

ST EUSTATIUS SEA TURTLE MONITORING PROGRAMME

ANNUAL REPORT 2004



PROTECTION



DATA COLLECTION



EDUCATION

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Programme affiliated with the Wider Caribbean Sea Turtle Conservation Network (WIDECAST)



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I Summary

- The Sea Turtle Conservation Programme is managed by St Eustatius National Parks Foundation (STENAPA), which is the main environmental non-governmental organization on St Eustatius (also known as Statia).
- Recent records of turtle nesting activities on St Eustatius date from June 1997 with the discovery of a nest by Jaap Begeman. Until this date, it was believed that leatherback turtles no longer nested on St Eustatius.
- Since 2001, there have been confirmed nesting of three species of marine turtles: the Leatherback (*Dermochelys coriacea*), the Green Turtle (*Chelonia mydas*) and the Hawksbill (*Eretmochelys imbricata*). It is possible that the Loggerhead (*Caretta caretta*) is nesting on St Eustatius, and there was an unconfirmed sighting in 2004.
- 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.
- The St Eustatius Sea Turtle Conservation Programme is part of the Wider Caribbean Sea Turtle Conservation Network and follows its monitoring and tagging protocols.
- In order to participate in the programme, volunteers follow a theoretical and practical training at STENAPA.
- In the latter half of 2004, monitoring extended to six beaches with regular day and night patrols.
- In 2004:
 - Two Green sea turtles were flipper tagged, 22 Green turtles nesting events were recorded, of which three were observed (with two successful lays) and 13 dry runs recorded.
 - Four Leatherback turtles were flipper tagged and two were pit tagged. 16 Leatherback nesting events were recorded, eight of these events were observed, (with seven successful lays), two dry runs were recorded in total.
- A total of six Green turtle nests and seven Leatherback nests were inventoried:
 - STENAPA personnel recorded that it takes between 44 and 51 days for a Green turtle nest to emerge, and noted that it takes 50-57 days for Leatherback nests left *in situ* to emerge, and 64-66 days for relocated nests to emerge

- In 2004, the sea turtle conservation programme reached the local and international communities. Three methods of publicizing the programme were used: STENAPA newsletters, STENAPA radio show and press releases.
- Achievements for 2004 includes:
 - Continuation of beach clean up;
 - Beach mapping;
 - Police participation to enforce laws in regards to sea turtles protection (e.g: sand mining and beach parties);
 - Additional staff training (e.g: WIDECAST AGM and Sea turtle Symposium 2005);
 - Increased volunteer supervision; and
 - Monitoring of six nesting beaches thank to the purchase of a dedicated vehicle for the programme.

II Introduction

Recent records of turtle nesting activities on St Eustatius date from June 1997 with the discovery of a nest by Jaap Begeman. Until this date, it was believed that leatherback turtles no longer nested on St Eustatius. After further sightings, Sea Turtle Conservation Programme started when the Marine Park commenced awareness raising about conservation of sea turtles in 2001. Since 2001, there have been confirmed nesting of three species of marine turtles: the Leatherback (*Dermochelys coriacea*), the Green Turtle (*Chelonia mydas*) and the Hawksbill (*Eretmochelys imbricata*). It is possible that the Loggerhead (*Caretta caretta*) is nesting on St Eustatius, and there was an unconfirmed sighting in 2004. The monitoring programme started in 2002 with random nightly patrols on the main beach Zeelandia, and patrols have been regularly scheduled since 2003. In the latter half of 2004, monitoring extended to six beaches with regular day and night patrols.

The objectives of the St Eustatius Marine Park Sea Turtle Conservation Project range from biological data collection to public awareness, and include the following:

- To increase the nesting populations of sea turtles
- To increase hatchling survival rates
- To obtain data on the sea turtle nesting population
- To obtain data on observed hatchling population
- To fully protect turtle nesting habitats
- To monitor turtle foraging habitats
- To apply national and international treaties and conventions (CITES, SPAW, IAC, etc)
- 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

St Eustatius National Parks (STENAPA) manages the Marine Park and 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 the Marine Park. In 2002, STENAPA commenced regular patrols on St Eustatius beaches and started collecting data. Additionally, in 2003, STENAPA 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.

In order to carry out the sea turtle conservation programme in 2004, STENAPA received funding from a number of sources: through the Working Abroad volunteer programme (Annex 6), Wider Caribbean Sea Turtle Conservation Network (WIDECAST), World Turtle Trust (WTT), KNAP Fonds Netherlands Antilles, IdeaWild and AMFO St Maarten. Thanks to the latter, STENAPA was able to purchase a vehicle for the turtle programme. This vehicle arrived in July and allowed personnel to increase patrols from one to six

beaches and to record a total of 52 nesting events in 2004, a record number since the onset of the programme.

The aims of this Annual Report include the following:

- Provide information locally and internationally about the 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 recommendations for 2005.

III Participating organizations

A) St Eustatius National Parks Foundation (STENAPA)

The Sea Turtle Conservation Programme is managed by St Eustatius National Parks Foundation (STENAPA), which is the main environmental non-governmental organization on St Eustatius (also known as Statia). In 1996, the island government gave legal mandate to STENAPA to manage a new Marine Park and, in 1998, for a new National Park. 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.

Internship programme

This programme started in September 2001 and, since then, 30 interns have helped to accomplish 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 managing and accomplishing specific assignments and overseeing volunteers from the Working Abroad volunteer programme on specific projects.

