THE NATIONAL REPORT
EL REPORTE NACIONAL

FOR THE COUNTRY OF
POR EL PAIS DE

SURINAM
SURINAME

NATIONAL REPRESENTATIVE / REPRESENTANTE NACIONAL

P. TEUNISSEN

Western Atlantic Turtle Symposium
Simposio de Tortugas del Atlantico Occidental

17-22 July / Julio 1983
San José, Costa Rica
Suriname National Report, WATS I Vol 3, pages 386-397

WESTERN ATLANTIC TURTLE SYMPOSIUM
San José, Costa Rica, July 1983

NATIONAL REPORT FOR THE COUNTRY OF

REPUBLIC of SURINAME

NATIONAL REPORT PRESENTED FOR

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DATE SUBMITTED: 27 November 1982

Please submit this NATIONAL REPORT no later than 1 December 1982 to:

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Suriname National Report, WATS I Vol 3, pages 386-397

WIDECAST
Wider Caribbean Sea Turtle Conservation Network

With a grant from the U.S. National Marine Fisheries Service, WIDECAST has digitized the databases and proceedings of the **Western Atlantic Turtle Symposium (WATS)** with the hope that the revitalized documents might provide a useful historical context for contemporary sea turtle management and conservation efforts in the Western Atlantic Region.

With the stated objective of serving "as a starting point for the identification of critical areas where it will be necessary to concentrate all efforts in the future", the first Western Atlantic Turtle Symposium convened in Costa Rica (17-22 July 1983), and the second in Puerto Rico four years later (12-16 October 1987). WATS I featured National Reports from 43 political jurisdictions; 37 presented at WATS II.

WATS I opened with these words: "The talks which we started today have the multiple purpose of bringing our knowledge up to date about the biological peculiarities of the marine turtle populations of the western Atlantic; to know and analyse the scope of the National Reports prepared by the scientific and technical personnel of more than thirty nations of the region; to consider options for the orderly management of marine turtle populations; and in general to provide an adequate forum for the exchange of experiences among scientists, administrators, and individuals interested in making contributions for the preservation of this important natural resource."

A quarter-century has passed, and the results of these historic meetings have been lost to science and to a new generation of managers and conservationists. Their unique importance in providing baseline data remains unrecognized, and their potential as a "starting point" is neither known nor appreciated.

The proceedings document what was known at the time concerning the status and distribution of nesting and foraging habitat, population size and trend, mortality factors, official statistics on exploitation and trade, estimated incidental catch, employment dependent on turtles, mariculture operations, public and private institutions concerned with conservation and use, legal aspects (e.g. regulations, enforcement, protected areas), and active research projects. In most cases it was the first time a national sea turtle assessment had been conducted.

Despite the potential value of this information to agencies responsible for conducting stock assessments, monitoring recovery trends, and safeguarding critical habitat in the 21st century, the hand-written National Reports, largely illegible in the published proceedings, have slipped into obscurity. To help ensure the legacy of these symposia, we have digitized the entire proceedings, including the National Reports, plenary presentations and panels, and annotated bibliographies of both meetings, and posted them online at http://www.widecast.org/What/RegionalPrograms.html.

Each article has been scanned from the original document. Errors in the scan have been corrected; however, to be true to the original content (as closely as we can discern it), potential errors of content have not been corrected. This article should be cited:

Mohadin, K. and H.A. Reichart. 1984. National Report for Suriname, pp.386-397. *In*: Bacon, P., F. Berry, K. Bjorndal, H. Hirth, L. Ogren and M. Weber (Editors), Proceedings of the First Western Atlantic Turtle Symposium, 17-22 July 1983, San José, Costa Rica. Volume III: The National Reports. RSMAS Printing, Miami.

Karen L. Eckert
WIDECAST Executive Director
June 2009

COUNTRY: SURINAME

I. INTRODUCTION

This National report has been prepared for Western Atlantic Turtle Symposium (W.A.T.S.) to be held in July 1983 in San José, Costa Rica. A great deal of the data for this report has been synthesized from reports published on sea turtle research done (or still in progress) in Suriname. I prepared this report in the hope that the data in the report will contribute to the survival if the endangered marine turtle species and that mankind will benefit from these animals as they contribute an important source of protein.

II. BACKGROUND

General Geographic Description of the Republic of Suriname

The Republic of Suriname, a former Dutch colony is situated between 2º and 6º North latitude and 54º and 58º West longitude on the northeastern part of South America, bordering on the Atlantic Ocean to the North, on Guyana to the West, on French Guiana to the east.

