Noteworthy sea turtle nesting records for the Netherlands Antilles

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Abstract.—Until the early 1990s, information on sea turtle nesting in the Netherlands Antilles amounted to little more than anecdotal accounts and sea turtle nesting was considered to be nothing more than a rare accidental occurrence. However, several recent studies have found unprecedented levels of sea turtle nesting activity and have served as an important impetus to succussful new conservation measures and initiatives. We here present and discuss new information that documents several additional sea turtle nesting beaches for conservation on four Caribbean islands, and that serves as baseline data for future reference. While most studies elsewhere have focused on large sea turtle nesting beaches, our findings support the idea that small, scattered nesting beaches could cumulatively contribute significantly to both reproductive output and recovery potential of several species when examined on a regional scale.

Keywords.—sea turtle, nesting beaches, Caribbean, Netherlands Antilles, Aruba

Historical records recount extensive sea turtle fisheries in the Netherlands Antilles, but provide few if any indications of former nesting (Boeke 1907a, b; Eeuwens 1907; Hermans 1961). Boeke specifically only mentions accounts of sea turtle nesting for Playa Grandi at Wacao in Curaçao, and Klein Bonaire (Boeke 1907b: resp. 130, 87). Van Buurt (1984) and Sybesma (1992) provided the first few more recent accounts of sea turtle nesting, but almost all of the hundreds of currently documented records post-date 1990. In particular, studies by Debrot and Pors (1995) for Curaçao, by van Eijck and Eckert (1994) and Valkering et al. (1996) for Bonaire, and by Barmes et al. (1993) for Aruba, have indicated previously unforeseen levels of sea turtle nesting activity on these islands.

Since these recent studies several measures have been implemented to better protect the turtles and their nesting beaches. In Curaçao, the most important sea turtle nesting habitat was declared and has been managed as a national park since 1993. The coastline concerned was legally designated as conservation area by means of the land-use zoning ordinance locally known as the EOP ("Island Development Plan") (A. B. 1995, no.36) and sea turtles were declared legally protected by island ordinance in 1996 (A.B. 1996 no.8). In Bonaire, the most important nesting area (the island of Klein Bonaire) was declared off limits to human occupation by the Bonaire Island Council in 1997, purchased by government in 1999 for nature protection purposes, and given in management to STINAPA-Bonaire, the Bonaire National Parks Foundation.

In 1998 the Netherlands Antilles passed a National Nature Conservation Ordinance, (P.B. 1998 no. 49, modified in P.B. 2001 no. 41) This national law

implements the Specially Protected Areas and Wildlife (SPAW) Protocol of the Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean, and also the Inter-American Convention for the Protection of Sea Turtles, both of which require complete protection of sea turtles and their nesting beaches. As a national law it overrides island legislation such as on Saba and St. Eustatius, which still allow restricted catch of sea turtles. Based on this national law and a community outreach program in St. Eustatius, the St. Eustatius National Parks Foundation achieved officially protected status for the Zeelandia Beach nesting site in October 2001, and subsequently started a structured sea turtle monitoring program on this beach.

As the documentation of sea turtle nesting beaches has clearly helped bolster and consolidate advances in local sea turtle conservation, we here document and discuss several noteworthy new sea turtle nesting records for the Netherlands Antilles.

Nesting Records

Southwest coast of Curaçao.—On the morning of August 11, 1997, a sea turtle nest was discovered by beach visitors hatching out on the public-access, private-owned beach of Porto Marie (UTM ^{19}490900, ^{13}51070). The hatchlings were identified as Loggerheads, *Caretta caretta,* based on scute counts (PH). To the great surprise of beachgoers a nest of Hawksbills, *Eretmochelys imbricata*, hatched on the afternoon of December 29, 2000, at the public beach of Daaibooi (UTM ^{19}491000, ^{13}50370) (L. Pors). More than eighty hatchlings made it to the sea, after being helped out of the compacted sand by volunteers.

A second Hawksbill nest hatched on the same beach on the night of January 15, 2001. The location of the nest could not be found, however, the next morning many hatchlings had not yet found their way to sea and had accumulated at the edge of the parking lot and under planted vegetation. The animals that were still alive were collected by beachgoers and released in the sea. Some time during the turtle breeding season in 2001, a beachgoer found turtle tracks and a nest pit on the public beach of Playa Kalki (UTM ^{19}483100, ^{13}68370).. A search for the nest was undertaken by experienced Carmabi park rangers but nothing could be found and no specific data was recorded (W. Sambo, pers. comm.). On the morning of June 31, 2004, visitors discovered a hatching sea turtle nest on the Playa Kalki beach. Ninety-one hatchlings made it to sea, 15 hatchlings died in the nest and 8 eggs failed to hatch (C. Schmitz, pers. comm.). No material was saved for identification but based on the size of the hatchlings and the early date of hatching compared to most Hawksbill records for Curaçao and Bonaire (Debrot and Pors 1995; van Eijck and Eckert 1994; Valkering et al. 1996), it was most likely a Loggerhead nest but could also have been a Hawksbill nest.

