Research and Monitoring Report 2011

CONTACT US

Sea Turtle Conservation Bonaire

Mabel Nava, Manager

Email: stcb@bonaireturtles.org

Phone: (+599) 717 2225
Cellular: (+599) 780 0433
TURTLE-HOTLINE: 780 0433

PO Box 492
Kralendijk, Bonaire
Netherlands Antilles

STCB is a member of

WIDECAST
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We proudly present our 2011 Sea Turtle Research and Monitoring Report.

Sea Turtle Conservation Bonaire (STCB) is a non-governmental, non-profit, research and conservation organization that began in 1991. Our mission is *to ensure the protection and recovery of Bonaire's sea turtle populations throughout their range*.

Three species of sea turtles are found in the waters of Bonaire. They are: the hawksbill, the green turtle, and the loggerhead. The hawksbill is considered "critically endangered" throughout its 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, green, and the incidental leatherback.

In 2011, we completed our 9th year of systematic research on the sea turtles of Bonaire. In this report you will read about the methods and results of our research and monitoring activities, which include nesting beach monitoring, foraging ground surveys, and turtle migration tracking. With our nesting beach monitoring, we track turtle nesting activity, determine nest size and productivity, and estimate the number of hatchlings produced. With our foraging ground surveys we tag, measure and photograph individual turtles and establish catch-per-unit-effort measures of turtle abundance. We inspect our captured turtles for signs of illness or injury, including fibropapillomatosis, which we first saw on green turtles at Lac Bay in 2005. Our recapture of previously tagged turtles provides valuable insight into turtle residency duration, recruitment, home range, growth rates, and habitat quality. With satellite telemetry, we are able to identify the migration paths and distant feeding grounds used by our breeding and nesting turtles.

Using the information we gather in our research and monitoring activities, we are able to identify and implement conservation efforts to improve the direct protection of Bonaire's sea turtles and their environments. Our activities also include partnerships and initiatives that focus on the bigger picture and use sea turtle conservation as a focal point to drive and stimulate conservation awareness and efforts. For information about these conservation, education, and advocacy activities, please visit our website at: http://www.bonaireturtles.org/.

Our important work could not be completed without significant financial support. We would like to acknowledge our flagship funder, World Wildlife Fund-Netherlands (WWF-NL), which renewed its grant support in 2011 for another 3-year period. We are also thankful to our other major funders, the Dutch Caribbean Nature Alliance (DCNA) and the Tides Foundation (Google Inc. Charitable Giving Fund). In addition, we received financial support from a variety of foundations and organizations, and many individual and business donors (Appendix III).

STCB's success is a result of the efforts of its staff, and board members (Appendix IV), its government partners, and the many business partners and dedicated volunteers that assist us (Appendix V).

We would like to especially acknowledge Dr. Robert van Dam, our scientific advisor, who oversees STCB's research efforts and contributed substantially to the production of this report.

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

Nesting Beach Monitoring

All known suitable nesting beaches of Bonaire and Klein Bonaire were surveyed periodically for sea turtle nesting activity during 2011, with emphasis on the most actively used nesting area around "No Name" beach on Klein Bonaire. No Name beach is Bonaire's index beach for measuring annual fluctuations in nesting activity and was visited at least twice weekly from May to November. The actual number of turtle nests deposited may be slightly underestimated, as only nesting activity with confirmed egg presence (determined either shortly after laying or upon the nest hatching) was counted.

The loggerhead turtle nesting season began in 2011 on May 9th, when a nest was discovered at No Name beach, and the last nest for the species was laid at Playa Chikitu on August 1st. The first hawksbill nesting occurred on July 4th at No Name beach, continuing until December 19th when the last two hawksbill nests were found (estimated to have been laid 1-2 days earlier). Green turtle nestings were only detected at Playa Chikitu and spanned the period from July 22nd to September 22nd.

During 2011, a total of 23 loggerhead and 20 hawksbill nests were recorded at No Name beach, with June showing the greatest nesting activity for loggerhead turtles (Figure 1). Confirmed nest counts for hawksbills indicate substantial activity late in the season (October-December), with very few nests encountered in peak season (August-September). However, eight nesting activities were recorded during August & September, for which nests were not confirmed, indicating a possibility of undercounting of the actual number of hawksbill nests deposited during this period.

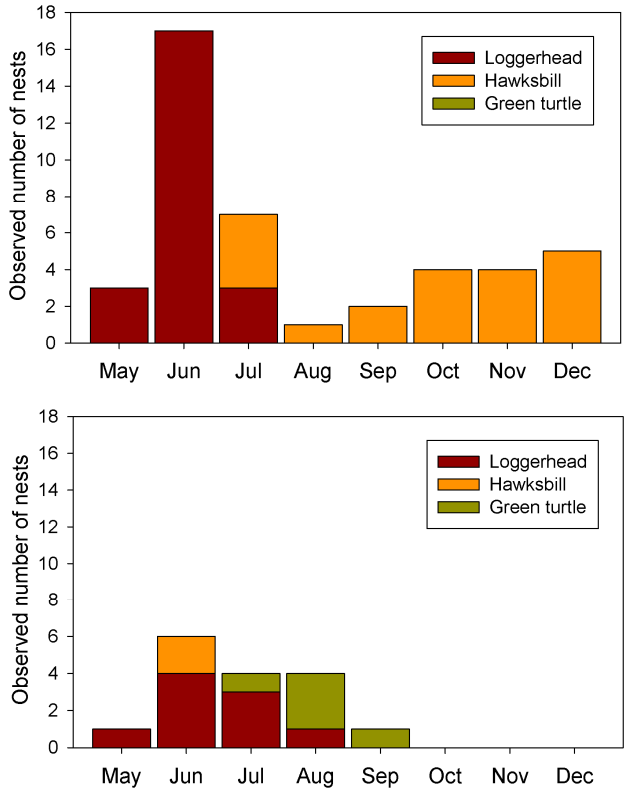

Figure 1. Temporal distribution of nests laid by loggerhead and hawksbill turtles at No Name beach, Klein Bonaire (top) and the beaches of Bonaire (bottom) during 2011.

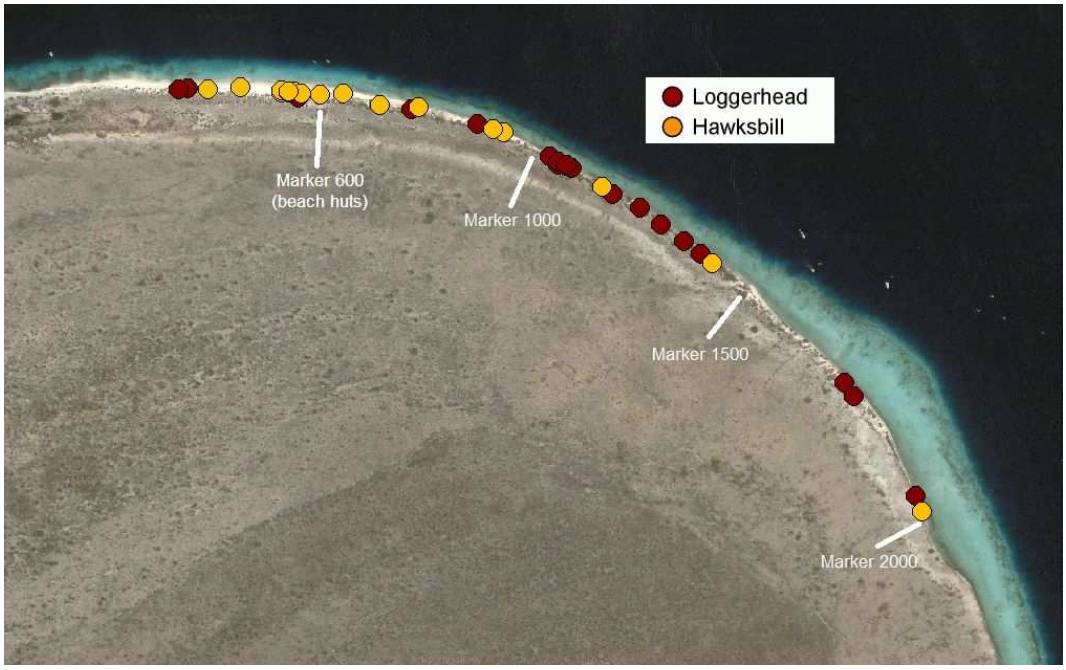

Figure 2. Distribution of hawksbill and loggerhead nests encountered during 2011 along No Name beach, Klein Bonaire.

Hawksbill nests at No Name were laid mostly in ~500m wide stretch of beach centered on the beach huts, and typically deposited under the higher vegetation which consists of Oleifi (*Bontia daphnoides*). Loggerhead nests were largely concentrated in the area between beach markers 1000 and 1500 (Figure 2).

Figure 3 illustrates the 9-year trend in nesting activity for the three species most commonly encountered nesting. For hawksbills the trend indicates a slight decline in the population (although the low 2011 nest numbers may have been the result of some undercounting during August and September).

On the island of Bonaire, nesting activity by loggerhead and hawksbill turtles during 2011 occurred along the southwest coast (7 loggerhead nests), at Donkey beach (1 loggerhead and 2 hawksbill nests) and at Playa Chikitu (1 loggerhead nest).

Green turtle nestings in the Caribbean are known to fluctuate strongly in 2-3 year cycles, where 2011 was a low year, and this was also evident in the nesting activity for the species on Bonaire. Only 5 green turtle nests were encountered during 2011, all at Playa Chikitu, and possibly all laid by a single individual turtle.

