night vision binoculars.



Figure 6 Emerging Leatherback hatchlings, July 2003.

Table 14 Nest inventory Leatherback, 2003 (codes are defined in Table 1)

Date dd/mm	Coordinates	E	UD	UH	UHT	Yolkless	S	L⁵	D
25/06-26/06	17°30.350' N 62°58.798' W	15	-	-	-	17	44	11	4
03/07-04/07	17° 30.353' N 62°58.797' W	3	5	6	-	-	56	9	8
10/07	17°30.380' N 62°58.829' W	-	24	12	-	27	37	5	3
30/07	17°30.361' N 62°58.815' W	3	-	-	-	-	-	-	-
31/07	-	-	12	19	-	26	35	6	5

Table 15 Nest inventory Green, 2003

Date dd/mm	Coordinates	E	UD	UH	UHT	S	L	D
04/07	17°30.303' N 62°58.753' W	-		7	2	112	1	6

⁵ Alive in nest includes hatchlings found in the nest chamber and above the neck of the nest.

Threats to Sea Turtles Conservation

Beach erosion

Sand miners have destroyed natural sea grapes on dunes to facilitate access to the beach with their heavy excavating machinery. This in turn has dramatically increased dune and beach erosion. As torrential rain washes downslope, it forms guts where sea-grape dunes were formally in place preventing erosion. From the 10 November 2003, there were 8 successive days of torrential rain. During this period beach features changed drastically and around 30 broken empty sea turtle eggs were observed on the sand. There is no reason to believe that these eggs had not hatched already and some could have been unhatched eggs from hatched clutches. Additionally, no nesting sites were recorded in the area where the majority of these eggs were found. Furthermore, when staff surveyed the site where eggs shells were found, broken small size eggs (yolkless eggs) were found among larger broken egg shells, suggesting that the eggs were from a previously hatched leatherback nest.

Joy riding on the beach also impacts on nests, and STENAPA applied to the Island Government for permission to ban driving on the beach. Permission was granted in July and STENAPA erected a sign (Figure 4). Volunteers also ask joy riders to leave the beach and explain the reason to do so.

Predation

Fish predation

Based on reports from fishermen it is known that the Atlantic coast of the island harbours barracuda, shark, tuna and other pelagic fishes alike which could mean that, at sea, predation is high for hatchlings entering from Zeelandia beach nesting site. So far no at sea predation surveys have been conducted.

Bird predation

On June 23, a report of frenzied emergence by Leatherback hatchlings was brought to STENAPA's attention. The observers mentioned scaring away birds predating on the hatchlings on Zeelandia. The emergence occurred at sunset. This event happened a few days before STENAPA staff were notified. No measurements were thus taken since the exact location of the nest could not be identified. No bird predation was recorded by STENAPA staff during night patrols while hatchling emergence occurred.

Crab predation

Shore crabs are another known predator of hatchlings. On July 7, a shore crab was observed attacking a Green hatchling as it emerged from a nest. Volunteers are trained to watch for crabs around emerging nests.

Poaching

Only one incident was recorded by STENAPA in 2003. One nest appeared to have been poached in May 2003 (Northern end of the beach). Although rumors of eggs selling on

the market were brought to our attention, however we did not find any proof or see any signs of poaching during that period. We have reason to believe that STENAPA's presence at night on Zeelandia beach has had a positive effect on limiting poaching of sea turtles and their eggs, as well as preventing joy riding and sand mining.

Sand mining

Limited sand mining occurred on the beach in 2003. One leatherback nest was destroyed directly by sand mining and reported to the police. As mentioned previously, past sand mining activities have affected Zeelandia beach feature, and possibly nesting sites. However, the frequency of sand mining as decreases as awareness of turtle conservation and beach erosion has increased.

Beach lighting

Light disorientation is low on Zeelandia beach and there are sources of light around the beach perimeter. One is located on the road about 150 meters away from the beach entrance (street light) and the second, shines horizontally from the cliff top 20 meters above the beach. Potential development of a hotel destroyed by hurricane Lenny (1999), may also affect turtle conservation.