The size is about 160,000 square kilometers and with the total population of about 355,000 (31.3% creoles, 37.6% Hindustani descent, 15.2% Indonesian descent, 9.5% Bushnegores, 2.1% Amerindians, 1.6% Chinese and 1.1% Europeans and 1.6% others).Suriname is one of the most thinly populated countries in South America. The annual main temperature is 80º F (the warmest month is September 83ºF and the coolest month is January; 78ºF). The annual rainfall varies from 1,500 mm in the coastal region to about 3,000 mm in the mountainous hinterland. Heavy rains usually fall from mid-April to mid-July. The periods of February-March and mid-August to November are relatively dry, especially in the latter period. About 80% of the country is covered with uninhabited and undisturbed Neotropical rainforest. In the north and the extreme south there ate a variety of unusual savanna types. Along almost the entire coast mangrove forest occurs, with scattered sand beaches here and there. The mangrove forest covers about 4% of the total land surface.

Coastline and Offshore Areas

The coast lies alternately in de NE tradewind belt and the SE tradewind belt, or on the division between the two. From December to the beginning of April the NE tradewind are blowing strongly onto the coast. In these months the swells are the heaviest, and the surf the strongest. The most important movements of the sandy beaches occur between December and February. From April to June, the wind becomes more variable and the sea becomes much calmer. From June to August the SE tradewind is weak and variable. In the November to December period it gives way to the more definite and stronger the tradewind which causes the heavy swells during winter and spring.

Along the coast of Suriname the Guiana Current flows in a WNW direction. It is the continuation of the Northern Equatorial Current, and travels along the north coast of Brazil and the Guianas, dividing at the Lesser Antilles into the Caribbean Current and the northwest directed Antillean Current. The water along the coast is brown due to mud particles in the water. At 20-30 km from the coast the brown color of this muddy water suddenly changes into a blue-green color of much clearer water. At 50-70 km offshore the water is blue. There is a very marked tidal difference along the coast of Suriname, which clearly has an influence on the nesting periodicity of sea turtles. At Eilanti, where an extensive mudbank is located, the tide determines the accessibility of the nesting beach.

One of the characteristics of the Surinam coast is the continuous alteration of the shoreline. The radical changes have a cyclic nature: accretion and erosion are succeeding each other alternately. The slow westward directed N. Equatorial Current carries along the Guiana coast, a large amount of mud, part of which is deposited in the Surinam mudbanks. The Amazon is held to be the source of this very mobile mud. The mudbanks are

separated by sections along which generally narrow sand and/or shell beaches are present. Deposition of mud on the one hand, and of sand and shells on the other takes place separately. The combination of sea current and the wave action, results in a cyclical erosion on the east side of the mudbanks and a silting up of the west side. Therefore, mudbanks and consequently the intermediate sections of the coast continually migrate to the west. The cycle is believed to repeat itself approx. every 35 years. The beaches are built up of send, shells and shell debris in all possible combinations, varying from pure send to pure shell material.

History and Knowledge of Sea Turtles in Suriname

The earliest account of sea turtle nesting in Suriname is found in the narrative of a Labbadist expedition (Anonymous, 1666; Knappert, 1926). In Stedman's narrative (1796), comments about the consumption of turtle meat in the colony are found; he also reported having observed off the Cayenne coast on January 33 of the year 1773 one or two large turtles, floating post the ship's side. Stedman stated further that in Suriname . . . . "The turtles are generally distinguished by the names of Calipee or green turtle, and carett". The first name may be a corruption of the local name krapé and "carett" probably refers to the warana (*Lepidochelys olivacea*). It seemed that, except for e short period before the Second World War, sea turtles on the Surinam coast were never killed for food on a large scale. At the present day sea turtle meat is not appreciated by the Caribs living near the principal nesting places. According to Kloos (1971) the Moroni Caribs say that they do not like the smell of the meat, but he mentions another probable reason, now forgotten: their fear to become as stupid as the animal from which the flesh is eaten. The meat of other turtles was probably seldom or never eaten. Capture of hawksbill for tortoise shell was probably never important, presumably because this species is not numerous here and, according to Kappler because American tortoise shell was worth less than that from Asia.

Geijskes (1945) records the following about use of the meat of the green turtle. Before 1940, green turtles were caught for export. This business was in the hands of a Mr. Berkeley at Albina. How long this trade had already been going on, and on what scale, is not mentioned. No information is given about of capture. Information obtained from the Caribs says that the turtles were caught as they came ashore to nest.

The late Mr. Lijkwan, who for many years worked for' the Honourable' Berkeley, mentions an average of approx. 600 female turtles killed by the Indians for Berkeley for export during the period 1933 to 1940. According to Geijskes this estimate is on the low side. He mentions a number of 1,000 green turtles and 1500 ridleys each year. In 1930 and 1939 for example, he had caught at least 3,000 green turtles. In 1968, a year in which more green turtles nested than in, previous years, only ca. 1,000 came ashore in this region. This means that thirty years ago many green turtles and ridleys nested on the beaches near the mouth of the Marowijne.