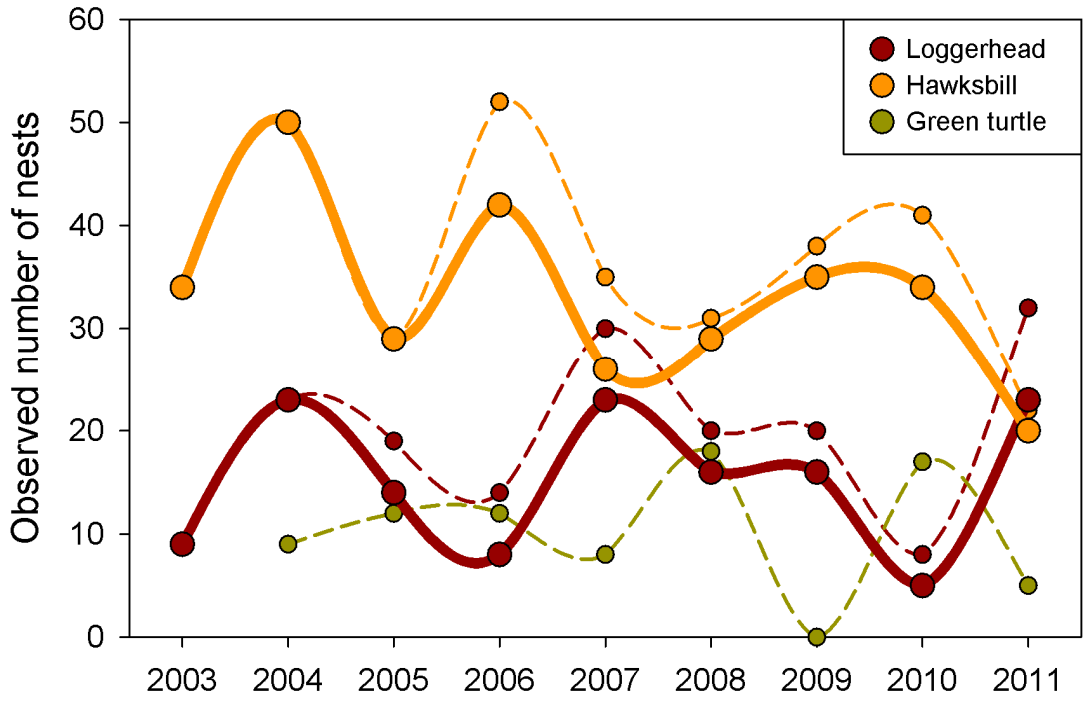

Figure 3. Trend in nest numbers by species at No Name Beach, Klein Bonaire (solid lines) and totals for all Bonaire and Klein Bonaire nesting beaches (dashed lines).

Nesting size and productivity were measured through nest revisions shortly after hatching. Revision of 15 loggerhead nests at No Name beach yielded an average nest size of 138.3 eggs (range 101 – 184) and the nests had an average hatching success of 77.7%. Revision of nine loggerhead nests on various beaches of Bonaire yielded an average nest size of 121.7 eggs (range 85 – 152) and an average hatching success of 78.1%. Hawksbill nests at No Name beach contained on average 134.5 eggs (range 116 – 171) and had average hatch success of 73.3%. Loggerhead hatching success rates were slightly higher than in 2011, whereas hawksbill hatching success was slightly lower.

The estimated number of hatchlings produced at the index beach of Klein Bonaire during 2011 can be calculated from the total number of nests, average nest size and average hatching rate. The 23 loggerhead and 20 hawksbill nests laid along No Name resulted in approximately 2472 loggerhead and 1972 live hawksbill hatchlings emerging from their nests. Trends in the estimated loggerhead and hawksbill hatchling production at No Name beach are illustrated in Figure 4.

Only 5 green turtle nests were laid during 2011 and all at Playa Chikitu, Washington Park. Revision of four of these nests yielded an average nest size of 95.5 eggs (range 70 – 161) and a hatching success of 76.3%. An estimated 364 green turtle hatchlings emerged from the Playa Chikitu nests.

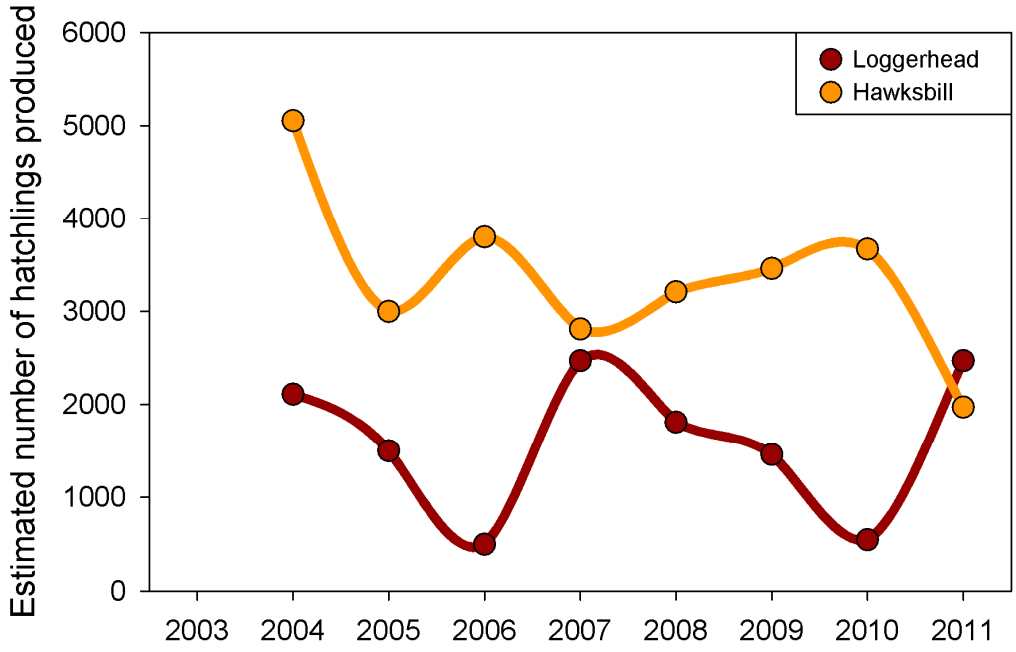

Figure 4. Trend in live hatchling production estimates for loggerhead and hawksbill turtles at No Name Beach, Klein Bonaire.

Foraging Ground Surveys

Foraging ground surveys were conducted by snorkeling along the entire west coast of Bonaire, circumnavigating Klein Bonaire, and in front of Lac Bay (figure 5, table 1). In addition, turtle surveys using the netting technique were performed inside Lac Bay. The purpose of these snorkeling surveys is to tag, sample, measure and photograph 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.

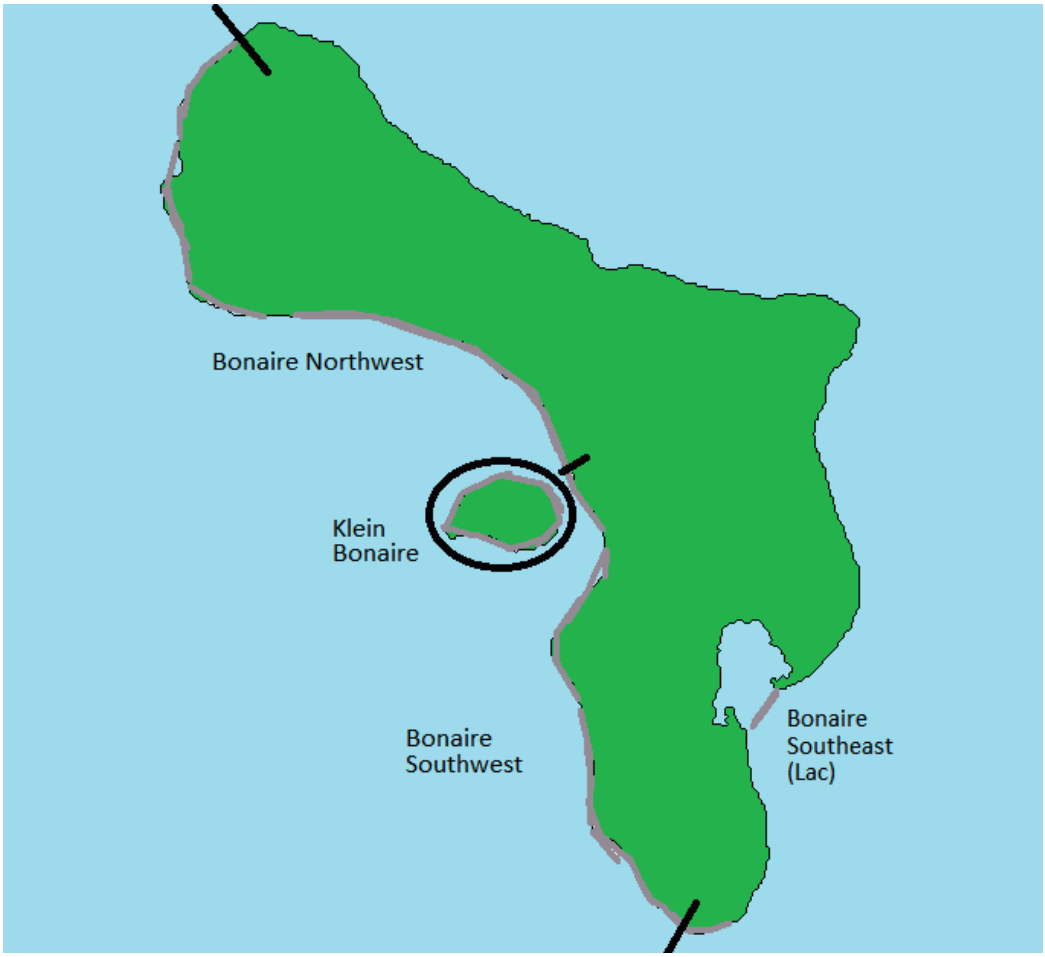

Figure 5. Sectors of coastal areas of Bonaire and Klein Bonaire covered during in-water surveys. Survey tracks are marked in gray (lines connect survey begin and endpoints, but do not necessarily indicate the precise survey tracks).

Table 1. In-water snorkeling survey effort in hours by sector from 2003 to 2011.

	Total survey hours							
	2003	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Klein Bonaire	25.9	24.5	17.5	13.2	11.2	8.4	19.9	12.1
Bonaire Northwest			38.7	25.2	18.5	24.0	28.2	32.3
Bonaire Southwest			23.9	20.2	13.7	15.5	18.7	24.9
Bonaire Southeast			14.3	9.9	4.8	4.7	1.4	4.8

From 2010 to 2011, juvenile green turtle abundance appeared to remain stable to slightly increasing in all areas (Figure 6), except on the reef outside of Lac Bay where numbers stabilized after a sharp increase 2010 (Figure 7). With the exception of the Lac Bay animals, the green turtles encountered during snorkeling surveys are mostly immatures smaller than 40 cm straight carapace length (SCL, see Figure 11). 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 8). The reef in front of Lac Bay harbors a very high density of animals (Figure 7), 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 (Figures 6 and 9) and their abundance in 2011 continues to drop in the surveyed areas (Figures 6 and 7). Similarly as for green turtles, but occurring in a much lower aggregation density but on average in greater body size (Figure 11), immature hawksbill turtles are found on the reefs adjacent to Lac Bay, and recaptures indicate that these animals also use the bay for foraging. Other areas of relatively high hawksbill abundance are Ebo's Reef (Klein Bonaire) and the southwest tip of Bonaire (Figure 9).

