# RESEARCH AND MONITORING REPORT 2009

CONTACT US

Sea Turtle Conservation Bonaire
Mabel Nava, Manager

Email: stcb@bonaireturtles.org
Phone: (+599) 717 2225
Cellular: (+599) 780 0433
HOTLINE: 780 0433

PO Box 492
Kralendijk, Bonaire
Netherlands Antilles

STCB is a member of

WIDECAST
Wider Caribbean Sea Turtle Conservation Network

**Welcome…**

We proudly present our 2009 Bonaire Sea Turtle Research and Monitoring Report.

Sea Turtle Conservation Bonaire is a non-governmental, non-profit research and conservation organization that has been protecting sea turtles since 1991. Our mission is *to ensure the protection and recovery of Bonaire's sea turtle populations throughout their range*. We are a recognized leader in sea turtle conservation in the Dutch Caribbean and we work to achieve our mission by:

- Building a strong case for sea turtle conservation through applied research;
- Implementing proactive management and conservation actions to protect Bonaire's sea turtles and their environments;
- Communicating effectively through education, training and advocacy to enhance awareness of sea turtle conservation issues; and
- Developing strategic partnerships and networks to protect Bonaire's turtles locally and throughout their migratory ranges.

Four of the Wider Caribbean's six species of sea turtles are found in the waters of Bonaire. They are: the hawksbill (*Eretmochelys imbracata*), the green turtle, (*Chelonia mydas*), the loggerhead (*Caretta caretta*), and the leatherback (*Dermochelys coriacea*). The hawksbill and leatherback are considered "critically endangered" throughout their global ranges; and the green and loggerhead considered "endangered". Bonaire offers a relatively safe haven for foraging juvenile hawksbill and green turtles, as well as critical nesting grounds for hawksbill, loggerhead, and green sea turtles.

In 2009, we completed our 7th year of systematic research on the sea turtles of Bonaire. In this research report you will find information about our methods, the information gathered, and results of our sea turtle research and monitoring activities, including nesting beach monitoring, foraging ground surveys, and turtle migration tracking.

This work could not have been completed without significant financial support. We would like to acknowledge our flagship funder, WWF-Netherlands and our major 2009 funders, the Dutch Caribbean Nature Alliance (DCNA) and UNESCO.

We are also thankful to our many other individual and business donors (Appendix IV), to STCB staff and board members (Appendix V), and the many business partners and volunteers that assisted us in our work (Appendix VI). Special thanks go to STINAPA-Bonaire for their continuing collaboration and support of our work.

We would like to acknowledge Dr. Robert van Dam, our scientific advisor who oversees STCB's research efforts and helped substantially in the production of this report. And on behalf of the sea turtles of Bonaire, we give our thanks to the many volunteers who helped us in our work this past year.

We hope you find this report informative and that it encourages your interest and support for the sea turtles of Bonaire.

## TABLE OF CONTENTS

## 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 2009 on May 22th, when a hawksbill nest was discovered at No Name beach. The first loggerhead nesting of the 2009 season also occurred at No Name beach, Klein Bonaire, on May 27st. No evidence of any green turtle nests was observed throughout 2009.

During 2009, a total of 16 loggerhead and 35 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 1).

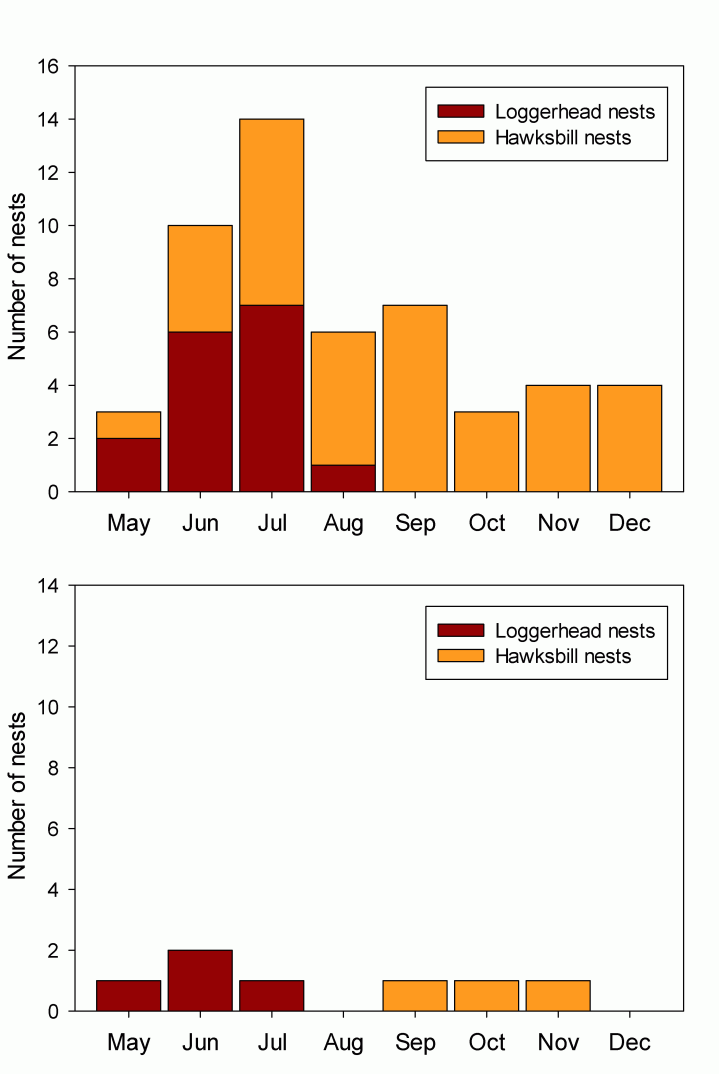


**Figure 1.** Temporal distribution of nests laid by loggerhead and hawksbill turtles on the beaches of Bonaire (bottom) and No Name beach, Klein Bonaire (top).

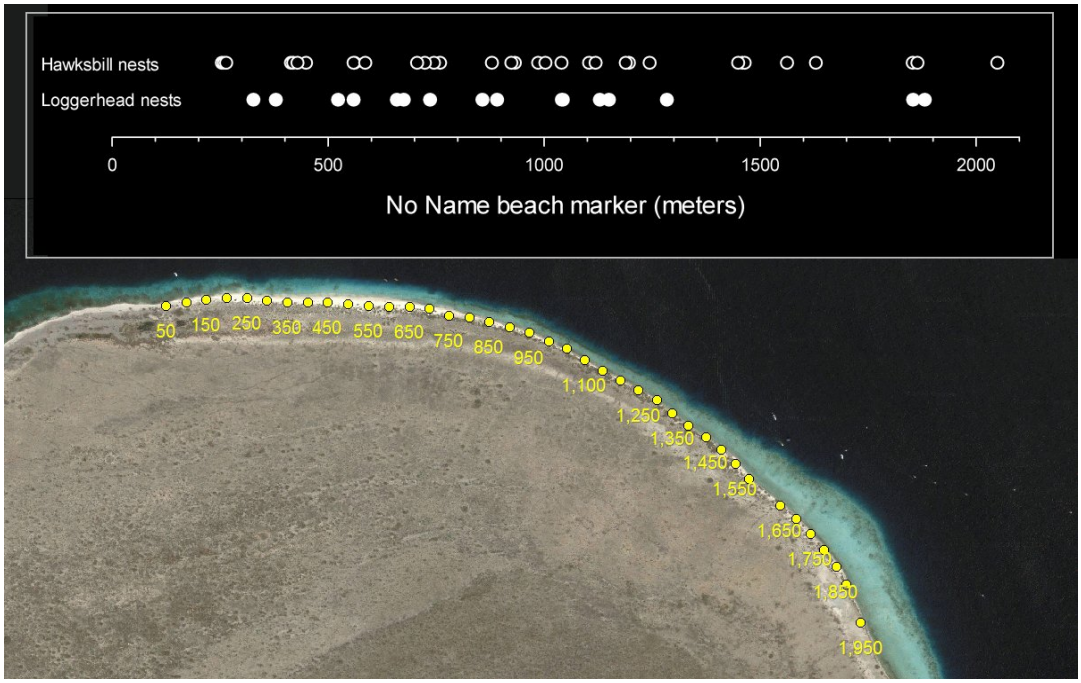


**Figure 2.** Diagram of individual hawksbill and loggerhead nest locations along No Name beach, Klein Bonaire. Yellow dots indicate beach markers.

Hawksbill nests were fairly uniformly spread out along No Name beach, whereas loggerhead nests were largely limited to the western, most accessible and sandy section of the beach (Figure 2). Compared to the 45 nests counted for both species there in 2008, the total number of turtle nests (51 nests) deposited at No Name beach remained stable. Loggerhead activity stayed the same (16 nests) compared to 2008, whereas hawksbill activity increased from 29 to 35 nests, indicating the presence of perhaps two additional nesting hawksbills 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 128.4 eggs (range 86 – 177) and average hatching success for these nests was 71.1%. Revision of 27 hawksbill nests yielded an average nest size of 141.0 eggs (range 78 – 171) and hatching success of 70.1%. Both hawksbill and loggerhead hatching success rates were somewhat lower than in 2008, indicating slightly less favorable nest incubation conditions on the beach at Klein Bonaire.

The estimated number of hatchlings produced at the index beach of Klein Bonaire during 2009 can be calculated from the total number of nests, average nest size and average hatching rate. The 16 loggerhead and 35 hawksbill nests laid along No Name resulted in approximately 1460 loggerhead and some 3460 live hawksbill hatchlings emerging from their nests. The total of 4920 turtle hatchlings estimated for emerging from No Name beach in 2009 is only slightly lower than the number of hatchlings produced there during 2008.

Nesting activity on the rest of Bonaire during 2009 occurred along the southwest coast (4 loggerhead nests), Windsock beach (2 hawksbill nests) and Washikemba (1 hawksbill nest). No green turtle nests were detected during 2009, which was a low year for green turtle nesting activity throughout the Caribbean.

In order to characterize the thermal ecology of the No Name nesting beach at Klein Bonaire, two Onset WaterPro temperature dataloggers were deployed at nest depth (~45 cm) in a representative section of the beach on May 30th 2008. The instruments were programmed to record ambient temperature automatically every hour and can be left unattended for over 1 year. One data logger was placed under an "olijfje" bush (*Bontia daphnoides*), while the second was left at the same depth in open sand ~2m in front of the vegetation. The data loggers were retrieved on 18 July 2009, however the unit placed in the open sand malfunctioned and no data was obtainable from it. The datalogger under the vegetation did function and yielded the temperature profile illustrated in Fig. 3. Of interest is the relation to the pivotal temperature (29.6°C) measured for Caribbean hawksbills, since nests that are warmer than this temperature tend to produce more females and colder nests produce more males. From this preliminary data it appears that there should be substantial production of male hawksbill hatchlings on Klein Bonaire, which is not the case for many other Caribbean rookeries that tend to produce mostly females.