Smith Gut solid waste landfill

In 1995 the Government of St Eustatius developed a project for relocating the waste disposal site of St Eustatius to a site called Smith Gut, a natural rainwater channel directly above the beach. Despite advice from STENAPA not to relocate the disposal site to Smith Gut, in 2002 the government contracted Windward Roads to construct and maintain the new landfill at Smith Gut. Unfortunately, the site is now having adverse impacts on the marine and terrestrial environment.

Constant debris such as plastic bags is transported to the sea with the wind. Every time there is heavy rainfall debris washes down through the gut in to the ocean (Annex 4 presents photographs). Smith Gut landfill is the second waste disposal site located on the Atlantic side of the island and exactly the same problem occurred at the first site.

There is no waste recycling facility on the island and solid waste causes an environmental hazard. Additionally, St Eustatius hosts a medical school with 200 students living on St Eustatius on a temporary basis. Increased import of US products contributes to the waste issue of St Eustatius. There are no batteries or waste oil recycling plans on the island. STENAPA hopes to work with the government and obtain funding to help educate and reduce waste problems on the island.

Roaming animals

It is illegal for a resident to let animals roam wild on St Eustatius. However many goats, cows, horses, sheep, pigs and donkeys roam on public and private lands, cliffs and beaches. These roaming livestock are an environmental disaster, a health hazard, an economic problem as well as a public health concern. STENAPA is greatly concerned with environmental damage that roaming animals are causing. They eat vegetation including endangered plants that stabilize cliffs and land in place. They eat the waste at

the landfill (on the sea side) or from rubbish bins of private houses leaving the streets full of household rubbish. Plastic bags are torn apart by the animals for their content and plastic is found floating in the air to the sea. No young shoots are able to grow and develop into fully mature trees except for invasive species of plants such as the Mexican Creeper. Roaming animals contribute to loss of trees such as sea grapes that stabilize sand dunes and therefore protect the beach from erosion. Lots of cattle footprints and faeces are left on the sand of protected beaches like the Zeelandia nesting ground.

Recommendations for 2004

Participation of Volunteers

The Working Abroad volunteer programme started in 2003. Without assistance from these volunteers, the sea turtle monitoring programme could not continue as intensely as currently planned.

At the end of each Working Abroad crew rotation we obtain constructive reports from the volunteers. From crew III reports, it was clear that some individuals had not been consistent with hourly patrols. Additionally, some management difficulty occurred with crew IV and at the end of their volunteering period we had ample reasons to believe that many night patrols were not conducted properly by certain unmotivated individuals.

STENAPA will continue with its Internship Programme and with Working Abroad volunteer programme. Working Abroad volunteer supervision during patrols will be increased in 2004 by full time turtle coordinator, staff and interns. Only interns will be trained for the tagging of sea turtles. Working Abroad volunteers will assist staff and interns with patrols, measurements, data collection and hatchling rescue.

Patrols

2004 patrols will be conducted in the same way as 2003 (phase 2) patrols were conducted. STENAPA will also conduct regular sunset patrols for hatchling emergence in accordance with nesting timings. Corrie Corrie Bay, Lynch Beach and Crooks Castle Beach will be also monitored for nests.

Carapace length measurements

In 2004, the curved carapace length minimum (CCLmin) will be added to the data measurements.

Equipment

STENAPA will purchase fiberglass flexible metric tapes for properly measuring the shells of nesting turtles. In addition, a GPS will be purchased to be used specifically by the monitoring programme only. Data will be collected on waterproof paper and a waterproof backpack will also be purchased. STENAPA will also purchase a passive integrated transponder tagging kit.

Training of staff

In 2004, staff will keep up to date with monitoring and conservation technique. Additionally staff will aim to gain funding to attend important meetings and conferences abroad pertaining to Sea Turtle Conservation. The Sea Turtle Programme Coordinator

will also attend the WIDECASST Annual General Meeting and Sea Turtle Symposium in Costa Rica.

Sunset emergence monitoring

In 2003, STENAPA did not conduct many sunset patrols to monitor nest emergence frenzy; the main reason for this was the lack of vehicle to get to the nesting area.

However night emergences where recorded. Hatchlings were followed to the sea and any debris were removed from their path, if a hatchling became disoriented or had turned over on its back (which happened a number of times), it was assisted and redirected towards the sea. It is hoped that funding for a new vehicle will be granted and that STENAPA will be able to extend hatchling monitoring in 2004.

