



## **PROGRESS REPORT 2008**

**May 2009**

STCB is a member of



**WIDECAST**

*Wider Caribbean Sea Turtle Conservation Network*

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## **Welcome...**

We proudly present the STCB Progress Report for 2008. In it you will learn of the range and extent of last year's activities carried out to further our mission: *to ensure the protection and recovery of Bonaire's sea turtle populations throughout their range.*

Our 2008 work plan focused on the following objectives to help us achieve our mission:

### **Science**

Improved understanding of sea turtle biology through research in order to guide conservation efforts in benefit of these endangered species.

### **Conservation**

Effective management, conservation and advocacy on behalf of Bonaire's sea turtles and their habitats, resulting in improvements in environmental policy, law and enforcement that ensure conservation and recovery; clean nesting sites; and abundant, high quality foraging habitats.

### **Education and Public Awareness**

Increased public awareness of, and concern for, sea turtle conservation, resulting in increased volunteerism and participation in conservation policy, action and advocacy.

### **Training and Collaboration**

Provision of training and collaboration opportunities for conservation volunteers and workers that results in increased capacity, locally and throughout the region, for sea turtle conservation efforts.

### **Fund Development**

Ongoing public and private financial investment in support of the protection and recovery of Bonaire's sea turtle populations.

### **Organizational Development**

Development, maintenance, and use of systems and resources that facilitate effective operation of the organization.

Many of the activities you will read about could not have been completed without significant community support. This year we had a dedicated core of volunteers that provided us dependable crews for much of our fieldwork.

On behalf of the sea turtles of Bonaire we give our thanks to all those who volunteered and supported us in our work this past year.

We hope you find this report informative and that it encourages your support of Sea Turtle Conservation Bonaire.

Warm regards,

Bruce Brabec  
Board President

Mabel Nava  
STCB Manager

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Robert van Dam, Scientific Advisor

## **Grantors and Donors**

### **Major Contributors**

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Rotterdam Zoo  
Sea Turtle Conservation Bonaire - Netherlands (STCB-NL)  
World Wildlife Fund - Netherlands (WWF-NL)

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Cher Floyd - JMFA-Greggy Girl, Inc.  
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Carolyn Siefman  
Buddy Stockwell  
Ann Thomas  
James & Dorothy Voyles

Anonymous contributions

## **Conservation Partners, In-Kind Services, Donors & Core Volunteers**

Barbel Heusinkveld  
BITS (Hanny Kalk & Gijs Hoogerkamp)  
Lee Bray & Andy Uhr  
Bruce Bowker's Carib Inn  
Buddy Dive Resort  
CARGILL Salt Bonaire NV  
Doi Boekhoudt  
Gaia Productions  
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Jong Bonaire  
Claudia & Marco di Gianvito  
Patrick Holian  
Kantika di Amor  
Ralph 'Moogie' Stewart  
NetTech N.V. (Jake Richter & Susan Davis)  
SELIBON NV  
SGB students  
STINAPA Bonaire - National Parks Foundation  
Support Bonaire Inc.  
The Beach Shop at Harbor Village  
Tina Lindeken  
Wannadive Bonaire  
Wider Caribbean Sea Turtle Network (WIDECAST)  
Anne Zaat

## **RESEARCH AND CONSERVATION ACTIVITIES**

### **DNA STUDY**

#### **Origins of Bonaire's sea turtles: where were our feeding ground turtles born and how did they arrive here?**

The nearshore waters surrounding Bonaire host a range of habitats that are used as foraging grounds by juvenile sea turtles. Since 2003, Sea Turtle Conservation Bonaire (STCB) has conducted detailed in-water surveys in many of these habitats, where turtles have been captured, tagged and sampled. While we've found that most areas are used to some extent, several habitats are used much more intensely, such as the sea grass beds and mangroves at Lac, which are grazed by numerous green and hawksbill turtles. Juvenile sea turtles will typically stay for several years in such habitats while they grow up and before moving on to adult habitats elsewhere, but where they were born before they arrive has always been a mystery.

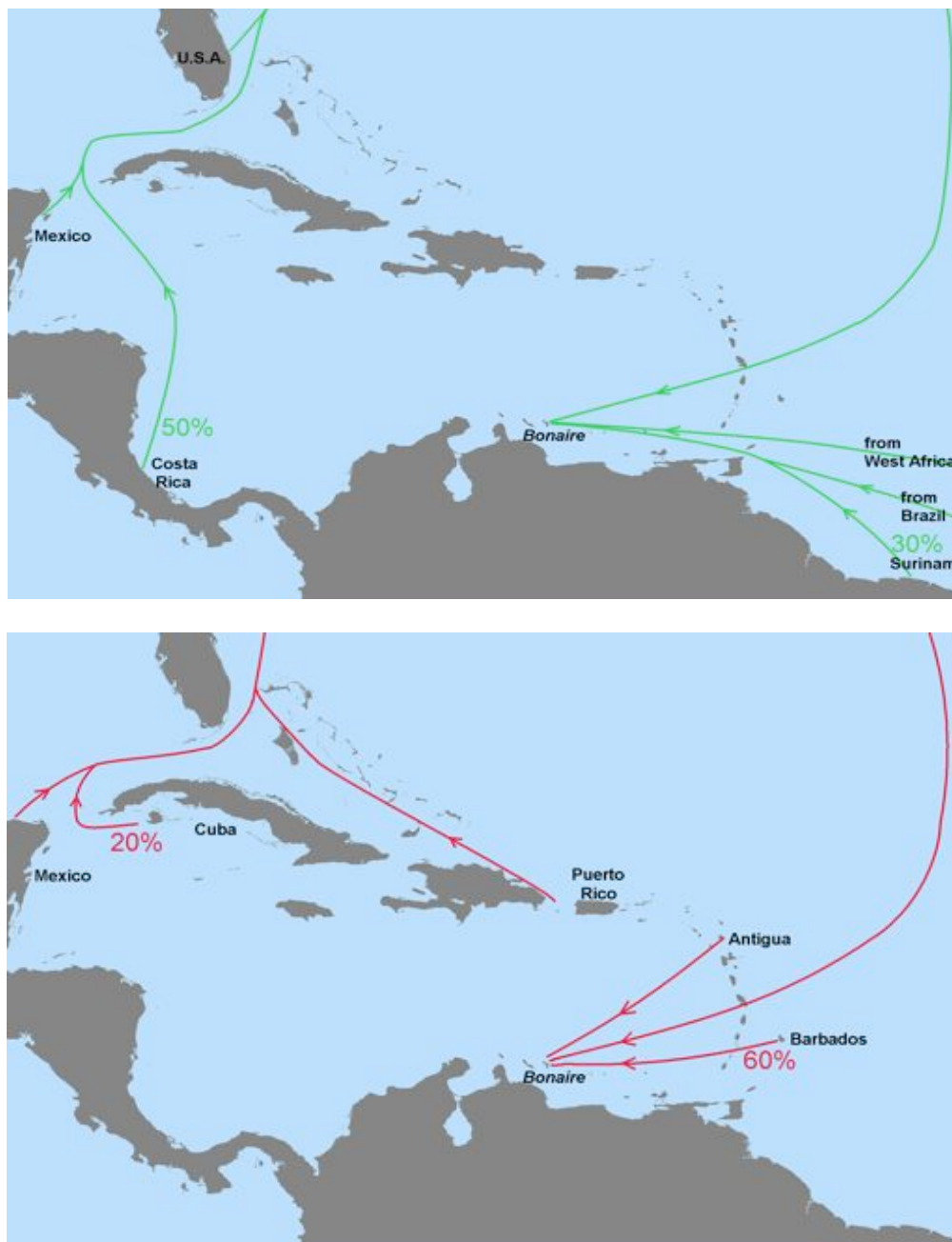
While nesting for both species does occur on Bonaire, too few nests are laid here to account for the number of turtles found on the island's foraging grounds. Results of a genetic study with juvenile green and hawksbill turtles now shed new light on where these animals come from.

In a collaborative study with Ms Ximena Velez of the University of Puerto Rico, STCB sent tissue samples for analysis to measure the genetic variation in 75 hawksbills and 94 green turtles. Compared with the few locations in the Caribbean where similar work has already been conducted, Bonaire's green turtles exhibited the highest genetic diversity so far observed. This means that Bonaire's juvenile green turtles were born on many different nesting beaches, with some individuals coming as far as from Brazil and the West Africa. Half of the green turtles sampled were born on the Caribbean's largest green turtle rookery at Tortuguero, Costa Rica, with another 30% originating on the beaches of Surinam. Other nesting beaches in the Yucatan Peninsula (Mexico), Florida (USA), Aves Island (Venezuela) and Trindade (Brazil) also contribute green turtles to Bonaire's foraging aggregation.

Similarly, the juvenile hawksbills living around Bonaire were traced to a large extent to the nesting grounds of Barbados (60%) and Cuba (20%). A mix of other locations, such as Antigua, the Yucatan Peninsula (Mexico) and Puerto Rico, also contribute hawksbills to the aggregation in Bonaire's waters.

Because sea turtle hatchlings leaving the nesting beach are so small and vulnerable, no effective way has been found of marking individuals with external or internal tags to track their movements. But by using genetic techniques to analyze small tissue samples, it is now possible to trace where sea turtles were likely born. Since baby turtles are thought to travel largely via ocean currents, we can then construct maps indicating how these animals arrived at Bonaire. The maps below illustrate the major

flows of the small pelagic-stage turtles from the beaches where they were born until arrival in Bonairean waters.



**Figure 1.** Origin of Bonaire's juvenile foraging ground green turtles (top) and hawksbills (bottom) and the likely routes taken to reach the island mostly by drifting with the ocean surface currents.

Once at Bonaire these turtles are expected to spend 5-15 years as residents while growing into almost adult-sized individuals before moving on to foraging habitats elsewhere.

Through transmitter work used to track adult turtles breeding on Bonaire, STCB has already shown how these large animals migrate long distances towards foraging grounds as far away as Mexico, Nicaragua, the

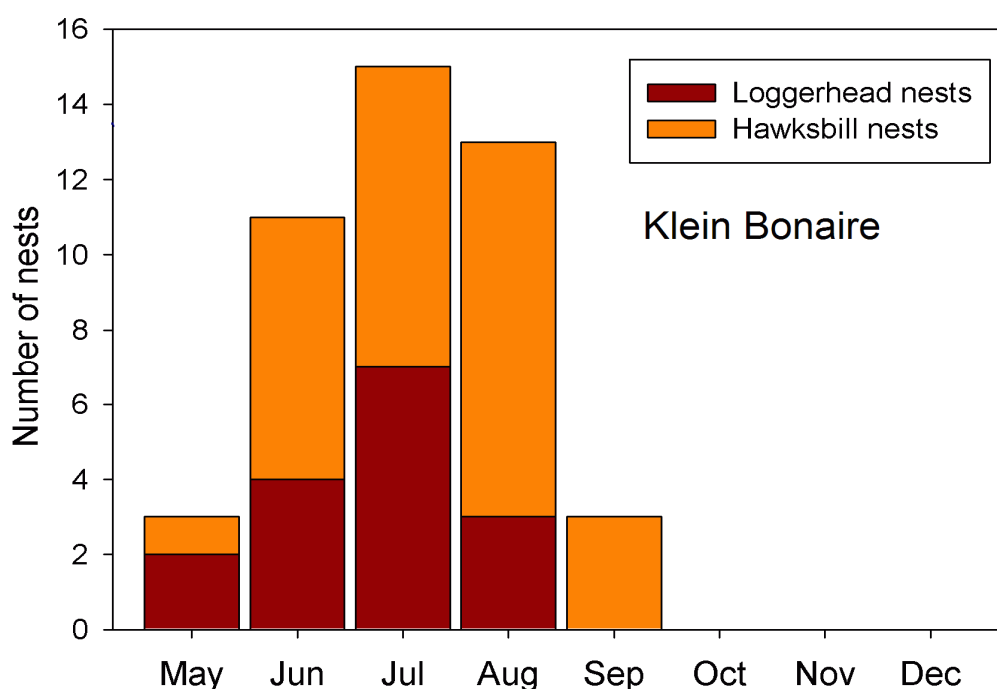


Dominican Republic and Venezuela. The results of the current genetic study further emphasize how separate sea turtle habitats in the Caribbean - and far beyond - are also connected through the widespread movement of smaller, immature turtles. All these turtle movements mean that if conservation actions in favor of sea turtles are to be effective, their reach must extend well beyond the protection of animals in a single location.