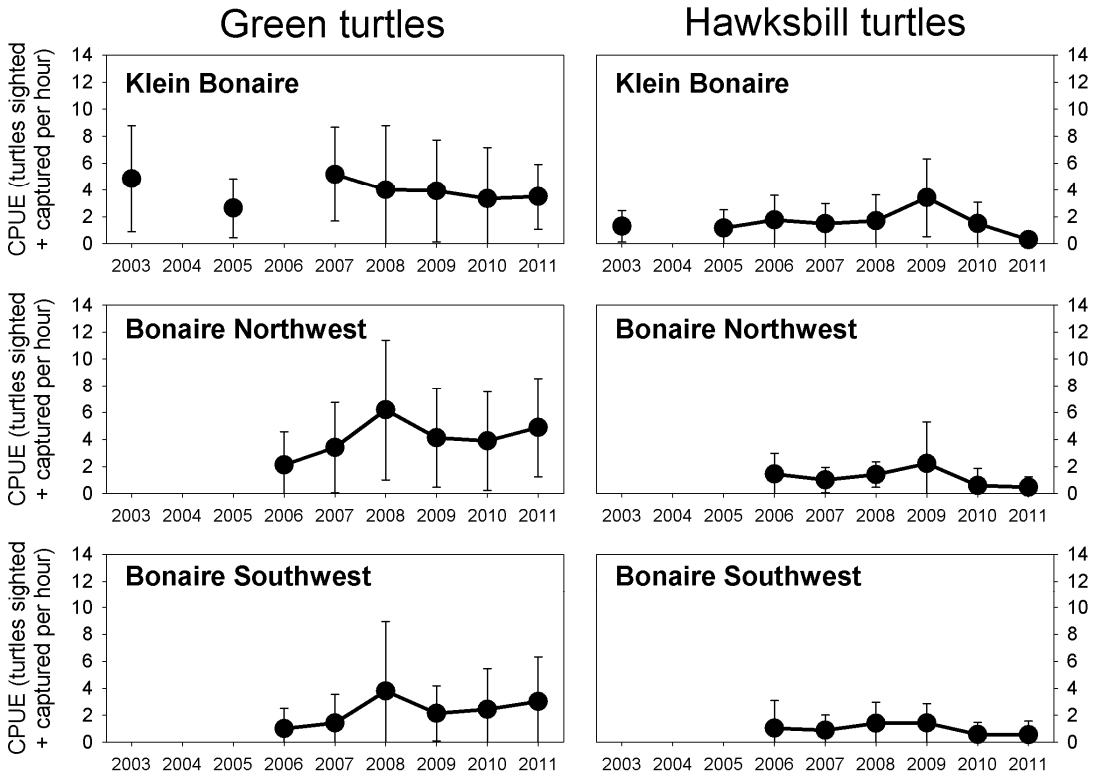

Figure 6. Comparison of 2003-2011 "catch-per-unit-effort" survey results by sector around Klein Bonaire and Bonaire (data prior to 2006 is not available for all areas).

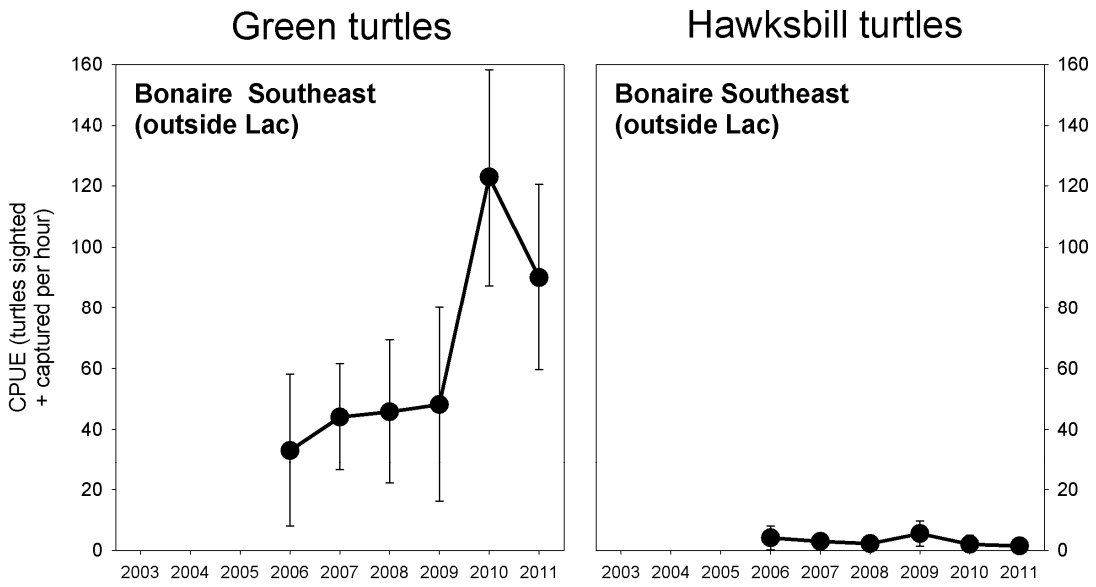

Figure 7. Comparison of "catch-per-unit-effort" survey results 2006-2011outside Lac on Bonaire's southeast coast.

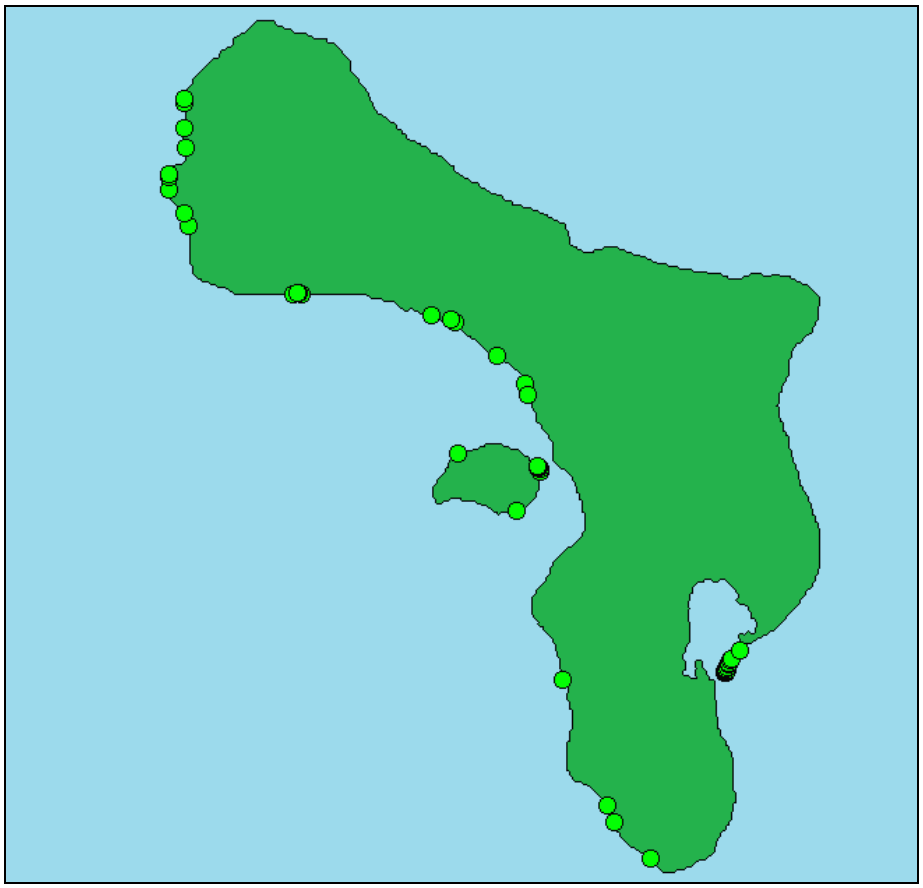

Figure 8. Locations where green turtles were captured during snorkeling surveys around Bonaire and Klein Bonaire.

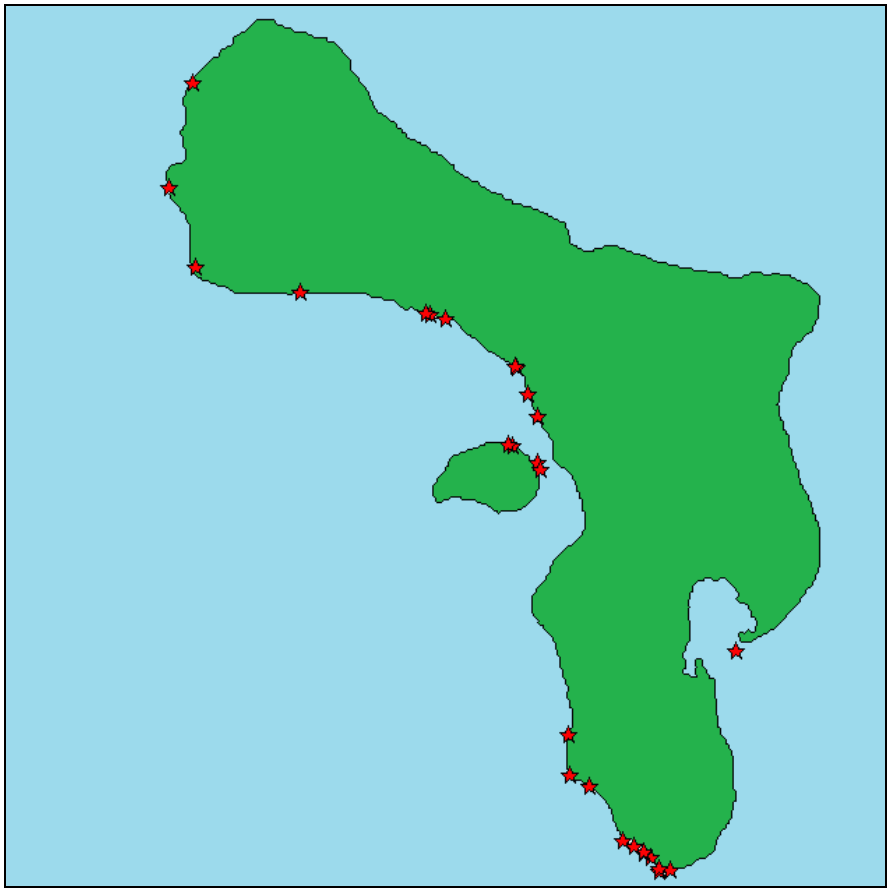

Figure 9. Locations where hawksbills were captured during snorkeling surveys around Bonaire and Klein Bonaire.