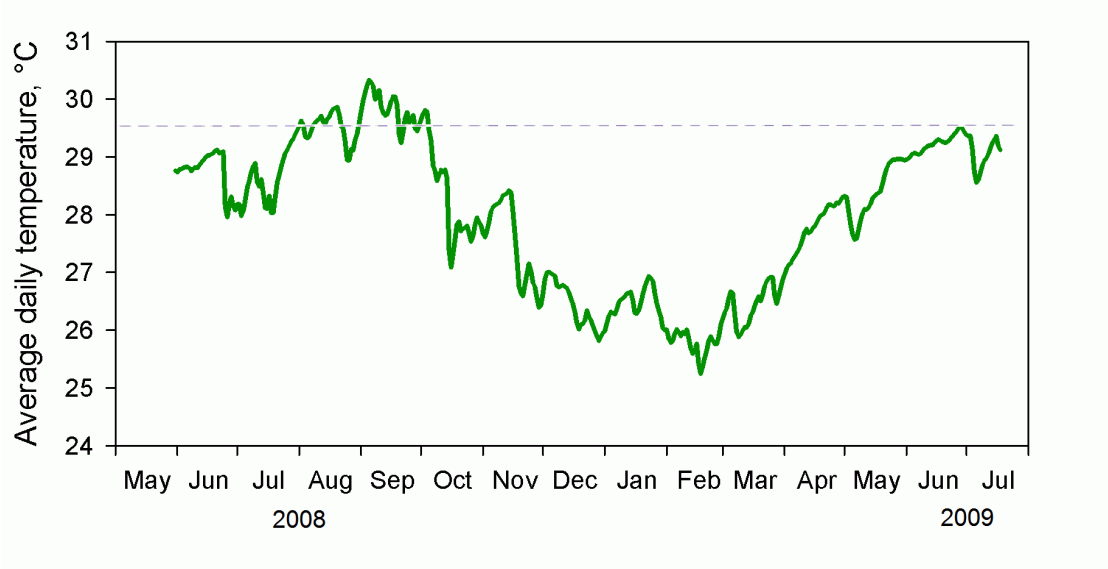


**Figure 3.** Temperature profile of sand at nest depth under Bontia daphnoides at No Name beach, Klein Bonaire. The dashed line indicates the approximate pivotal temperature for Caribbean hawksbill turtles.

## 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 4, table 1). 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 for comparison as follows: Klein Bonaire, Northwest and Southwest Bonaire, the reef outside of Lac Bay (Southeast), and inside Lac Bay itself.

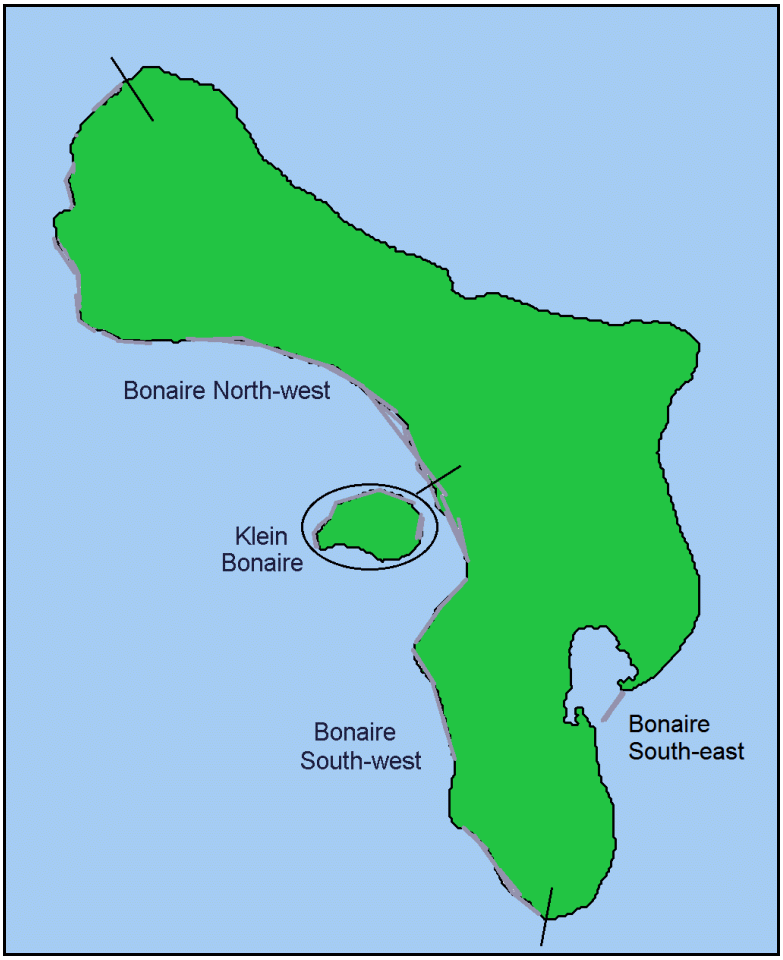


**Figure 4**. Sectors of coastal areas of Bonaire and Klein Bonaire covered during in-water surveys.

**Table 1.** In-water snorkeling survey effort in hours by sector from 2003 to 2009.

| | Total survey hours | | | | | |
|---|---|---|---|---|---|---|
| | **2003** | **2005** | **2006** | **2007** | **2008** | **2009** |
| **Klein Bonaire** | 25.88 | 24.54 | 17.45 | 13.22 | 11.2 | 8.4 |
| **Bonaire Northwest** | | | 38.68 | 25.18 | 18.5 | 24.0 |
| **Bonaire Southwest** | | | 23.85 | 20.17 | 13.7 | 15.5 |
| **Bonaire Southeast** | | | 14.25 | 9.85 | 4.8 | 4.7 |

From 2008 to 2009, green turtle abundance decreased slightly in all areas except on the reef outside of Lac Bay where a steady increase has been observed since 2006 (figure 5). 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), Playa Frans, and the Slagbaai area of Washington Park (figure 6). The reef in front of Lac Bay harbors a very high density of animals (see figure 5), which are associated with the Lac Bay sea grass pasture foraging grounds.

Hawksbill turtles occur in lower numbers than green turtles throughout Bonaire and Klein Bonaire (figure 7) and their abundance now appears to be relatively stable or slightly increasing throughout the surveyed areas (figure 5). Similarly as for green turtles, but occurring in a much lower aggregation density but greater body size, immature hawksbill turtles are found on the reefs adjacent to Lac Bay, and these animals also use the bay for foraging. Other areas of relatively high hawksbill abundance are the east half of Klein Bonaire and the Marine Reserve, south of Bopec.