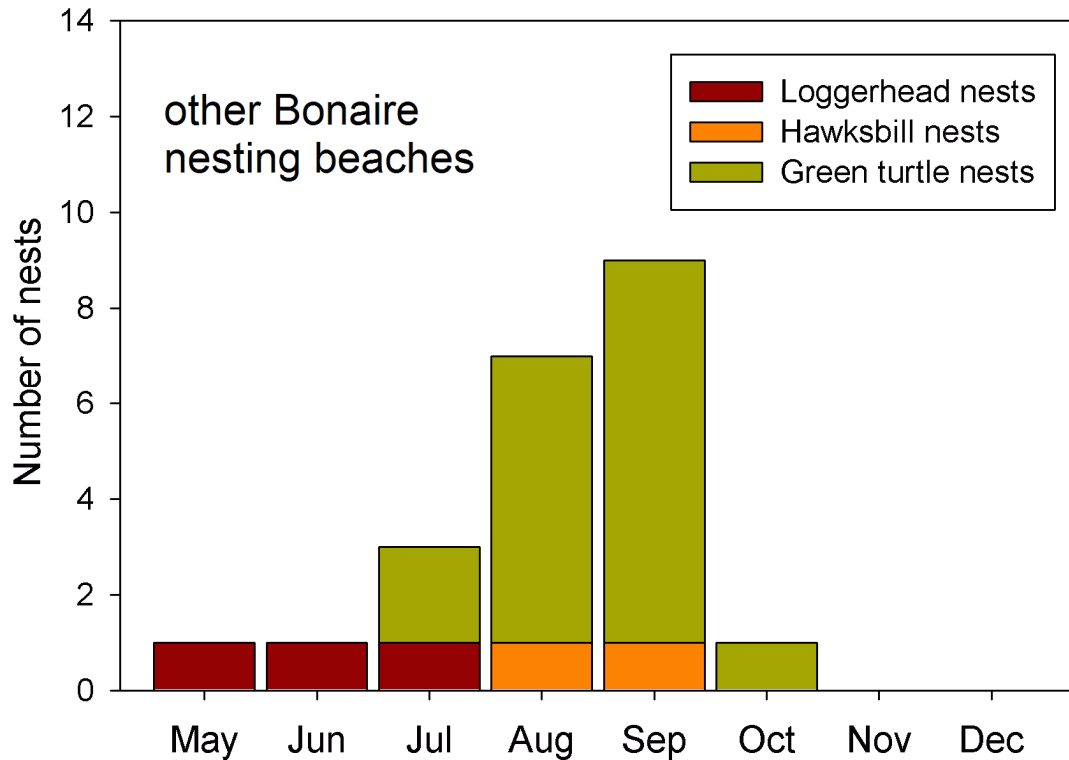
## NESTING BEACH MONITORING

The beaches of Bonaire and Klein Bonaire were surveyed periodically for sea turtle nesting activity, with emphasis on the most actively used nesting area around "No Name" on Klein Bonaire. No Name beach was visited with greatest frequency and is Bonaire's index beach for measuring annual fluctuations in nesting activity.

Turtle nesting activity was first registered during 2008 on May 19<sup>th</sup>, when a hawksbill nest was discovered at No Name beach. The first loggerhead nesting of the 2008 season also occurred at No Name beach, Klein Bonaire, on May 21<sup>st</sup>. A nest found at Playa Chikitu on July 8<sup>th</sup> marked the start of nesting for green turtles.



**Figure 2.** Temporal distribution of nests laid by loggerheads, hawksbills and green turtles on No Name beach, Klein Bonaire.

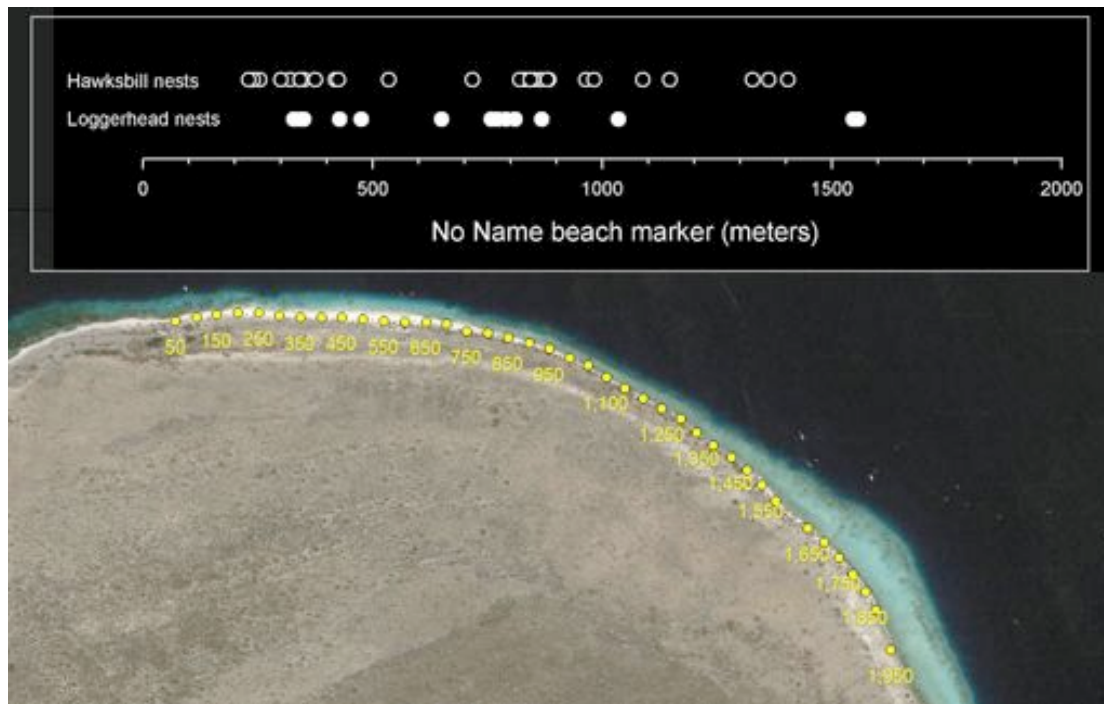


**Figure 3.** Temporal distribution of nests laid by loggerheads, hawksbills and green turtles on the other beaches of Bonaire.

During 2008, a total of 16 loggerhead and 29 hawksbill nests were recorded on No Name beach, with the months of May and June showing the greatest nesting activity for loggerheads, whereas hawksbills were most active in June and July (Figure 2).

Both loggerhead and hawksbill nests were fairly uniformly spread out along No Name beach (Figure 4). Compared to the 49 nests counted there in 2007, the total number of turtle nests deposited at No Name beach remained stable. Loggerhead activity decreased from 23 nests laid in 2007 to 16 in 2008, reflecting perhaps two fewer nesting females. Hawksbill activity increased from 26 to 29 nests, indicating the presence of perhaps one additional nesting hawksbill at Klein Bonaire. Such stochastic annual fluctuations are typical for a population consisting of only a limited number of individuals.

Nesting size and productivity were measured through nest revisions after hatching. At No Name beach, revision of 12 loggerhead nests yielded an average nest size of 138.2 eggs (range 106 – 181) and average hatching success for these nests was 81.9%. Revision of 23 hawksbill nests yielded an average nest size of 146.2 eggs (range 75 – 191) and hatching success of 75.8%. Both hawksbill and loggerhead hatching success rates were slightly higher than in 2007, and are at healthy levels observed for these species breeding in the Caribbean.



**Figure 4.** Diagram of individual hawksbill and loggerhead nest locations along No Name beach, Klein Bonaire. Yellow dots indicate beach markers.

The estimated number of hatchlings produced at the index beach of Klein Bonaire during 2008 can be calculated from the total number of nests, average nest size and average hatching rate. The 16 loggerhead and 29 hawksbill nests laid along No Name resulted in approximately 1810 loggerhead and some 3210 live hawksbill hatchlings emerging from their nests. The total of 5020 turtle hatchlings estimated for emerging from No Name beach in 2008 is essentially equal to the number of hatchlings produced there during 2007.

Nesting activity on the rest of Bonaire during 2008 was concentrated at Playa Chikitu within the Washington Park, where 17 green turtle nests were detected. No nests were observed on the other beaches within the Park. Three loggerhead, one green turtle and 2 hawksbill nests were deposited at other beaches along the southwest coast of Bonaire. One additional loggerhead nest was recorded on the beach nearby the airport. A nesting attempt by a leatherback was recorded at Cai in June, but no eggs were apparently laid by this turtle.

In a new effort to characterize the thermal ecology of the No Name nesting beach at Klein Bonaire, two temperature WaterPro dataloggers were deployed at nest depth in a representative section of the beach on May 30<sup>th</sup> 2008. The instruments are programmed to record ambient temperature every hour and can be left unattended for over 1 year. One datalogger was placed at 45 cm depth under an "olijfje" bush (*Bontia daphnoides*), while the second was left at the same depth in open sand ~2m in front of the vegetation (Fig. 5). Dataloggers will be recovered in

2009 for data downloading, then replaced at the same location to continue with temperature profiling.



**Figure 5.** Deployment of two temperature dataloggers in the sand at No Name beach, Klein Bonaire, for long term measurement of sand temperatures at nest depth.

## FORAGING GROUND SURVEYS

Foraging ground surveys were conducted by snorkeling along the entire west coast of Bonaire, all around Klein Bonaire, and in front of Lac Bay (Figure 6). In addition, turtle surveys using the netting technique were done inside Lac Bay. The purpose of these snorkeling surveys is to tag, sample and measure individual turtles, and to establish catch-per-unit-effort measures of turtle abundance. For comparison, the surveyed area was separated into sectors as follows: Klein Bonaire, Northwest and Southwest Bonaire, the reef outside of Lac Bay (Southeast), and Lac Bay proper.

|                   | Total survey hours |       |       |       |      |
|-------------------|--------------------|-------|-------|-------|------|
|                   | 2003               | 2005  | 2006  | 2007  | 2008 |
| Klein Bonaire     | 25.88              | 24.54 | 17.45 | 13.22 | 11.2 |
| Bonaire Northwest |                    |       | 38.68 | 25.18 | 18.5 |
| Bonaire Southwest |                    |       | 23.85 | 20.17 | 13.7 |
| Bonaire Southeast |                    |       | 14.25 | 9.85  | 4.8  |

**Table 1.** In-water snorkeling survey effort in hours by sector from 2003 to 2008.

From 2007 to 2008, all surveyed areas of Bonaire again saw increases in green turtle abundance (Table 3). With the exception of the Lac Bay turtles, the green turtles encountered during snorkeling surveys are mostly immatures smaller than 40 cm straight carapace length (SCL). Locations with particularly high green turtle abundance include Ebo's Reef at Klein Bonaire (associated with the sea grass beds in the shallow lagoon there), the Andrea dive site (up until storm Omar perturbed the area), and the Marine Reserve south of Bopec. The reef in front of Lac Bay harbors a very high density of animals (see "Bonaire Southeast" in Table 2 and Figure 7), which are associated with the Lac Bay sea grass pasture foraging grounds.