Interns stay on St Eustatius for periods of approximately six months. Interns are provided with basic living quarters, drinking water, a truck and fuel. Interns must pay their own travel costs and food costs during their stay. The 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.

B) Wider Caribbean Sea Turtle Conservation Network (WIDECAST)

The St Eustatius Sea Turtle Conservation Programme is part of the Wider Caribbean Sea Turtle Conservation Network. In June 2003, STENAPA manager Nicole Esteban was appointed St Eustatius country coordinator for WIDECAST following a training course whereby two staff learned about tagging and nest inventorying of Leatherback sea turtles in St Croix (V.I.). The St Eustatius Sea Turtle Monitoring Programme protocols were based on this training. In April 2002 and in February 2004, STENAPA staff were able to attend the WIDECAST Annual General Meeting with funding and logistical assistance provided in part through WIDECAST.

C) Working Abroad Programme: Stata Conservation 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 US\$ 1267 each for food, water, lodging, a truck, fuel, and a project expenses fee (this does not include traveling costs). In 2004, a total of 31 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.

D) Dutch Caribbean Nature Alliance (DCNA)

DCNA is a foundation established in St Maarten which represents a formal cooperation between the nature conservation management organizations of the Netherlands Antilles with international agency representation. The goal of the foundation is to safeguard the biodiversity and natural heritage of the islands by supporting and assisting nature conservation efforts throughout the Antilles.

E) Funding agencies and donors

To properly run the Sea Turtle Conservation Programme, the manager and field coordinator allocate approximately 20 to 40 % of work time to raise funds for programme costs per year. Fundraising occurs internationally and locally by soliciting specific organizations and by donation requests through newsletters and turtle awareness watches.

Organizations that have donated to the programme in 2004 are:

- ❑ Antillean Co-financing Organization (AMFO), Netherlands Antilles
- ❑ Department of Environment and Public Health (MINA-VOMIL) Curacao.
- ❑ Dutch Caribbean Nature Alliance (DCNA), Netherlands Antilles
- ❑ IDEAWILD, USA
- ❑ KNAP Fund, Netherlands Antilles
- ❑ Symposium committee of Sea Turtle Conservation and Biology
- ❑ Wider Caribbean Sea Turtle Conservation (WIDECAST), USA.
- ❑ World Turtle Trust (WTT), USA.
- ❑ Working Abroad Programme, UK

We also wish to recognize individuals that have contributed to the success of the programme by donating their time while on patrol and providing financial assistance.

IV Methodology

A) Study site: *St Eustatius (DWI)*

The island of St Eustatius is located in the Windward Islands and is part of the Netherlands Antilles. St Eustatius lies within the longitude and latitude median of 17°30 North and 62°58 West. Sister islands of Saba and St Maarten stretch out 30 Km north-west and 63 Km north of St Eustatius respectively. St Eustatius is 21km² in size and is made up of an extinct volcano comprising the “Northern Hills” to the north (150 Million years old) and a dormant volcano called the “Quill” to the south formed 22000 to 32000 years ago. Because of its volcanic origin, the beaches of St Eustatius are made of dark sand.



Figure 1: Map of St Eustatius in the Eastern Caribbean

B) *St Eustatius nesting beaches:*

Atlantic side: Zeelandia; Turtle Beach; Lynch Beach

STENAPA is able to monitor three nesting beaches located on the Atlantic side of St. Eustatius. The largest beach of St Eustatius is Zeelandia beach, it stretches to 1 Km in length and is linked to Turtle Beach (400 meters) which is in turn linked to Lynch beach (200 meters) (Figure 2).



Figure 2: Map of St Eustatius (DWI)

Zeelandia beach (Figure 3) is highly active and sand erosion is continuous. Direct access to the beach from the Atlantic deep sea for Leatherback Turtles is restricted to the first 780 meters of the beach with 94 % of Leatherback nesting activities observed within the first 420 meters of beach. Zeelandia Beach is a nesting site for Green (68% of Green turtle nesting activities of 2004) and Hawksbill turtles. Zeelandia is the only beach monitored at night by STENAPA.



Figure 3: Zeelandia beach

Turtle beach (Figure 4) is the second largest beach on the Atlantic side of Statia and where 27 % of Green turtles nesting events were recorded. Unfortunately access to this beach at night is highly restricted and only possible during day time when seas are quiet, additional access to Turtle beach can be influenced by the moon effect on tides. This nesting beach is very much affected by sand movement especially during hurricane months June-November.



Figure 4: Turtle beach

Lynch beach is a rocky beach covered by ground vegetation; the beach morning glory. Lynch beach hosts a nesting habitat for Hawksbill turtles and Green turtles as well as (possibly) Loggerheads. Lynch beach is stable due to the adjacent rocky and reef barrier that provides a natural shelter for sand retention.

Lynch beach and Turtle beach have been monitored daily since September 2004.

Caribbean Side: Crooks castle Beach; Kay Bay

The Caribbean side of St Eustatius has two nesting beaches which are monitored: Crooks castle and Kay bay beach.

Crooks castle beach is composed of mostly rocks and sandy patches, it also includes 300 year old ruins of former trading warehouses. In 2004, Crooks castle beach was not regularly monitored due to the new ISPS regulations in place. Since July 2004, a security pass is needed for access to that beach. Crooks castle beach extends about 400 meters. No turtle activities were recorded on Crooks castle beach in 2004.

Kay bay beach is made of rocks and sand. The only access to Kay bay beach is via private residential property. Hawksbill and Green turtles were documented nesting on this beach in 2004.