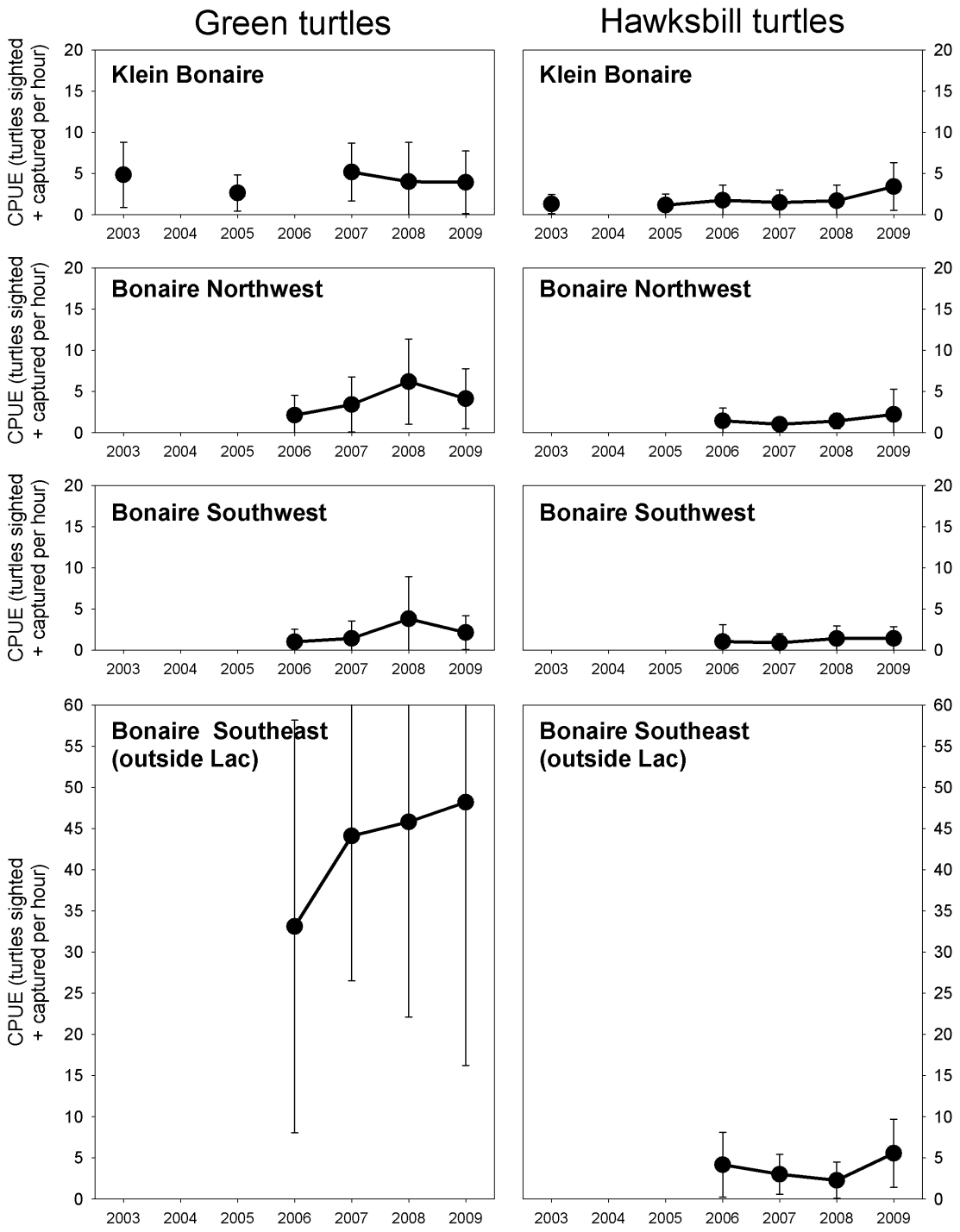


**Figure 5.** Comparison of 2003-2009 "catch-per-unit-effort" survey results by sector around Klein Bonaire and Bonaire.

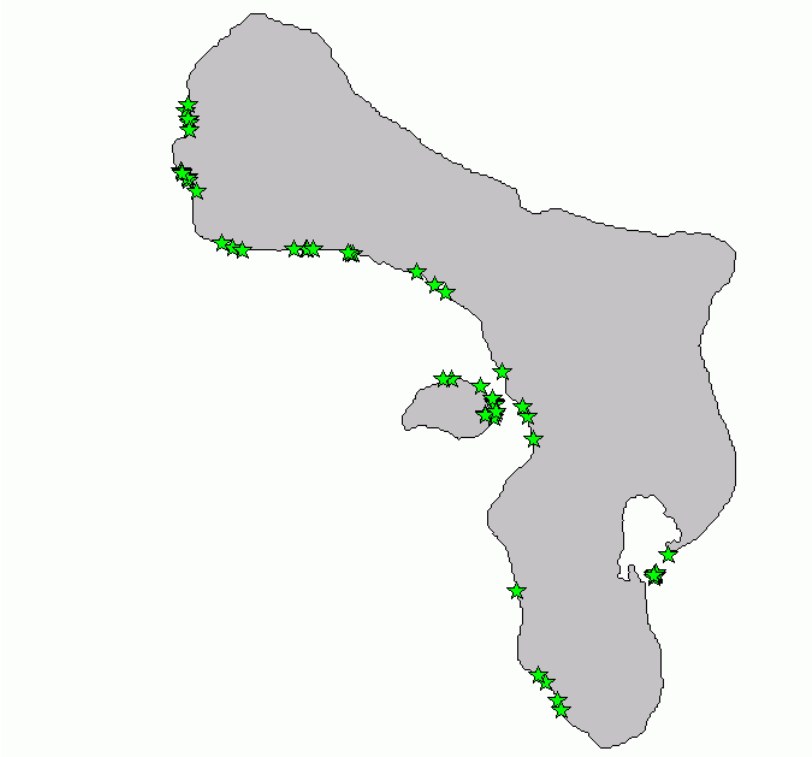

**Figure 6.** Locations where green turtles were captured during snorkeling surveys around Bonaire and Klein Bonaire.

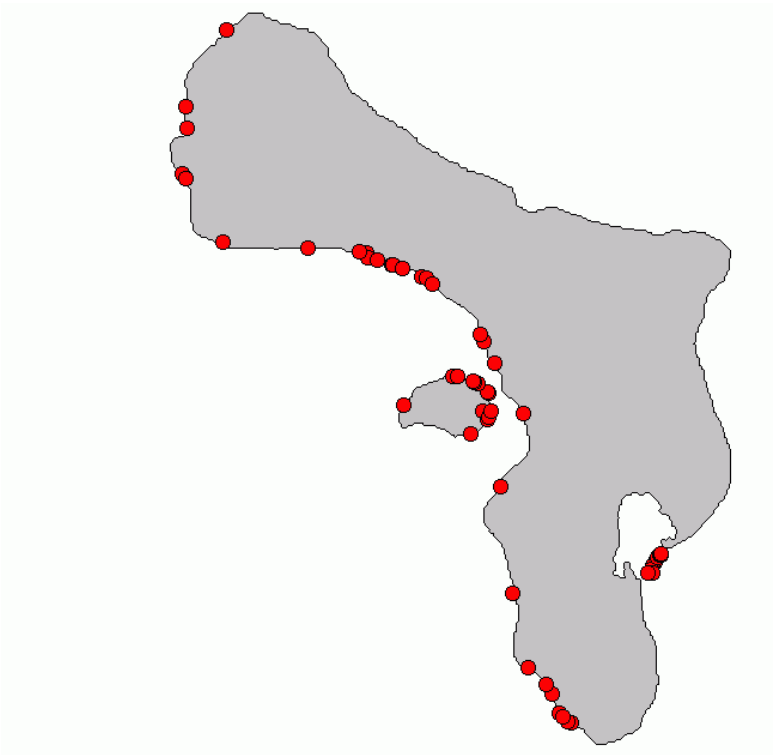

**Figure 7.** Locations where hawksbills were captured during snorkeling surveys around Bonaire and Klein Bonaire.

Netting surveys were conducted during two periods within Lac Bay: during March –April and November 2009. A total of 105 green turtles and 7 hawksbills were caught during these surveys. Figure 8 indicates the netting locations, aimed at areas with highest green turtle abundance as determined by observing turtles surfacing to breathe. Table 2 indicates the abundance trends for both species as measured by captures per hour of netting time ("net soak time"). Green turtles are vastly more abundant than hawksbills within Lac and their numbers appear to be stable or increasing slightly. Hawksbill abundance at Lac now appears to be stable, however their low catch rate by netting make it difficult to determine any true abundance trend.

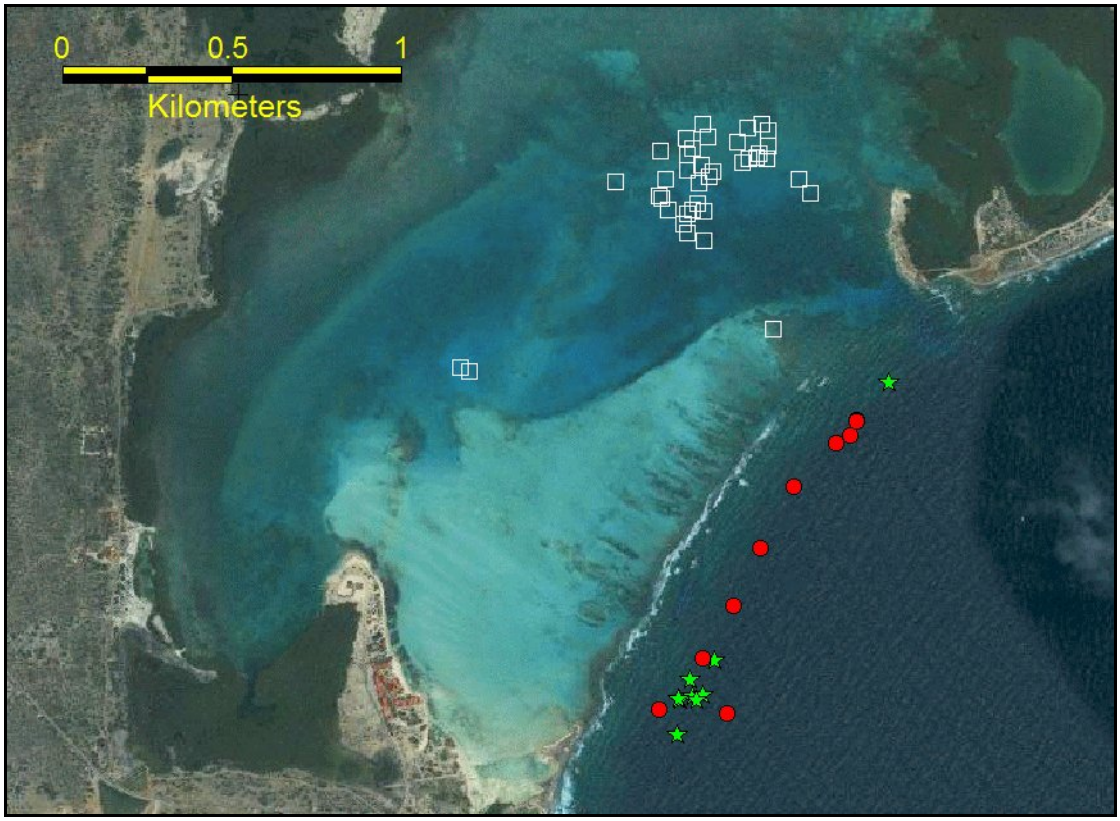


**Figure 8.** Netting locations inside Lac Bay (white boxes), and locations of hand-captured green turtles (green stars) and hawksbills (red circles) on the reefs outside Lac Bay.

**Table 2.** Comparison of catch-per-unit-effort results for netting surveys conducted at Lac Bay.

| | 2003 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| **Number of netting sessions** | 16 | 13 | 40 | 33 | 37 | 41 |
| **Total netting hours ("net soak time")** | 17.9 | 8.9 | 32.9 | 30.0 | 24.8 | 32.0 |
| **Green turtle catches/hour** | 0.88 ± 0.76 | 4.38 ± 3.97 | 2.90 ± 2.25 | 2.42 ± 1.67 | 3.00 ± 2.66 | 3.98 ± 3.42 |
| **Hawksbill catches/hour** | 0.10 ± 0.28 | no data | 0.16 ± 0.39 | 0.26 ± 0.69 | 0.35 ± 0.76 | 0.27 ± 0.73 |

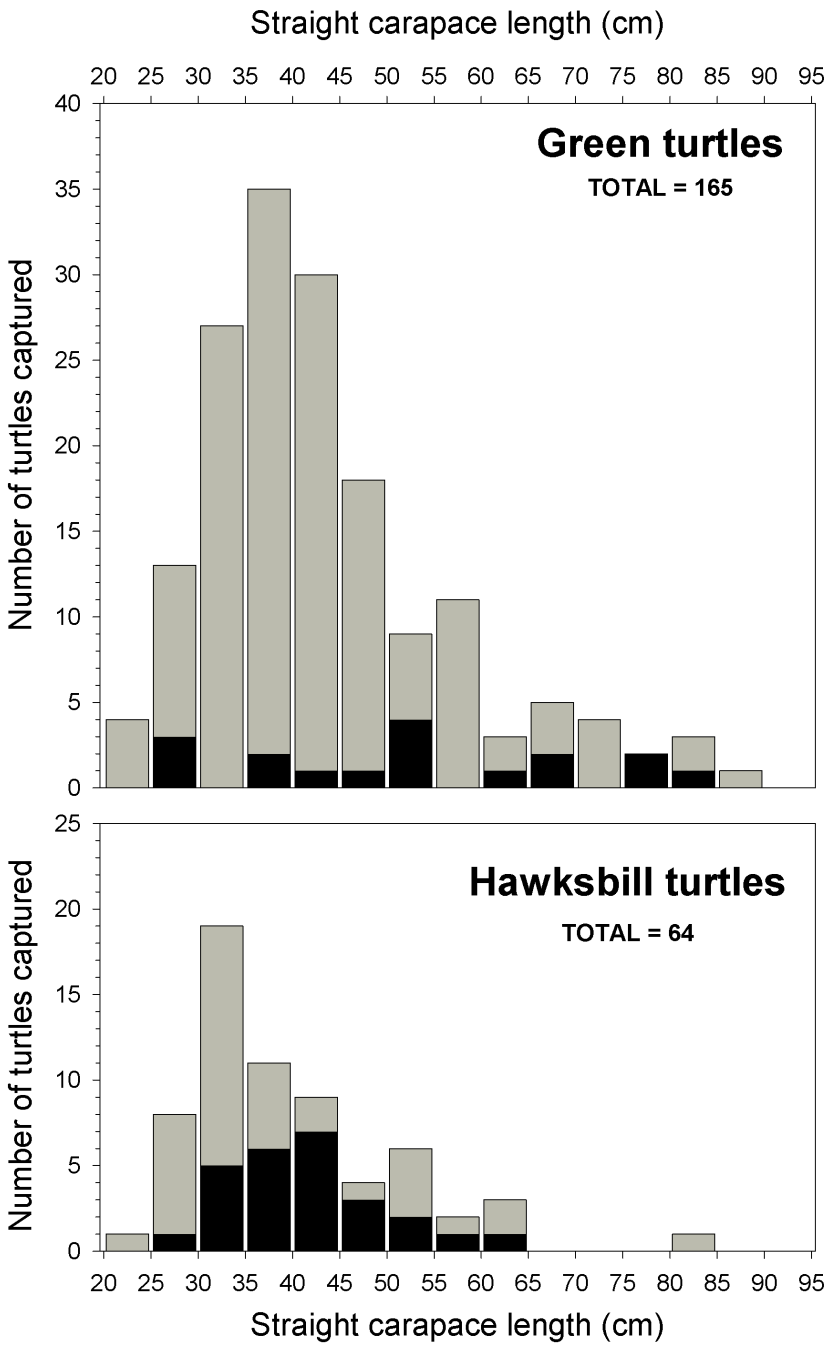


**Figure 9.** Size distribution of hawksbill and green turtles captured, tagged and measured at Bonaire. Black bars indicate recapture of turtles tagged in previous years.