Netting surveys were conducted during two periods within Lac Bay: during May and October 2011. A total of 90 green turtles and 4 hawksbills were caught during these surveys. Figure 10 indicates the netting locations, aimed at areas with highest green turtle abundance as determined by observing turtles surfacing to breathe. Table 2 shows the abundances measured for both species through 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. Hawksbill abundance at Lac appears to be slightly declining and their net-capture rate is the lowest measured since 2003 (Table 2).

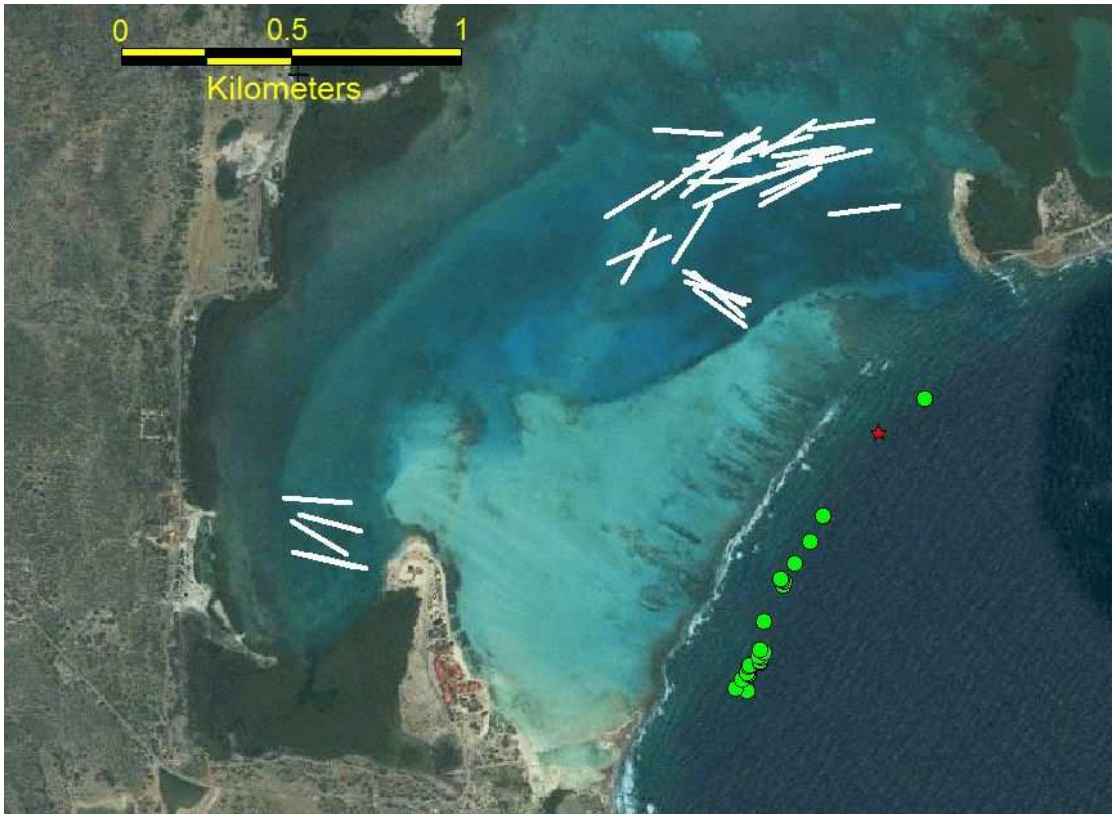

Figure 10. Netting locations inside Lac Bay (white bars indicate net location and orientation), and locations of hand-captured green turtles (green circles) and hawksbills (red stars) on the reefs outside Lac Bay.

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

	2003	2005	2006	2007	2008	2009	2010	2011
Number of netting sessions	16	13	40	33	37	41	48	35
Total netting hours ("net soak time")	17.9	8.9	32.9	30.0	24.8	32.0	39.0	26.8
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	3.14 ± 2.90	3.10 ± 2.67
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	0.21 ± 0.44	0.12 ± 0.47

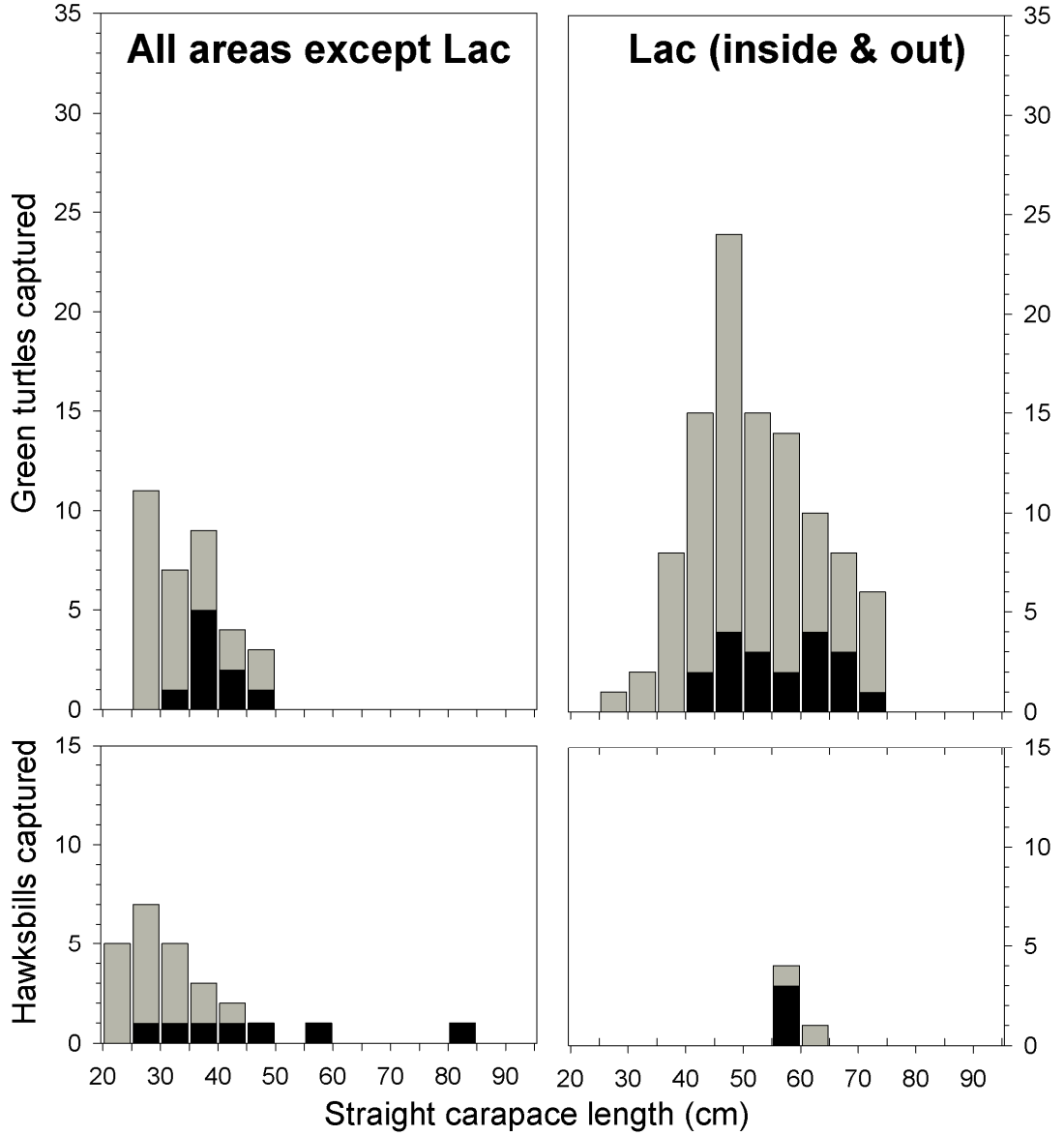

Figure 11. Size distribution of hawksbill and green turtles captured, tagged and measured at Bonaire. Black bars indicate recapture of turtles tagged in previous years.

Combined, the snorkeling and netting surveys yielded a total of 138 individual green turtles and 30 hawksbills, of which 29 green turtles and 19 hawksbills were recaptures of turtles marked by us from previous years (Figure 11). An additional juvenile turtle, apparently a hybrid between a hawksbill and loggerhead was found on March 1st near the "Tori's Reef" dive site, where it was tagged and released (Figure 12).

Figure 12. A 36.6 cm SCL hawksbill-loggerhead hybrid captured at “Tori’s Reef” dive site. The goose-neck barnacle attached to the carapace indicates a recent pelagic existence for this turtle.

Whenever previously tagged turtles are recaptured, they yield valuable information on movement and somatic growth rates. Our surveys detected one hawksbill turtle (07-132) that had moved significantly from where it was tagged in 2005 at Ebo’s reef (Klein Bonaire). It was captured again along the northwest Klein Bonaire in 2009 and then in 2011 off Playa Benge (Washington Park). The now 41.3 cm turtle exhibited only a minimal growth rate of 0.9 cm/yr during the last 2 year recapture period (whereas while at Klein Bonaire 2005-2009 it had been 4.2 cm/yr), suggesting it now resides in suboptimal habitat. Two green turtles were encountered at Lac Bay that had been encountered and tagged first at Klein Bonaire (Figure 13). Turtle 03-071 originally measured 45.7 cm SCL in 2003 and was only recaptured again in 2011 (8.4 years later), now at Lac, where it measured 74.0 cm, resulting in a mean growth rate of 3.4 cm/yr. Turtle 04-027 was marked at Klein Bonaire in 2004 when it measured 31.7 cm, then recaptured twice in the same location during 2005 after which it was not seen until caught at Lac in 2011 measuring 65.6 cm SCL. This animal grew on average a respectable 4.7 cm/yr in the last 6 years, which will have included some residency time at Klein Bonaire. Once again no turtles were detected having moved away from Lac to other areas around Bonaire, but only into the Lac area.

Figure 13. Green turtles 03-071 (top) and 04-027 (bottom) were tagged initially at Klein Bonaire (left photos), and then recaptured in 2011 at Lac Bay (right photos).

Somatic Growth

Recaptured turtles yielded substantial information on somatic growth rates for green turtles and hawksbills over a wide size range (Figure 14). For both species, animals caught in or near Lac Bay continued to exhibit very high growth rates (mean growth for green turtles of 6.2 cm/yr, for hawksbills 4.9 cm/yr), suggesting that the Lac Bay area contains high quality foraging habitat. Growth rates of turtles living on the reefs along the rest of Bonaire and Klein Bonaire (mean growth for green turtles of 3.2 cm/yr, for hawksbills 3.1 cm/yr) are more in line with those growth rates measured in other Caribbean turtle populations.