All beaches are bordering a moderate to high cliff line which erodes constantly especially after rainfall. Erosion also occurs through natural and manmade (Zeelandia beach entrance & Smith gut) channels during heavy rainfall.

C) Pre-nesting (monitoring) preparation

The sea turtle conservation 2004 programme commenced with the following monitoring activities:

- January: preparation of numbered stakes for Zeelandia Beach day and night patrols. The stakes were cut from a plank of wood 2x4x16. A total of 64 stakes were cut using 2 planks of 2x4x16. The stakes were engraved with numbers from 1 to 64. The numbers were painted over with white paint and a reflective strip was taped to the top of the stake. Stakes were hammered deep in the sand at 20 meter intervals, starting from the northern most part of the beach (**Figure 5**). Volunteers Alexander Cadle and Shon Norris prepared and installed the stakes.
- February and March: two beach clean ups were organized in preparation for the first Leatherback turtle nesting season (Annex I: press release)
- Preparation and posting of flyers advertising the commencement of daily morning patrols, to encourage the participation in patrols by local residents (Annex II)
- March 15: beginning of morning patrols on Zeelandia beach.



Figure 5: Stakes placement

D) Patrol activities

Day and night patrols of Zeelandia beach commenced on March 15, 2004. During the second week of September, day patrols extended to the Turtle beach, Lynch beach and Kay bay after the purchase of a dedicated vehicle for the programme. Night patrols (Zeelandia beach) stopped on September 23, since the last nesting activities were observed on Zeelandia beach on September 16. Daily patrols continued on all beaches and ended on November 3.



Figure 6: New vehicle for the monitoring programme

Tagging Methods

Metal flipper tags were donated by the Marine Turtle Tagging Center, Barbados, part of WIDECAST. All tag applicators are inspected and cleaned on a routine basis and discarded when they cease to function properly.

Tagging methods are based on the protocols of the Turtle Monitoring Programme in St Croix, USVI. These techniques are also described in the literature “research and management techniques for the conservation of sea turtles”. 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 Greens and Hawksbills 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 hard shell turtle to minimize the effect of tag loss. For Leatherbacks only, one metal and one Passive Integrated Transponder (PIT) tag are applied to each individual. A single PIT tag is inserted in the front shoulder part of the turtle under the skin with the use of an applicator. An AVID scanner is used to detect PIT Tags. Only trained persons are allowed to tag turtles.

Carapace Measurements

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

Hard shell species:

The carapace length measurement 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 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. Upon entering the data in the spreadsheet the average of the three measurements is computed. This technique allows for fewer mistakes in measurement.

Nest measurements

When a turtle is observed nesting, the details are recorded on a data sheet in the following manner:

- Stake number (Zeelandia Beach only)
- Date (we record two dates since a typical night patrol is from 20:00-21h00hrs to 03:00-04:00hrs and therefore overlaps over 2 days)
- Time (we use the 24hrs clock system, and we write down the time a turtle is first observed)
- Triangulation measurements are taken from stakes located nearest to the center of the nest.
- Distance of center of nest from vegetation
- Distance of center of nest from the high water line.
- GPS marker of nest is recorded.
- Species of sea turtle

Nests only data collection

Nests are recorded in the following manner:

- Stake number (Zeelandia Beach only)
- Date and time the nest is first observed, (if possible we estimate the exact night that nest was laid this can done based on previous patrol records)
- Distance of nest from vegetation
- Distance of nest from high water line
- GPS marker of nest
- Species of Sea turtle (if possible to identify)

Dry Run Measurements

Dry runs are recorded in the following manner:

- Track width measurements
- Date and time (if possible we estimate the exact night that nest was laid this can done based on previous patrol records)
- Stake number (Zeelandia Beach only)
- GPS
- Species of sea turtle (if possible to identify)

V Results

A) Nesting data

This section of the report presents nesting data for three confirmed species of sea turtles nesting on Zeelandia beach for 2004. Additionally, it is possible that a fourth species (the loggerhead) visited St Eustatius in 2004. Staff were able to tag two species of sea turtles: the green and the leatherback and summary tables are included below.

Green turtles

The first nesting Green turtle was observed on Zeelandia beach on July 19, 23:30 hours. The last nesting event was observed on September 19. Two Green sea turtles were flipper tagged, 22 Green turtles nesting events were recorded, of which 3 were observed (with 2 successful lays) and 13 dry runs recorded.

Table 1: Carapace measurement and tagging of nesting green turtles

Carapace ¹ (meters)		Flipper tag	Location
Width	Length		
0.96	1.15	WE 19	Front left
1.10	1.36	WE 13	Front left

Hawksbill turtles

The first nesting Hawksbill turtle visited on Zeelandia beach on June 27. The last nesting visit was recorded on October 13. 12 Hawksbill turtles nesting events were recorded, 4 of these were dry runs. One of these events was observed at Turtle beach at 8:20am (a dry run) and no tags were seen on this turtle. An interesting set of tracks happened at Kay Bay Beach where residents indicated that 8 narrow tracks < 0.70m wide, no tail drag and alternate gait were observed on the morning of October 13. We recorded these tracks as Hawksbill tracks based on the description of the residents who have been helpful at assisting with previous turtle nesting events on Kay Bay Beach.