Combined, the snorkeling and netting surveys yielded a total of 165 individual green turtles and 64 hawksbills, of which 17 green turtles and 26 hawksbills were recaptures (Figure 9). Gathering information on movement and somatic growth rates is possible by recaptures of previously tagged turtles. Our surveys detected two green turtles that had made a significant movement from their original capture location: immature green 08-028, first tagged at Karpata on March 5th 2008, was recaptured at Playa Frans on April 29th 2009. Similarly, green turtle 08-163 first tagged at Sabadeco on November 20th 2008 was recaptured 3 months later within the Marine

Reserve section of Bonaire's Northwest coast. Juvenile hawksbill 06-021, tagged in 2006 at Washington Slagbaai was recaptured at Playa Frans on 27th February 2009.

Recaptured turtles yielded substantial information on somatic growth rates for green turtles and hawksbills over a wide size range (Figure 10). 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.

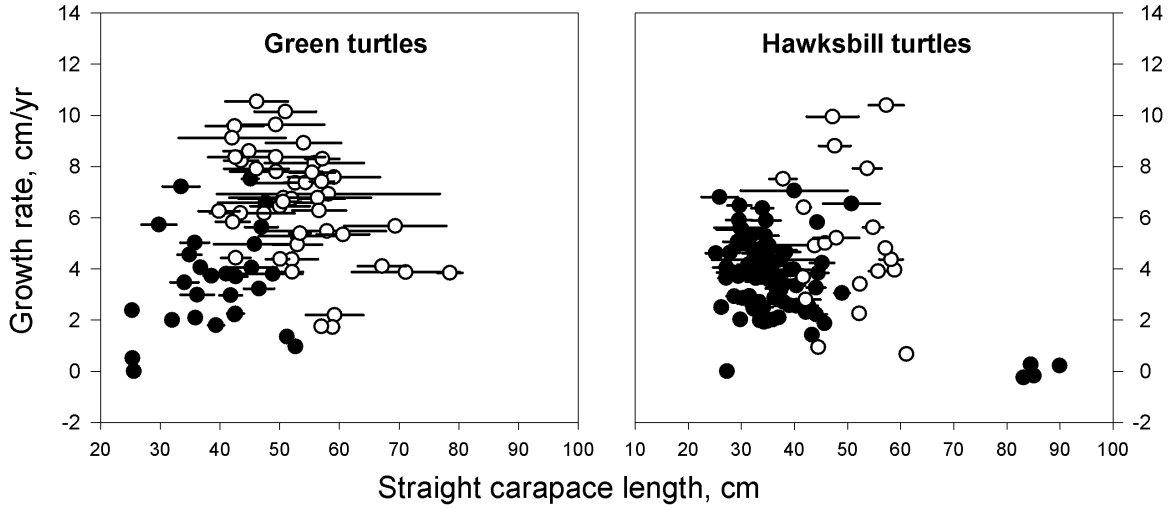


**Figure 10.** Somatic growth of hawksbill and green turtles recaptured at Bonaire, with turtles captured at Lac Bay indicated with open circles. Horizontal lines indicate the size range over which an individual's growth was recorded.

One measure of turtle health is the "body condition index", which is a "fatness" measure calculated as BCI= 10000 * body mass / SCL_. Green turtles living at Lac Bay have a mean BCI of 1.30 kg/cm_ (± 0.09 standard deviation, n=116) versus 1.21 ± 0.09 kg/cm_ (n=50) for non-Lac residents, indicating that green turtles are fatter at Lac (figure 11). For hawksbills there is no significant difference, with BCI in Lac resident juveniles at 1.12 ± 0.09 kg/cm_ (n=16) versus non-Lac hawksbills with a BCI of 1.10 ± 0.09 kg/cm_ (n=47). These body condition index numbers further emphasize the exceptional nutritional qualities of the Lac Bay habitat for immature green turtles.

Figure 11 also illustrates the size range differences between Lac Bay and non-Lac turtles for both species. Lac Bay tends to harbor larger individuals of green and hawksbill turtles than any of the Bonaire reef habitats. Small (<30 cm SCL) green turtles are likely to be present in Lac too, but may escape sampling due to the mesh size of the net (30 cm stretched mesh) used to capture turtles within the bay.

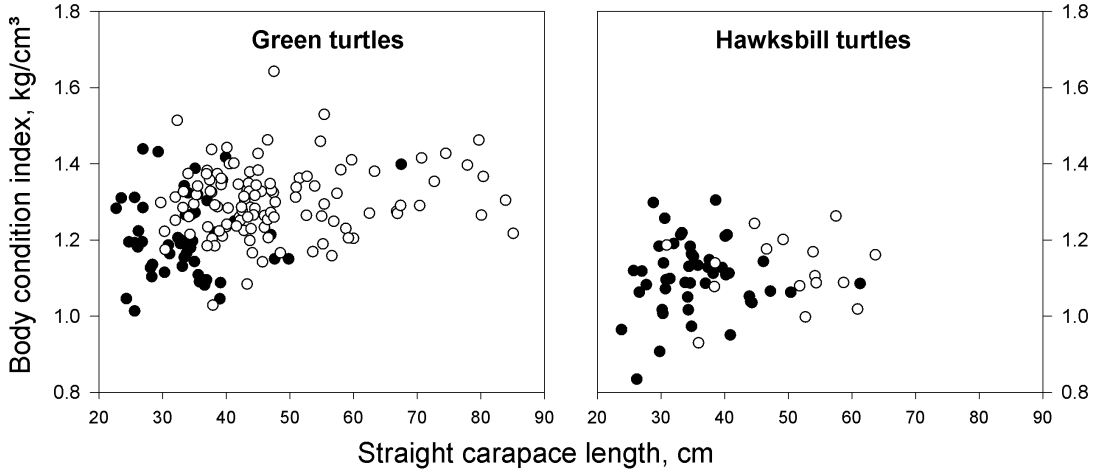


**Figure 11.** Body condition index, or "fatness" index, numbers measured for individual green and hawksbill turtles and the size range of these individuals. Open circles indicate turtles living at Lac Bay. A higher BCI generally means fatter and healthier turtles.

## 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 44 green turtles examined in March-April 2009, no turtles exhibited evidence of tumors (Table 3). However, three individuals captured in November 2009 (out of 68) exhibited tumor-like growth around the eyes. The occurrence of fibropapillomatosis in the Lac Bay green turtles appears to be declining and no longer affects as many individuals as observed in 2005-2006.

**Table 3.** Number of green turtles captured in Lac by survey period and occurrence of visible tumors.

| 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 |
| 2008 | October-November | 48 | 1 | 2.1 |
| **2009** | **March-April** | **44** | **0** | **0** |
| **2009** | **November** | **68** | **3** | **4.4** |

## SATELLITE TRACKING

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. Since our satellite-tracking program started in 2003, we have tracked 17 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 2009, transmitters were placed on two nesting hawksbill turtles at Klein Bonaire. The first, named 'Doris', was encountered at No Name beach, Klein Bonaire, on August 1st and fitted with a Telonics ST-20 transmitter. This hawksbill departed to the west 50 days later and swam for 14 days and approximately 768 km, reaching her foraging grounds near Isla de Salamanca, Colombia (figure 12). The last transmission for this turtle was received on February 1st 2010 indicating she remained on the same foraging grounds.

The second female hawksbill tracked, named 'Tina', was fitted with the same transmitter type at No Name beach, on September 16th 2009. This turtle departed the next

day towards the south, then turned east and made several loops in open water east of Bonaire before finally arriving around December 18th 2009 at her foraging ground along the western shore of the Paraguaná Peninsula in Venezuela (figure 13). The latest transmission for 'Tina' was received on March 25th 2010 and indicated that she remained foraging in the same area.

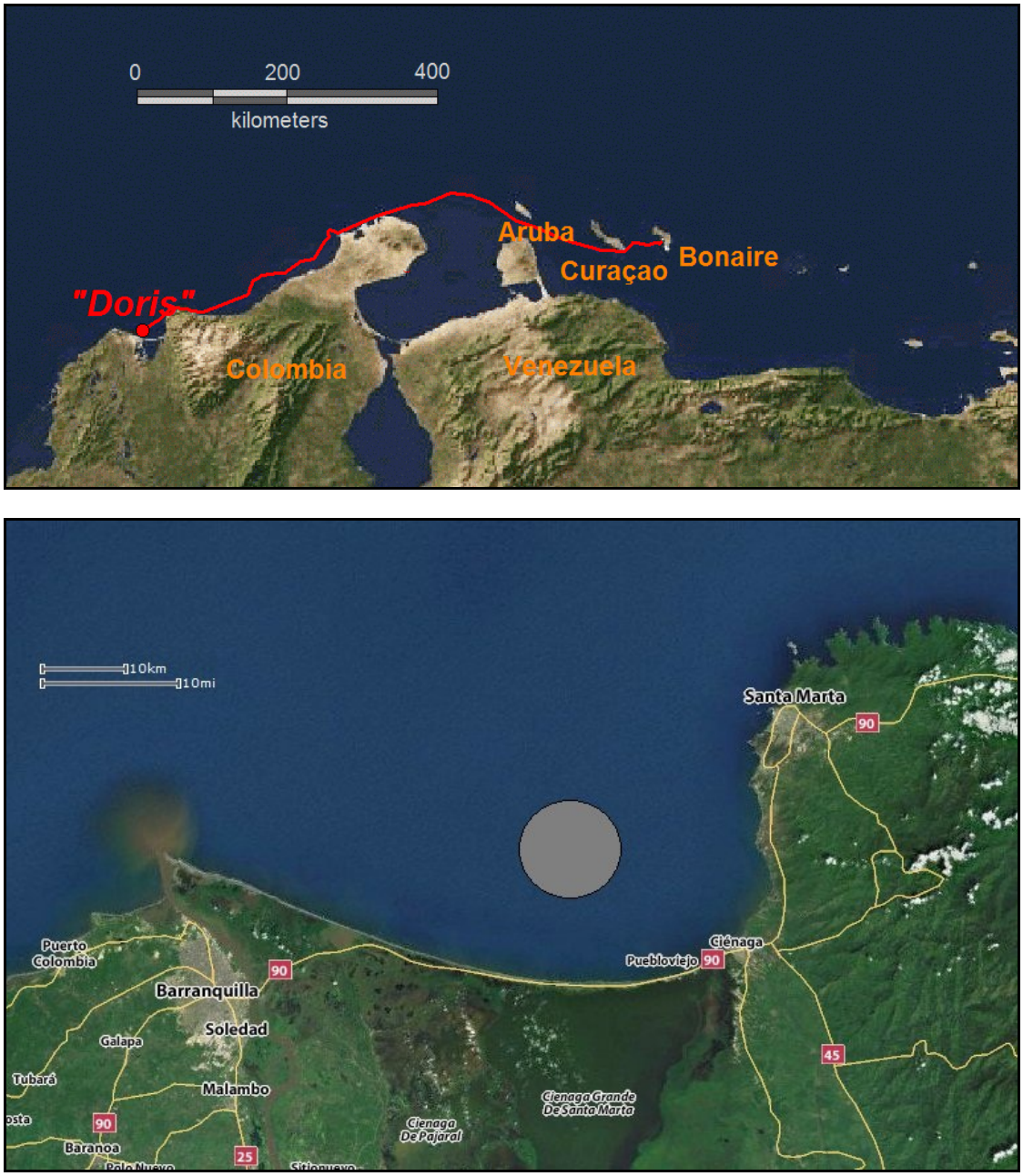


**Figure 12.** Track (top) and approximate extent of foraging area (bottom) of female hawksbill 'Doris' tracked from Bonaire to Colombia..

