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## **New Sea Turtle Nesting Records for the Netherlands Antilles Provide Impetus to Conservation Action**

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**ABSTRACT.**—Until the early 1990s, information on sea turtle nesting in the Netherlands Antilles amounted to little more than a few anecdotal accounts and sea turtle nesting was considered nothing more than a rare or accidental occurrence. However, several recent studies have found significant levels of sea turtle nesting activity and have served as an important impetus to successful implementation of new conservation measures and initiatives. We present and discuss new information that documents several additional sea turtle nesting beaches for conservation on four Caribbean islands, and that can serve 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 nest-

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ing (Boeke 1907a, b; Eeuwens 1907; Hermans 1961). Boeke mentions sea turtle nesting at Playa Grandi at Wacoo in Curaçao, and at Klein Bonaire (Boeke 1907b: resp. 130, 87). Van Buurt (1984) and Sybesma (1992) summarize 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 unanticipated levels of sea turtle nesting activity on these islands.

Following these recent studies, and based on the recommendations of Sybesma (1992), several measures have been implemented to better protect sea turtles and their nesting beaches; measures which are proving successful for the recovery of depleted sea turtle stocks elsewhere (e.g., Balazs and Chaloupka 2004). 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 a 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 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 UNEP Convention for the Protection and Development of the Marine Environment of the Wider Caribbean (Cartagena Convention), and also the Inter-American Convention for the Protection and Conservation of Sea Turtles, both of which require, under most circumstances, complete protection of sea turtles and habi-

tat critical to their survival. As a national law it overrides island legislation, such as on Saba and St. Eustatius, which still allows a 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 document and discuss several records of sea turtle nesting activity for the Netherlands Antilles. All species identifications were based on Pritchard et al. (1983). The records provided are summarized in Table 1 and discussed below for each island separately.

*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) and van Buurt (1984) reported on nesting-related activity on three southwest coast beaches of the island. We here document nesting-related activity at four additional beaches, and a first record for nesting by the Leatherback (Table 1). The 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

TABLE 1. New records of sea turtle nesting-related activity on beaches of four islands of the Netherlands Antilles.

Locality name/Coordinates species	Date d/m/y	Type of record*	Observer	Comments**
Curaçao, SW coast				
Porto Marie (UTM <sup>19</sup> 490900, <sup>13</sup> 51070)				
Loggerhead	11/8/1997	H	P. Hoetjes	
Daaibooi (UTM <sup>19</sup> 491000, <sup>13</sup> 50370)				
Hawksbill	29/12/2000	H	CARMABI	>80 hatchlings
"	15/1/2001	H	CARMABI	
Groot Knip (UTM <sup>19</sup> 483725, <sup>13</sup> 65830)				
Leatherback	18/5/2005	N	CARMABI	
Playa Kalki (UTM <sup>19</sup> 483100, <sup>13</sup> 68370)				
Unident.	?/?/2001	H	CARMABI	
Loggerhead?	31/6/2004	H	CARMABI	91 hatchlings, 15 dead, 8 unhatched
Klein Curaçao				
North Beach (UTM <sup>19</sup> 538910, <sup>13</sup> 25280)				
Green	22/10/2000	DH	CARMABI	100 m inland in karst pool
Hawksbill	"	DF	CARMABI	>100 m inland
St Eustatius				
Zeelandia Beach (UTM <sup>20</sup> 502390, <sup>19</sup> 35150)				
Leatherback	16/6/1997	N	J. Begeman	
"	24/4/2003	T	STENAPA	
"	29/4/2003	T	"	
"	30/4/2003	T	"	
"	13/5/2003	T	"	
"	19/5/2003	T	"	
"	24/5/2003	T	"	
"	29/5/2003	T	"	
"	1/6/2003	T	"	
"	14/6/2003	T	"	
"	22/6/2003	T	"	
"	14/4/2004	L	"	
"	17/4/2004	L	"	
"	18/4/2004	T	"	
"	26/4/2004	L	"	FT# WC335
"	4/5/2004	L	"	FT# WE3
"	5/5/2004	L	"	FT# WC335
"	13/5/2004	L	"	FT# WC335
"	21/5/2004	R	"	FT# WC335
"	23/5/2004	L	"	FT# WC335
"	23/5/2004	R	"	FT# WE18
"	23/5/2004	T	"	
"	2/6/2004	L	"	FT# WE18, PT# 133713290A
"	7/6/2004	L	"	FT# WE9, PT# 134822465A
"	10/6/2004	T	"	
"	20/6/2004	T	"	
"	28/6/2004	T	"	
Green	7/8/2002	F	"	FT# WE25
"	7/8/2002	T	"	
"	9/8/2002	T	"	
"	13/8/2002	T	"	
"	21/08/2002	F	"	FT# WE4
"	21/08/2002	F	"	FT# WE2
"	21/8/2002	T	"	
"	8/6/2003	T	"	
"	24/6/2003	T	"	
"	29/6/2003	T	"	

TABLE 1. Continued.