Beach Mapping

STENAPA will continue with mapping of the beach. Data will be gathered and will be entered in Microsoft Excel. It is hoped that staff will acquire expertise to produce more advanced maps in future.

Education

STENAPA will continue with its educational programmes (School and business presentation). In 2004, STENAPA will be present for the first time at Week of the Future which is a business week organized by the local senior school 'Gwendolyn Van Putten'. Island businesses and organizations present their activities to graduating students that are about to choose a career. STENAPA will continue to host job training programmes for high-school students. Students participate in all activities of the STENAPA Foundation including in 2004, the sea turtle conservation and monitoring programme.

Waste management and roaming animals

STENAPA hopes to collaborate with the government to find solutions to the waste and recycling issue on Saint Eustatius. The Foundation will continue with beach clean ups. STENAPA will continue to raise awareness about roaming animals on the island.

Acknowledgements

STENAPA Foundation wishes to recognize the following persons that have contributed and offered support to the 2003 sea turtle conservation and monitoring programme

The St Eustatius Sea Turtle Conservation programme would not be operational without financial assistance from IdeaWild, KNAP Fund, WIDECAST, Working Abroad and World Turtle Trust. Additionally we would like thank Statia Terminals and St Eustatius School of Medicine for their support and donations towards the programme.

This programme would not be in force without the involvement of STENAPA staff and board members and local and international volunteers therefore we wish to recognize the following people: Gershon Lopes, Walter Blair, Peter Esteban, Ine Boogear, Curt Coker, Alastair Cole, Julie Davis, Armanita Dhooghe, Liz Evan, Mieke Ficher, Andrew Hallewell, Katie Hotchkiss, Sylvie Huguet, Adam Keatts, Caroline Kull, Adam Levy, Aidan MacNamara, Marco Maeder, Ross Mc Murtry, Natasha Michel, Mary Millington, Joseph Morpeth, Elizabeth Murphy, Jeanne Panuczak, Craig Parrett, Devon Patrick, Norwin and Diana Richards, Peter Shields, Kath Silkerck, Joanne Smith, Jim Taggart, Joanna White. We also thank the Director of Working Abroad (UK): Victoria McNeil.

For sharing their expertise in sea turtle monitoring we would to thank Dr William Coles, Endangered Species Coordinator, US Fish and Wildlife Agency, St Croix and his field staff.

For sharing their knowledge we would to specially thank the following local residents of St Eustatius Mr. Clifford Gibbs Senior and Mr. Johaness Schrewhardt.

For many advice, recommendations and support we wish to specially thank Dr Karen Eckert (WIDECAST), Paul Hoetjes (MINA/VOMIL) and Laura Sasaki (WTT).

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Sybesma, Jeffrey. 1992. WIDECAST Sea Turtle Recovery Action Plan for the Netherlands Antilles (Karen L. Eckert, Editor). *CEP Technical Report No. 11*. UNEP Caribbean Environment Programme, Kingston, Jamaica. 63 P.

Annex 1 Training report-Leatherback Turtle Monitoring

ATTENDEES: Nicole Esteban, Rozenn Le Scao, STENAPA, St Eustatius
DATES: Monday 19 – Friday 23 May 2003
LOCATION: Sandy Point Refuge, St Croix, US Virgin Islands
AGENCY: US Fish and Wildlife Agency
CONTACT: Dr William Coles, Endangered Species Coordinator

Objectives:

The aim of the training was to learn about the leatherback turtle monitoring programme that has been in existence since the early 1980s in St Croix. During this time, a volunteer programme from Earthwatch has provided groups of volunteers during the turtle nesting season (April – August/September). Three scientists coordinate the programme.