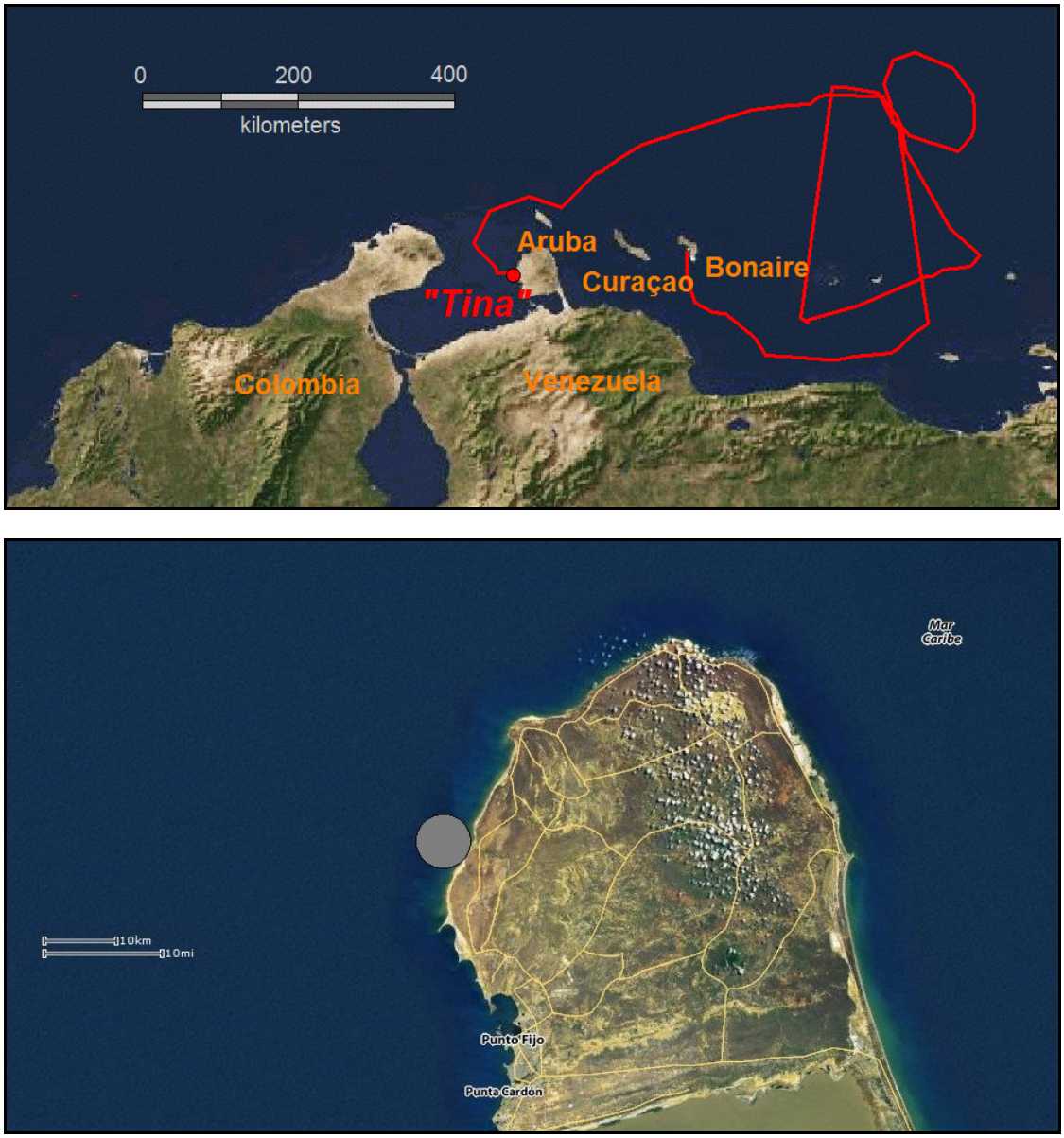


**Figure 13.** Track (top) and approximate extent of foraging area (bottom) of female hawksbill 'Tina' tracked from Bonaire to Venezuela.

## RESEARCH COLLABORATION with CIEE RESEARCH STATION BONAIRE

CIEE Research Station Bonaire offers semester and summer courses for American university students. It is a field-based program designed to prepare students for graduate programs in Marine Science or for jobs in Natural Resource Management. In 2009, two CIEE students collaborated with Sea Turtle Conservation Bonaire to do their Independent Research projects.

STCB is committed to partnering with high school and college students to encourage and support students to pursue learning in science and conservation. We are pleased with this ongoing collaboration with CIEE and look forward to working with more of their students in the future.

CIEE student Marylou Hildebrand worked with us in spring semester and conducted

research on the unique community of organisms that reside on the shell and skin of Green and Hawksbill sea turtles. Her project was entitled “Comparison of Epibionts between Green (*Chelonia mydas*) and Hawksbill (*Eretmochelys imbricata*) Sea Turtles in Bonaire, NA”.

CIEE student Noelle Hawthorne worked with us fall semester and did a project assessing the impacts that sea turtles nests have on beach communities including the plants growing and the animals living within the sand. Her project was entitled “Hawksbill turtle (*Eretmochelys imbricata*) nests: Possible nutrient sources and drivers of community structure in a tropical marine system”.

See *Appendix III* for the Abstracts of these projects that were published in the CIEE Journal of Marine Science: Physis. This journal can be downloaded from the CIEE website at www.cieebonaire.org.

**Appendix I.** List of turtles captured and tagged during 2009.

**Green turtles**

| Date capture | Tag left | Tag right | PIT | Turtle ID | Location | SCL | Weight |
|---|---|---|---|---|---|---|---|
| 21-Jan-09 | BBG151 | BBG152 | | 09-001 | Ebo's reef | 47.0 | 12.6 |
| 21-Jan-09 | BBG154 | BBG153 | | 09-003 | Ebo's Reef | 49.8 | 14.2 |
| 26-Jan-09 | BBG155 | BBG156 | | 09-009 | Nearest point | 41.3 | 8.8 |
| 26-Jan-09 | | | 135116251A | 09-010 | Nearest point | 39.0 | 6.2 |
| 26-Jan-09 | | | 134736324A | 09-011 | Nearest point | 32.8 | 4.2 |
| 16-Feb-09 | | | 134554647A | 09-023 | Karpata | 36.6 | 5.3 |
| 18-Feb-09 | WH5949 | BBG249 | | 08-056 | Klein Bonaire | 36.9 | 5.5 |
| 20-Feb-09 | | | 113936557A | 09-029 | Karpata | 35.8 | 5.0 |
| 20-Feb-09 | | | 133735097A | 08-163 | Reserve | 25.6 | 2.2 |
| 20-Feb-09 | | | 133924752A | 09-032 | Reserve | 28.4 | 2.6 |
| 20-Feb-09 | | | 134621243A | 09-033 | Reserve | 22.7 | 1.5 |
| 25-Feb-09 | | | 34527222A | 09-034 | Bopec | 26.1 | 2.1 |
| 25-Feb-09 | | | 049019059 | 09-035 | Bopec | 34.4 | 4.8 |
| 27-Feb-09 | | | 133926677A | 09-037 | New Kove | 28.1 | 2.5 |
| 27-Feb-09 | | | 134526270A | 09-038 | Playa Frans | 24.3 | 1.5 |
| 27-Feb-09 | WH5921 | WH5920 | 134729222A | 08-028 | Playa Frans | 25.6 | 1.7 |
| 27-Feb-09 | | | 134733191A | 09-041 | Playa Frans | 28.3 | 2.5 |
| 27-Feb-09 | | | 134422317A | 09-042 | Slagbaai | 33.4 | 4.3 |
| 2-Mar-09 | | | 133918213A | 09-043 | Wayaka | 35.6 | 5.0 |
| 2-Mar-09 | | | 134739122A | 09-044 | Wayaka | 35.0 | 4.9 |
| 2-Mar-09 | | | 134666462A | 09-046 | | 33.8 | 4.5 |
| 9-Mar-09 | | | | 09-051 | Sweet Dreams | 26.8 | 2.3 |
| 9-Mar-09 | | | 134575312A | 09-053 | Marget Bay | 23.5 | 1.7 |
| 13-Mar-09 | | | 133951761A | 09-055 | Atlantis | 33.6 | 4.8 |
| 13-Mar-09 | | | 133925112A | 09-058 | Atlantis | 33.1 | 4.1 |
| 13-Mar-09 | | | 134564097A | 09-060 | Salt Pier | 38.2 | 6.8 |
| 16-Mar-09 | | | 133635214A | 09-061 | Nearest point | 37.0 | 6.6 |
| 16-Mar-09 | | | 135145474A | 09-062 | Nearest point | 30.3 | 3.1 |
| 16-Mar-09 | | | 133732326A | 09-063 | Nearest point | 39.1 | 6.5 |
| 18-Mar-09 | | | 133639794A | 09-064 | Flamingo Beach | 24.7 | 1.8 |
| 18-Mar-09 | | | 134532465A | 09-066 | Kralendijk | 39.9 | 9.0 |
| 20-Mar-09 | | | 107639599 | 09-067 | Cliff | 32.7 | 4.2 |
| 23-Mar-09 | | | 135137356A | 09-071 | Lac | 30.4 | 3.3 |
| 24-Mar-09 | BBG165 | BBG164 | | 09-072 | Lac | 45.7 | 10.9 |
| 24-Mar-09 | | | 135135171A | 09-073 | Lac | 39.2 | 8.1 |
| 24-Mar-09 | BBG171 | BBG170 | | 09-074 | Lac | 54.8 | 24.0 |
| 24-Mar-09 | BBG169 | BBG168 | | 09-075 | Lac | 55.2 | 20.0 |
| 24-Mar-09 | BBG167 | BBG166 | | 09-076 | Lac | 43.3 | 10.8 |
| 24-Mar-09 | | | 134965572A | 09-077 | Lac | 37.0 | 7.0 |
| 24-Mar-09 | | | 134734223A | 09-078 | Lac | 32.0 | 4.3 |
| 24-Mar-09 | | | 133936794A | 09-079 | Lac | 38.9 | 7.2 |
| 24-Mar-09 | | | 134967522A | 09-080 | Lac | 34.9 | 5.5 |
| 24-Mar-09 | | | 134626795A | 09-081 | Lac | 33.3 | 4.9 |
| 24-Mar-09 | BBG173 | BBG172 | | 09-082 | Lac | 46.0 | 12.0 |
| 24-Mar-09 | | | 134454125A | 09-083 | Lac | 37.8 | 6.5 |
| 25-Mar-09 | WH5891 | BBG174 | | 09-085 | Out of Lac | 74.5 | 59.0 |
| 25-Mar-09 | BBG185 | BBG184 | | 09-092 | Lac | 55.4 | 26 |
| 25-Mar-09 | BBG181 | BBG182 | | 09-093 | Lac | 57.4 | 25 |
| 27-Mar-09 | | | 133955522A | 09-096 | Lac | 39.4 | 7.4 |