**Figure 6.** Sectors of coastal areas of Bonaire and Klein Bonaire covered during in-water surveys.

Hawksbill turtles occur in lower numbers than green turtles throughout Bonaire and Klein Bonaire, and since 2006 their abundance now appears to be relatively stable throughout the surveyed areas (Table 2). Similarly to green turtles, a high density aggregation of hawksbill turtles is found on the reefs adjacent to Lac Bay (Figure 8), and these animals also use the bay for foraging.

|                   | Green turtles                    |                 |                   |                  |                   | Hawksbill turtles |                 |                 |                 |                 |
|-------------------|----------------------------------|-----------------|-------------------|------------------|-------------------|-------------------|-----------------|-----------------|-----------------|-----------------|
|                   | 2003                             | 2005            | 2006              | 2007             | 2008              | 2003              | 2005            | 2006            | 2007            | 2008            |
|                   | average $\pm$ standard deviation |                 |                   |                  |                   |                   |                 |                 |                 |                 |
| Klein Bonaire     | 4.85 $\pm$ 3.95                  | 2.64 $\pm$ 2.19 |                   | 5.18 $\pm$ 3.50  | 4.01 $\pm$ 4.79   | 1.29 $\pm$ 1.17   | 1.16 $\pm$ 1.34 | 1.76 $\pm$ 1.83 | 1.48 $\pm$ 1.50 | 1.70 $\pm$ 1.91 |
| Bonaire Northwest |                                  |                 | 2.12 $\pm$ 2.44   | 3.41 $\pm$ 3.35  | 6.20 $\pm$ 5.19   |                   |                 | 1.45 $\pm$ 1.53 | 1.01 $\pm$ 0.93 | 1.41 $\pm$ 0.95 |
| Bonaire Southwest |                                  |                 | 1.01 $\pm$ 1.52   | 1.43 $\pm$ 2.12  | 3.80 $\pm$ 5.16   |                   |                 | 1.04 $\pm$ 2.06 | 0.89 $\pm$ 1.13 | 1.41 $\pm$ 1.55 |
| Bonaire Southeast |                                  |                 | 33.10 $\pm$ 25.06 | 44.1 $\pm$ 17.57 | 45.81 $\pm$ 23.68 |                   |                 | 4.17 $\pm$ 3.94 | 3.01 $\pm$ 2.42 | 2.28 $\pm$ 2.21 |

**Table 2.** Comparison of 2003-2008 “catch-per-unit-effort” survey results by sector around Klein Bonaire and Bonaire.

Netting surveys were conducted during two periods within Lac Bay: during April-May and October-November 2008. A total of 78 green turtles and 8 hawksbills were caught during these surveys. Figure 9 indicates the netting locations, aimed at areas with highest green turtle abundance as determined by observing turtles surfacing to breathe.



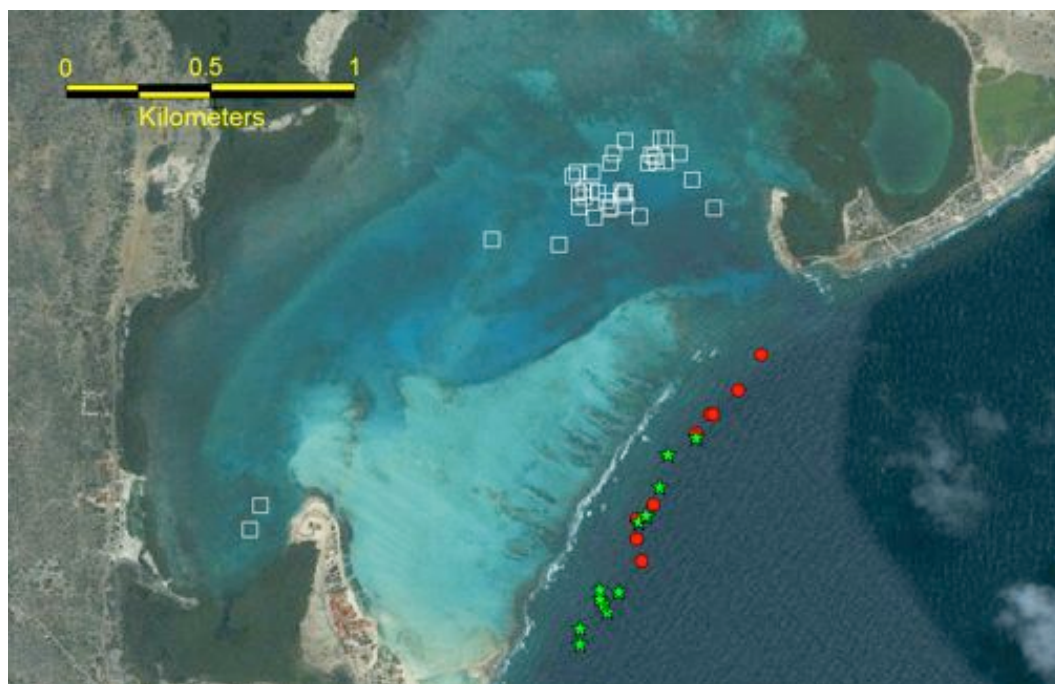
**Figure 7.** Locations where green turtles were captured during snorkeling surveys around Bonaire and Klein Bonaire.





**Figure 8.** Locations where hawksbills were captured during snorkeling surveys around Bonaire and Klein Bonaire.

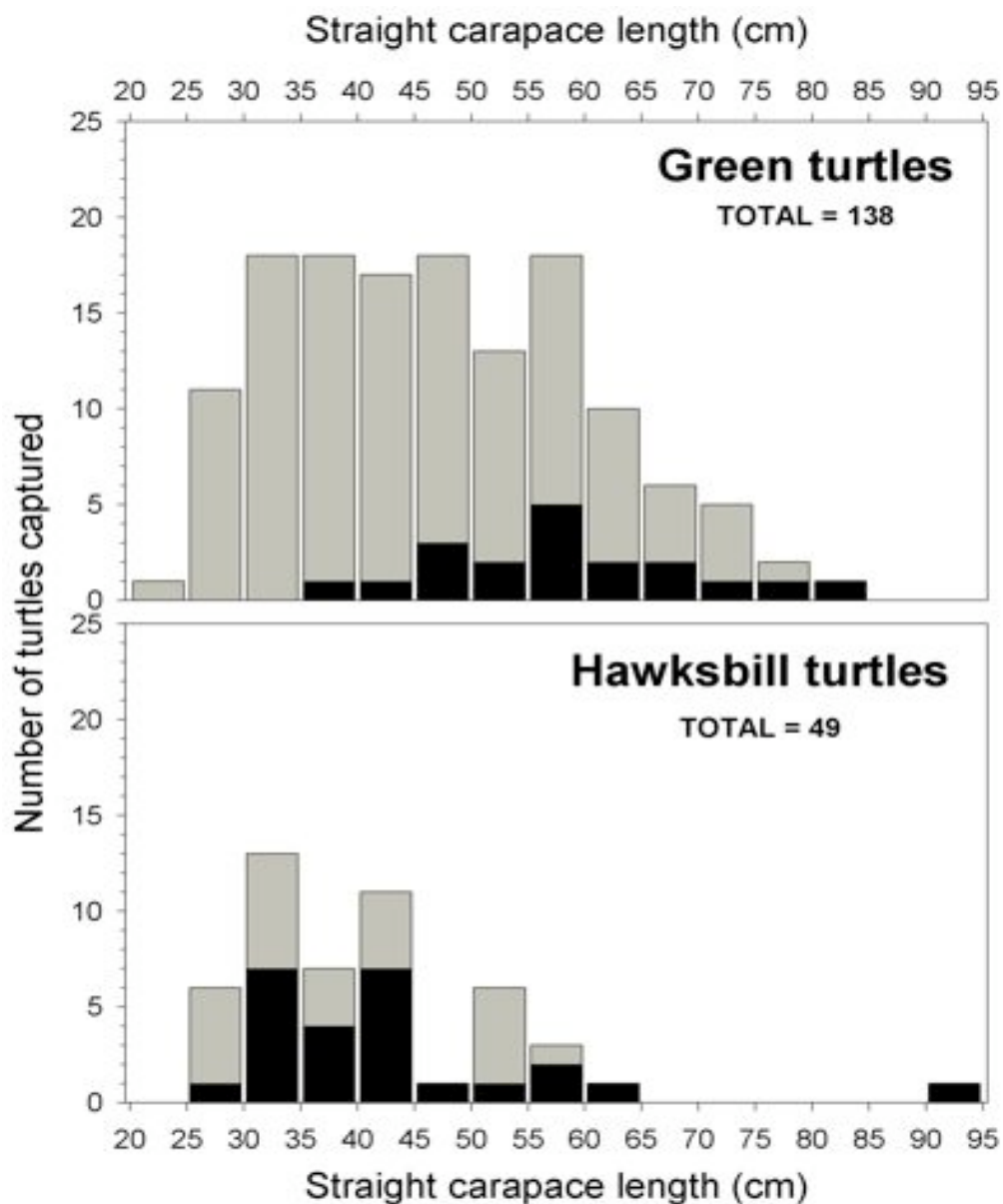
Table 3 indicates the abundance trends for both species as measured by captures per hour of netting time ("net soak time"). Whereas green turtles are vastly more abundant, their numbers have remained relatively stable. Hawksbills show a steady increase since the first netting surveys carried out there in 2003.



**Figure 9.** Netting locations inside Lac Bay (white boxes), and locations of hand-captured green turtles (green stars) and hawksbills (red circles) on the reefs outside Lac Bay.

|                                       | 2003        | 2005        | 2006        | 2007        | 2008        |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|
| Number of netting sessions            | 16          | 13          | 40          | 33          | 37          |
| Total netting hours ("net soak time") | 17.9        | 8.9         | 32.9        | 30.0        | 24.8        |
| Green turtle captures/hour            | 0.88 ± 0.76 | 4.38 ± 3.97 | 2.90 ± 2.25 | 2.42 ± 1.67 | 3.00 ± 2.66 |
| Hawksbill captures/hour               | 0.10 ± 0.28 | no data     | 0.16 ± 0.39 | 0.26 ± 0.69 | 0.35 ± 0.76 |

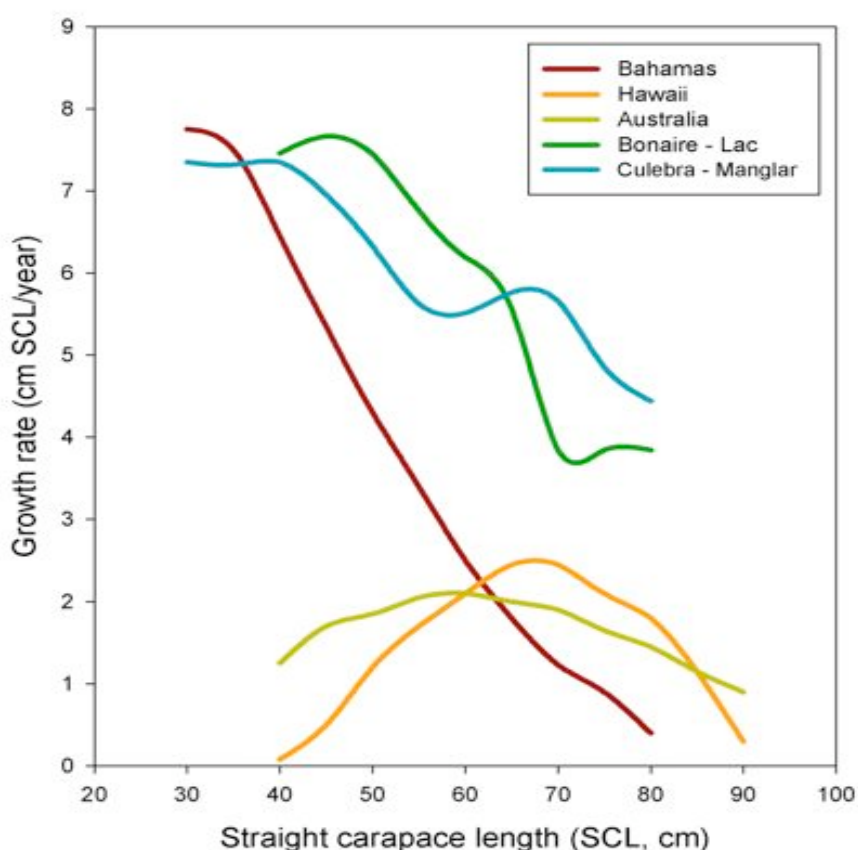
**Table 3.** Comparison of catch-per-unit-effort results for netting surveys conducted at Lac Bay.