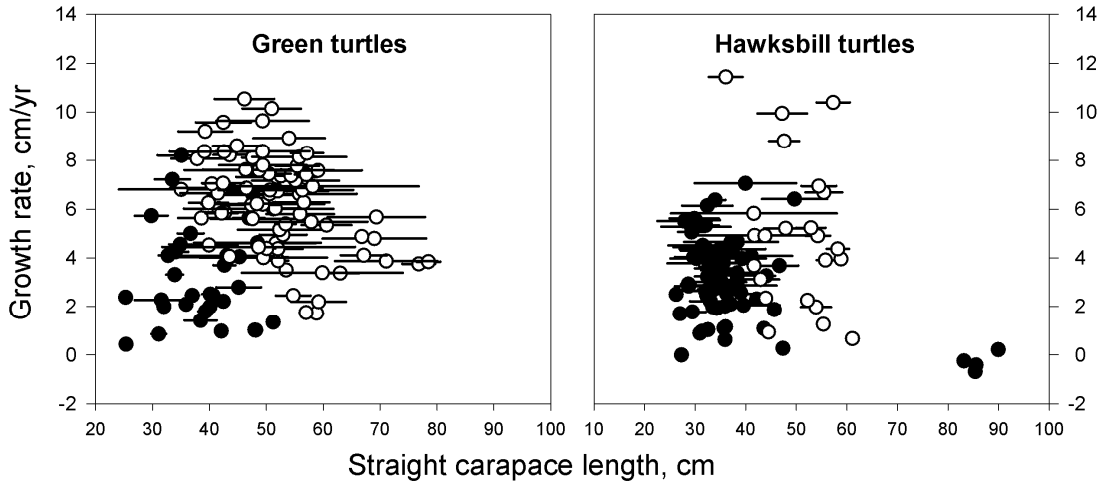

Figure 14. Somatic growth of all hawksbill and green turtles recaptured to date at Bonaire, with turtles recaptured at Lac Bay indicated with open circles. Horizontal lines indicate the size range over which an individual's growth was recorded.

Recapture profiles also provide indications of the residency durations by species and habitat location (figure 15). Too few hawksbill turtles were recaptured to detect any trends, but green turtles at Lac Bay appear to remain longer in that habitat than elsewhere around Bonaire and Klein Bonaire. Juvenile green turtles from areas other than Lac are mostly transient, remaining in place for a few years unless they move to Lac Bay. Older and larger green turtles from Lac are probably underrepresented in the data due to our reduced ability to catch these powerful and fast-swimming animals.

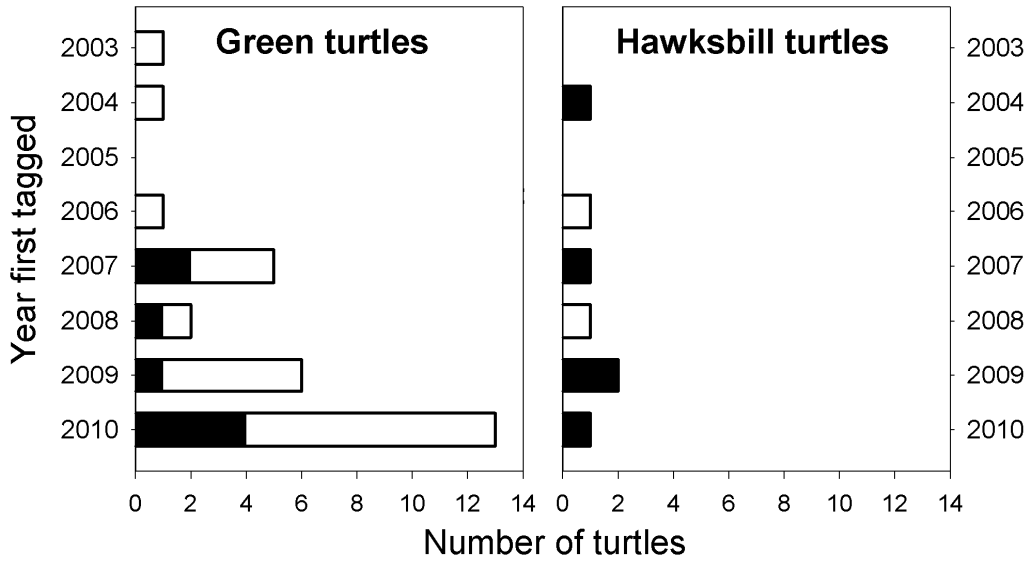

Figure 15. Distribution by year of initial tagging of recaptured turtles encountered during 2011. White-filled bars indicate turtles recaptured at Lac Bay, black bars for turtles elsewhere.

Presence of Disease

Fibropapillomatosis occurs in green turtles at Lac Bay and all animals captured there are examined for the presence of external tumors. Several of the 90 green turtles examined during the two netting periods in 2011 exhibited evidence of obvious tumors, typically wart-like protrusions most often around the neck and eyes. The occurrence of fibropapillomatosis in the Lac Bay green turtles has generally declined from the higher levels seen in 2005-2008; however the October 2011 session revealed 5 animals with obvious fibropapilloma tumors, a much higher rate of occurrence than observed recently (Table 3).

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
2010	May	79	0	0
2010	December	54	0	0
2011	**May**	**54**	**1**	**1.9**
2011	**October**	**36**	**5**	**13.9**

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 22 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 the Los Roques Archipelago, some 150 kilometers to the east.

During 2011, Wildlife Computers model SPOT5 transmitters were placed on a loggerhead turtle nesting at Playa Chikitu, Washington Park, and on a hawksbill turtle nesting at No Name beach, Klein Bonaire. The first turtle, a 91.5 cm CCL loggerhead named 'Toyo', was encountered at Playa Chikitu at 2:45 am on August 1st and fitted with a SPOT5 transmitter. This loggerhead departed immediately towards the south-east, swimming for 23 days and about 1000 km to reach the lagoon of the Los Roques Archipelago, Venezuela (figure 16). Transmissions ceased for the period from 4 September 2011 to 30 March 2012, but then 3 days of transmissions by the turtle indicated she remained at her Los Roques foraging grounds (Figure 17), about 168 km from Playa Chikitu.

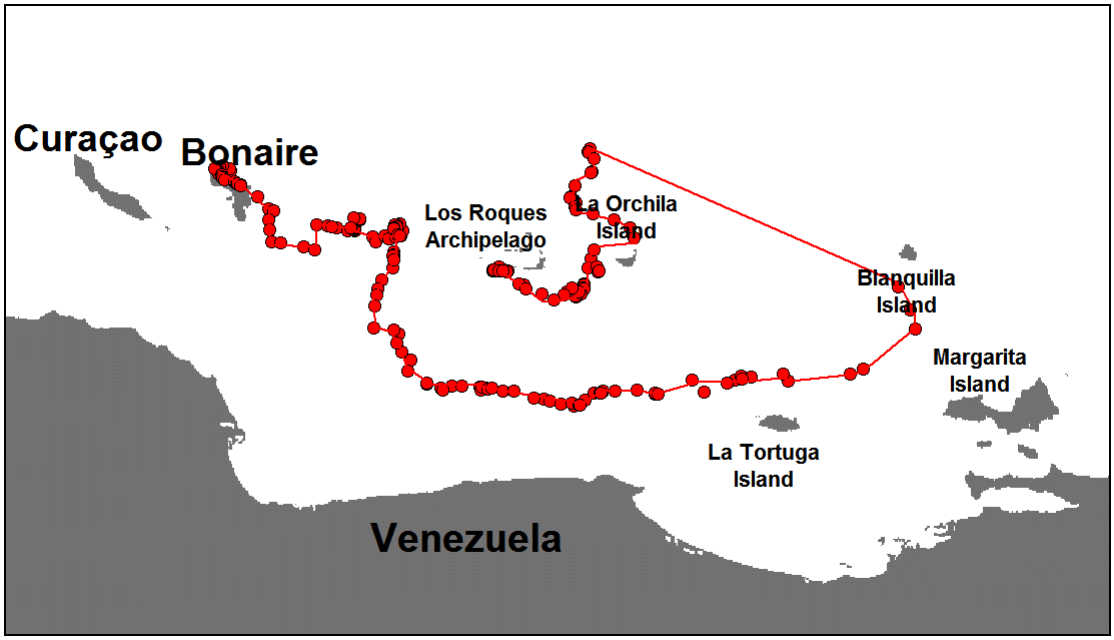

Figure 16. Track of female loggerhead 'Toyo' from Playa Chikitu, Bonaire to Los Roques, Venezuela.

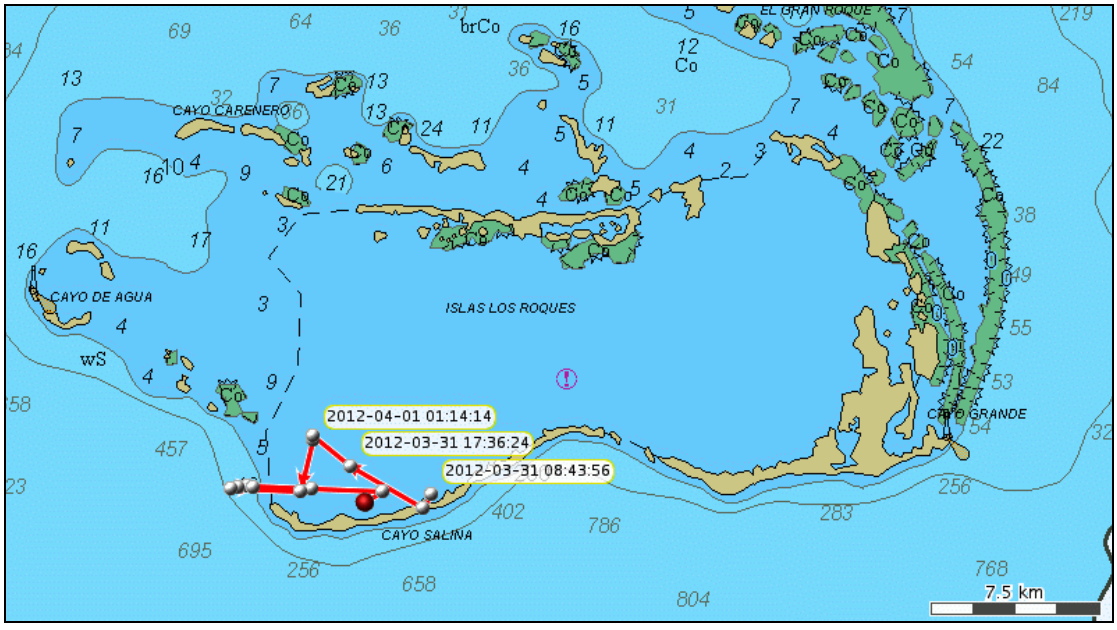

Figure 17. Latest signals of female loggerhead 'Toyo' indicating her foraging grounds at Los Roques, Venezuela.