**Green turtles** (continued)

| Date capture | Tag left | Tag right | PIT | Turtle ID | Location | SCL | Weight |
|---|---|---|---|---|---|---|---|
| 27-Mar-09 | BBG285 | WH5827 | | 08-107 | Lac | 53.6 | 18.0 |
| 27-Mar-09 | BBG191 | BBG188 | | 09-098 | Lac | 56.9 | 23 |
| 27-Mar-09 | | | 133954772A | 09-099 | Lac | 38.6 | 7.9 |
| 27-Mar-09 | BBG180 | BBG185 | | 09-100 | Lac | 41.7 | 9 |
| 27-Mar-09 | BBG190 | BBG189 | | 09-101 | Lac | 40.1 | 9.3 |
| 27-Mar-09 | BBG186 | BBG187 | | 09-102 | Lac | 44.1 | 10.0 |
| 30-Mar-09 | BBG192 | BBG193 | | 09-103 | Out of Lac | 85.1 | 75 |
| 30-Mar-09 | WH1080 | BX1155 | | 06-065 | Out of Lac | 77.9 | 66 |
| 30-Mar-09 | WH1370 | BBG235 | | 07-180 | Out of Lac | 60.0 | 26.0 |
| 30-Mar-09 | | | 133963367A | 09-107 | Lac | 32.3 | 5.1 |
| 30-Mar-09 | WH1251 | BX1264 | | 07-057 | Lac | 66.8 | 38.0 |
| 30-Mar-09 | BBH001 | BBG200 | | 09-109 | Lac | 42.1 | 9.4 |
| 30-Mar-09 | BBG197 | BBG196 | | 09-111 | Lac | 63.3 | 35 |
| 31-Mar-09 | | | 134459125A | 09-112 | Lac | 33.2 | 4.7 |
| 31-Mar-09 | | | 133654790A | 09-113 | Lac | 35.5 | 5.9 |
| 31-Mar-09 | BBH003 | BBH002 | | 09-114 | Lac | 42.8 | 9.6 |
| 1-Apr-09 | WH1334 | BBG202 | | 07-142 | Lac | 51.5 | 18.6 |
| 1-Apr-09 | | | 134734120A | 09-117 | Lac | 40.0 | 7.9 |
| 1-Apr-09 | BBH005 | BBH004 | | 09-118 | Lac | 43.3 | 8.8 |
| 2-Apr-09 | WH5990 | BBG275 | | 08-089 | Out of Lac | 53.9 | 21 |
| 2-Apr-09 | | | 135138556A | 09-122 | Out of Lac | 70.4 | 45 |
| 2-Apr-09 | BBH008 | BBH007 | | 09-123 | Lac | 42.9 | 10.3 |
| 2-Apr-09 | BBG010 | BBH009 | | 09-124 | Lac | 43.5 | 11.1 |
| 3-Apr-09 | BBH014 | BBH013 | | 09-126 | Lac | 47.5 | 17.6 |
| 3-Apr-09 | BBH016 | BBH015 | | 09-127 | Lac | 43.8 | 10.8 |
| 3-Apr-09 | | | 133637111A | 09-128 | Lac | 34.0 | 5.4 |
| 3-Apr-09 | | | 134553215A | 09-129 | Lac | 34.3 | 4.9 |
| 3-Apr-09 | BBH018 | BBH017 | | 09-130 | Lac | 45.5 | 12.5 |
| 3-Apr-09 | BBH020 | BBH019 | | 09-131 | Lac | 62.5 | 31 |
| 8-Apr-09 | | | 135138116A | 09-134 | Ebo's reef | 35.1 | 5.5 |
| 8-Apr-09 | | | 133532195A | 09-135 | Jerry's sponges | 32.4 | 4.1 |
| 8-Apr-09 | BBH022 | BBH021 | | 09-137 | Jerry's sponges | 47.6 | 12.4 |
| 15-Apr-09 | | | 134476766A | 09-138 | Jeff Davis | 30.9 | 3.5 |
| 17-Apr-09 | | | 133731295A | 09-140 | Knife | 39.4 | 8.3 |
| 17-Apr-09 | BBH024 | BBH025 | | 09-141 | Knife | 51.0 | |
| 20-Apr-09 | | | 133735674A | 09-143 | Jeff Davis | 34.0 | 5.2 |
| 20-Apr-09 | | | 133947245A | 09-144 | Thousand steps | 26.9 | 2.5 |
| 24-Apr-09 | | | 134736631A | 09-147 | Reserve | 33.4 | 5.0 |
| 24-Apr-09 | | | 134956666A | 09-148 | Karpata | 31.1 | 3.5 |
| 24-Apr-09 | | | 133632265A | 09-149 | Karpata | 33.8 | 4.6 |
| 29-Apr-09 | | | 133937170A | 09-151 | Wayaka | 26.2 | 2.2 |
| 29-Apr-09 | | | 134667611A | 09-152 | Bisemorto | 35.1 | 6.0 |
| 29-Apr-09 | WH5921 | WH5920 | 134729222A | 08-028 | Playa Frans | 25.6 | 2.0 |
| 29-Apr-09 | | | 135145472A | 09-154 | Playa Frans | 29.3 | 3.6 |
| 29-Apr-09 | | | 133871443A | 09-155 | Playa Frans | 26.9 | 2.8 |
| 29-Apr-09 | | | | 09-156 | Playa Frans | 34.5 | 5.2 |
| 4-May-09 | BBH026 | BBH028 | | 09-158 | Bopec | 67.5 | 43.0 |
| 23-Jul-09 | | | 01048731 | 09-159 | :hi-released at Nea | 34.7 | 5 |
| 2-Nov-09 | | | 151348222A | 09-163 | Lac | 29.7 | 3.4 |
| 2-Nov-09 | BBH042 | BBH041 | | 09-164 | Lac | 47.4 | 14.1 |
| 2-Nov-09 | BBH031 | BBH033 | | 09-165 | Lac | 56.6 | 21 |
| 2-Nov-09 | BBH044 | BBH043 | | 09-166 | Lac | 58.8 | 25 |

**Green turtles** (continued)

| Date capture | Tag left | Tag right | PIT | Turtle ID | Location | SCL | Weight |
|---|---|---|---|---|---|---|---|
| 2-Nov-09 | | | 151347362A | 09-167 | Lac | 37.7 | 7.1 |
| 2-Nov-09 | | | 151347524A | 09-168 | Lac | 30.3 | 3.4 |
| 3-Nov-09 | | | 151347292A | 09-169 | Lac | 42.2 | 9.4 |
| 3-Nov-09 | | | 151347100A | 09-170 | Lac | 38.6 | 7.4 |
| 3-Nov-09 | WH1039 | BX1388 | | 06-046 | Lac | 67.8 | |
| 3-Nov-09 | BBH048 | BBH047 | | 09-173 | Lac | 59.7 | 30 |
| 3-Nov-09 | BBH046 | BBH045 | | 09-174 | Lac | 44.5 | 11.3 |
| 4-Nov-09 | WH7477 | BBH055 | | 09-175 | Lac | 80.4 | 71 |
| 4-Nov-09 | BBH054 | BBH053 | | 09-176 | Lac | 47.1 | 13.9 |
| 4-Nov-09 | BBH051 | BBH052 | | 09-177 | Out of Lac | 70.7 | 50 |
| 4-Nov-09 | BBH050 | | 151347612A | 09-178 | Out of Lac | 55.4 | 22 |
| 9-Nov-09 | | | 151347786A | 09-181 | Lac | 40.1 | 8 |
| 9-Nov-09 | BBH062 | | 135116250A | 09-027 | Lac | 42.5 | 9.8 |
| 9-Nov-09 | BBH061 | BBH060 | | 09-183 | Lac | 43.9 | 10.4 |
| 9-Nov-09 | | | 151348156A | 09-184 | Lac | 35.3 | 5.8 |
| 9-Nov-09 | | | 151347201A | 09-185 | Lac | 48.5 | 13.3 |
| 9-Nov-09 | WH5810 | BBG119 | | 08-148 | Lac | 45.0 | 12.6 |
| 9-Nov-09 | | | 151347092A | 09-187 | Lac | 37.1 | 6.3 |
| 9-Nov-09 | BBH057 | BBH034 | | 09-188 | Lac | 43.7 | 10 |
| 9-Nov-09 | BBH059 | BBH058 | | 09-189 | Lac | 41.6 | 8.9 |
| 10-Nov-09 | BBH070 | BBH071 | | 09-190 | Lac | 45.0 | 13 |
| 10-Nov-09 | BBH069 | BBH068 | | 09-191 | Lac | 46.5 | 14.7 |
| 10-Nov-09 | | | 151348010A | 09-192 | Lac | 32.0 | 4.1 |
| 10-Nov-09 | | | 151348391A | 09-193 | Lac | 40.5 | 9.3 |
| 10-Nov-09 | BBH066 | BBH067 | | 09-194 | Lac | 43.6 | 11 |
| 10-Nov-09 | WH1260 | BX1272 | | 07-070 | Lac | 55.0 | 21 |
| 10-Nov-09 | BBH064 | BBH065 | | 09-196 | Lac | 41.9 | 9.9 |
| 11-Nov-09 | | | 151348266A | 09-197 | Lac | 37.4 | 7.1 |
| 11-Nov-09 | | | 151347485A | 09-198 | Lac | 37.9 | 5.6 |
| 11-Nov-09 | | | 151348001A | 09-199 | Lac | 44.5 | 11.6 |
| 11-Nov-09 | | | 151347792A | 09-200 | Lac | 39.2 | 8.2 |
| 11-Nov-09 | BBH073 | BBH072 | | 09-201 | Lac | 44.3 | 11 |
| 11-Nov-09 | BBH075 | BBH079 | | 09-202 | Lac | 47.0 | 13.2 |
| 11-Nov-09 | BBH076 | BBH077 | | 09-203 | Lac | 43.4 | 10.3 |
| 11-Nov-09 | | | 151348355A | 09-204 | Lac | 41.2 | 9.8 |
| 11-Nov-09 | | | 151348410A | 09-205 | Lac | 37.7 | 7.7 |
| 11-Nov-09 | | | 151348395A | 09-206 | Lac | 38.2 | 7.2 |
| 11-Nov-09 | | | 151348095A | 09-207 | Lac | 37.5 | 7 |
| 11-Nov-09 | | | 151348127A | 09-208 | Lac | 38.9 | 7.2 |
| 11-Nov-09 | WM5984 | BBG268 | | 08-077 | Lac | 79.7 | 74 |
| 11-Nov-09 | WE4218 | BBH082 | | 05-006 | Lac | 80.1 | 65 |
| 11-Nov-09 | | | 151347556A | 09-211 | Lac | 66.9 | 38 |
| 11-Nov-09 | | | 151347450A | 09-212 | Lac | 59.2 | 25 |
| 11-Nov-09 | BBH081 | BBH090 | | 09-213 | Lac | 52.6 | 18.4 |
| 11-Nov-09 | BBH078 | BBH079 | | 09-214 | Lac | 47.5 | 13.5 |
| 11-Nov-09 | BBH084 | BBH083 | | 09-215 | Lac | 72.7 | 52 |
| 12-Nov-09 | | | 151348262A | 09-216 | Lac | 42.8 | 10.3 |
| 12-Nov-09 | | | 151347136A | 09-218 | Lac | 37.0 | 6 |
| 12-Nov-09 | | | 151347490A | 09-219 | Lac | 46.9 | 13.9 |
| 11-Nov-09 | | | 151348417A | 09-220 | Lac | 44.7 | 12 |
| 11-Nov-09 | | | 151347162A | 09-221 | Lac | 46.6 | 12.2 |
| 11-Nov-09 | BBH086 | BBH085 | | 09-222 | Lac | 58.0 | 27 |
| 16-Nov-09 | WH1381 | missing | 151347147A | 07-193 | Lac | 51.0 | 17.75 |