After 1940 the slaughter of turtles for export came almost to an end. Yet many turtles were still being killed on the beach by among others, the fishermen, as appears from Geijskes' remarks. About the hawksbill Geyskes reported In 1945 that people in Suriname mostly do not recognise this species and kill the turtle only for the meat which, however, cannot be particularly tasty as the Caribs consider it to be poisonous.

Collecting of eggs (mostly ridley and green turtle) seems to have been quite important. This was a tradition of the coastal Caribs at least during the last century – chiefly in and near the Marowijne estuary, According to Geijskes' (1945) report, egg taking in the forties was more intensive than in the previous century due to the increased demand by Chinese and other people of Asiatic origin., especially Javanese. The eggtakers kept the daily proceeds of eggs in their camps, until enough were collected to load a boat (17,000 to 100,000). In those days the eggs were taken to Paramaribo, the Commewijne district, and to St. Laurent (French Guiana). No figures are mentioned for the total number of eggs taken per year. In 1954 a big change occurred in the fate of sea turtles nesting in Suriname. In that year the Game Ordinance and the Nature Preservation Ordinance came into force, followed by the Game Decree and the Decree

that declared the Bigi-santi breeding beach (once one of the most important nesting beaches of the leatherbacks, now washed away a Nature Reserve). These legislative measures prohibited the killing of marine turtles and limited the collection of their eggs along part of the coast. But the turtles did not immediately benefit from these measures, as the most important beaches near the Marowijne estuary remained outside the area to which the regulations apply. Since 1954, the policy of turtle management aims at complete protection of the nesting animals on the beaches and the harvesting of a “justifiable" quota of the eggs of the green turtle.

Eggs of other species are not collected and will not be collected in the near future. In 1969, the Galibi area was declared a Nature Reserve which Includes all the nesting beaches of the Marowijne estuary, thus effectively protecting the rookeries there. The primary reason for the decision to harvest some of the eggs of the green turtle is the intention to attempt a rational exploitation of the eggs, on a sustained yield basis, as a cheap part of the protein requirement in the diet of the population. Apart from this, an abrupt, total barn on the collecting of eggs of all species probably would have met with such strong resistance, both from the side of the egg collectors and from the consumers that it could have jeopardized the entire project from the start. Yearly a quota of approx. 250,000 eggs are collected, which are sold in Paramaribo and in the various districts of Suriname. The major portion of these eggs are removed from beach sections where nests were endangered by erosion or were laid below high tide level. Many of these so-called "doomed eggs" are also relocated in man-made nests on higher reaches of the beach, or they are hatched out in styrofoam nest boxes at the field station. Upon emergences, these hatchlings are released to the sea. The logistics of collecting and selling the eggs is in the hands of the Surinam Foundation for Nature Preservation. (STINASU) an organization with the purpose to stimulate, coordinate and finance scientific exploration in the Nature Reserves and to stimulate public awareness of nature conservation. Some of the green turtle eggs are also being used for a green turtle ranching protect. Part of these captive-reared turtles are released at various age classes while the others are kept in the turtle ranch at Matapica for future commercial use. The turtle ranch, at Matapica which so far is only a feasibility study, was founded in 1977 to investigate the idea that captive-raised sea turtles can contribute to the socioeconomic development of a country as well as and protect and possible increase the wild populations.

In the past little scientific attention has been paid to sea turtles nesting in Surinam. Kappler's observations were the only ones that were published before the present research was commenced in 1963. In 1963 en 1964, six expeditions were made by personnel of the Forest Service with the primary intention of locating the nesting places of the sea turtles in Suriname. Among others, group nesting “arribada") of the olive ridley (*Lepidochelys olivacea*) was discovered. During these expeditions it was also established that in Suriname most sea turtles come ashore near the mouth of the Marowijne River. In 1965 and 1966 only occasional observation were made. In 1966 tagging of turtles was begun by students from the University of Florida, led by P.C.H. Pritchard, and a number of turtles were weighed end measured. In 1967, surveillance and the systematic collecting of quantitative data about nesting was resumed by a permanent staff at Bigisanti, and commenced at Eilanti. The daily counting of nests was carried out along similar lines as in 1964. Also more data were collected about incubation periods and hatching percentages of eggs, including those in relocated nests. Daily countings of the nests were continued at Bigisanti in 1968, as well as at Eilanti. Up to now daily countings are taking place and on all known nesting beaches. On the basis of observations on returns of previously tagged turtles, the first data about breeding cycles were collected. Mrosovsky (University of Toronto) began research into the stimuli that affect leatherback young as they travel from the nest to the sea.