Leatherback turtles

The first Leatherback turtle track was recorded on the 18 April, 14:30 hours. The first nesting Leatherback turtle was observed on the 26 April, 23:00 hours. The last nesting event for Leatherbacks was recorded on the June 29. 4 Leatherback turtles were flipper tagged and 2 were pit tagged. 16 Leatherback nesting events were recorded, 8 of these events were observed, (with 7 successful lay), 2 dry runs were recorded in total. Inter-nesting intervals for tagged Leatherback ranged from 8 to 10 days.

¹ These measurements are average of measurements taken from each nesting observance.

Table 2: Carapace measurement and tagging of nesting leatherback

Carapace ² (meters)		Flipper tag	Location	PIT tag	Location
Width	Length				
1.07	1.41	WC 335	Rear left	-	-
1.20	1.49	WE 3	Rear left	-	-
1.07	1.44	WE 18	Rear right	133713290A	Front right
1.16	1.85	WE 9	Rear left	134822465A	Front right

Loggerhead

On September 26 at 17:00hrs Mr Ishmael Berkel saw a turtle nesting on Lynch Beach. He reported it and later identified the turtle as a Loggerhead after looking at the WIDECAS Key Identification sea turtle sheet. It is not known whether this nest was successful or not. The track left behind the turtle had been erased by heavy rainfall that started during and continued after the nesting process.

Unknown sea turtle tracks

Seven additional sea turtle tracks were labeled as unknown. These tracks were not identified either because they were too faint due to rain fall, or they were located in an erosion area where the tide had greatly washed over the tracks.

Another example of unidentified tracks happened on Turtle Beach. On the October 13 two sets of tracks were labeled as unknown for the following reason: The first track had a smaller overlapping hawksbill track partially covering it. This track was large, we noted no tail drag and its width measured 1.33 meters. The second set of unidentified tracks has its incoming and out going gait well overlapping each other. The track had no tail drag and its width was measured about 1.22 meters.

² These measurements are average of measurements taken from each nesting observance.

B) Emergence data

STENAPA staff and volunteers monitored hatching emergence. Emergence was observed from a total of 8 Leatherbacks and 6 Green turtle nests. Hatchlings and/or nest content were recorded following the WIDECASST protocol.

Table 3: Table from Sea Turtle Conservation Manual Eckert *et al.* (1999)

Code	Detail
E = Emerged	Hatchling leaving or departed from nest
S = Shell	Number of empty shells counted (>50% complete)
L = 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)

Green turtles

STENAPA personnel recorded that it takes between 44 and 51 days for a Green turtle nest to emerge.

Table 4: Green Turtle nests inventory

Date dd/mm	Coordinates	E	UD	UH	UHT	S	L	D	Yolkless
06/09 to 9/09	Zeelandia 17 30.309' N 62 58.759' W	1 ³	-	-	1	-	31 ⁴	6	
20/09	Zeelandia		-	-	-	44 ⁵	0	2	1
27/09-29/09	Kay bay 17 28.259' N 62 58.938' W	41				48	-	19 ⁶	
30/09	Zeelandia	-	-	-	-	-	8 ⁷	-	-
13/10 – 15/10	Zeelandia	24 ⁸	-	-	-	-	11 ⁹	10	-
17/10 – 18/10	Zeelandia 17 30 309'N 62 58 759' W	15-20	-	-	8	-	5	6	

³ This hatchling was rescued from a ghost crab. Due to the location where this hatchling was found on the beach, it was noted that prior to being attacked by the crab, this hatchling had been disorientated by the lights of the Pompier Country Club House.

⁴ Rescued hatchlings were placed on the sand and followed; some were observed moving towards the lights of Pompier Country Club House.

⁵ One live hatchling was found on his back on the beach. From the tracks mark left by the hatchlings it was estimated that 1/3 of them were temporarily disorientated by the Country Club lights, they re-orientated themselves to the sea upon reaching the shadow of the cliff line. 3-4 tracks were followed towards the main entrance of the beach, these hatchlings could have been disrupted by the street lights or by car lights.

⁶ On the 27th 16 hatchlings were found dead on top of nest entrance during a routine sunset patrol. On 28th 1 was found dead on top of the nest and two dead in the nest

⁷ On the morning of August 16th, 10 eggs were found scattered around a partially covered nest with a distinct body pit, we carefully buried those eggs and found more eggs already buried we left them in place and finished covering the nest. More eggs were found along the departing track 3 crushed 3 complete. It seems as if the turtle was disrupted, no footprints found around the track. The turtle could have been disrupted by car lights from the opposite cliff before laying. She wandered extensively and she found herself disorientated in a dry sand gut made on the beach by flooding (between stake 2 & 4). This nest was dug on September 30 (approx. emergence date) 8 hatchlings were saved from the nest. It was observed that the nest contained numerous worms and green eggs.

⁸ 4 hatchlings disorientated by Country Club light, 2 of these were rescued from ghost crabs.

⁹ Early morning of October 15, we were able to find the nest entrance by looking at the flies accumulating on top of the nest, we removed a layer of sand and found dead hatchlings. We recovered hatchlings with deformed scute patterns **Error! Reference source not found.**, some hatchlings were trapped in roots below the nest entrance, we released them.

Leatherback turtles

It appears to take 50-57 days for leatherback nests left *in situ* to emerge, and 64-66 days for relocated nests to emerge.