Achievements:

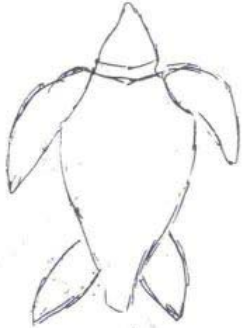
We were trained in the following skills:

- Data collection
 - Measuring turtle size parameters
 - Counting eggs/determining hatchling success
 - Determining nest specifics and location
 - Datasheet entry
- Turtle tagging
 - PIT tags (internal tags)
 - Metal tags (external metal tags)
- Nest relocation
 - Catching eggs from nesting turtle and relocating them
 - Digging nests
 - Tamping and disguising nests
- Beach monitoring practices
- Nest monitoring
 - Digging up to assess hatchling success
 - Protecting hatchlings from predation during entry to sea
- Volunteer training activities
- General information on biology and reproduction of turtles

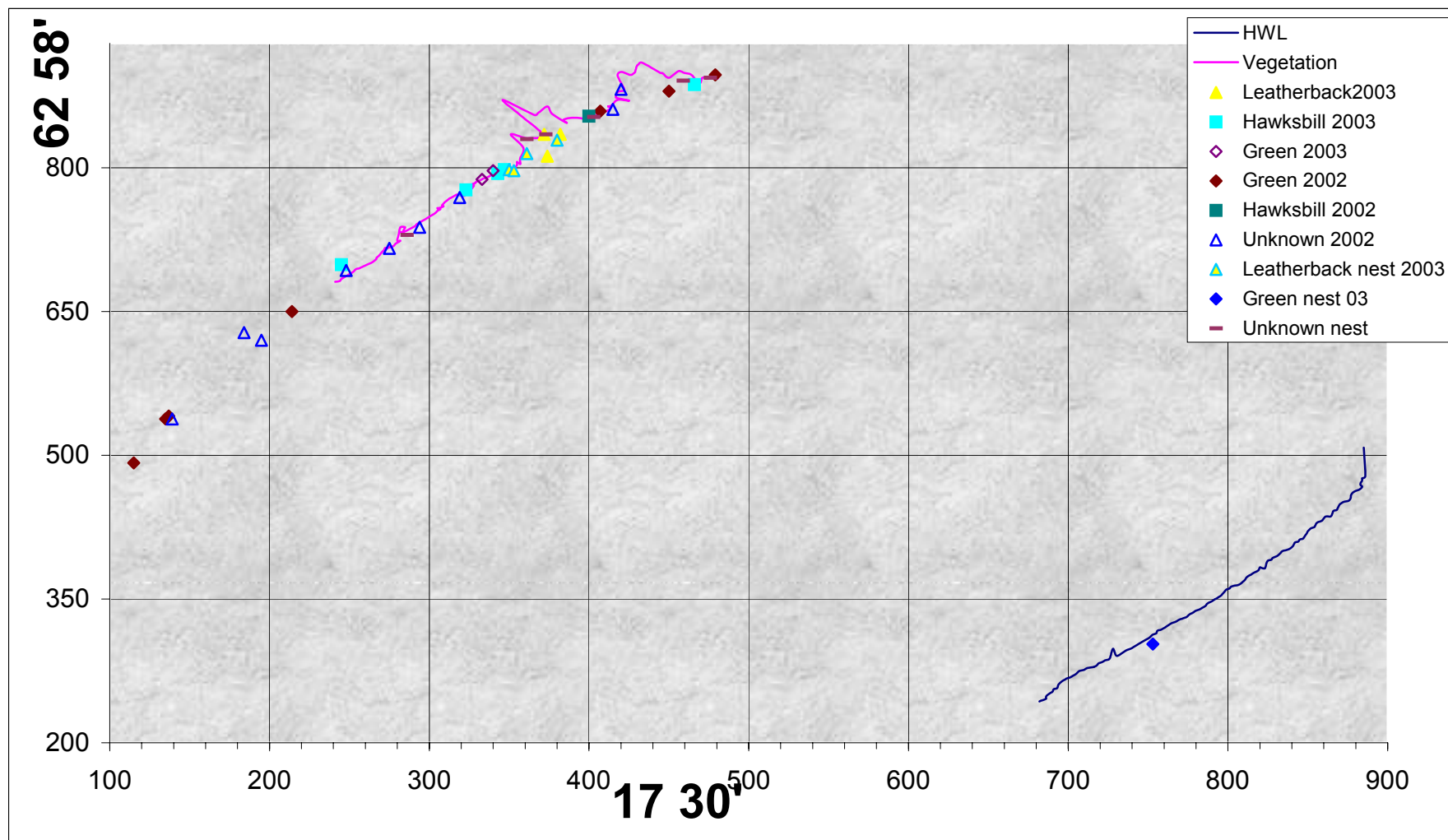
End results:

- We were able to video different activities taking place for use in training of volunteers.
- We attended volunteer training so that we are able to follow standardized procedures in training of our volunteers.
- We collected St Croix education materials for use in our school programmes.
- We are now able to continue the turtle monitoring programme on Zeelandia beach (training will take place w/c 26 May and monitoring to commence w/c 2 June).