**Figure 10.** Size distribution of hawksbill and green turtles captured, tagged and measured at Bonaire. Black bars indicate recapture of turtles tagged in previous years.



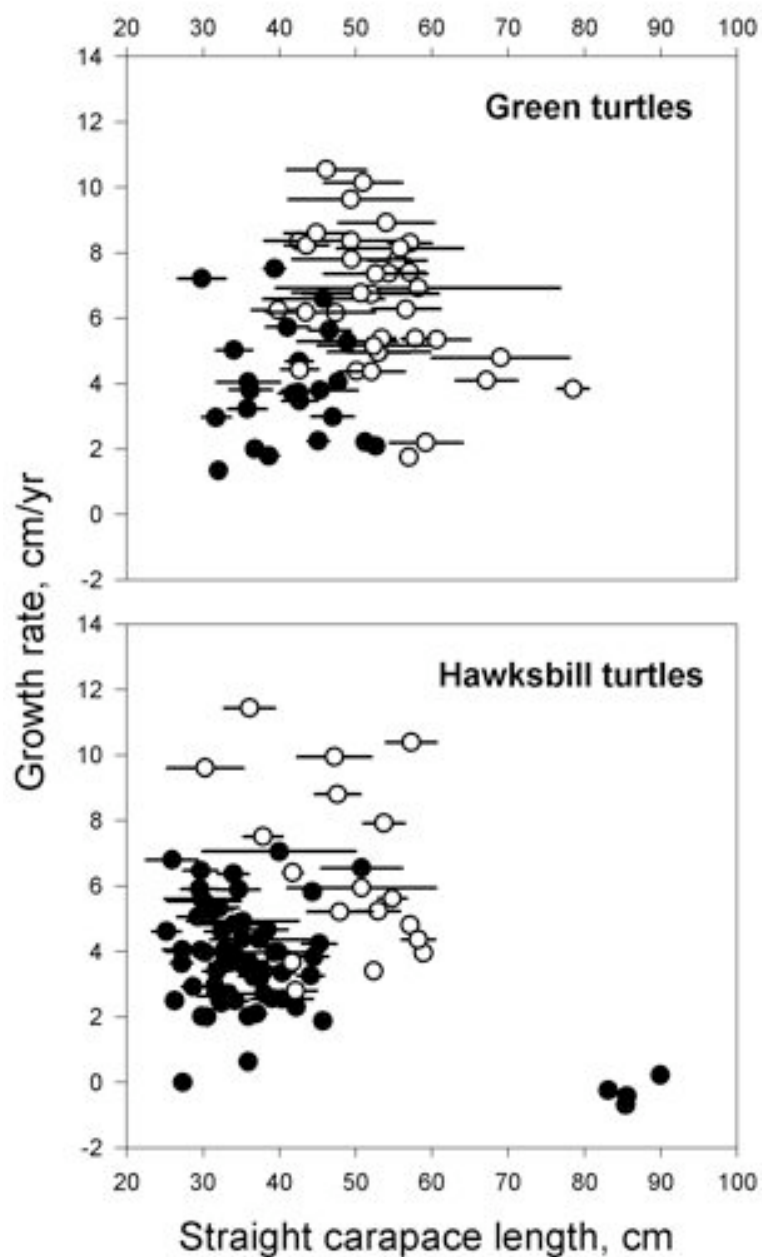
Combined, the snorkeling and netting surveys yielded a total of 49 hawksbills and 138 green turtles, of which 25 hawksbills and 19 green turtles were recaptures (Figure 10). Gathering information on movement and somatic growth rates is possible by recaptures of previously tagged turtles. Our surveys detected only one hawksbill turtle that had made a significant movement from its original capture location: juvenile hawksbill turtle 07-040 first tagged at Punt Vierkant (South-west coast of Bonaire) on February 28<sup>th</sup>, 2007, was recaptured on March 31<sup>st</sup>, 2008 at the Salt Pier. No significant movements of tagged green turtles on the foraging grounds of Bonaire or Klein Bonaire were detected through the surveys, although casual visits to the Andrea area following the passage of storm Omar (occurring around October 16<sup>th</sup>, 2008) indicates that the sizeable group of hawksbill and green turtles that foraged there has departed. Presumably, these animals dispersed to other nearby foraging areas (initial results from early 2009 surveys show that some Andrea green turtles were now to be found at Klein Bonaire).



**Figure 11.** Somatic growth curves measured for green turtles at Lac compared to those for other foraging grounds.

Recaptured turtles yielded substantial information on somatic growth rates for green turtles and hawksbills over a wide size range (Figure 12). For both species, animals caught in or near Lac Bay exhibited exceptionally high growth rates, suggesting that Lac Bay has very high quality foraging habitat. Growth rates of turtles living on the reefs along the rest of Bonaire and Klein Bonaire are more in line with those growth rates

measured in other Caribbean turtle populations. Recaptured adult hawksbill turtles did not increase significantly in body size, which is normal in such animals.



**Figure 12.** Somatic growth of hawksbill and green turtles recaptured at Bonaire, with turtles captured at Lac Bay indicated with open circles. Horizontal lines indicate the size range over which an individual's growth was recorded.

## PRESENCE OF DISEASE

Fibropapillomatosis occurs in green turtles at Lac Bay and all animals captured there are examined for the presence of external tumors. Of 49 green turtles examined in March-April 2008, 9 turtles (16.4%) exhibited some evidence of tumors (Table 4). However, only one of the 48 turtles (2.1%) caught subsequently in October-November 2008 in Lac had evident tumors. A similar seasonal variation was observed in 2007, but it is yet unclear as to why there would be such variation in tumor occurrence.

| Year | Month            | Green turtles | w/FP | Occurrence % |
|------|------------------|---------------|------|--------------|
| 2003 | March            | 14            | 0    | 0            |
| 2004 | March            | 20            | 0    | 0            |
| 2005 | March            | 46            | 8    | 17.4         |
| 2006 | March            | 56            | 13   | 23.2         |
| 2006 | November         | 37            | 7    | 18.9         |
| 2007 | March            | 50            | 8    | 16.0         |
| 2007 | November         | 49            | 0    | 0            |
| 2008 | April-May        | 55            | 9    | 16.4         |
| 2008 | October-November | 48            | 1    | 2.1          |

**Table 4.** Number of green turtles captured in Lac by survey period and occurrence of visible tumors.

## TURTLE TRACKING STUDY

Our satellite-tracking program continued to add to our knowledge of the migratory patterns and behavior of the adult sea turtles that come to Bonaire to mate and nest. After the nesting season, adult male and female sea turtles return to their resident foraging grounds. With satellite transmitters, we are able to learn where these turtles live outside of the nesting season and what routes are taken to return to those sites. A transmitter is attached to the carapace of a turtle. Signals are sent from the transmitter whenever the turtle comes to the surface to breathe. These transmissions are received by weather satellites circling the earth, and from the collected data we can then plot where the turtle is located. Learning the movement of these sea turtles helps us to identify their range states, that is, other countries that share our management responsibility for "Bonaire's" sea turtles. This information can be useful in guiding our networking and conservation activities.

Since our satellite-tracking program started in 2003, we have tracked 15 adult turtles as they returned to their resident foraging grounds. It is likely that these turtles were born on Bonaire many years ago, yet now live all around the Caribbean. From our tracking program, we know that our adult turtles can live as far as 2200 kilometers away and as close as Los Roques, only 150 kilometers to the east.

During 2008 two loggerhead turtles were tracked, 'Wiske' and 'Greggy Girl'.



STCB staff and volunteers after deploying Gregggy Girl's transmitter

## FEMALE LOGGERHEAD '**WISKE**': THE FIRST TURTLE TRACKED IN BONAIRE'S 2008 NESTING SEASON

On June 19th, the first of these transmitters was attached on a large adult female loggerhead turtle. This animal was found resting just off the dive site "Knife" at Klein Bonaire, then caught by STCB staff and volunteers and lifted on board the research boat "Nancy Too" for transmitter attachment.

The female loggerhead had a shell length of 96 cm and was estimated to weigh about 120 kg. Adult loggerhead turtles come to Bonaire to breed from May through July.

'Wiske' departed for her home foraging grounds sometime around sunset on July 10<sup>th</sup> and headed in a northwesterly direction traveling at a rate of approximately 95 km per day. 'Wiske' reached the coast of Nicaragua entering the shallower coastal shelf around July 28<sup>th</sup>. This shelf is the home to extensive reefs and coral communities and is especially important to Bonaire's breeding population. In the last several years we have tracked a total of 6 turtles to these waters off Nicaragua and Honduras. Last signals received from 'Wiske' were approximately mid-day on July 30.

Tracking of this loggerhead turtle was possible by a full sponsorship provided by the Rotterdam Zoo.



Loggerhead 'Wiske's' route from Bonaire to Nicaragua.

## FEMALE LOGGERHEAD '**GREGGY GIRL**': THE SECOND TURTLE TO BE TRACKED IN BONAIRE'S 2008 NESTING SEASON

A loggerhead nesting on Klein Bonaire was fitted with a satellite transmitter on the 4<sup>th</sup> of August 2008. Named 'Greggy Girl' after her sponsors, the approximately 120 kg animal was intercepted by the

team on her way towards the sea and a transmitter was applied to the top of her carapace. The loggerhead turtle was then released, and she quickly departed into the sea.

This female loggerhead had a shell length of 96.7 cm and was estimated to weigh about 120 kg. 'Greggy Girl' departed to her home feeding grounds on the evening of August 29<sup>th</sup> traveling to the northeast direction at rate of approximately 3 km per hour. Swinging to the south she headed directly at the Los Roques Archipelagoes. At that point she was traveling at a rate of about 65 km per day. Then, turned to the east and left Los Roques behind her, swimming north of the island of La Orchila where she started heading in the direction of the island La Banquilla.

Her rate of travel increased significantly at this point moving at a rate over 90 km per day. 'Greggy Girl' kept on moving to the east towards the northwest of Isla Margarita. Her speed decreased at that point, traveling at a daily rate of slightly over 60 km. She arrived to the Isla Margarita on September 09<sup>th</sup> near the city of Porlamar.

She covered over 660 km during her journey to get there and remained just off the east coast of Margarita Island for several weeks until we considered 'Greggy Girl' arrived to her home feeding grounds and ended the tracking of this loggerhead.

Tracking 'Greggy Girl' was possible by a full sponsorship provided by Houston, Texas-based children's wear company, JMFA-Greggy Girl, Inc.