Klein Curaçao.—This is a small flat 1.3 km^2 reef island (UTM ^{19}538910, ^{13}25280) about 9 km off the eastern tip of Curaçao, and lies inside Curaçao jurisdiction. On October 22, 2000, AOD collected a hatchling Green Turtle, *Chelonia mydas*, on the north side of the island of Klein Curaçao about 150 m from shore in a brackish inland karst pool. The intact specimen was positively identified as a green turtle based on scute counts (L. Pors). The animal had evidently taken a wrong direction after hatching and headed inland from the western shore and eventually perished. It no longer had its egg tooth and its ventral

scutes had already fused shut indicating that it must have survived for some time in the pool before dying. The same day AOD found the complete intact dry skeleton of an adult Hawksbill, *Eretmochelys imbricata*, at least 100 m inland from the western shore on the north side of the island. The specimen was collected on November 26 and identified on the basis of photos by K. Eckert and P. Borkent. Adult turtles do not climb the beach other than to lay eggs. This specimen had evidently lost its way after nesting and died almost midway on the island. During the November visit, AOD further saw more than a dozen old nesting pits along the west side of the southern half of the island, indicative of considerable nesting activity during the past season. According to the crew of the commercial day-trip boat *Mermaid* (V. Mons, pers. comm.), most turtle tracks are seen during the months of October and November (2002 and 2003), which suggest predominant nesting by Hawksbills.

St Eustatius.—On June 16, 1997, the St. Eustatius National Parks Foundation (STENAPA) discovered a nest of the Leatherback on Zeelandia Beach (UTM ^{20}502390, ^{19}35150), on the north coast of the island (J. Begeman). The nest was identified based on the large size of the eggs compared to the other species known to nest in the region.

In 2002, Statia Marine Park started a consistent sea turtle monitoring and tagging program. Since the start of the programme, the Marine Park has documented that three species of sea turtles nest on the island regularly, albeit in limited numbers: the Leatherback Turtle (*Dermochelys coriacea*), the Green Turtle (*Chelonia mydas*) and the Hawksbill Turtle (*Eretmochelys imbricata*) (Le Scao and Esteban 2003).

In 2002 detailed night patrols of Zeelandia Beach documented 7 beach visits by Green Turtles amounting to at least 3 separate individuals, and one beach visit by a Hawksbill Turtle (August 7 - August 21). In 2003, patrols documented ten beach visits by at least two different Leatherback Turtles (April 29 - June 2), three beach visits by three individual Green Turtles (June 8 - June 30), and six beach visits by at least three different Hawksbill Turtles (June 8 - October 7) resulting in at least two nests. The exact number of nesting females is not known due to the fact that not all turtles could be measured or tagged.

More intensive monitoring started in 2004 with saturation tagging of all sea turtles visiting Zeelandia Beach. In 2004, Leatherbacks accounted for 16 beach visits (April 4 and June 28) by a minimum of 4 separate (tagged) individuals, and resulted in at least nine nests. Records for 2004 show that the nesting interval for Leatherback Turtles nesting on Zeelandia Beach varied between eight and ten days. The incubation period for Leatherback hatchlings ranged around 60 days. On June 26, 2004, one Hawksbill visited Zeelandia Beach.

St. Maarten.— We here report five Leatherback and three Hawksbill records for St. Maarten. On the night of June 19, 2000, a Leatherback turtle was filmed while depositing eggs at Simpson Bay (UTM ^{20}489070, ^{19}94570). The nest hatched about two months later but no data were recorded. On March 30, 2004, a Leatherback laid a nest at Guana Bay (UTM ^{20}497420, ^{19}93890). On June 4, 2004, upwards of 100 hatchlings left the nest. Leatherback tracks were observed on the same beach on April 8, but no nest could be dicovered. On May 24, 2004, a Leatherback Turtle carrying a tag KL-11 climbed on land

at Simpson Bay (UTM ^{20}489070, ^{19}94570) to lay its eggs. Egg laying took about one and a half hours, starting about midnight (morning of May 25). Video and photo footage was obtained of the entire nesting event. On June 19, 2004, the same Leatherback (tag KL-11) was again observed depositing eggs at Simpson Bay.

A fresh Hawksbill nest with 178 eggs was laid July 16, 2001, on the beach of Gibb's Bay (UTM ^{20}497840, ^{19}94590). An already-hatched Hawksbill nest was discovered on July 26, 2001, on the same beach. As the tracks of hatchlings leaving the nest were still visible, hatching must have taken place at most a day or two before discovery. Total number of hatchlings was not recorded but three unhatched eggs were found. On September 29, 2003, a Hawksbill climbed onto the beach of Guana Bay and layed a nest. The event was photographed and observed by over 30 bystanders. Another nesting beach on which (unidentified) turtle tracks can be reported (three in August and September 2001) is Mullet Bay (UTM ^{20}486670, ^{19}95010).