Annex 2 Nesting data sheet

Record Number		Turtle Identification, Size and Health		Nesting/Sighting Information	
Observer				Longitude (W) Latitude (N)	
Date	Species	Locale name		Triangulation (m):	
Time	Gender	Landmark 1		Landmark 2	
Weather	Tag Nb	Highwater (m)		Vegetation (m)	
Moon Phase	Tag location	unsuccessful nest cavities		Result	
 Waxing Crescent First Quarter Waxing Gibbous		Activity		Lay, probable lay, dry run, track only.	
 Full Moon Waning Gibbous Last Quarter		Length Car. (m)		Nest Relocation...	
 Waning Crescent		Width Car. (m)		New Longitude (W)	
		Carapace Damage		New Latitude (N)	
		Parasites Ectobiota		Locale Name	
		Injuries		Triangulation (	
		Notes		Landmark 1	
In absence of turtle		Landmark 2		Highwater (m)	
Track width (m)		Vegetation (m)		Number of Eggs	
		Yolked:		Yolkless	
		Time Laid		Time Removed	
		Time Reburied			

Annex 3 Map of Zeelandia nesting beach, October 2003



Islands

THE DAILY HERALD, Friday June 27,

Statians monitor, assist with sea turtle nesting

ST. EUSTATIUS—Staff of the St. Eustatius National Parks Foundation Stenapa is assisting with preserving the nests of the four species of sea turtles known to nest on the island from April through November.

They also strive to protect baby turtles as they emerge from the nests and make their way to the sea. The four species are the huge leatherback turtle, hawksbill turtle, green turtle and loggerhead turtle, which are protected under the Convention on International Trade of Endangered Species Wild Flora and Fauna (CITES), signed by the Netherlands Antilles and many other nations.

Stenapa members recently attended a leatherback turtle monitoring workshop in St. Croix and are now putting what they learned into practice. Workers and volunteers walk the beach from Zeelandia to Lynch every night from 9:00pm until 4:00am looking for signs of turtle nesting and monitoring the location and condition of nests. Last week Dmitri and Sari Tonkopi watched the first leatherback hatchling emergence from the sand.

Another leatherback nest was observed hatching Wednesday night, with 15 baby turtles making it into the water. The Stenapa people went back Thursday morning to find one dead hatchling on top of the nest. It was noted that one leath-

erback nest had been destroyed by sand mining, which is a serious infraction of the CITES treaty and must be reported to international authorities.

Stenapa reminds everyone that sand mining is illegal.

When the Stenapa workers find that a nest is beginning to hatch, they dig into it to help the weaker hatchlings make it to the surface. They may also carry the hatchlings to within a few feet of the high water mark and shoo birds away to ensure a higher survival rate among the tiny turtles.

Stenapa also asks to people refrain from driving on the beach, as vehicle tires tend to pack the sand, making it more difficult for the hatchlings to dig themselves out.

The workers are also tagging and measuring turtles and gathering data about the number, size and variety of turtles that come on the



Stenapa workers Gershon Lopes and Rozenn LeScao prepare to walk the beach looking for signs of sea turtle nesting.

beach. So far this year, three of the four species have been seen.

Stenapa requests the cooperation of tourists and locals in preserving and protecting the native sea turtles, and

invites anyone to participate in the monitoring programme, for which they can contact Gershon Lopes, Rozenn LeScao, or Nicole Esteban at the Marine Park Office in Lower Town.

27 May 2003 Daily Herald

Islands

11

Stenapa workers attend turtle monitoring workshop

ST. EUSTATIUS—Nicole Esteban and Rozenn Le Scao of St. Eustatius Nature Parks Stenapa returned Saturday from a one-week training workshop on leatherback turtle monitoring at Sandy Point Refuge in St. Croix, US Virgin Islands.