Journey of loggerhead 'Greggy Girl' from Bonaire to Margarita island, Venezuela.



## **BEACH CLEANING**

### **Earth Day beach Clean-up**

As in past years, STCB and STINAPA organized a beach clean-up during the Earth Day celebration. Last year it was decided to prepare the beaches on Klein Bonaire for a good start of the 2008 sea turtle nesting season, which begins in May.

On Sunday, April 20, a beach clean-up was conducted successfully on Klein Bonaire. Klein Bonaire is Bonaire's most important hawksbill and loggerhead nesting beach. Maintaining unobstructed access to beaches for egg laying female turtles is extremely important to the survival of these endangered animals.



STCB staff and volunteers during the briefing before the clean-up started

A total of 90 volunteers participated during this clean-up and 105 bags of trash were collected and sorted for further classification and analysis. Volunteers were mainly residents from the island, with a large group of teenagers from the Youth Center, Jong Bonaire, along with two of their youth leaders. The Coast Guard was also part of this clean-up. Another group, students from the CIEE Research Station Bonaire, was in charge of classifying and documenting the collected trash. Results from the data collected were sent to the Ocean Conservancy.

### **STCB/STINAPA/Ocean Conservancy beach clean-up**

"The international Coastal Cleanup is the world's oldest and largest volunteers effort to clean up our marine environment. Each year, volunteers remove trash and debris from their local beaches, rivers, lakes and streams – along shorelines and under the water. Since 1986, over

five million volunteers in 123 countries have cleaned 130.000 miles of shoreline – over five times the circumference of the earth”

The Ocean Conservancy joined STCB for another Klein Bonaire Beach Cleanup in the fall, on September 14<sup>th</sup>. Collected trash was counted and categorized. The Ocean Conservancy compiles the data and produces a year report with all results. The information collected becomes part of an international database that tracks waste pollution in the world’s oceans. In celebration of a successful cleanup, a king and queen of Klein Bonaire were crowned in an “elaborate”, feet-in-the-sand ceremony. All hail to a clean Klein!



Queen and King of Trash

## **LAC BAY - BUOY PLACEMENT PROJECT PROPOSAL-PHASE 1**

This new project was developed in response to an urgent need to protect the sea grass beds of Lac. The initiative grew from discussions between STCB and Progressive Environment Solutions (PROES). STINAPA was invited to join as a partner, and two private businesses joined as financial partners in the first stage: Jibe City and The Windsurfing Place.

The project is the replica of an old project put in place by the Marine Park in 1999 and which failed due to a lack of man power and community support. Taking in consideration the reasons why this project failed the first time we have added new components of education and public awareness to this effort. Phase one is in process. Meetings have been



held, presentations have been given, and buoys are being installed. Following is a summary from our project proposal.

#### What

- < Install a series of buoys and swim lines at Lac to clearly designate the following important activity boundaries and sensitive areas: 1) the white zone boundary of blue zone activities (i.e. windsurfing and unguided kayaking); 2) the sea grass beds at the shoreline of from Jibe City to the windsurf competition area and; 3) the coral dam.
- < We proposed, through cooperation between STINAPA-Bonaire, Sea Turtle Conservation Bonaire and Progressive Environmental Solutions, the installation of a system of ropes and buoys which will serve a visual indicator of zones and as a physical barrier to those using the bay.



Sorobon aerial view - orange sports delineating where the lines and buoys will be place

#### Why us

- < The fact that part of STINAPA-Bonaire's focus is on sustainable use of Bonaire's resources, protecting sea turtle habitats is part of Sea Turtle Conservation Bonaire's mission and one aspect of the mission of Progressive Environmental Solutions is to develop and implement sustainable solutions for aquatic systems means our combined organizational missions make us ideally suited to tackle the current challenges facing Lac. Because Lac is part of the marine park, its importance for sea turtles and its importance for the biodiversity of Bonaire overall, all three organizations have long term interests in the sustainability of Lac and its unique ecosystem.
- < The collaboration of all three organizations helps to ensure the sustainability of the proposed buoy implementation project for Lac by providing a unique opportunity for the three organizations to work together to share financial, conceptual, organizational and long term oversight

responsibility thus increasing the likelihood for the attainment of our combined goals.

### Objectives

- < Protect the sea grass beds at the shoreline of the blue zone
- < Increase windsurfer compliance to restrict their activity to the blue zone
- < Reduce damage/impact on coral dam from recreational users

### RESCUED TURTLES

The rescue of a green turtle in Lac transformed itself into an opportunity for showing once again how assistance from the community has become an essential element for achieving a better environment for the sea turtles of Bonaire.

The turtle was found and reported by local fisherman Doi Boekhoudt. This turtle was missing both front flippers from the base of the shoulders. It was successfully rescued and transported to the Curacao Sea aquarium where it lives now. A recent report indicates that the animal is doing well. The Sea aquarium planned to use this animal as an example of the dangers the sea turtles face during their lives (See press release for the story, it is published in our website)



Handicapped turtle transported in a Jacuzzi with seawater and sea grass to Curacao Seaquarium.



Handicapped green turtle rescued in January 2008

### **The Hawksbill Odyssey**

In March 2008, Sea Turtle Conservation Bonaire (STCB) recovered an injured hawksbill turtle that had just been tagged two days before during the in-water survey. It had a bleeding wound on its right front flipper, probably caused by a small shark or moray eel. STCB staff took it to a local veterinarian for treatment and then transferred the animal to Bonaire Prawn, the shrimp farm near Lac Bay.

Under the watchful eyes of their staff Raimundo and Raimundo Jr, the hawksbill began its month-long recovery in a large salt-water tank. At first the turtle was fed with fish and shrimp, but after a few days the animal refused to eat. We then switched to a more natural diet. Rocks from the salt pond, full with small sponges, were brought to the tank. So were upside down jellyfish, which the turtle relished. With the diet change and special care from Raimundo Jr, the hawksbill began to heal and thrive.



Veterinarian examining the injured hawksbill turtle

On May 3rd, STBC staff and volunteers returned the turtle to the spot where it was found and released it back into the sea. Immediately after the release, the turtle remained calm and swam using mainly her uninjured flipper, but hopes were high that the animal would soon be using both front flippers equally.



Releasing the recovered turtle

Sadly after three weeks, a diver spotted the hawksbill entangled in fishing line over gorgonian coral at the Atlantis dive site. The animal, unable to surface for fresh air, died in forty feet of water. We learned much from the rehabilitation of this turtle and hope that in the future, the lessons learned will help other sea turtles in distress. But citizens also need to do their part by not leaving dangerous items like fishing line, plastic bags, and other debris in the sea. Not only do these

contribute to the visual pollution of the reef, but also they put sea turtles and other animals in extreme peril.



Recovering the dead turtle and fishing line



## EDUCATION AND PUBLIC AWARENESS

During 2008 our program with SGB, Bonaire's public high school, consisted of a group of 8 students from the social science class. The goal of this program is for students to learn through community service. The program began in September and ran through March. During 30 hours of classes, field work and community service, these students learned theory and some practice about sea turtle biology and conservation work. This is the third consecutive year of the high school program.



STCB staff teaches the children about turtle behavior

We continued to support STINAPA's NME (Education) program, providing turtle presentations for the elementary schools of the island. Presentations were given in Papiamentu by STCB staff Gielmon 'Funcchi' Egbreghts, who is very popular with the kids.

STCB staff also contributed to STINAPA's snorkel program, "Turtuganan di Boneiru," giving the class about sea turtles.

We released satellite tracking maps and conservation news on our web site at [www.bonaireturtles.org](http://www.bonaireturtles.org), and through email newsletters.

Board member, Bruce Brabec, continued to provide the weekly presentation, "Sea Turtles of Bonaire," alternating between Buddy Dive Resort and the Carib Inn.

Informative articles and releases were published in the local press and in STINAPA's quarterly publication "Makubeken." We used radio to publicize conservation issues and advertise volunteer opportunities.

We participated for another year in the Stichting Project's Junior Ranger program for at-risk students. STCB staff provided a program in turtle conservation and biology at the end of the program. Two groups of students were certified as honorary turtle rangers.

## **TRAINING AND COLLABORATION**

### Volunteerism

In 2008, volunteers once again played an important role in STCB's success. As an organization with only two staff members, STCB understands the value of having people donate their time to the turtle conservation effort, and staff actively recruit volunteers from the local community and beyond.

Volunteers increased their efforts for the in-water surveys (including the netting surveys at Lac) and nesting monitoring, contributing a total of 612 hours of direct effort (number of hours in the field).

One of our very popular programs, satellite tracking, depends on volunteers to assist with the deployment of the transmitter and the long-term tracking effort that follows. In 2008 Andy Uhr once again wrote the Satellite Tracking Update Reports and the regular releases to the public.



STCB staff and a volunteer during one of our in-water surveys

As part of our volunteer-training and collaboration program with other turtle conservation efforts in the Caribbean Region we hosted Luisa Otero, an undergraduate biology student from the Universidad de Los Andes

Venezuela who is passionate about sea turtle biology and conservation and who wants to become a turtle specialist. Luisa worked with us during our March netting surveys. These are great opportunities for both student interns and for STCB.



Luisa with kids at Sorobon during our netting surveys

Volunteer Arno Buscop came to Bonaire from the Netherlands and provided enormous help for a two week period during our November netting surveys. Arno is a great example of how people coming from abroad can volunteer: he contacted us while planning his vacation trip.

A core of resident volunteers helped throughout the year in the different field activities:

- ∞ In water surveys: Claudia & Marco di Gianvito, Tina Lindeken, Lee Bray, Patrick Holian
- ∞ Nesting monitoring: Tina Lindeken, Ralph "Moogie" Stewart
- ∞ Sighting sheets program: Anne Zaat

Other volunteers are part time residents or tourists who come back to Bonaire each year. Last year was not an exception; we had ongoing help throughout the year.





Claudia, Marco, Robert and Arno with green turtle at Lac

### **Sea Turtle Biology and Conservation Course:**

STCB presented the first course in *Research and Management Techniques for the Conservation of Sea Turtles* to be held on Bonaire. The course was held October 14<sup>th</sup> to 18<sup>th</sup> and provided participants lessons in turtle biology, conservation, surveying and monitoring.

The course was possible due to support from WIDECAST and DCNA. With DCNA as a major funder, this course was organized for participants from the Dutch Caribbean islands. It was designed to empower the park management organisations on each of the Dutch Caribbean islands to set up and manage their own turtle conservation initiatives. Key staff members from each park management organisation were selected by the parks to participate.



Snapshots of course activities

### **Course training components included:**

1. Basic marine turtle biology
2. The role of sea turtles in the environment
3. Threats to turtles
4. Surveying techniques
5. Data management
6. Current topics (such as satellite tracking)
7. Turtle injuries and disease and necropsy

Dr. Robert van Dam, our scientific advisor, and Dr. Alonso Aguirre, a wildlife veterinarian and senior scientist of Wildlife Trust, instructed. Both are WIDECAST affiliated scientists.



Snapshots of course activities

### **FUND DEVELOPMENT**

In 2008 we made progress with our objective to increase public and private financial investment in support of the protection and recovery of Bonaire's sea turtle populations. Our strategy was to diversify our funding sources and to continue building a stable and systematic fund development program to sustain our program effectively over the long-term. Our fund development plan targeted grants, individual and business donations, and merchandising as our primary funding sources.