Table 5: Leatherback turtle nests inventory

Date dd/mm	Coordinates All nests on Zeelandia	E	UD	UH	UHT	Yolkless	S	L	D	Unkno wn
06/17-06/21	17°30.468' N 62°58.893' W	21	7	3	2	70	32		1	-
06/17	17°30.419' N 62°58.859' W	15	-	-	-	-	-	-	-	
07/06	17° 30.400' N 62° 58.853' W	Unknown ¹⁰	17	2	1	96	17	-	-	
07/08	17°30.415' N 62°58.856' W	Unknown ¹¹	8	1	9	95	24	8	3	2
07/20	17 ° 30.442' N 62°58.880' W	22 ¹²	-	-	-	-	-	-	-	-
07/20	17 ° 30.409' N 62°58.851' W	6	15	9		64	6		4	8 ¹³
07/06-07/07	17 ° 30.413' N 62 ° 58.856' W	11 ¹⁴	27	8	22	17	23	1	16	1

¹⁰ Nest collapsed before the end of the inventory. However this nest had been relocated and 59 yoked eggs were counted.

¹¹ This nest was relocated and 57 yoked eggs were counted

¹² Did not find the nest entrance, additional tracks (not counting 22 observed hatchlings) were observed many in the vegetation line, no source of artificial lights were observed on the beach, however a slope (between stake 2 & 4) was created (because of dune erosion) on the beach and towards the sea grapes dunes because of heavy rain fall. Since it is believed that hatchlings use the natural slope of the beach to reach the ocean, this may have been the reason why we found tracks disorientated towards the dunes.

¹³ It was noted that some eggs might have been predated upon by a ghost crab found alive inside the nest while inventorying.

¹⁴ Two dead

VI Discussion

A) Education

Dutch Caribbean Nature Alliance (DCNA) Educational Officer (2004-2005)

In May 2004, DCNA proposed to lead a project on education awareness about turtles for a year, commencing September 2004. This project funded an educational officer for the three islands of Saba, Statia and St Maarten for a year from November 2004 to November 2005. This officer will create an educational curriculum (based on RARE manual) for the protection of sea turtles and their habitats. Dominique Vissenberg from Holland was hired by the three marine parks of the Dutch Windward Islands to create and implement this educational awareness project.

Media Information

In 2004, the sea turtle conservation programme reached the local and international communities. Three methods of publicizing the programme were used: STENAPA newsletters, STENAPA radio show and press releases (**Annex 1**).

Newsletters are published on a quarterly basis. In 2004, three of the newsletters included information on the Sea Turtle Conservation and Monitoring Programme (June, September, December). Newsletters are printed and distributed locally (schools, businesses, shops) and sent via emails reaching past volunteers and conservationists abroad (Caribbean, Europe and USA). Newsletters are created by Statia Resident Heidi Duncan.

STENAPA radio show was aired on local radio PJR1 91.5 FM for the first time in February 2004. This programme runs monthly and was funded for a year by the VNP Funds. Executive board member of STENAPA, Jessica Berkel, is responsible for the radio programme and designed a turtle awareness talk: "Statia Sea Turtle Conservation Programme", this was aired on April 1st, 2004.

Public awareness watches

On 11th June, Marine Park staff created a 'visitors guidelines' (eg using red flashlights) to the sea turtle conservation programme due to reoccurring problems with guests on patrols. The guidelines are based on Marine Park personal observations and the Florida Fish and Wildlife Conservation Commission Sea Turtles Guidelines (**Annex 3**). These basic guidelines became very helpful especially since an increasing number of tourists desire to participate in night watches. These guidelines reinforce that STENAPA is a conservation foundation and ensures that proper behavior is followed around nesting sea turtles and hatchlings.

In addition to night watch patrols, adverts were made for volunteers for sunset emergence patrols.

A total of 22 persons participated in public awareness watches (night and sunset). This number is expected to increase as the programme grows.

School presentations

At the end of every month, STENAPA gives presentations in all four island schools. The presentation topics differ each month and are based on programmes conducted by STENAPA. The presentations are created and given by staff and volunteers. In 2004, one presentation on

sea turtle conservation and biology was given at four local schools.

School trainees and Vacation Job Programme

In 2004, two high-school students, Coen Cherubin and Genillio Hassell and one graduate Antonio Raphael Flemming of Gwendolyn van Putten High-school assisted with the sea turtle monitoring programme.

Coen Cherubin (16 years old) worked at STENAPA for a month from April - May 2004 and was able to assist staff with night monitoring of Leatherback Sea Turtles.



Figure 7: Coen and Leatherback turtle

Genillio Hassell (17 years old) accompanied STENAPA staff to the WIDECAST Annual General Meeting (January 2005) and to the XXV Symposium of Sea Turtle Biology and Conservation. Genillio attended all meetings as well as posters session. Genillio recognized that this experience was valuable and gained much from this week of events. Genillio was accompanied and supervised by his teacher Etienne De Vries. All expenses for this trip were funded by AMFO Sint Maarten and the Sea Turtle Symposium Committee.

Antonio Flemming (18 years old) graduated in June 2004 and was assigned to work at STENAPA for the month of July 2004. This Vacation Job Programme was recently implemented by the Island Government to give young graduates an opportunity to obtain work experience before pursuing studies abroad. Antonio helped with night patrols, nest inventories and hatchling recovery.



Figure 8: Antonio inventorying a leatherback nest

B) Financial management

Accounting

STENAPA Treasurer Jana Mason volunteered time for maintaining the accounting for the Sea Turtle Conservation and Monitoring Programme.