The objective of the training was to learn about the leatherback turtle monitoring programme that has been ongoing in St. Croix for 20 years, so that similar methods can be used in St. Eustatius.

Their trip was made possible through a grant from the Wider Caribbean Sea Turtle Conservation Network Widecast. Although four spe-

cies of sea turtle are found near Statia, only the leatherback is on the endangered species list and this species was the focus of their studies in St. Croix.

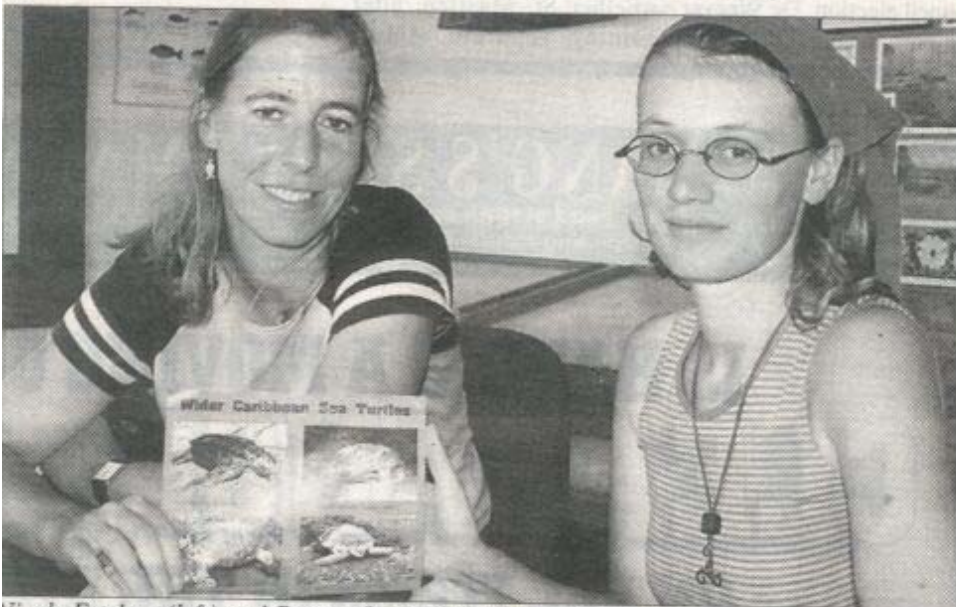
Esteban said that among the things they had learned were data collection, including measuring turtle size parameters, counting eggs, determining hatching success and determining nest specifics and location, turtle tagging, nest relocation, beach monitoring practices, nest monitoring and volunteer training.

They photographed various activities and collected materials in preparation for continuing the monitoring

programme begun last year at Zeelandia Beach in Statia.

The Statia monitoring programme will begin the week of June 2, with training for volunteers beginning this week. Esteban asks anyone who wants to participate in the program to contact the Stenapa Marine Park office for specifics. She particularly requested that persons refrain from driving on the beach or removing sand during this nesting period.

She said they had already observed several signs of leatherback nesting activities on the beach and will be patrolling regularly to monitor this activity.



Nicole Esteban (left) and Rozenn Le Scao display a Widecast turtle poster.

Statia Terminals Employee News Letter

August 2003

Safety Meeting

The subject for the month of August was ongoing activities on the Island of St. Eustatius to preserve and improve the natural environment on the Island. Nicole Esteban, Gershon Lopes and Rozenn Le Scao of STENAPA made presentations here during this month. **STENAPA** is the **ST. Eustatius NATIONAL PARKS**, which includes the marine park under the waters of St. Eustatius out to 100ft depth, the Botanical Gardens on the East side of the Quill and the Northern Mountains area. Since much of this work is out of the public eye, STENAPA personnel work with the Island community to make public presentations to raise awareness of environmental issues, steps that STENAPA is taking to help preserve, protect, and restore the natural environment and provide information on how everyone that has an interest in preserving the natural heritage of Statia can help in these efforts.