Three green turtles feeding on jelly fish

Grants were our major source of funds in 2008. Some grant funds used for operations were carried over from those obtained in previous years for multi-year activities (e.g. DCNA, MINA Fund, and KNAP). We also received new grant funds in 2008 from DCNA, Rotterdam Zoo, and WIDECAS; and in mid-year were awarded a significant grant from World Wildlife Fund – Netherlands (WWF-NL) WWF/NL is providing a 3-year grant covering nearly half of our operations budget, and particularly targeting our conservation, education and awareness, and training work. WWF-NL's intent is to provide stability for STCB operations funding so that we can focus not only on our direct mission, but also on building our development program to sustain STCB into the future. WWF-NL is encouraging further development of the relationship between STCB and STINAPA, as the grant funds are provided by WWF-NL through a contract with STINAPA and earmarked for STCB. Although the WWF-NL grant provides significant funding support for the next 2 1/2 years, STCB must still raise over half of our annual budget income from other sources. We also have the challenge of planning for and developing new funding sources to replace the WWF-NL grant when it ends in 2011.

We surpassed our budget expectation for individual and business donations in 2008. This success was due to an increase in the number of public presentations and to an expansion of our funding appeals. Though we had many new donors this year, we did not carry over a significant number of donors from previous years. The challenge for the future will be to retain donors as well as to acquire new donors.

We didn't make our budget expectations with merchandise sales this year but this was mostly due to a change in strategy that wasn't in place until near the end of the year. Board member Marlene Robinson began working

on creating a new line of t-shirts for STCB. The t-shirts are made from organically grown cotton and printed by hand on Bonaire from hand-cut original block prints. We decided to limit the number of retail sites we would use and asked shops to donate their services by selling our merchandise and passing on the full sale price to us. We were able to recruit two stores willing to provide this support, and had our new line of shirts available by the end of the year at both The Beach Shop in Harbour Village and the Local Art Shop at the Sand Dollar shopping mall. Though we got a late start with our new line of shirts, we saw a good response and with an expansion of the merchandise line and a planned advertising campaign, are projecting an increase in merchandise sales in 2009.



New line of t-shirts in organic cotton and printed by hand on Bonaire.

## **FINANCIAL REPORT**

The total program operations expense for 2008 was 184.786 Naf (not an audited figure).

Grant revenue accounted for 63% of the total revenue for operations. Individual and corporate donations accounted for 30% and 5% came from merchandise sales and interest income. We provided the remaining 2% from reserves.

A copy of our 2008 financial report, prepared by a contracted accountant, is available for review at the office of Sea Turtle Conservation Bonaire.



## Firemen Save Sea Turtles



These baby sea turtles are in good hands

On Friday the 17<sup>th</sup> of October, the team of airport firemen on duty found one live hawksbill hatchling in the parking lot of the Flamingo Airport. An other hatchling, strangled by a car, was also found on the main road. The firemen called STCBA to report the find and the STCBA staff went to check the area. In cases like this, STCBA staff look for more hatchlings and try to find the nest from

where these hatchlings come from.

STCBA Manager Mahel Nave found the nest on Pali Mar golf beach in front of the airport. The procedure of opening and searching began and 10 live hatchlings were found in the nest. Baby turtles typically hatch during the evening hours when it is cooler and there are fewer predators by the sea, especially sea birds. Accordingly, these hatchlings



were kept in a safe place until the evening when they were released with the help of the firemen on duty.

In a more recent sighting, hatchlings emerged from the sand and fled their way to the sea by orienting themselves to the subtle brightness of the day when the horizon. In this case, STCBA staff were just that the airport's bright lights were faced the turtle hatchlings, drawing them inland instead of toward the sea.

Light pollution from beachfront properties causes the deaths of thousands of sea turtle hatchlings each year around the world and it is a major factor in slowing the population recovery of our depleted sea turtle populations.

Light pollution is without a major problem on Bonaire for our sea turtles, but that is not the first time that hatchlings from nests on Pali Mar have crossed the road towards the airport and been killed by cars instead of going to the sea. Perhaps it is time to start thinking about a proper lighting system for coastal development to prevent our baby turtles from going where wrong place. STCBA encourages developers to install turtle-friendly lighting when building close to the coast, and STCBA staff are happy to assist developers in looking for alternative solutions for their lighting systems. ■ STCBA Release Story & photos by Mahel Nave

## Marvellous and Arkion Save a Sea Turtle

Marvellous Maingot and Arkion Jongs were fishing this Sunday morning in the area of Fisherman's Hut on the south end of Bonaire. They saw a buoy drifting with something large attached and went to check it out. They were surprised to find a sea turtle entangled in the buoy by rope wound around one of the turtle's front flippers. Marvellous and Arkion brought the turtle onto their boat and contacted STCBA's staff to report the turtle in trouble at Fisherman's Hut.



Mahel thanks Marvellous and Arkion for the rescue

When STCBA's staff arrived they had already cut the line and put the turtle on the sand where they kept



Mahel and Marvellous keep the turtle cool and wet

it wet and ready for inspection. The line had strangled the base of the flipper. After some time, if help is not given, the flipper could have been lost and the turtle would have to survive with only one front flipper. Luckily for this animal, help arrived before this happened and it was released back in the sea after a proper evaluation.

The turtle was a sub-adult hawksbill of 65-cm carapace length. It was weak and somewhat thin, but the flipper wound was not bleeding. Because sea turtles are resilient animals, the best practice was to release it right away. The turtle swam from shore at a slow but steady stroke. Soon after release, Marvellous swam with his mask and snorkel to check on the turtle, but it had already disappeared by swimming away.

AN EXAMPLE TO FOLLOW

It is encouraging to see how Marvellous and Arkion, teenage students at SCB, while working on their free time as young fishermen took the time to help a sea turtle in trouble and did this in such an effective way.

Sea turtles are endangered species and threats come in different packages.

In the Caribbean there is a high mortality rate of sea turtles associated with incidental or accidental capture from fisheries. While at sea (coastal and offshore waters), sea turtles can get caught in drifting nets, fishing lines attached with buoys, and other fishing equipment such as polypropylene ropes which are use for long line

# **APPENDIX I.** List of turtles captured and tagged during 2008.

## **Green turtles**

| Date capture | Tag left | Tag right | PIT        | Turtle ID | Location          | SCL  | Weight |
|--------------|----------|-----------|------------|-----------|-------------------|------|--------|
| 24-Jan-08    | WH1393   | WH1394    |            | 08-001    | Town pier         | 25.5 | 2      |
| 11-Feb-08    | WH1399   | WH1398    |            | 08-007    | Sabadeco          | 34.9 | 5.3    |
| 25-Feb-08    | WH5903   | WH5902    |            | 08-012    | Jeannie's Glory   | 32.3 | 4.3    |
| 26-Feb-08    | BX1348   | WH1005    |            | 05-096    | Ebo's             | 55.6 | 23     |
| 26-Feb-08    | WE4113   | WE4112    |            | 03-085    | Ebo's             | 52.6 | 19     |
| 29-Feb-08    | WH5906   | WH5905    |            | 08-020    | Andrea I          | 32.7 | 4.2    |
| 29-Feb-08    | WH5907   | BBG245    |            | 08-021    | Andrea I          | 42.1 | 8.7    |
| 29-Feb-08    | WH5909   | WH5908    |            | 08-022    | Sabadeco          | 31.9 | 4.1    |
| 29-Feb-08    | WH5911   | WH5910    |            | 08-023    | Sabadeco          | 33.5 | 4.6    |
| 29-Feb-08    | WH5913   | WH5912    |            | 08-024    | Sabadeco          | 27.7 | 2.9    |
| 5-Mar-08     | WH5919   | WH5918    |            | 08-026    | Karpata           | 34.8 | 6.4    |
| 5-Mar-08     | WH5917   | WH5914    |            | 08-027    | Karpata           | 27.3 | 2.4    |
| 5-Mar-08     | WH5921   | WH5920    |            | 08-028    | Karpata North     | 25.1 | 1.7    |
| 5-Mar-08     | WH5926   | WH5924    |            | 08-029    | Reserve           | 43.4 | 5.3    |
| 5-Mar-08     | WH5923   | WH5922    |            | 08-030    | Reserve           | 29.8 | 3.6    |
| 6-Mar-08     | WH5932   | WH5931    |            | 08-032    | Reserve           | 31.5 | 4      |
| 6-Mar-08     | WH5930   | WH5929    |            | 08-033    | Reserve           | 29.8 | 3.3    |
| 6-Mar-08     | WH5928   | WH5927    |            | 08-034    | Reserve           | 32.3 | 3.8    |
| 12-Mar-08    | WH5940   | BX1367    |            | 06-018    | Nukove            | 49.5 | 14.3   |
| 12-Mar-08    |          |           | 133812764A | 08-039    | Playa Frans       | 24.9 | 1.9    |
| 14-Mar-08    | WH5944   | BBG250    |            | 08-041    | Playa Frans       | 38.4 | 7      |
| 14-Mar-08    | WH5947   | WH5946    |            | 08-042    | Slag-baai         | 34.5 | 5.5    |
| 14-Mar-08    | BX1252   | WH1208    |            | 07-034    | Slag-baai         | 37.0 | 6.6    |
| 14-Mar-08    |          |           | 133729671A | 08-045    | Slag-baai         | 27.7 | 2.4    |
| 26-Mar-08    | WH5972   | WH5971    |            | 08-048    | Margate Bay       | 31.1 | 3.8    |
| 31-Mar-08    | WH5941   | WH5939    |            | 08-052    | Genie Glory       | 33.8 | 5      |
| 31-Mar-08    | WH5975   | WH5925    |            | 08-053    | Genie Glory       | 30.3 | 3.9    |
| 31-Mar-08    | WH5974   | WH5973    |            | 08-054    | Genie Glory       | 31.1 | 3.8    |
| 3-Apr-08     | WH5949   | BBG249    |            | 08-056    | Klein Bonaire EBO | 32.9 | 4.6    |
| 4-Apr-08     | WE4113   | WE4112    |            | 03-085    | Ebo's             | 52.7 | 20     |
| 4-Apr-08     | WH5952   | BBG251    |            | 08-060    | Ebo's             | 40.0 | 7.7    |
| 4-Apr-08     | WH1001   | BX1079    |            | 03-057    | Ebo's special     | 53.8 | 20     |
| 4-Apr-08     | WH5954   | WH5953    | 133935525A | 08-062    | Ebo's special     | 25.5 | 1.8    |
| 9-Apr-08     | WE4087   | BX1045    |            | 03-063    | Just a nice dive  | 59.6 | 30     |
| 14-Apr-08    | WH5958   | WH5957    |            | 08-065    | Wayaka            | 29.6 | 3.1    |
| 23-Apr-08    | WH5962   | BBG252    |            | 08-067    | Lac               | 42.7 | 10.9   |
| 23-Apr-08    | WH5961   | BBG253    |            | 08-068    | Lac               | 38.6 | 7.3    |
| 23-Apr-08    | WH5963   | BBG254    |            | 08-069    | Lac               | 34.8 | 5.5    |
| 23-Apr-08    | WH5964   | BBG256    |            | 08-070    | Lac               | 35.5 | 6      |
| 23-Apr-08    | WH5966   | BBG257    |            | 08-071    | Lac               | 38.7 | 7.2    |
| 23-Apr-08    | WH5965   | BBG258    |            | 08-072    | Lac               | 38.7 | 7.2    |
| 23-Apr-08    | WH5967   | BBG260    |            | 08-073    |                   | 68.4 | 46     |
| 24-Apr-08    | WH5968   | BBG259    |            | 08-074    | Lac               | 70.8 | 44     |
| 24-Apr-08    | WH5969   | BBG261    |            | 08-075    | Lac               | 74.7 | 54     |
| 24-Apr-08    | WH5975   | BBG262    |            | 08-076    | Lac               | 54.5 | 21     |
| 24-Apr-08    | WH5977   | BBG263    |            | 08-077    | Lac               | 56.5 | 25     |
| 24-Apr-08    | WH5978   | BBG264    |            | 08-078    | Lac               | 48.3 | 15     |
| 25-Apr-08    | WH5983   | BBG269    |            | 08-083    | Out of Lac        | 54.9 | 22     |
| 25-Apr-08    |          | BBG270    |            | 08-084    | Out of Lac        | 59.4 |        |
| 25-Apr-08    | WH5982   | BBG265    |            | 08-085    | Out of Lac        | 62.4 | 33     |