Fund-raising

This programme is self sufficient within the STENAPA programme and has been funded through a number of grants that have paid for the salary for the Turtle Programme Coordinator, a new vehicle dedicated to the Turtle Programme, travel to the WIDECAS AGM and XXIV Symposium in Costa Rica in February 2004 and travel to the WIDECAS AGM and XXV Symposium in Savannah Georgia in January 2005.

C) Publication and data sharing

The following correspondence and assistance was given for publications and to exchange information:

- May: Nature Conservancy Eastern Caribbean Program, Raquel Seybert: Sea Turtle Data Collection.
- June: WIDECAS Project Officer, Maria Perez: survey completion on illegal trade of Sea Turtle Product.
- July – September: correspondence with Adolphe Debrot from Carmabi Foundation in Curacao for publication of a paper on nesting sea turtle in the Dutch Antilles: “Noteworthy sea turtle nesting records for the Netherlands Antilles”.
- August: correspondence with WIDECAS Director, Dr. Karen Eckert. Information submitted for a manuscript written by Dr. Eckert to be published in the Journal of the Center for Maritime Research (MARE), University of Amsterdam.
- September: correspondence with World Turtle Trust Director, Laurie McKeon, STENAPA submitted a photo of Zeelandia beach for the new WTT brochure.

D) Achievements 2004

Beach clean ups

A series of nine beach clean ups were organized by STENAPA in 2004 (Annex 2). The purpose of these clean ups is to remove as much debris as possible to facilitate access to the beach for nesting females and to the sea for hatchlings. Adjacent to Zeelandia beach is an operational landfill called Smith Gut. Since its creation (2003), increasing amounts of debris have been reported (by locals and visitors) on Zeelandia beach. One resident reports: "Since Smith Gut landfill has opened, every time I go line fishing on Zeelandia beach, I hook trash such as plastic sacs...".

Further south on Turtle beach is an old landfill (Figure 9). Although it was closed down in 2003, the turtle programme coordinator has observed sporadic use of the landfill by residents while on day patrols. This landfill still spills over on the beach with high seas. Marine Park rangers are continuously picking up plastic bags afloat at sea while patrolling.



Figure 9: Closed landfill on Turtle Beach (still being used)

Beach mapping

One complete mapping of all the beaches on the Atlantic side was created using Microsoft Excel. The mapping was conducted with the assistance of volunteers Naomi Osborne and Sheila Morrison. The technique used for mapping is as follows, a team of two people records coordinates along the beach, at both the high water line and the vegetation line at intervals of five meters. It took three full days for STENAPA team to register the mapping data for Zeelandia, Turtle beach and Lynch Beach. All nests were added to the map for a bird's eye view of nesting sites (Annex 4).

Law enforcement

Sand mining

Previous to 2003, Zeelandia beach was heavily sand-mined. This beach was the only source of sand for construction. The demand for sand increased in part due to the growing number of medical students enrolling at the local medical school and needing housing. In 2001, STENAPA

successfully lobbied the Island Government to stop sand-mining activities and apply the SPAW and CITES treaties signed in 1991. Since 2002, local company TRICO Supplies has imported construction sand and, with the support of the St Eustatius Police enforcing the legislation, sand mining drastically decreased.

Beach parties

On June 11, STENAPA was approached by Chief of Police Inspector Look as Gwendolyn van Putten High School requested a permit to conduct a party on Zeelandia Beach for its graduating class. Since this party was involving use of fire (BBQ) and was going to take place from sunset during a period of Leatherback turtle hatchling emergence, the Marine Park recommended that the party be moved to the Caribbean side "Gallows bay" where no nesting of sea turtles had been previously recorded.

Staff training

In 2004, programme coordinator Rozenn the Scao was able to attend the XXIV Symposium on Sea Turtle Conservation and Biology and the WIDECAST AGM 2004 meeting in Costa Rica (February 2004). Attending these two conferences was fruitful for the programme. Attendance at both meetings was an eye opener about similar conservation programmes in the Caribbean and abroad.

Volunteer supervision

In 2003, limited patrolled supervision by staff occurred due to the vital need of raising funds for 2004 nesting season. In 2004, increase in patrol supervision by staff and interns was achieved and 80 % of night patrols were supervised by the Coordinator.

Dedicated Vehicle for the Sea Turtle Programme

In August 2004 STENAPA crew were able to greatly increase night and sunset patrols on six nesting beaches on Statia. The new vehicle allowed to increase data collection for the programme. Staff were happily surprised by the number of nesting events recorded and nest monitoring conducted thanks to this vehicle.

E) Recommendations for 2005

Participation of Volunteers should continue

The *Working Abroad* volunteer programme started in 2003 and STENAPA internship programme began in September 2001. Without assistance from these volunteers, the sea turtle monitoring programme could not continue as intensely as currently planned.

Regular patrols at night and at sunset

2005 patrols will be conducted in the same way as 2003 (phase 2) and 2004 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 and Kay Bay will continue to be monitored for nests.

Staff Training

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

Sunset emergence monitoring

In 2004, STENAPA increased sunset patrols to monitor nest emergence frenzy. In 2005 STENAPA will continue and monitor nest emergence at sunset and at night.

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. In 2004, staff were able to increase data collecting and mapped a wider portion of beach. In 2005, the aim will be to map all nesting beaches.