In addition to this introduction to STENAPA and the invitation to all to come and see the progress that the volunteers are making in developing the botanical gardens, much of this month's talk was based on the "Turtle Program" a topic that has been shared with many of our children through STENAPA presentations at our schools. We learned that there are 4 kinds of sea turtles that are present in the Statian waters and each of these turtles face serious challenges that require our help and attention if they are to survive for present and future generations to appreciate. These special creatures live and breed in this area because Statia is special to them also. Long before any people were in the Caribbean the Leatherback, Green, Hawksbill and Loggerhead turtles were here because the reefs provide lots of food (hard and soft corals, sea grasses, algae, sponges and jelly fish) and the right kind of sandy beaches such as at Zeelandia, close to deep water with good areas for burying egg nests. The height of the nesting season runs April through September but turtles may nest as early as January and as late as November.

As part of the turtle program trained volunteers patrol the beaches at night tagging and identifying turtles as part of ongoing scientific study. Nest locations are mapped and dated so volunteers can assist the turtles when they hatch by helping them get to the sea, and in some cases, relocated nests within 4 hours of the eggs being laid if the nest is seen to be in a spot that may wash out before the eggs are ready to hatch, which is about 60 days after they are laid. Artificial lights that can cause the turtles to head for land rather than for sea, trash on the beach and sand mining threaten turtle survival. Helping with beach patrols and beach clean up, not driving on the beach and not mining sand in nesting areas are ways that were identified for us to help turtles survive. For more call STENAPA 3182884

Annex 5 Smith Gut landfill photos



Photo by G. Lopes. 11- Nov-03



Photo by N. Esteban 12- Nov-03

Left:

Smith Gut flooded and the trash is floating inside the dump

Right:

The wall is broken and trash is flowing on the beach into the sea.

Annex 6 Budget 2003-2004

Operating budget 2003		
DETAILS	INCOME US \$	EXPENSES US\$
Income		
Grants		
WIDECAST	250	
KNAP	4300	
Donors		
Medical School	100	
Working Abroad (project expenses)	1900	
Expenses		
WIDECAST		
Trip to St Croix		250
KNAP		
Salary + wage taxes		3000
Programme expenses + shipping costs (radio, GPS, batteries + Digital video casing)		1300
Working Abroad		
Fuel + truck maintenance		500
Project costs		700
STENAPA		
Fuel + truck maintenance		300
Office costs (paper, internet, phone, ink, etc.)		500
TOTAL US \$	6550	6550

Operating Budget 2004*		
DETAILS	INCOME US \$	EXPENSES US\$
Income		
Grants		
KNAP	2933.33	
World Turtle Trust (WTT)	18550	
Working Abroad	2400	
Ideawild	1000	
Expenses		
KNAP		
Salary + wage taxes		2933.33
WTT		
Salary + taxes		13500
Project costs (GPS, Radio, tagging supplies, batteries, lamp, educational materials, vehicle maintenance)		5050
Working Abroad		
Fuel + truck maintenance		800
Project costs		1600
STENAPA		
Office costs (paper, internet, phone, ink)		1000
TOTAL US \$	24883.33	24883.33

* This budget may change pending additional grants approval.

Annex 7 List of relevant legislation

International legislations signed by the kingdom of the Netherlands Antilles:

- **Convention on International Trade in Endangered Species (C.I.T.E.S)**
Chelonia mydas (Linnaeus, 1758)
Eretmochelys imbricata (Linnaeus, 1766)
Dermochelys coriacea (Vandelli, 1761)

Additional information about C.I.T.E.S Endangered Species list for the Netherlands Antilles can be found at: <http://www.cites.org/eng/resources/species.html>

- **The Protocol Concerning Specially Protected Areas and Wildlife of the Cartagena Convention (the SPAW Protocol).**

Additional information about the SPAW Protocol for the Netherlands Antilles can be found at: <http://grid2.cr.usgs.gov/cepnet/pubs/legislation/spawnut.html>

- **The Inter-American Convention for the protection and Conservation of Sea Turtles (IAC)**

Additional information about the IAC Convention can be found at: <http://www.sinac.go.cr/otros/coptortuga/i-index.htm>

- **The Convention of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention)**

Additional information about the CMS Convention: <http://www.wcmc.org.uk/cms/>

National legislation:

- **Island Territory of Sint Eustatius**
Marine Environment Ordinance Sint Eustatius 1996 NR.3
- **Protection of Fauna and Flora, 1998**