# Green turtles (continued)

| Date capture | Tag left     | Tag right | PIT        | Turtle ID | Location      | SCL  | Weight |
|--------------|--------------|-----------|------------|-----------|---------------|------|--------|
| 25-Apr-08    | WH1255       | BX1267    |            | 07-065    | Lac           | 47.2 | 13.3   |
| 25-Apr-08    | WH5984       | BBG268    |            | 08-087    | Lac           | 73.9 | 58     |
| 28-Apr-08    | WH5991       | BBG271    |            | 08-088    | Lac           | 37.9 | 6.9    |
| 28-Apr-08    | WH5990       | BBG275    |            | 08-089    | Lac           | 50.3 | 17     |
| 28-Apr-08    | WH1260       | BX1272    |            | 07-070    | Lac           | 45.1 | 12.1   |
| 28-Apr-08    | WH5989       | BBG272    |            | 08-091    | Lac           | 39.1 | 7.3    |
| 28-Apr-08    | WH5988       | BBG274    |            | 08-092    | Lac           | 37.5 | 7      |
| 28-Apr-08    | WH5987       | BBG278    |            | 08-093    | Lac           | 53.8 | 22     |
| 28-Apr-08    | WH5986       | BBG277    |            | 08-094    | Lac           | 49.5 | 13.8   |
| 28-Apr-08    | WH5985       | BBG267    |            | 08-095    | Lac           | 55.7 | 25     |
| 28-Apr-08    | WH1150       | BX1198    |            | 06-139    | Lac           | 61.1 | 31     |
| 28-Apr-08    | WH5992       | BBG273    |            | 08-097    | Lac           | 65.1 | 40     |
| 28-Apr-08    | WH5993       | BBG279    |            | 08-098    | Lac           | 79.4 | 74     |
| 29-Apr-08    | WH5994       | BBG276    |            | 08-099    | Lac           | 40.2 | 8      |
| 29-Apr-08    | WH5995       | BBG280    |            | 08-100    | Lac           | 53.3 | 22     |
| 29-Apr-08    | WH5996       | BBG281    |            | 08-101    | Lac           | 55.0 | 23     |
| 29-Apr-08    | WH1184       | BX1233    |            | 06-174    | Lac           | 60.3 | 27     |
| 29-Apr-08    | WH5998       | BBG283    |            | 08-104    | Lac           | 53.1 | 20.5   |
| 29-Apr-08    | WH6000       | BBG287    |            | 08-105    | Lac           | 58.2 | 25     |
| 30-Apr-08    | WH5826       | BBG284    |            | 08-106    | Lac           | 41.5 | 9      |
| 30-Apr-08    | WH5827       | BBG285    |            | 08-107    | Lac           | 47.6 | 13.2   |
| 30-Apr-08    | WH5828       | BBG288    |            | 08-108    | Lac           | 39.5 | 8      |
| 30-Apr-08    | WH5829       | BBG289    |            | 08-109    | Lac           | 43.2 | 11     |
| 1-May-08     | WH5830       | BBG290    |            | 08-110    | Out of Lac    | 43.7 | 11     |
| 1-May-08     | WH5831       | BBG393    |            | 08-111    | Out of Lac    | 74.4 | 59     |
| 1-May-08     | WH5832       | BBG292    |            | 08-112    | Out of Lac    | 68.2 | 41     |
| 1-May-08     | WH5833       | BBG294    |            | 08-113    | Lac           | 55.6 | 22     |
| 1-May-08     | WH5834       | BBG295    |            | 08-114    | Lac           | 49.0 | 16.4   |
| 2-May-08     | WH5835       | BBG296    |            | 08-115    | Sorobon Pier  | 45.1 | 13     |
| 2-May-08     | WH1305       | WH1305    |            | 07-116    | Lac           | 80.6 | 88     |
| 2-May-08     | BBG298       | WH5837    |            | 08-118    | Lac           | 45.4 | 13     |
| 2-May-08     | WH5838       | BBG299    |            | 08-119    | Lac           | 61.0 | 30     |
| 2-May-08     | WH5839       | BBG300    |            | 08-123    | Out of Lac    | 46.3 | 12.5   |
| 2-May-08     | WH5840       | BBG110    |            | 08-124    | Out of Lac    | 59.9 | 33     |
| 5-May-08     | WH5843       | BBG114    |            | 08-125    | Lac           | 36.4 | 6.9    |
| 5-May-08     |              |           | 13473654A  | 08-126    | Lac           | 28.0 | 2.8    |
| 5-May-08     | WH5844       | BBG105    |            | 08-127    | Lac           | 38.5 | 7.9    |
| 5-May-08     | H1299 BBG111 | WH1298    |            | 07-111    | Lac           | 43.3 | 11.3   |
| 5-May-08     | WH5845       | BBG106    |            | 08-130    | Lac           | 60.2 | 28     |
| 5-May-08     | WH5846       | BBG101    |            | 08-131    | Lac           | 61.5 | 32     |
| 16-Jun-08    |              |           | 134976690A | 08-132    | Carls hill KB | 30.6 | 3      |
| 6-Oct-08     | WH5803       | BBG116    |            | 08-138    | Lac           | 47.8 | 15     |
| 17-Oct-08    | WH5804       | BBG102    |            | 08-139    | Lac           | 50.2 | 16.2   |
| 17-Oct-08    | WH5805       | BBG103    |            | 08-140    | Lac           | 50.7 | 17.9   |
| 17-Nov-08    | WH1350       | BB6209    |            | 07-154    | Lac           | 59.3 | 29     |
| 17-Nov-08    | WH1094       | BX1168    |            | 06-082    | Lac           | 65.3 | 37     |
| 17-Nov-08    | WH5806       | BB6104    |            | 08-143    | Lac           | 56.6 | 24     |
| 17-Nov-08    | WH5807       | BBG112    |            | 08-144    | Lac           | 60.2 | 30     |
| 17-Nov-08    | WH5808       | BBG117    |            | 08-145    | Lac           | 57.4 | 26     |
| 17-Nov-08    | WH5996       | BB6281    |            | 08-101    | Lac           | 59.1 | 31     |
| 17-Nov-08    | WH5809       | BB6116    |            | 08-147    | Lac           | 47.2 | 13.6   |
| 17-Nov-08    | WH5810       | BBG119    |            | 08-148    | Lac           | 39.3 | 8      |

### Green turtles (continued)

| Date capture | Tag left | Tag right | PIT         | Turtle ID | Location   | SCL  | Weight |
|--------------|----------|-----------|-------------|-----------|------------|------|--------|
| 17-Nov-08    | WH5811   | BBG120    |             | 08-149    | Lac        | 48.1 | 13.3   |
| 18-Nov-08    | WH1176   | BXX1225   |             | 06-166    | Lac        | 57.6 | 26     |
| 18-Nov-08    | WH5814   | BBG123    |             | 08-151    | Lac        | 60.8 | 30     |
| 18-Nov-08    | WH5813   | BBG122    |             | 08-152    | Lac        | 61.4 | 30     |
| 18-Nov-08    | WH5812   | BB121     |             | 08-153    | Lac        | 62.1 | 34     |
| 19-Nov-08    | WH5816   | BBG125    |             | 08-156    | Out of Lac | 52.7 | 19.5   |
| 19-Nov-08    | WH5977   | BBG263    |             | 08-077    | Out of Lac | 57.5 | 28     |
| 19-Nov-08    | WH5815   | BBG924    |             | 08-158    | Out of Lac | 55.1 | 23     |
| 19-Nov-08    | WH5817   | BBG126    |             | 08-159    | Out of lac | 57.5 | 25     |
| 19-Nov-08    |          |           | 1345377221A | 08-160    | Lac        | 36.9 | 6.3    |
| 19-Nov-08    | WH5821   | BBG130    |             | 08-161    | Lac        | 44.2 | 10     |
| 19-Nov-08    | WH5822   | BBG128    |             | 08-162    | Lac        | 47.7 | 15.4   |
| 20-Nov-08    |          |           | 133735097A  | 08-163    | Sabadeco   | 25.0 | 2      |
| 20-Nov-08    | WH5823   | BBG131    |             | 08-164    |            | 39.3 | 7.5    |
| 20-Nov-08    | WH1182   | BX1231    |             | 06-173    | Lac        | 71.2 | 45     |
| 20-Nov-08    | WH5824   | BBG132    |             | 08-166    | Lac        | 55.0 | 22     |
| 21-Nov-08    | WH1314   | WH1313    |             | 07-120    | Lac        | 65.0 | 41     |
| 21-Nov-08    | WH5852   | BBG133    |             | 08-170    | Lac        | 38.2 | 6.9    |
| 21-Nov-08    | WH5854   | BBG135    |             | 08-171    | Lac        | 42.4 | 9.8    |
| 24-Nov-08    | WH5858   | BBG139    |             | 08-172    | Lac        | 50.0 | 16     |
| 24-Nov-08    | WH5856   | BBG137    |             | 08-173    | Lac        | 44.2 | 11.5   |
| 24-Nov-08    | WH5855   | BBG136    |             | 08-174    | Lac        | 52.4 | 18.8   |
| 24-Nov-08    | WH5857   | BBG138    |             | 08-175    | Lac        | 45.9 | 12.9   |
| 24-Nov-08    |          |           | 133735552A  | 08-176    | Lac        | 30.5 | 4.4    |
| 24-Nov-08    | WH5859   | BBG140    |             | 08-177    | Lac        | 45.0 | 21.2   |
| 26-Nov-08    | WH5860   | BBG129    |             | 08-179    | Lac        | 42.4 | 10.3   |
| 26-Nov-08    | WH5861   | BBG141    |             | 08-180    | Lac        | 55.7 | 24     |
| 27-Nov-08    | WH5863   | BBG143    |             | 08-181    | Lac        | 45.6 | 12.6   |
| 27-Nov-08    | WH5862   | BBG142    |             | 08-182    | Lac        | 46.1 | 12.4   |
| 27-Nov-08    | WH4105   | BBG144    |             | 03-079    | Out of Lac | 76.8 | 63     |
| 28-Nov-08    |          |           | 134622621A  | 08-185    | Sorobon    | 38.4 | 7.8    |
| 28-Nov-08    | WH5868   | BBG149    |             | 08-186    | Sorobon    | 41.7 | 9      |
| 28-Nov-08    | WH5867   | BBG145    |             | 08-187    | Sorobon    | 40.2 | 8.4    |
| 28-Nov-08    | WH5866   | BBG147    |             | 08-188    | Sorobon    | 43.6 | 10.6   |
| 28-Nov-08    | WH5865   | BBG147    |             | 08-189    | Sorobon    | 38.5 | 7.3    |
| 28-Nov-08    | WH5864   | BBG145    |             | 08-190    | Sorobon    | 44.4 | 12.2   |
| 28-Nov-08    |          |           | 135149754A  | 08-191    | Sorobon    | 33.0 | 5.4    |
| 28-Nov-08    | WH5869   | BBG150    |             | 08-193    | Out of Lac | 68.8 | 49     |