Education

STENAPA will continue with its sea turtle education programme lead by Dominique Wissenberg through the DCNA project (school and business presentations). In 2004 STENAPA launched its first public radio show to talk about environmental issues including sea turtle protection. It is hoped that the radio show will continue providing there is necessary funding. STENAPA has two after-school programmes in which primary school children (grades 5-6) are introduced to sea turtle conservation among other environmental issues. Both these programmes will be ongoing in 2005. In 2004, a small amount of residents participated in sea turtle monitoring field work and three high-school students were directly involved with STENAPA programmes and sea turtles conservation. It is hoped that participation will increase in 2005

Waste management and roaming animals

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

VI Acknowledgments

This programme would not be in force without the involvement of STENAPA staff and board members and many local and international volunteers. STENAPA Foundation wishes to recognize its staff, interns and *Working Abroad* Volunteers that have contributed and offered support to the 2004 sea turtle conservation and monitoring programme

The St Eustatius Sea Turtle Conservation programme would not be operational without financial assistance from AMFO Sint Maarten, IdeaWild, Knap Fund, The Sea Turtle Symposium Committee, WIDECAS, Working Abroad and World Turtle Trust.

For sharing their expertise, recommendations and support, we wish to especially thank Dr Karen Eckert (WIDECAS) and Paul Hoetjes (MINA/VOMIL).

Special thanks to Jessica Berkel, Martine Cotten, Dr Jan and Corrie van Duren, Sheila Morrison, Naomi Osborne and Joanna White for their assistance.

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VII Annexes

Annex 1: Press release (Parks Foundation tags its first turtle of 2004 season)

Parks Foundation tags its first turtle of 2004 season

ST. EUSTATIUS--The St. Eustatius National Parks Foundation Stenapa, began its third year of patrolling the beaches of the island to monitor sea turtle nesting activities last week.

On the first night, a nesting leatherback turtle was observed and tagged on her flipper. Her nest, which was made in an eroding area, was relocated to a safer region of the beach.

Stenapa's Sea Turtle Monitoring Programme is sponsored by Wider Caribbean Sea Turtle Conservation Network WIDECAST and by World Turtle Trust. The Stenapa patrol crew of two includes Programme Coordinator Rozenn Le Scao and high school student Coen Cherubin of Gwendolyn van Putten School.

The pair started their patrol at 8:00pm and finished at 4:00am. Their first night was successful, as they spotted a nesting leatherback turtle. The nest was in an area susceptible to flooding, therefore the patrol crew had to collect the eggs and relocate the clutch.

The following night, the crew noted that the site where the leatherback had first dropped her clutch was flooded. Without the help of the Stenapa crew, the nest would have been lost.

Cherubin, a Stenapa intern, said that his first night patrol was not what he had expected. "It was wonderful," he said, "and it was the first time I ever saw a leatherback turtle. At first, I was afraid to touch her, but I soon realized that she is a gentle animal. It's a great learning experience."

Leatherback turtles are listed as critically endangered and are protected under national and international laws. Stenapa greatly appreciates Cherubin's work and plans to continue working with students.

Stenapa will conduct a training programme on Thursday, May 13, for anyone who would like to participate in the Sea Turtle Monitoring Programme. The training will start at 3:00pm at the Marine Park Office. Interested persons may call 318-2884 or stop by the office for further information.



Coen Cherubin with a nesting leatherback turtle.

Annex 2: Press release (Volunteers clean Zeelandia Beach)

THE DAILY HERALD, Friday April 11, 1997

Islands



Nature Parks' staff, volunteers and Snorkel and Junior Ranger Club members, as they prepare to clean the beach.

Volunteers clean Zeelandia Beach

ST. EUSTATIUS—The St. Eustatius National Parks Foundation (STENAPA) sponsored a beach clean-up on Zeelandia Beach Wednesday.

The clean-up was part of the Snorkel Club and Junior Ranger Club activities for children and youths. STENAPA staff members, five volunteers and six Snorkel and Junior Ranger Club members participated.

Nature Parks Manager Nicole Esteban said the last beach cleanup took place about six weeks ago. Since then, a lot of debris has again accumulated on the beach, mainly consisting of plastic bottles for outboard oil, motor oil, water, sunscreen, glass bottles, Styrofoam cups and fishing nets.

Much of the debris was collected from downwind of Smith's Gut entrance in the vicinity of Statia's landfill.

Esteban said that beach cleaning is particularly important at the moment because of the start of the turtle nesting season. The first hawksbill turtle nesting activity took place on Zeelandia Beach earlier this week.

Regular beach cleaning activities will take place during the turtle season until November.

STENAPA appealed to the public to clean up after a visit to the beach. Marine turtles, in particular the soft-shelled Leatherback turtles, are easily injured by debris left on the beach.

RAM'S FOOD WORLD
TEL: 5422800

TODAY'S HOT PLATE
aloped Potatoes
served with
New Curry Goat
\$3.99
WOP Every DAY

Annex 3: Guidelines for visitors to the St Eustatius Sea Turtle Monitoring Programme at Zeelandia Beach

St Eustatius National and Marine Parks Foundation (STENAPA) started its monitoring programme in 2001. In the Netherlands Antilles all sea turtles and their habitats are protected. The Marine Park is part of the Wider Caribbean Sea Turtle Conservation Network and follows WIDECAST protocols to carry out with monitoring of sea turtles nesting on Statia. As a visitor and guest to the programme, we ask that you please closely follow these guidelines:

- Because the Marine Park will be conducting field work, we ask that no more than 2 guests visit the beach per night. Visitors must remain with the group at all time unless further advice from Marine Park personnel.
- We ask that guests sign this waver at the National Parks office before joining a patrol. This also allows for Marine Park field workers to know when visitors are going to join a patrol.
- We ask that you arrange your own transport to Zeelandia beach since the Marine Park does not provide transportation for visitors to and from the beach.
- NO FLASH PHOTOGRAPHY is allowed. The Marine Park patrol will be taking flash photography only when needed. You are welcome to leave your email with the Marine Park and we will gladly forward pictures of sea turtles to your email address.
- The use of flashlight by visitors is not permitted unless a red filter is placed over the light (The Marine Park will not provide red filters). Improper use of lights may deter a nesting female and disorientate hatchlings
- Be aware that hatchlings are emerging from nests and you will be asked to walk right behind field workers so that no hatchlings are injured or killed by foot steps. Note that hatchlings will only be handled if they are trapped or have flipped over on their back, this will be performed by Marine Park personnel.
- We asked that you closely follow any requests by Marine Park field workers. For instance, you will be asked to stand behind a nesting turtle, be aware that contact or light touching with a nesting female is permitted only after all eggs have been deposited and she is on her way back to the ocean.

Finally, we would like to thank you in advance for observing these guidelines. Be aware that Zeelandia beach hosts a low number of nesting sea turtle and that you may not see any turtles while on patrols. You should bring an extra layer of clothing and water/snacks for rest periods between patrols.

I would like to participate in the patrol taking place on the night of _____

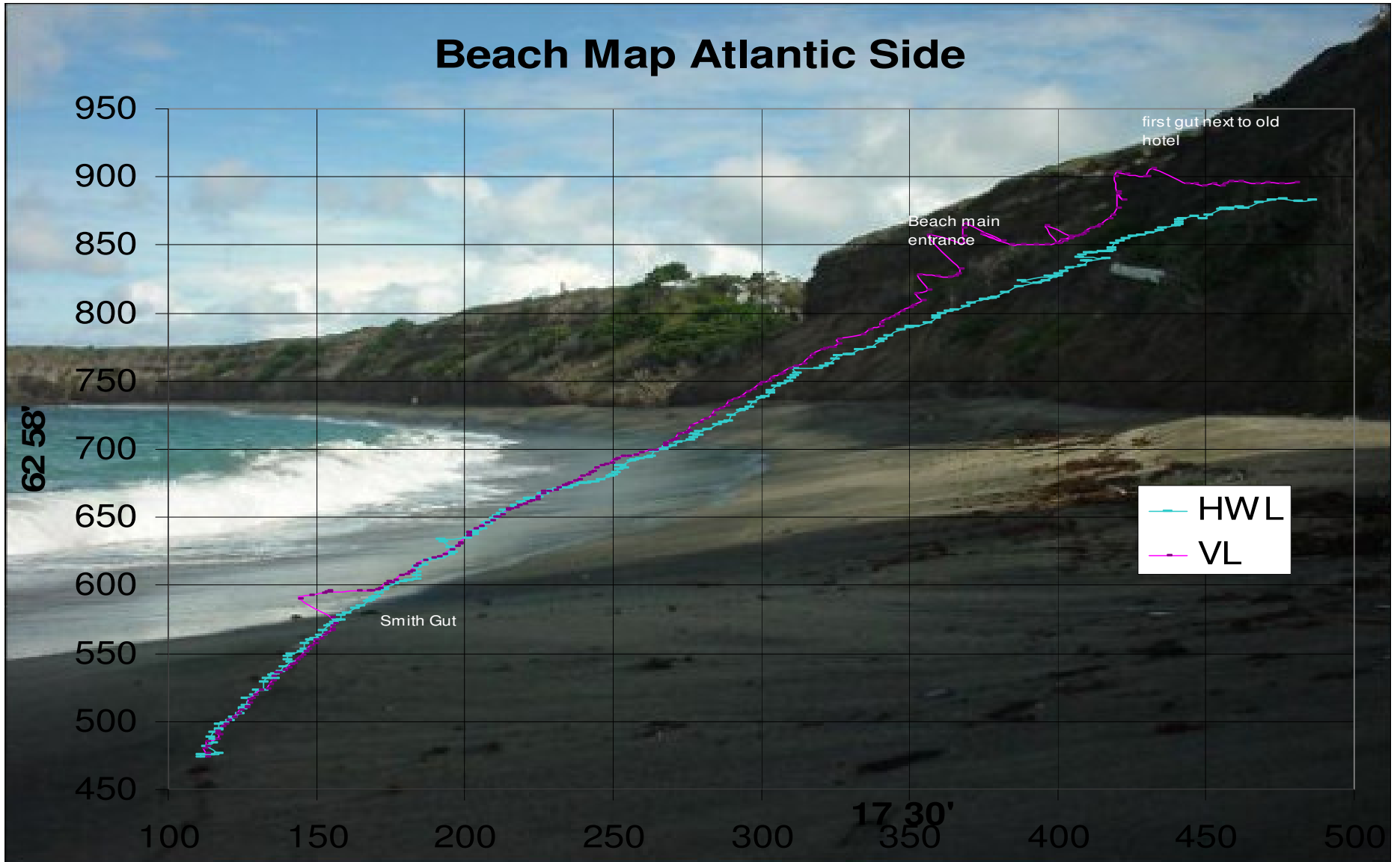
I have read and acknowledge these guidelines and will respect these regulations.

Name: _____

Signature: _____

Date: _____

Annex 4: Map of beach on the Atlantic side (Zeelandia)



Annex 5: Relevant legislations

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