Locality name/Coordinates species	Date d/m/y	Type of record*	Observer	Comments**
Hawksbill	21/8/2002	T	"	
"	8/6/2003	L	"	
"	8/6/2003	T	"	
"	5/7/2003	L	"	FT# WE8
"	8/9/2003	T	"	
"	14/9/2003	T	"	
"	7/10/2003	T	"	
"	26/6/2004	L?	"	
St. Maarten				
Simpson Bay (UTM <sup>20</sup> 489070, <sup>19</sup> 94570)				
Leatherback	19/6/2000	L	A. Caballero	
"	24/5/2004	L	"	FT# KL-11
"	19/6/2004	L	"	FT# KL-11
Guana Bay (UTM <sup>20</sup> 497420, <sup>19</sup> 93890)				
Leatherback	3/30/2004	L	"	hatched on 4/6/2004
"	8/4/2004	T	"	
Gibb's Bay (UTM <sup>20</sup> 497840, <sup>19</sup> 94590)				
Hawksbill	7/16/2001	L	"	178 eggs
"	7/26/2001	H	"	
"	29/9/2003	L	"	
Mullet Bay (UTM <sup>20</sup> 486670, <sup>19</sup> 95010)				
Unid.	?/8/2001	T	"	
"	?/8/2001	T	"	
"	?/9/2001	T	"	

\*DF = dead female, DH = dead hatchling, H = hatching, L = laying, N = nest, R = dry run, T = track

\*\*FT = flipper tag, PT = pit tag

the seven, only two beaches (East Point and Santu Pretu) are free from intensive public use. 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. Helpful recommendations on both accounts were provided by Sybesma (1992). Surveys by Debrot and Nagelkerken (2000) further indicate high public support for sea turtle protection under coastal user groups in Curaçao; groups such as divers, boaters, and even fishermen (90 ± 6%), who until 1996 could legally take and kill sea turtles.

*Klein Curaçao*.—This is a small, flat 1.3 km<sup>2</sup> reef island located about 9 km off the eastern tip of Curaçao, and lies inside Curaçao jurisdiction. In early colonial times Klein Curaçao was an important sea turtle breeding site, as evidenced by at least two accounts. In 1635, Juan Mestizo, an Indian elder, told of his people visiting 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 new records (Table 1) provided here show that aside from Green turtles, Hawksbills also continue to nest on this island. During a November 2000, visit, AOD 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, Mermaid Boat Trips, pers. comm.), most turtle tracks are seen during the months of October and November (2002 and 2003), which suggest predominant nesting by Hawksbill turtles.

Anecdotal evidence even suggests nesting by Loggerheads, though this has not been proven (Sybesma 1992). The island possesses the longest stretch of natural sandy beach under Curaçao jurisdiction, amounting to at least 600 m of almost 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 important sea turtle nesting area of the island territory of Curaçao, and should be managed as such, as a matter of priority. Sea turtle abundance around this island has increased in recent years to the point where sea turtle snorkel and diving trips are now a new product offered year-round with more than 90% sighting success (V. Mons, Mermaid Boat Trips, pers. comm.).

*St. Eustatius*.—Until recently, all nesting reports for sea turtles (Green, Leatherback, Hawksbill) on the island of St. Eustatius have been purely based on anecdotal accounts by residents (Sybesma 1992). However, in 2002, Statia Marine Park started a consistent sea turtle monitoring and tagging program at Zeelandia Beach (Le Scao and Esteban 2003). As a result, several new records can be reported for all three species (Table 1). In 2002, detailed night patrols documented seven visits by Green turtles (August 7-21) amounting to at least three separate individuals (based on tagging and carapace measurements) and one beach visit by a Hawksbill turtle (August 8). In 2003, ten beach visits were made by Leatherback turtles (April 24-June 24), three beach visits by three Green turtles (June 8-June 29), and six beach visits by Hawksbill turtles (June 8-October 7) resulting in at least two Hawksbill nests. In 2004, Leatherbacks accounted for 16 beach visits (between April 14 and June 28) by a minimum of four separate (tagged) individuals, and resulted in at least nine nests. In 2004, up to the end of June, one Hawksbill had visited Zeelandia Beach but no nest could be confirmed.

The results 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 has been problematic. Zeelandia Beach is by far the largest beach on the island and the only documented nesting site for the Leatherback turtle. The documented records will help support national and insular conservation efforts, as well as provide baseline data for future comparison.

*St. Maarten*.—We here report five new Leatherback and three new Hawksbill records for St. Maarten. The only other record for nesting by the Leatherback in St. Maarten dates from more than 50 years ago (Hermans 1961; Sybesma 1992). In the Netherlands Antilles, only Saba 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 December 10, G. Weetink, Mermaid Boat Trips, pers. comm.). At present the Leatherback is the most common breeding sea turtle of Aruba (Barnes 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 (Table 1) are the only recent records for the island and establish it as part of the current breeding range for this species.

Considering the high intensity of tourist use of the turtle nesting beaches of St. Maarten in recent decades, it is highly unlikely that nesting by sea turtles could have gone totally unnoticed in the recent past. Yet records of such events have remained missing. Therefore, our results suggest a recent increase in beach use by sea turtles on this island, indicative of recovery similar to that taking place on nearby St. Croix (Dutton et al. 2003). Also public and institutional awareness of the value of reporting such events has likely increased.

Aside from the Leatherback, both Green turtles (at Guana Bay and Oyster Pond) and

Hawksbills (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 indicate 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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