## Hawksbill turtles

| Date capture | Tag left | Tag right | PIT        | Turtle ID | Location           | SCL  | Weight |
|--------------|----------|-----------|------------|-----------|--------------------|------|--------|
| 6-Feb-08     | WH1003   | WH1002    |            | 05-094    | Sand Dollar        | 44.0 | 9.9    |
| 6-Feb-08     | WH1139   | WH1138    | 134622751A | 06-124    | Water Plant        | 37.4 | 6.2    |
| 6-Feb-08     | WH1135   | WH1134    | 133865617A | 06-126    | Habitat            | 34.1 | 4.6    |
| 8-Feb-08     | WH1021   | BX1362    |            | 06-011    | WEB to Andrea      | 56.1 | 20     |
| 8-Feb-08     | WH1397   | WH1396    |            | 08-006    | Andrea to Sabadedo | 32.4 | 4.2    |
| 11-Feb-08    | WH1223   | WH1224    | 133951151A | 06-103    | Jeff Davis         | 33.9 | 4.6    |
| 11-Feb-08    |          |           | 134427195A | 08-009    | Witches hut        | 26.8 | 1.9    |
| 13-Feb-08    | WH1328   | WH1327    | 134673374A | 06-123    | No Name            | 32.0 | 3.6    |
| 13-Feb-08    | WH1400   | WH5901    | 134567321A | 08-010    | No Name            | 29.9 | 2.8    |
| 26-Feb-08    | WH1006   | BX1354    |            | 05-098    | Bon Adventure      | 41.6 | 8      |
| 26-Feb-08    | WH1126   | WH1127    | 134976345A | 06-120    | Bon Adventure      | 34.0 | 4.5    |
| 27-Feb-08    | BBG244   | WE4268    | 133647097A | 05-051    | Donkey beach       | 50.0 | 15.5   |
| 27-Feb-08    | WH5904   | BBG243    |            | 08-018    | Donkey beach       | 43.0 | 8.8    |
| 28-Feb-08    | WH1232   | WH1233    |            | 07-042    | Small Wall         | 34.7 | 5      |
| 3-Mar-08     | WH5916   | WH5915    | 133976792A | 08-025    | Weber's choice     | 28.7 | 2.5    |
| 6-Mar-08     | WH5934   | WH5933    | 134734490A | 07-049    | Reserve            | 29.3 | 3.1    |
| 6-Mar-08     | WH5936   | WH5935    |            | 08-035    | Karpata            | 31.0 | 3.3    |
| 12-Mar-08    | WH5943   | WH5942    | 134966290A | 07-025    | Nukove             | 32.0 | 4      |
| 12-Mar-08    | WH5937   | WH5938    |            | 08-036    | North BOPEC        | 29.7 | 3.2    |
| 14-Mar-08    | WH1202   | BX1248    |            | 07-024    | Nukove             | 34.7 | 4      |
| 14-Mar-08    | WH5945   | BBG6255   |            | 08-043    | Slag-baai          | 42.5 | 8.3    |
| 26-Mar-08    | WH1066   | WH1067    | 134576174A | 06-027    | Margae Bay         | 36.1 | 5.5    |
| 26-Mar-08    | WH1193   | WH1192    | 133683348A | 07-004    | Sweet Dreams       | 35.1 | 5.6    |
| 26-Mar-08    | BBG246   | WH5970    |            | 08-047    | Fisherman's hut    | 37.7 | 6.2    |
| 28-Mar-08    | WH1201   | BX1250    |            | 07-001    | Atlantis           | 41.1 | 7.8    |
| 31-Mar-08    | BX1254   | WH1229    |            | 07-040    | Salt Prer          | 47.5 | 11.3   |
| 2-Apr-08     | BBG247   | WH5948    |            | 08-055    | No Name            | 36.9 | 6      |
| 3-Apr-08     | WH1320   | WH1319    |            | 07-130    | Ebo's              | 35.1 | 5      |
| 4-Apr-08     | WH5951   | WH5950    |            | 08-058    | Ebo's              | 33.6 | 4      |
| 9-Apr-08     | WH5956   | WH5955    | 134956526A | 08-064    | Nearest point      | 26.0 | 2.1    |
| 16-Apr-08    | WH5960   | WH5959    |            | 08-066    | South bay          | 32.2 | 4      |
| 24-Apr-08    | WH5979   | WH5980    |            | 08-079    | Lac                | 32.7 |        |
| 25-Apr-08    | WH1256   | BX1268    |            | 06-025    | Out of Lac         | 43.1 | 9.9    |
| 25-Apr-08    | WH1372   | BBG237    |            | 07-184    | Out of Lac         | 42.4 | 9.1    |
| 25-Apr-08    | WH5981   | BBG266    |            | 08-082    | Out of Lac         | 39.8 | 7      |
| 29-Apr-08    | WH5997   | BBG282    |            | 08-103    | Lac                | 55.8 | 19.8   |
| 2-May-08     | WH1369   | BBG233    |            | 07-181    | Out of Lac         | 44.7 | 9      |
| 2-May-08     | WH5836   | BBG297    |            | 08-117    | Lac                | 54.0 | 22     |
| 2-May-08     | WH5841   | BBG109    |            | 08-121    | Out of Lac         | 51.6 | 16     |
| 5-May-08     | WH1283   | BX1293    |            | 07-094    | Lac                | 55.8 | 22     |
| 20-Jun-08    | WH5847   | BX1336    |            | 05-053    | 550 KB             | 90.3 |        |
| 16-Oct-08    | WH 5801  | BBG111    |            | 08-136    | Lac                | 50.9 | 14.8   |
| 16-Oct-08    | WH5802   | BBG115    |            | 08-137    | Lac                | 51.7 | 13.7   |
| 19-Nov-08    | WH5820   | BBG127    |            | 08-154    | Out of Lac         | 42.9 | 9.2    |
| 19-Nov-08    | WH5818   | WH5819    |            | 08-155    | Out of Lac         | 34.6 | 4      |
| 21-Nov-08    | WH1156   | BX1205    |            | 06-143    | Lac                | 44.9 | 10.7   |
| 21-Nov-08    | WH5953   | BBG134    |            | 08-169    | Lac                | 52.1 | 15.3   |
| 24-Nov-08    | WH5979   | WH5980    |            | 08-079    | Lac                | 39.4 | 7.2    |
| 27-Nov-08    | WH5981   | BBG266    |            | 08-183    | Out of Lac         | 41.2 | 8.5    |
| 28-Nov-08    | WE8301   | WE8302    |            | 08-192    | Out of lac         | 60.5 | 28     |

**APPENDIX II.** List of nests observed on Klein Bonaire during 2008

| Activity number | Location stake | Observation date | Species    | Observations                  |
|-----------------|----------------|------------------|------------|-------------------------------|
| 1               | 320            | 19-May           | Hawksbill  |                               |
| 2               | 328            | 21-May           | Loggerhead |                               |
| 3               | 810            | 25-May           | Loggerhead |                               |
| 4               | 343            | 2-Jun            | Loggerhead |                               |
| 5               | 350            | 4-Jun            | Hawksbill  |                               |
| 6               | 475            | 4-Jun            | Loggerhead |                               |
| 8               | 865            | 9-Jun            | Hawksbill  |                               |
| 9               | 830            | 17-Jun           | Hawksbill  |                               |
| 10              | 1362           | 17-Jun           | Hawksbill  |                               |
| 11              | 758            | 20-Jun           | Loggerhead |                               |
| 12              | 535            | 20-Jun           | Hawksbill  | Night watch                   |
| 13              | 850            | 25-Jun           | Loggerhead |                               |
| 14              | 1546           | 25-Jun           | Hawksbill  |                               |
| 15              | 254            | 30-Jun           | Hawksbill  |                               |
| 16              | 1035           | 2-Jul            | Loggerhead |                               |
| 17              | 428            | 4-Jul            | Loggerhead |                               |
| 18              | 350            | 7-Jul            | Loggerhead |                               |
| 19              | 1147           | 7-Jul            | Hawksbill  |                               |
| 20              | 790            | 10-Jul           | Loggerhead |                               |
| 22              | 820            | 10-Jul           | Hawksbill  |                               |
| 24              | 964            | 10-Jul           | Hawksbill  |                               |
| 25              | 330            | 10-Jul           | Loggerhead |                               |
| 26              | 883            | 12-Jul           | Hawksbill  |                               |
| 28              | 419            | 21-Jul           | Hawksbill  | Crab invasion                 |
| 29              | 342            | 21-Jul           | Hawksbill  | Opened                        |
| 30              | 759            | 21-Jul           | Loggerhead |                               |
| 31              | 650            | 23-Jul           | Loggerhead |                               |
| 33              | 300            | 25-Jul           | Hawksbill  | Opened to save from crabs     |
| 34              | 843            | 28-Jul           | Hawksbill  |                               |
| 35              | 982            | 1-Aug            | Hawksbill  | Nesting female                |
| 36              | 868            | 1-Aug            | Loggerhead | Greggy girls - transmitter    |
| 37              | 425            | 4-Aug            | Hawksbill  | Opened to save from crabs     |
| 38              | 717            | 6-Aug            | Hawksbill  |                               |
| 39              | 772            | 6-Aug            | Loggerhead |                               |
| 41              | 1327           | 8-Aug            | Hawksbill  | Lost of Brash to get stuck in |
| 45              | 1088           | 15-Aug           | Hawksbill  |                               |
| 46              | 1404           | 15-Aug           | Hawksbill  | Emerge nest                   |
| 47              | 240            | 18-Aug           | Hawksbill  |                               |
| 48              | 880            | 20-Aug           | Hawksbill  |                               |
| 49              | 230            | 25-Aug           | Hawksbill  |                               |
| 50              | 1557           | 25-Aug           | Loggerhead |                               |
| 51              | 375            | 29-Aug           | Hawksbill  |                               |
| 52              | 1420           | 3-Sep            | Hawksbill  |                               |
| 53              | 1548           | 8-Sep            | Hawksbill  |                               |
| 54              | 1605           | 24-Sep           | Hawksbill  |                               |

**APPENDIX III.** List of nests on other Bonaire beaches during 2008

| Location        | Observation date | Species      | Observations        |
|-----------------|------------------|--------------|---------------------|
| Fishermens hut  | 22-May           | Loggerhead   | Zuid                |
| Airport beach   | 24-Jun           | Loggerhead   |                     |
| Fishermens hut  | 3-Jul            | Loggerhead   |                     |
| Playa Chikitu   | 8-Jul            | Green turtle |                     |
| Playa Chikitu   | 30-Jul           | Green turtle | Older nest          |
| Playa Chikitu   | 8-Aug            | Green turtle |                     |
| South Atlantis  | 19-Aug           | Loggerhead   |                     |
| S. Sweet dreams | 19-Aug           | Hawksbill    |                     |
| Playa Chikitu   | 21-Aug           | Green turtle |                     |
| Playa Chikitu   | 21-Aug           | Green turtle |                     |
| Playa Chikitu   | 21-Aug           | Green turtle |                     |
| Playa Chikitu   | 26-Aug           | Green turtle |                     |
| Playa Chikitu   | 26-Aug           | Green turtle |                     |
| Sweet dreams    | 2-Sep            | Green turtle | Emerged during Omar |
| South Atlantis  | 2-Sep            | Hawksbill    |                     |
| Playa Chikitu   | 5-Sep            | Green turtle |                     |
| Playa Chikitu   | 5-Sep            | Green turtle |                     |
| Playa Chikitu   | 5-Sep            | Green turtle |                     |
| Playa Chikitu   | 8-Sep            | Green turtle |                     |
| Playa Chikitu   | 10-Sep           | Green turtle |                     |
| Playa Chikitu   | 22-Sep           | Green turtle |                     |
| Playa Chikitu   | 25-Sep           | Green turtle |                     |
| Playa Chikitu   | 8-Oct            | Green turtle | Emerged nest        |