The second turtle tracked during 2011 was encountered at No Name beach on October 14th. The 84.0 cm CCL hawksbill turtle, named 'Jklynn', was fitted with a SPOT5 transmitter shortly after she nested. She laid another 4 nests before finally departing on December 9th towards the northwest (Figure 18). Shortly after reaching waters near the Jaragua National Park along the southwestern coast of the Dominican Republic on December 19th, her transmissions ceased. However, on January 14th signals for the turtle started to be received again and have since indicated that the animal is on its foraging ground at Alto Velo, near Beata Island, Dominican Republic, approximately 700 km from Klein Bonaire (Figure 19).

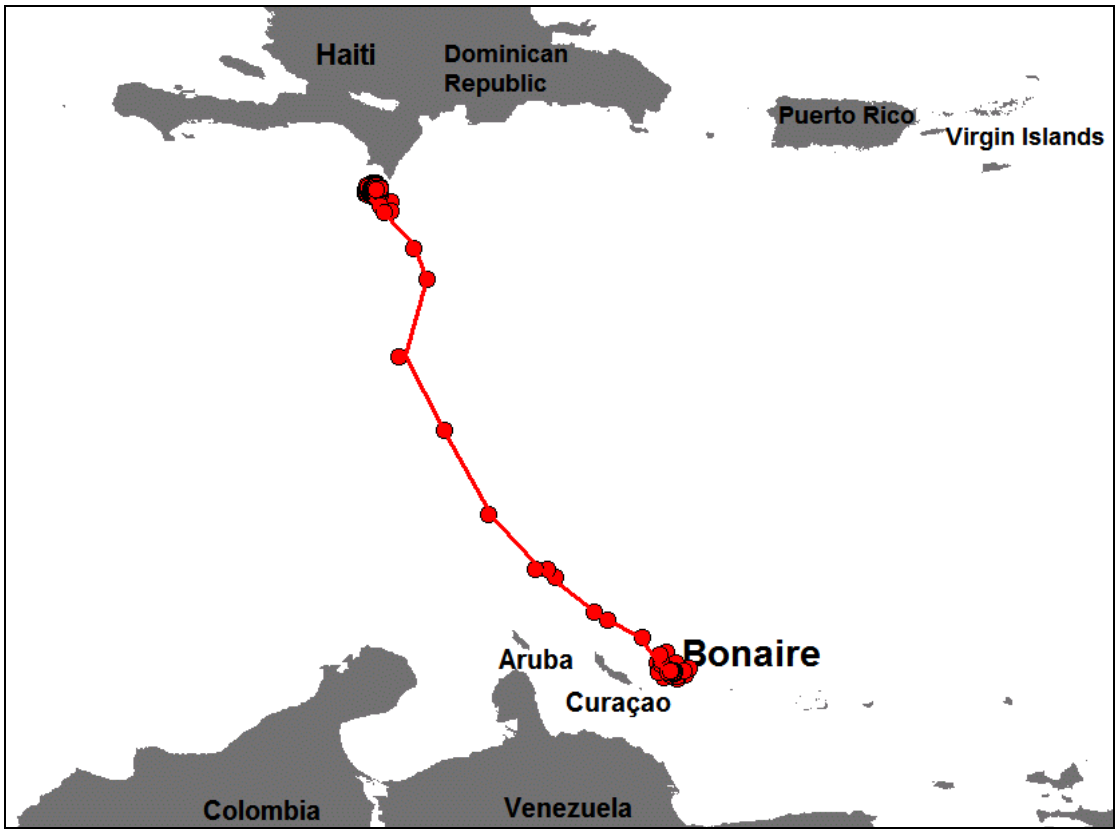

Figure 18. Track of female hawksbill turtle 'Jklynn' from No Name beach, Klein Bonaire to Jaragua National Park, Dominican Republic.

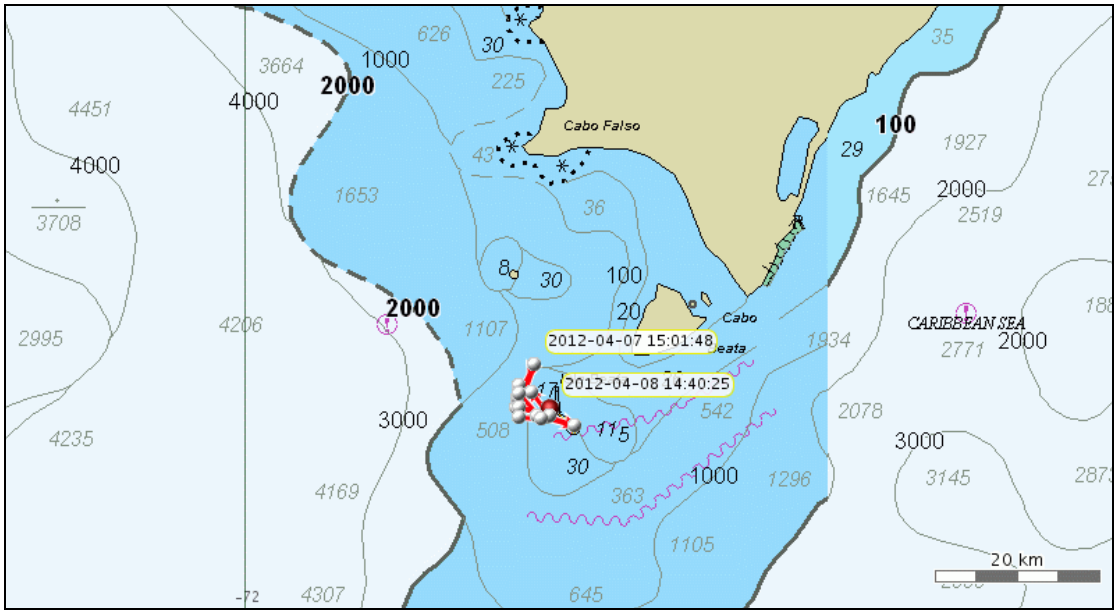

Figure 19. Latest signals of female hawksbill 'Jklynn' indicating her foraging grounds near Alto Velo, southwest of Beata Island, Jaragua National Park, Dominican Republic.

Turtle Strandings

Stranding events appear to be on the rise in recent years and we therefore consider it relevant to start including them in our report. Stranded turtles are animals found dead, injured, sick, tumored, or otherwise abnormal, and sometimes apparently healthy but in an unsuitable circumstance, such as entangled in debris along the shoreline. Strandings are reported to STCB through partner organizations, directly to the Turtle Hotline or by volunteers.

During 2011 we had 73 stranded turtles that we acted upon (Table 4). Five animals were found dead, out of these five dead turtles two were clearly poached for human consumption; one had signs of a punctured lung; one died of an unknown cause and, another one possibly died drowned in fishing net (Figure 20). One stranded turtle was found alive but in very bad conditions and died from emaciation while being cared for.

Two live post-hatchlings were rescued, one in Lac Bay (Figure 21), then successfully released back into the open seas by the west coast. Thirty-two hatchlings were rescued from a trench made for the construction of the sewer system and then released into the sea; another 32 were killed by vehicles while crawling across the road as they were attracted to the lights of the airport.

Figure 20. Sea turtle stranding event recovery actions during 2011.

Figure 21. Post-hatchling hawksbill turtle encountered in Lac Bay and released off the west coast of Bonaire.

Table 4. Sea turtle stranding events recorded for Bonaire and Klein Bonaire during 2011.

DATE	LOCATION	SPECIES	SIZE - Curved carapace length	STATUS
8-Jan-11	Klein Bonaire	Green	unknown - not bigger than 35 cm	Killed by poachers for consumption - three men were apprehended by the Coast Guard for poaching two sea turtles, one of which had been killed.
1-Mar-11	Playa Frans	Hawksbill	Adult size estimated 85 cm	Found dead on the bottom - no signs of cause of death
15-Apr-11	Playa Grandi	Green	64.7 cm	Found dead stranded on the rubble. The broken carapace indicated the turtle was hit and probably dead by a punctured lung
11-May-11	Lagoen	Hawksbill	36.8 cm	Found alive stranded by the coast. Very emaciated, missing one front flipper. It was treated during 4 days without success and died. Necropsy didn't show cause of death
15-Oct-11	Lac Bay	Hawksbill	6 cm	Post hatchling found floating in the bay and released on open seas by the west coast
25-Nov-11	Lac Bay	Green	55 cm	Dead - found carapace only. Poached for human consumption
29-Nov-11	Lac Bay	Green	44 cm	Found dead floating in the bay. In advance state of decomposition necropsy indicated that the turtle drowned. Possibly in a fishing net.
1-Dec-11	Plaza Marina	Green	31.5 cm	Caught by a fisherman, swallowed hook. X rays showed the hook but it could not be removed. Released with hook. Tagged with a pit tag and relocated to Lac Bay
4-Dec-11	Fisherman's boat at Playa Lechi	Hawksbill	7.2 cm	A fisherman was raising the hatchling in captivity for later release. The hatchling was retrieved and released in open waters by the west coast
2-Dec-11	32 live hatchlings stranded in a road (sewerage) trench	Hawksbill	4 cm	Staff from a construction company (MNO) found 32 live hatchlings that crawled onto the road guided by the lights of the airport and got stranded in the trench made for the sewerage system). Another 32 were killed by cars on the road

Appendix I. List of turtles encountered during 2011.