**Green turtles** (continued)

| Date capture | Tag left | Tag right | PIT | Turtle ID | Location | SCL | Weight |
|---|---|---|---|---|---|---|---|
| 16-Nov-09 | | | 151347657A | 09-225 | Lac | 47.7 | 14.1 |
| 16-Nov-09 | WH7479 | BBH089 | | 09-226 | Lac | 83.9 | 77 |
| 16-Nov-09 | BBH087 | BBH088 | | 09-227 | Lac | 67.4 | 39.5 |
| 17-Nov-09 | BBH090 | BBH091 | | 09-228 | Sorobon | 50.9 | 17.3 |
| 17-Nov-09 | | | 151347451A | 09-229 | Sorobon | 35.5 | 6 |
| 17-Nov-09 | | | 151347021A | 09-230 | Sorobon | 36.9 | 6.9 |
| 17-Nov-09 | | | 151347206A | 09-231 | Sorobon | 40.3 | 8.4 |
| 17-Nov-09 | | | 151347483A | 09-232 | Lac | 34.1 | 5 |
| 17-Nov-09 | | | 151347674A | 09-233 | Lac | 42.4 | 9.8 |
| 17-Nov-09 | BBH093 | BBH092 | | 09-234 | Lac | 52.7 | 20 |

## Hawksbill turtles

| Date capture | Tag left | Tag right | PIT | Turtle ID | Location | SCL | Weight |
|---|---|---|---|---|---|---|---|
| 21-Jan-09 | BX1117 | WE4192 | | 04-065 | Ebo's reef | 44.3 | 9 |
| 21-Jan-09 | WH1320 | WH1319 | | 07-130 | Ebo's reef | 37.4 | 5.9 |
| 21-Jan-09 | BBG247 | WH5948 | 134731386A | 05-075 | No name | 40.2 | 7.2 |
| 21-Jan-09 | WH1400 | WH5901 | 134567321A | 08-010 | No name | 34.4 | 4.6 |
| 23-Jan-09 | WH1328 | WH1327 | 134673374A | 06-123 | No name | 37.0 | 5.5 |
| 26-Jan-09 | WH1126 | WH1127 | 134976345A | 06-120 | Nearest poi | 35.8 | 5.2 |
| 26-Jan-09 | WH1006 | BX1354 | | 05-098 | Nearest poi | 43.9 | 8.9 |
| 26-Jan-09 | WH5956 | WH5955 | 134956526A | 08-064 | Nearest poi | 29.7 | 3.1 |
| 28-Jan-09 | WH5872 | WH5871 | 134531312A | 09-014 | Bon Bini na | 34.2 | 4.2 |
| 16-Feb-09 | WH5872 | WH5871 | 134531312A | 09-014 | Ladanias | 34.3 | 4.1 |
| 28-Jan-09 | | | 134474720A | 09-015 | Bon Bini na | 33.1 | 4.4 |
| 28-Jan-09 | | | 133437335A | 09-016 | 1000 steps | 33.8 | 4.2 |
| 28-Jan-09 | | | 134557735A | 09-017 | Weisers Jo | 23.8 | 1.3 |
| 9-Feb-09 | WH5870 | BBG157 | | 09-018 | Bachelors E | 37.6 | 6.1 |
| 16-Feb-09 | WH1223 | WH1224 | 133951151A | 06-103 | Old Bloe | 38.2 | 6.2 |
| 16-Feb-09 | WH5874 | BBG160 | | 09-021 | Ladanias | 34.8 | 4.1 |
| 2-Apr-09 | BBH006 | | 134515113A | 09-121 | Out of Lac | 38.4 | 6.1 |
| 16-Feb-09 | WH5936 | WH5935 | | 08-035 | Karpata | 34.8 | 4.9 |
| 18-Feb-09 | WE4055 | WE4056 | 134552391A | 03-038 | Klein Bonai | 46.1 | 11.2 |
| 18-Feb-09 | WH5873 | WH5875 | 133662111A | 09-027 | Klein Bonai | 30.3 | 2.8 |
| 18-Feb-09 | WH5877 | WH5876 | 134533453A | 09-028 | Klein Bonai | 31.4 | 3.4 |
| 20-Feb-09 | WH5934 | WH5933 | 134734490A | 07-049 | Reserve | 33.3 | 4.5 |
| 25-Feb-09 | WH5878 | WH5879 | 134563783A | 09-036 | Bopec | 32.0 | 3.9 |
| 27-Feb-09 | WH5880 | WH1060 | 133922530A | 06-021 | Playa Frans | 40.7 | 7.5 |
| 2-Mar-09 | WH5882 | WH5881 | 133733263A | 09-045 | Wayaka | 26.2 | 1.5 |
| 4-Mar-09 | WH5883 | BBG161 | | 09-047 | Malmok | 40.9 | 6.5 |
| 6-Mar-09 | WH5886 | BBG162 | | 09-048 | Sweet Drea | 47.2 | 11.2 |
| 6-Mar-09 | WH5885 | WH5884 | 133731261A | 09-049 | Sweet Drea | 29.8 | 2.4 |
| 6-Mar-09 | WH5887 | WH5888 | 133937540A | 09-050 | Sweet Drea | 34.6 | 4.5 |
| 9-Mar-09 | WH1193 | WH1192 | 133663346A | 07-004 | Sweet Drea | 38.6 | 7.5 |
| 9-Mar-09 | | | 133666440A | 09-054 | Marget Bay | 27.7 | 2.3 |
| 13-Mar-09 | WH5900 | BBG163 | | 09-056 | Atlantis | 35.1 | 5.0 |
| 13-Mar-09 | WH5898 | WH5899 | 133758355A | 09-057 | Atlantis | 30.8 | 3.2 |
| 13-Mar-09 | BX1254 | WH1229 | | 07-040 | Salt Pier | 50.4 | 13.6 |
| 18-Mar-09 | WH5897 | WH5896 | 134424637A | 09-065 | Zeezicht | 28.8 | 3.1 |
| 20-Mar-09 | WH5895 | WH5894 | 134739122A | 09-068 | Cliff | 30.7 | 3.1 |
| 20-Mar-09 | WH5893 | WH5892 | 134525750A | 09-069 | Pitri's Pillar | 26.6 | 2.0 |
| 20-Mar-09 | WH1397 | WH1396 | | 08-006 | Andrea 1 | 34.6 | 4.9 |
| 25-Mar-09 | WH7407 | BBG177 | | 09-084 | Out of Lac | 63.7 | 30.0 |
| 25-Mar-09 | WH5890 | BBG176 | | 09-086 | Out of Lac | 54.2 | 17.6 |
| 25-Mar-09 | WH7403 | BBG178 | | 09-087 | Out of Lac | 58.7 | 22.0 |
| 25-Mar-09 | WH5889 | BBG175 | | 09-088 | Out of Lac | 35.9 | 4.3 |
| 25-Mar-09 | WH7406 | BBG179 | | 09-089 | Out of Lac | 38.5 | 6.5 |
| 25-Mar-09 | WH1156 | BX1205 | | 06-143 | Out of Lac | 46.6 | 11.9 |
| 25-Mar-09 | WH5836 | BBG297 | | 08-117 | Lac | 57.5 | 24 |
| 27-Mar-09 | | | 133965737A | 09-094 | Lac | 30.9 | 3.5 |
| 27-Mar-09 | WH5802 | BBG115 | | 08-137 | Lac | 52.7 | 14.6 |
| 30-Mar-09 | BBG194 | BBG195 | | 09-106 | Out of Lac | 60.9 | 23 |
| 30-Mar-09 | BBG199 | BBG198 | | 09-110 | Lac | 51.8 | 15 |
| 31-Mar-09 | WH1256 | BX1268 | | 09-115 | Lac | 49.2 | 14.3 |

**Hawksbill turtles** (continued)

| Date capture | Tag left | Tag right | PIT | Turtle ID | Location | SCL | Weight |
|---|---|---|---|---|---|---|---|
| 2-Apr-09 | WH5820 | BBG127 | | 08-154 | Out of Lac | 44.7 | 11.1 |
| 2-Apr-09 | BBH012 | BBH011 | | 09-125 | Lac | 53.9 | 18.3 |
| 8-Apr-09 | WH7417 | WH7416 | 134935232A | 09-132 | Ebo's reef | 27.0 | 2.2 |
| 8-Apr-09 | WH7408 | BBH023 | 134451445A | 06-114 | Ebo's reef | 40.4 | 8.0 |
| 8-Apr-09 | WH7412 | WH7410 | 133944792A | 09-136 | Jerry's spor | 30.6 | 3.6 |
| 17-Apr-09 | WH1326 | WH1321 | | 07-132 | Twixed | 39.6 | 7.0 |
| 20-Apr-09 | WH7418 | WH7419 | 13458716A | 09-142 | Jeff Davis | 30.2 | 2.8 |
| 20-Apr-09 | WH8060 | WH8061 | 134733586A | 09-145 | Old Blue | 30.4 | 3.2 |
| 22-Apr-09 | WH7423 | WH7422 | 133736210A | 09-146 | Klein Bonair | 25.7 | 1.9 |
| 29-Apr-09 | WH5945 | BBG255 | | 08-043 | Slagbaai | 44.1 | 8.9 |
| 29-Apr-09 | WH9074 | BBH027 | | 09-157 | Playa Frans | 40.1 | 7.8 |
| 31-Jul-09 | WH7457 | BBH0032 | | 09-160 | No name sta | 81.9 | |
| 16-Sep-09 | WH8056 | BBH030 | | 09-161 | No name stake 450 | | |
| 2-Nov-09 | BBH029 | WH7476 | | 09-162 | Lac | 54.4 | 17.5 |
| 4-Nov-09 | BBG194 | BBG195 | | 09-106 | Out of Lac | 61.3 | 25 |