Discussion

Southwest coast Curaçao.—The island of Curaçao is basically spindle-shaped and two coasts are typically distinguished; the wave-exposed northeast coast and the sheltered southwest coast. The pocket beaches along the sheltered southwest coast of the island are generally bigger and better supplied with sand than those on the exposed northeast coast where beach quality for turtle nesting is poor (Debrot and Pors 1995). Therefore we surmise that in the past most sea turtle nesting must have taken place along the southwest coast. The reason that today most sea turtles nest on the inferior beaches of the northeast

coast (Debrot and Pors 1995) is undoubtedly that those beaches have escaped most disturbance and fishing activity because they are largely too rough for human use.

Debrot and Pors (1995) were able to report nesting at two southwest coast beaches, namely Blauwbaai and Santu Pretu. Van Buurt (1984) further reported nesting activity on the isolated sheltered beach of Awa di Kabes (East Point) at the eastern tip of the island. We here document nesting related activity at three additional beaches, increasing the total of southwest coast beaches known to be visited by turtles to six. These results not only indicate an evident potential for partial recovery of sea turtle nesting along the southwest coast but at the same time herald problems juggling turtle and human use of the beaches. Of the six beaches listed, only two are not intensively used by the public on a daily basis (East Point and Santu Pretu). Recovery of sea turtle nesting along Curaçao's southwest coast will thus depend both on protection of undisturbed nesting beaches and management measures to reduce disturbance on public access beaches as much as possible.

Klein Curaçao.—In early colonial times Klein Curaçao stands out as an important sea turtle breeding site, as evidenced by at least two accounts. In 1635, Juan Mestizo, an Indian elder told that his peoples visited Klein Curaçao to catch seals and sea turtles (van Grol 1934:76). In 1643, faced with dwindling food supplies Peter Stuyvesant ordered his men to sail to Klein Curaçao to "see if they could turn over some sea turtles" (de Smidt et al.. 1978:24). The first reliable modern record for sea turtle nesting on this island dates from August 1991 when an adult green turtle climbed the beach and was caught and slaughtered by fishermen (Sybesma 1992). The two additional records provided here

show that aside from Green Turtles, Hawksbills also continue to nest on this island. Anecdotal evidence even suggests nesting by Loggerheads, though this has not been proven (Sybesma 1992). The island posseses the longest stretch of natural sandy beach in Curaçao jurisdiction, amounting to at least 600 m of continuous sand. With few exceptions most beaches in Curaçao are well below 100 m long (Debrot and Pors 1995). The documentation of continued recent nesting by at least two species and the historical evidence indicating the longstanding importance of this island as a nesting site, suggest that this is the single most impotant sea turtle nesting area of the island territory of Curaçao.

St Eustatius.—Until recently all nesting reports for sea turtles on the island of St. Eustatius (Green Turtle, Leatherback and Hawksbill) have been purely based on anecdotal accounts by residents (Sybesma 1992). We here report on numerous recent records for all three species for Zeelandia Beach. The results recounted here not only serve to substantiate the validity of the prior anecdotal information but also establish Zeelandia Beach as the most important nesting beach of the island; a beach where until recently illegal sand mining and motor-crossing have been problematic. Zeelandia Beach is by far the largest beach on the island and the only documented nesting site for the Leatherback. The reported results will help support national and insular conservation efforts and provide baseline data for future comparison.

St. Maarten.—Aside from the five records provided here, the only other record for nesting of the Leatherback in St. Maarten dates from more than 50 years ago (Hermans

1961; Sybesma 1992). In the Netherlands Antilles only Saba and Curaçao as yet have no confirmed nesting records for this species, though it is in any case not uncommon along the windward reefs of Curaçao and Klein Curaçao (for 2004, three sightings for Klein Curaçao as of July 7, G. Weetink, pers. comm.). At present the Leatherback is the most common breeding sea turtle of Aruba (Barmes et al. 1993). The earliest record that could be found for Aruba dates from May 10, 1974, when a turtle came ashore and was caught at Eagle Beach, Aruba (Kristensen 1975). Until now only one record exists for Bonaire, dating from 1988 (Sybesma 1992). Our five new records of Leatherback nesting for St. Maarten are the only recent records for the island and establish it as part of the current breeding range for this species.

Aside from the Leatherback, both the Green Turtle (at Guana Bay and Oyster Pond) and the Hawksbill (at Guana Bay, Oyster Ponds, Long Bay and Flat Island) are known to breed on St. Maarten (Sybesma 1992). While no recent nesting by the Green Turtle can be confirmed, we here present three recent nesting records for the Hawksbill. The results confirm the continued use of St. Maarten beaches by at least two sea turtle species as well as the need to actively implement turtle conservation measures in St. Maarten.

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