Green turtles

Date capture	Tag left	Tag right	PIT	Turtle ID	Location	SCL *CCL*	Weight
28-Feb-11			151851372A	11-002	Sweet Dreams	32.6	4.0
3-Mar-11			151850155A	11-006	Jeannie's Glory	26.7	2.0
11-Mar-11			151850171A	11-009	Petrie's Pillar	33.0	5.2
11-Mar-11			151531184A	10-071	Andrea I	39.0	8.4
11-Mar-11			151848062A	11-012	Oil Slick	35.9	6.8
14-Mar-11			151929480A	11-013	1000 Steps	29.2	3.2
18-Mar-11			15184767A	11-016	Playa Frans	28.6	3.0
18-Mar-11			151852712A	11-017	Playa Frans	28.7	2.8
18-Mar-11		BX1255	151347282A	07-052	Marine Reserve Nort	41.3	9.3
21-Mar-11			151348387A	10-046	Marine Reserve Sou	39.3	8.4
21-Mar-11			151847233A	08-030	Marine Reserve Sou	32.4	4.4
21-Mar-11			151850390A	07-021	Marine Reserve Sou	36.2	5.6
21-Mar-11			151853003A	11-023	Marine Reserve Sou	28.5	2.8
22-Mar-11			151852320A	11-028	Red Slave	41.0	8.2
4-Apr-11			151847482A	11-033	Fishermens Hut	30.1	3.6
8-Apr-11			151851062A	11-035	1000 Steps	28.4	2.8
8-Apr-11			151528655A	11-036	1000 Steps	32.5	4.8
11-Apr-11			151849575A	11-039	Bopec	36.8	7.2
11-Apr-11			151534462A	11-040	Bopec	28.0	2.8
11-Apr-11			151852344A	11-041	Bopec	35.7	6.4
13-Apr-11			151851226A	11-043	Reserve North	37.4	7.6
13-Apr-11			151850344A	11-044	Reserve North	29.1	3.2
15-Apr-11			151848282A	11-045	Bise Morto	28.2	3.0
15-Apr-11			151851561A	11-046	Bise Morto	28.6	2.8
15-Apr-11			151850002A	11-047	Playa Benge	26.6	2.6
20-Apr-11			151847080A	11-049	Bonaventure	35.4	6.2
29-Apr-11			151347392A	10-035	Just a nice dive	41.6	9.6
29-Apr-11			151523075A	10-065	Just a nice dive	36.3	6.8
29-Apr-11			151849797A	11-052	Just a nice dive	41.6	9.2
29-Apr-11	BBG151	BBG152		09-001	Just a nice dive	49.3	15.8
4-May-11	BBH230	BBH229		11-055	Ebo's Special	45.6	13.2
6-May-11	BBH232	BBH231		11-058	Just a nice dive	46.0	13.2
16-May-11	BBH237	BBH236		11-059	Lac	54.9	23.0
16-May-11			151929681A	11-060	Lac	35.5	6.0
16-May-11			151850533A	11-061	Lac	42.9	10.2
16-May-11			151852354A	11-062	Lac	42.9	10.4
16-May-11	BBH235	BBH234		11-063	Lac	59.7	30.0
16-May-11			151847303A	11-064	Lac	55.7	25.0
16-May-11	WH7450	BBH233		11-065	Lac	72.6	54.0
17-May-11			151853105A	11-066	Sorobon	34.2	5.6
17-May-11	BBH239	BBH238		11-067	Sorobon	45.7	13.8
18-May-11			151851370A	11-068	Lac	44.7	10.6
18-May-11	WH1383	BBH106		07-195	Lac	61.9	30.0
19-May-11			151848060A	11-070	Lac	44.9	11.4
19-May-11			151853564A	11-071	Lac	25.2	2.2
19-May-11	BBH244	BBH243		11-073	Outside Lac	64.3	39.0
19-May-11	BBH240		134967522A	09-080	Outside Lac	48.1	15.4
19-May-11	BBH242	BBH241		11-075	Outside Lac	68.6	45.0
20-May-11	BBH249	BBH248		11-076	Lac	49.8	18.0
20-May-11	BBH247	BBH246		11-077	Lac	46.1	13.4

Green turtles (continued)

Date capture	Tag left	Tag right	PIT	Turtle ID	Location	SCL *CCL*	Weight
20-May-11			151850405A	11-078	Lac	35.5	5.8
20-May-11	BBH253	BBH252		11-079	Lac	49.9	16.0
20-May-11	BBH251	BBH250		11-080	Lac	57.9	26.0
23-May-11			151849141A	11-081	Lac	42.8	10.6
23-May-11			151853391A	11-082	Lac	44.8	12.6
23-May-11	BBH255	BBH254		11-083	Lac	45.7	11.6
23-May-11			151846320A	11-084	Lac	43.3	11.0
23-May-11			151850737A	11-085	Lac	45.7	12.8
23-May-11			151851593A	11-086	Lac	43.7	11.8
23-May-11			151852392A	11-087	Lac	35.6	6.0
23-May-11	BBH257	BBH256		11-088	Lac	56.7	26.0
23-May-11			151852197A	11-089	Lac	49.0	17.0
23-May-11	BBH014	BBH013		09-126	Lac	62.8	34.0
23-May-11	BBH259	BBH258		11-091	Lac	65.6	40.0
23-May-11			151849685A	11-092	Lac	40.3	8.2
23-May-11			151852124A	11-093	Lac	46.1	13.4
24-May-11			151851693A	11-094	Lac	45.4	13.8
24-May-11			151851704A	11-095	Lac	45.6	15.0
24-May-11	BBH261	BBH260		11-096	Lac	56.9	24.0
24-May-11	BBH158	BBH159		10-138	Lac	54.3	22.0
24-May-11	BBH148	BBH147		10-123	Lac	51.6	18.8
24-May-11			151530253A	10-112	Lac	46.1	13.8
26-May-11	BBH187	BBH186		10-178	Lac	49.5	17.0
26-May-11			151852040A	10-234	Lac	42.0	9.6
26-May-11	BBH264	BBG202		07-142	Lac	61.8	33.0
26-May-11	BBH262	BBH263		11-103	Lac	52.2	19.5
26-May-11	BBH268	BBH267		11-104	Lac	53.5	20.0
26-May-11	BBH266	BBH265		11-105	Lac	53.7	22.0
27-May-11			151537104A	10-118	Lac	45.7	12.2
27-May-11	BBH211	BBH210		10-210	Lac	67.9	47.0
27-May-11	BBH270	BBH269		11-108	Lac	52.9	18.6
27-May-11			151852232A	11-109	Lac	49.0	15.4
27-May-11	BBH272	BBH273		11-110	Lac	59.9	27.0
30-May-11	BBH275	BBH274		11-112	Lac	58.4	28.0
30-May-11	BBH277	BBH276		11-113	Lac	59.1	24.0
30-May-11	WH7490	BBH278		11-114	Lac	71.0	54.0
30-May-11			151847657A	11-115	Sorobon	45.6	12.4
31-May-11	BBH280	BBH279		11-116	Lac	57.6	23.0
18-Oct-11	BBH287	BBH285		11-119	Lac	50.1	16.8
18-Oct-11	BBH289	BBH288		11-120	Lac	44.8	12.4
18-Oct-11	WH7507	BBH290		11-121	Lac	41.5	9.2
19-Oct-11	BBH291	BBH292		11-122	Lac	56.4	27.0
19-Oct-11			151847102A	11-123	Lac	48.2	16.2
19-Oct-11			151537104A	10-118	Lac	46.5	13.4
19-Oct-11			151852437A	11-125	Lac	48.2	15.7
19-Oct-11			151852096A	11-126	Lac	43.9	11.5
19-Oct-11	BBH156	BBH157		10-131	Outside Lac	55.8	25.0
19-Oct-11	BBH296	BBH295		11-130	Outside Lac	71.7	64.0
19-Oct-11	BBH293	BBH294		08-068	Outside Lac	60.2	36.0
19-Oct-11	BBH048	BBH047		09-173	Outside Lac	66.3	47.0
19-Oct-11			151852443A	11-133	Outside Lac	58.7	24.0
20-Oct-11			151850202A	11-134	Lac	37.1	6.5

Green turtles (continued)

Date capture	Tag left	Tag right	PIT	Turtle ID	Location	SCL *CCL*	Weight
20-Oct-11			151531351A	10-119	Lac	42.7	10.3
20-Oct-11	BBH298	BBH297		11-136	Outside Lac	52.0	18.5
20-Oct-11			151848405A	11-137	Outside Lac	45.8	14.8
20-Oct-11	BBH302	BBH301		11-138	Outside Lac	60.4	31.0
20-Oct-11	BBH300	BBH299		11-139	Outside Lac	52.8	19.8
21-Oct-11			151848743A	11-140	Sorobon Pier	38.3	7.3
21-Oct-11			151852612A	11-141	Sorobon Pier	32.4	4.5
21-Oct-11	BBH303	BBH304		11-142	Sorobon Pier	54.5	19.0
24-Oct-11			151852791A	11-143	Lac	36.0	5.4
24-Oct-11	BBH306	BBH305		11-144	Lac	60.3	28.0
24-Oct-11	WH7508	BBH310		11-145	Outside Lac	72.1	52.0
24-Oct-11			151851727A	11-146	Outside Lac	50.5	19.1
24-Oct-11	BBH308	BBH309		11-147	Outside Lac	66.1	38.0
24-Oct-11	WH7502	BBH307		11-148	Outside Lac	71.2	47.0
26-Oct-11	BX1082	WE4150	151850554A	04-027	Outside Lac	65.6	42.0
26-Oct-11	BBH156	BBH157		10-131	Outside Lac	56.0	21.0
26-Oct-11	BBH311	BBH312		11-151	Outside Lac	66.7	40.0
26-Oct-11			151929601A	11-152	Outside Lac	49.9	18.0
26-Oct-11			151849136A	11-153	Lac	49.7	19.8
26-Oct-11	BBH314	BBH313		11-154	Lac	50.2	18.8
26-Oct-11	BBH316	BBH315		11-155	Lac	60.5	29.0
26-Oct-11	BBH318	BBH317	151348417A	09-220	Lac	59.0	28.0
28-Oct-11			151847645A	11-157	Lac	36.3	6.0
28-Oct-11			151848390A	11-158	Lac	41.7	11.0
28-Oct-11	BBH320	BBH319		11-159	Lac	50.5	16.8
28-Oct-11			151850715A	11-160	Lac	59.4	28.0
28-Oct-11	WH1381		151853347A	07-193	Lac	59.9	28.0
28-Oct-11			151850297A	11-162	Lac	60.6	25.0
28-Oct-11			151851281A	11-163	Lac	33.9	4.6
31-Oct-11			151849232A	11-164	Outside Lac	46.4	14.1
31-Oct-11		BX1173	151848147A	06-089	Outside Lac	60.7	28.0
31-Oct-11			151847172A	11-166	Outside Lac	65.1	34.0
31-Oct-11	WE4095	BBH322		03-071	Outside Lac	74.0	58.0
31-Oct-11			151851562A	11-168	Lac	49.3	16.0
31-Oct-11			151849025A	11-169	Lac	38.4	7.6
31-Oct-11			151848473A	11-170	Lac	48.6	17.0
31-Oct-11			151348127A	09-208	Lac	53.9	21.0
1-Dec-11			151853447A	11-173	Plaza Marina	31.2	3.1