**Appendix II.** Lists of nests observed on Bonaire and Klein Bonaire during 2009

List of nests observed on Klein Bonaire during 2009

| Activity number | Location stake | Observation date | Species |
|---|---|---|---|
| **2** | 328 | 27-May | Cc |
| **4** | 892 | 30-May | Cc |
| **3** | 524 | 1-Jun | Cc |
| **8** | 380 | 12-Jun | Cc |
| **9** | 1044 | 12-Jun | Cc |
| **11** | 1855 | 24-Jun | Cc |
| **13** | 660 | 26-Jun | Cc |
| **14** | 858 | 26-Jun | Cc |
| **17** | 737 | 8-Jul | Cc |
| **19** | 1285 | 13-Jul | Cc |
| **21** | 1151 | 20-Jul | Cc |
| **24** | 676 | 22-Jul | Cc |
| **25** | 1882 | 22-Jul | Cc |
| **28** | 1042 | 30-Jul | Cc |
| **30** | 560 | 31-Jul | Cc |
| **34** | 1130 | 19-Aug | Cc |
| **2** | 1197 | 22-May | Ei |
| **7** | 1190 | 8-Jun | Ei |
| **10** | 1630 | 19-Jun | Ei |
| **12** | 415 | 24-Jun | Ei |
| **15** | 1105 | 26-Jun | Ei |
| **16** | 987 | 4-Jul | Ei |
| **20** | 1004 | 18-Jul | Ei |
| **22** | 760 | 20-Jul | Ei |
| **23** | 255 | 22-Jul | Ei |
| **26** | 1460 | 24-Jul | Ei |
| **27** | 1120 | 27-Jul | Ei |
| **29** | 1465 | 31-Jul | Ei |
| **31** | 1245 | 7-Aug | Ei |
| **32** | 1563 | 11-Aug | Ei |
| **33** | 1854 | 17-Aug | Ei |
| **35** | 260 | 25-Aug | Ei |
| **36** | 2050 | 26-Aug | Ei |
| **37** | 562 | 4-Sep | Ei |
| **38** | 880 | 9-Sep | Ei |
| **39** | 450 | 16-Sep | Ei |
| **40** | 746 | 18-Sep | Ei |
| **41** | 1004 | 21-Sep | Ei |
| **42** | 420 | 25-Sep | Ei |
| **43** | 265 | 29-Sep | Ei |
| **44** | 1865 | 2-Oct | Ei |
| **47** | 1120 | 14-Oct | Ei |
| **45** | 430 | 28-Oct | Ei |
| **46** | 560 | 20-Nov | Ei |
| **48** | 933 | 23-Nov | Ei |
| **49** | 925 | 25-Nov | Ei |
| **50** | 725 | 25-Nov | Ei |
| **51** | 707 | 2-Dec | Ei |
| **53** | 1450 | 12-Dec | Ei |
| **54** | 587 | 19-Dec | Ei |
| **55** | 1041 | 31-Dec | Ei |

There were a total of 38 hawksbill (Ei) nests and 20 loggerhead (Cc) nests on Bonaire and Klein Bonaire. No green turtle nests were detected during 2009, which was a low year for green turtle nesting activity throughout the Caribbean.

List of nests observed on other Bonaire beaches during 2009.

| | | | |
|---|---|---|---|
| **1** | Fisherman's hut | 30-May | Cc |
| **2** | Fisherman's hut | 21-Jun | Cc |
| **3** | Fisherman's hut | 29-Jun | Cc |
| **4** | Fisherman's hut | 27-Jul | Cc |
| | | | |
| **5** | Donkey Beach | 20-Oct | Ei |
| **6** | Donkey Beach | 14-Nov | Ei |
| | | | |
| **7** | Washikemba | 20-Sep | Ei |

**Appendix III.** Abstracts of CIEE students' research

Physis, Journal of Marine Science
CIEE Research Station Bonaire
Tropical Marine Ecology & Conservation Program
(available at www.cieebonaire.org.)

## 1. Vol. V Spring 2009

**Comparison of Epibionts between Green (*Chelonia mydas*) and Hawksbill (*Eretmochelys imbricata*) Sea Turtles in Bonaire, NA**
Marylou Hildebrand

Abstract: Many pelagic organisms, including sea turtles, host unique communities of epibionts on the surfaces of their bodies. Although sea turtle epibiota have been studied in other areas of the world, very little research has been conducted on the epibionts found on sea turtles inhabiting the water around Bonaire, Netherland Antilles. In this study, epibiont samples were obtained from 33 sea turtles found in Bonaire. Epibionts included green and red algae, polychaete worms, skin barnacles, and turtle barnacles. Barnacle abundance and epibiont biodiversity was determined for each size class (Small, Medium, Large juveniles) of the two most common species of sea turtles found on Bonaire (*Eretmochelys imbricata* and *Chelonia mydas*). There was no significant difference in number of barnacles between *E. imbricata* and *C. mydas*. However, there was a significant increase in the number of barnacles with increasing size class in both *E. imbricata* and *C. mydas*. Epibiont biodiversity was significantly higher on *E. imbricata* but did not increase with size class for either species. Such findings indicate that the distinct life histories of *C. mydas* and *E. imbricata* may lead to varying degrees of epibiont accumulation.

## 2. Vol. VI Fall 2009

**Hawksbill turtle (Eretmochelys imbricata) nests: Possible nutrient sources and drivers of community structure in a tropical marine system**
Noelle Hawthorne, Bucknell University

Abstract: Beach environments are considered nutrient poor systems that support limited abundances of life due to the lack of attainable nutrients. Since the surrounding environment is nutrient limited, plants and organisms residing in sandy beach communities take advantage of available nutrients whenever possible, for example, nests laid on the beach. This study assessed whether nesting hawksbill sea turtles (*Eretmochelys imbricata*) are transporters of nutrients from ocean systems to nutrient-poor beaches of Bonaire, N.A. It was hypothesized that nitrogen (N) and phosphorus (P) levels would be elevated, infaunal organisms would be more abundant, and plant cover would be higher in nest plots compared to areas without nests. To determine the input of nutrients from nesting and the potential effects of nutrient enrichment on the plants and infauna, five experimental arrays, including nest, mechanically disturbed (no nutrient addition), and undisturbed treatments were sampled from September to October 2009 on Klein Bonaire. Five days following hatching events, sediment cores were taken to assess concentrations of N and P, as well as to determine the abundance of infauna. Plant percent cover was also determined for each plot. Nutrients did not differ significantly among plot type, with both N and P consistently at low concentrations. For all nest plots, 2.5 X more taxonomic groups, including known predators, were detected than in undisturbed or mechanically disturbed plots. No plants were found in any plot type for the duration of the study. This study suggests that hawksbill sea turtle nests are not strong drivers of coastal community structure in Bonaire. It is believed that the $CaCO_3$ composition of the sand and the limestone base of the island do not allow for nutrient retention and thus excess nutrients are not available for exploitation by beach plants or infauna.

**Appendix IV.** Funders and donors during 2009

STCB is a non-profit, non-governmental organization. We raise funds through conservation and research grants, merchandise sales and from individual and business donors.

**Flagship Funder 2008 – 2010**

www.worldwildlife.org

In 2008, WWF Netherlands expanded its longtime presence on Bonaire by awarding a 3-year grant in support of STCB's work in sea turtle conservation on Bonaire. This grant is administered by STINAPA Bonaire.

**Major Funders**
UNESCO
Dutch Caribbean Nature Alliance (DCNA)

**Platinum Donors**
Marlene Robinson and Bruce Brabec
Michael and Anne Contratto
Maduro & Curiel's Bank (Bonaire)

**Gold Donors**
Marcel Cleerer
Robert and Robbie Revel

**Silver Donors**
Kristen Harris
Co de Koning
Diane Hopkins
Bonnie and David Pascoe
Pauline Kayes
Serena Black

**Bronze Donors**
Milton Best
Patrick and Hettie Holian
Lisa Ahonen
Barbel Heusinkveld
Leo Hoogenboom
Meade Lowance

Anonymous contributors

**Appendix V.** Staff and Board of Directors

**Staff**

Mabel Nava, *Manager*
Funchi Egbreghts, *Field Specialist*

**Scientific Advisor**

Robert van Dam

---

**STCB – Bonaire, Board of Directors**

Bruce Brabec, *President/Treasurer*
Anouschka van de Ven, *Secretary*
Corine Gerharts
Marlene Robinson
Diana Sint Jago
Albert de Soet, *STCB Founder*
Guido Wiersma

**Advisory Members of the Board**

Jan Kloos
Allerd Stikker

**Appendix VI.** STCB partners, supporters and volunteers

**International Partners**

Wider Caribbean Sea Turtle Conservation Network (WIDECAST)
Wildlife Trust
WWF Netherlands (WWF-NL)
Support Bonaire, Inc.

**Regional Partners**

Department of Environment & Nature (MINA)
Dutch Caribbean Nature Alliance (DCNA)
Nature Foundation St. Maarten
Parke Nacional Arikok (Aruba)
Saba Conservation Foundation
St. Eustatius National Parks Foundation
Turtugaruba

**Local Partners**

STCB is a member of Aliansa Naturalesa di Bonaire
Bonaire Department of Environment and Natural Resources (DROB)
CIEE Research Station Bonaire
Jong Bonaire
Progressive Environmental Solutions
Salba Nos Lora
STINAPA Bonaire
    Bonaire National Marine Park
    Washington-Slagbaai National Park
Tene Boneiru Limpi

**Local Business Supporters**

These businesses provide ongoing support to STCB programs and activities through the donation of in-kind services:

The Beach Shop at Harbour Village
BITS (Hanny Kalk & Gijs Hoogerkamp)
Buddy Dive Resort
Budget Rent A Car Bonaire
Carib Inn (Bruce Bowker)
CARGILL Salt Bonaire
Gaia Productions
Harbour Village Marina
Kantika di Amor
Mangrove Kayak Center
NetTech (Jake Richter & Susan Davis)
SELIBON
Wannadive
Woodwind Cruises

**Appendix VI.** (continued)

**2009 Volunteers**

Barbel Heusinkveld
Chris Richards
Doi Boekhoudt
Lee Bray & Andy Uhr
Marylou Hildebrand
Patrick and Hettie Holian
Ralph 'Moogie' Stewart
Red Berger
SGB students
Tina Lindeken
Anne Zaat

And to the many volunteers who helped with our in-water sea turtle surveys: Claudia, Marco, Enny, Elisabeth, Gil, Gladys, Amy, Lee, Marylou, Moogie, Tricia, Robert, Hettie, Jan, Annemarie, Femke, Lee, Irene, Michele, Patrick, Barbel, Jeanie, Diego, Jessica, Anna, Asco, Maria, Greetje, Kevin, Anouschka, Mary Kay, Ken, Luisa, Sam, Rhian, Roan, Diana, Marianne, Alissa, Julie, Amanda, Bill, Nathan, Tarek, Kris, Ton, CIEE, Patricia, Esther, Jill, Kate, Jacob, Ely, Blue, Max, Arno

Special thanks to jazz artist Izaline Calister who donated her voice for a series of radio spots we produced on sea turtle conservation and that we distributed to the islands of the Dutch Antilles.

**Appendix VII.** Ways to donate

You can help protect Bonaire's sea turtle populations by donating to STCB. We welcome – and depend on – the financial support of people like you. Whether it's $10, $100, or $10,000, whatever you give makes an important difference.

**Online:**
Go to our website at bonaireturtles.org

**Donate by mail:**
Make check payable to:
Sea Turtle Conservation Bonaire

And mail to:
STCB
PO Box 492,
Kralendijk, Bonaire
Netherlands Antilles

**Donate by bank transfer:**
**To make a donation locally on Bonaire:**

Maduro & Curiel's Bank Bonaire
Account name: Sea Turtle Conservation Bonaire
Account number: 101.169.209

**To make a donation from the USA:**

Beneficiary: Sea Turtle Conservation Bonaire
Account number: 101.169.209
Beneficiary Bank: Maduro & Curiel's Bank Bonaire
Swift code: MCBKANCUBON
Correspondent Bank: Bank of America
Swift Code: BOFAUS3N

**To make a donation from Europe:**

Beneficiary: Sea Turtle Conservation Bonaire
Account number: 101.169.209
Beneficiary Bank: Maduro & Curiel's Bank Bonaire
Swift code: MCBKANCUBON
Correspondent Bank for Euro: Rado Bank Nederland
Swift Code RABONL2U

To discuss other ideas for giving, please call Manager Mabel Nava at 599-717-2225, or email us at stcb@bonaireturtles.org