Hawksbill turtles

25-Feb-11			151930240A	11-001	Red Slave	23.1	1.4
28-Feb-11			151546653A	11-003	Margate Bay	29.2	2.8
28-Feb-11	WH7466		151847285A	11-004	White Slave	34.2	4.6
11-Mar-11			151853345A	11-007	Small Wall	25.8	1.8
11-Mar-11			151849192A	11-008	Petrie's Pillar	24.8	2.0
11-Mar-11			151850406A	11-011	Sabadeco pier	24.8	1.8
14-Mar-11			151847632A	11-014	Bon Bini Na Kas	28.9	3.2
18-Mar-11	WH5874	BBG160		09-021	South of Carels Visic	37.2	5.2
21-Mar-11			151852471A	11-021	Marine Reserve Sou	27.6	2.2
22-Mar-11	WH7471		151853243A	11-024	Radar Tower	35.6	5.6
22-Mar-11			151852021A	11-025	North of Radar Towe	22.6	1.6
22-Mar-11			151851077A	11-026	North of Radar Towe	29.7	3.4
22-Mar-11	WH7440	BBH102		11-027	South of Red Slave	55.9	21.0
22-Mar-11	WH7473		151849786A	11-029	Red Slave	34.1	4.0
22-Mar-11			151846677A	11-030	Chocogo	30.2	3.4
4-Apr-11	WH7474		151526346A	11-031	Chocogo	39.4	7.6
4-Apr-11	WH7487	BBH227		11-032	Vista Blue	41.6	9.4
6-Apr-11			133963571A	11-034	Sabadeco pier	25.0	2.0
8-Apr-11	WH8060	WH8061	134733586A	09-145	1000 Steps	32.3	3.8
8-Apr-11			151849621A	11-038	Old Blue	23.2	1.6
13-Apr-11	BBH228	WH7488		11-042	Reserve North	83.8	73.0
18-Apr-11	WH1326	WH1321		07-132	Playa Benge	41.3	8.0
29-Apr-11	WH7436	WH7435	151538775A	10-066	Just a nice dive	27.9	2.6
6-May-11			151850526A	11-056	No Name	30.0	3.4
6-May-11	BX1117	WE4192		04-065	Just a nice dive	46.7	11.6
19-May-11	WH7469	BBH245		11-072	Outside Lac	63.0	28.0
27-May-11	WH7489	BBH271		11-111	Lac	55.1	20.0
14-Oct-11	WH7498	WH7499		11-118	No Name		
19-Oct-11	WH1256	BX1268	134428772A	06-025	Lac	58.0	24.0
19-Oct-11	WH7489	BBH271		11-111	Lac	55.6	22.0
31-Oct-11		BBG111	151849556A	08-136	Lac	56.9	21.0

Loggerhead turtles

Date capture	Tag left	Tag right	PIT	Turtle ID	Location	SCL *CCL*	Weight
1-Aug-11	WH7493	WH7494		11-117	Playa Chikitu		70.0

Loggerhead/hawksbill hybrid

Date capture	Tag left	Tag right	PIT	Turtle ID	Location	SCL *CCL*	Weight
1-Mar-11	WH7467		151848354A	11-005	Tori's Reef	36.6	5.8

Appendix II. List of confirmed nests observed on Klein Bonaire during 2011.

Activity number	Location stake	Observation date	Species
1	345	9-May	Cc
2	1330	22-May	Cc
3	1049	22-May	Cc
4	1094	1-Jun	Cc
5	1090	3-Jun	Cc
6	1212	3-Jun	Cc
7	1320	3-Jun	Cc
8	1106	7-Jun	Cc
9	325	13-Jun	Cc
10	912	13-Jun	Cc
11	1118	13-Jun	Cc
12	1093	15-Jun	Cc
13	1422	15-Jun	Cc
14	784	17-Jun	Cc
15	1800	17-Jun	Cc
16	2006	17-Jun	Cc
17	558	20-Jun	Cc
18	1271	20-Jun	Cc
20	1831	24-Jun	Cc
22	1103	27-Jun	Cc
25	977	4-Jul	Ei
26	1190	4-Jul	Ei
27	1450	4-Jul	Ei
28	1090	7-Jul	Cc
29	1108	8-Jul	Cc
30	1383	11-Jul	Cc
35	2045	20-Jul	Ei
41	383	22-Aug	Ei
44	518	29-Sep	Ei
45	520	30-Sep	Ei
46	771	13-Oct	Ei
47	948	14-Oct	Ei
48	615	8-Oct	Ei
49	799	27-Oct	Ei
50	675	5-Nov	Ei
51	448	10-Nov	Ei
52	552	21-Nov	Ei
53	522	24-Nov	Ei
54	555	4-Dec	Ei
55	540	6-Dec	Ei
56	575	8-Dec	Ei
57	642	19-Dec	Ei
58	558	19-Dec	Ei

During 2011 a total of 23 loggerhead (Cc) and 20 hawksbill (Ei) nests were confirmed on Klein Bonaire.

List of nests observed on other Bonaire beaches during 2011.

Location	Observation date	Species
Fishermen's Hut	14-May	Cc
Fishermen's Hut	6-Jun	Cc
Fishermen's Hut	7-Jun	Cc
Fishermen's Hut	21-Jun	Cc
Fishermen's Hut	24-Jun	Cc
Fishermen's Hut	2-Jul	Cc
Fishermen's Hut	15-Jul	Cc
Playa Chikitu	22-Jul	Cm
Donkey Beach	26-Jul	Cc
Playa Chikitu	1-Aug	Cc
Playa Chikitu	4-Aug	Cm
Playa Chikitu	16-Aug	Cm
Playa Chikitu	23-Aug	Cm
Donkey Beach	August	Ei
Donkey Beach	August	Ei
Playa Chikitu	22-Sep	Cm

During 2011 a total of 9 loggerhead (Cc), 2 hawks-bill (Ei), and 5 green (Cm) turtle nests were confirmed on the beaches of Bonaire.

Appendix III. 2011 Funders and Donors

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 – 2014

www.worldwildlife.org

In 2008, WWF Netherlands awarded a 3-year grant in support of STCB's work in sea turtle conservation on Bonaire. In 2011, this grant was renewed for another 3 years. The grant is administered by STINAPA Bonaire.

Major Funders
Dutch Caribbean Nature Alliance (DCNA)
Tides Foundation (Google Inc. Charitable Giving Fund)

Platinum Donors
Allerd Stikker
Dutch Ministry of Economic Affairs, Agriculture and Innovation (EL&I)
Pifworld
Sea Turtle Conservation Bonaire - Netherlands
Eco Dive Bonaire 2010
The Dr Robert Andrew Rutherford Trust
Cees van Lede
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Michael and Anne Contratto
Buz Smith and Bruce Schnaak

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Benjamin Hildebrand
Paul Eglesto
Sue Willis
Esther Bushman
Patricia Davis
Mrs. Croteau's 3rd grade class (Hampton, New Hampshire, USA)
In memoriam: Clayton Baird (Bud) Pearson Jr.

Appendix IV. 2011 Staff, Interns and Board(s) of Directors

Staff

Mabel Nava, *Manager*
Leo Hoogenboom, Program Assistant (January-September 2011)
Gielmon Egbreghts, Contractor *Field Specialist (October-December 2011)*

Scientific Advisor

Robert van Dam

Interns

Bart Boomstra, *Hoogeschool Zeeland, Netherlands*
Jochem Lastdrager, *University of Utrecht, Netherlands*

STCB – Bonaire, Board of Directors

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

Advisory Members of the Board

Jan Kloos
Allerd Stikker

STCB – Netherlands, Board of Directors

Pieter Borkent, *Chair*
Marlene van Koert, *Secretary*
Duco van Hogendorp, *Treasurer*
Niels Valkering
Albert de Soet, *Advisor and STCB Founder*
Guido Wiersma
Tom van Eijck, *Advisor, first field project coordinator (1993)*

Appendix V. 2011 STCB Partners, Supporters and Volunteers

International Partners

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

Regional Partners

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

Local Partners

Aliansa Naturalesa di Bonaire
Bonaire Department of Environment and Natural Resources (DROB)
CIEE Research Station Bonaire
Echo Bonaire
Jong Bonaire
RCN Ministry of Economic Affairs, Agriculture and Innovation
RCN Ministry of Infrastructure and Environment
STINAPA Bonaire
    Bonaire National Marine Park
    Washington-Slagbaai National Park

Local Business Partners and Supporters

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

Administratiekantoor Brandaris
BonPhoto
Bonfysio Bonbida
Captain Don's Habitat
Carib Inn (Bruce Bowker)
Caribe Car Rental
CARGILL Salt Bonaire
Dive Friends Bonaire
Harbour Village Marina
Kantika di Amor
Mangrove Kayak Center
Multifish N.V
MNO
NetTech (Jake Richter & Susan Davis)
SELIBON
Yellow Submarine
Wannadive Bonaire
Woodwind Snorkel Sail

Appendix V. (continued)

2011 Volunteers

Barbel Heusinkveld
Leanne Pinkerton
Leo Hoogenboom
Frank Veerbennen
Janice Elloway
Patrick and Hettie Holian
Ralph 'Moogie' Stewart
SGB students
Tina Lindeken
Anne Zaat
Rich & Lila Nicholson
Sue Willis
Richard Willis
Nat Miller
Zsuzsanna Pusztai
Lynne Bentsen

And to the many volunteers who helped with our in-water sea turtle surveys: Patrick, Hettie, Maggie, Patty, Red, Tina, Rick, Lila, David, Dorinde, Silvia, Nicky, Melvin, Craig, Nancy, Bill, Esther, Barry, Merylou, Nathaly, Jan Willem, Kyora, Christina, Astrid, Jimmy, Karsten, Jocelyn, Clarke, Daxo, Fleur, Alicia, Jolande, Bonsee family, Suz, Pieter, Meaghan, Grace, Pieter, Egon, Roald, Ricus, Sijeh, Bente, Dee, CIEE students, Elly, Terry, Robert.

Appendix VI. 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) N.V.
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) N.V.
Swift code: MCBKBQBN
Correspondent Bank: Standard Chartered Bank
ABA # 026002561
Swift Code: SCBLUS33

To make a donation from Europe:

Beneficiary: Sea Turtle Conservation Bonaire
Account number: 101.169.209
Beneficiary Bank: Maduro & Curiel's Bank (Bonaire) N.V.
Swift code: MCBKBQBN
Correspondent Bank for Euro: Rabo Bank Nederland
Swift Code: BBRUBEBB

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