In the following years, Mrosovsky continued these studies, and in 1971 the Dutch zoologist J.T. Wildschut devoted four mouths to ethological experiments will hatchlings. Pritchard continued tagging, and his reports on weights of ridleys and green turtles have been published (Pritchard, 1969, 1969a). In 1969-1973, the work of previous years was continued and intensified with considerable assistance from R.L. Hill (1969-1971), a British zoologist. In 1969

and 1971, respectively D.J. Green and J.T. Wildschut assisted in research activities. Data collected concerning inter-nesting intervals, incubation periods, size of clutches and hatching success of turtle nests show the following:

a. Inter-nesting intervals: Green turtles seem to return to nest in a 1-, 2-, 3 or 4-year cycles and while the biennial cycle probably predominates. The ridley shows a predominance of 1-year intervals and the leatherback a predominance of 2-year Intervals.

b. Incubation periods: The incubation period of green turtle, as well as that of the Olive ridley and the leatherback varies from an average of 52 days during February-March to 58 days during the raining season (April-May). Transplanted nests show about the same incubation time as natural nests.

c. Size of clutches: The average number of eggs per nest for the green turtle is 138, for the Olive ridley 116 for the leatherback 85 and for hawksbill 146. This is an average taken from a 5-year period.

d. Hatching success: The hatching success in wild nests for the green turtle around 84%, for the leatherback 50% , and for the olive ridley 60%. Replanted nests show a lower percentage of hatchlings: for the green turtle around 58% for the leatherbacks around 30% for the ridley around 50%.

The low emergence percentage in the nests of the leatherbacks is due to a high percentage of small, infertile eggs in the nests. The leatherback clutches contain on the average 30% small, infertile eggs. A study done by C. Whitmore and P. Dutton of the University of Stirling in Scotland to get more data about clutch size, hatching success and incubation period in natural nests (in total 39) of the green turtle show the following:

- average clutch size**:** 131 eggs.
- hatching success 89.14%.
- incubation period 56.4 days.

This study was done on the Krofajapasi beach during April-June 1981. As mentioned above, some eggs are also hatched in styrofoam boxes. For the green turtle the average emergence in these boxes is nearly as high as in the natural nests (around 86% vs. 84%) and for the leatherback even higher (54% vs. 50%). The incubation period in the boxes however is somewhat longer than in the natural nests, which is probably due to the lower ambient temperature in the boxes. From 1969 onward, about 4,500 turtles have been tagged, making a total of 5,676 turtles tagged in Suriname.

Up to 1973, 130 captures at sea of Surinam-tagged turtles were reported which give us the following information:

a. The migratorv patterns: Green turtles nesting In Suriname forage on the feeding grounds centered off the coast of Ceard (Brazil); recoveries of tagged olive ridleys span roughly 4,500 km of coastline, extending from Natal In Brazil to the Gulf of Venezuela, with secondary concentration occurring in the arise around the Island of Margarita and in the Gulf of Paria; one leatherback tagged in Suriname was caught at Salt Pond, Ghana, while four leatherbacks tagged In French Guiana were recovered at sea, at locations off the coast of Campeche (Mexico), Texas, S. Carolina and New Jersey (Pritchard, 1973a). These recoveries confirm that at least part of the leatherbacks nesting in our area comes from northern temperate waters.

b. Number of clutches per season: It seems that most of the olive ridleys nest once per season, while the green turtle and the leatherbacks have an average of 3 to 4 nests per season. (pers. information from beach guards).

c. The degree of attachment of the turtles to a particular beach: It seems that sea turtles of all species use the same nesting beaches year after year.

Other studies on sea turtle to be mentioned are:

- Norbert Pilz and assistant (1979): Comparison of the temperature in natural nests and styrofoam boxes. This study has been done on the Babosanti beach.
- Peter Dutton and Clare Whitmore (1979-1963): a) collect data on the sand characteristics including salinity, moisture content, grain type, rootlet content and a temperature profile; b) determine the size end weight of the leatherback hatchlings artificially incubated in the styrofoam boxes. This study has been done on the Krofajapasi beach.
- Dr. A.N. Grande (1980): Neurological studies on green turtle and leatherback hatchlings.
- Prof. N. Mrosovsky: Effect of temperature on sex determination in hatchlings.
- Clare Whitmore (1961): Electron microscopic studies of sea turtle egg shells.

Another project on sea turtle that should be mentioned is the Surinam-Brazil green turtle population protect. The aim of this project is an attempt: a) To better direct and implement the management of natural populations which are to be exploited on a sustained-yield basis as a renewable natural resource; b) To determine if operation "headstart" is an additional means to build up natural sea turtle populations where necessary.

III METHODS

Data for this national report has been obtained by:

1. Beach aerial survey
2. The ongoing daily countings of nests on all nesting beaches
3. Personal interviews with beach guards
4. Visits to the beaches
5. Consulting literature.

Aerial surveys

A total of 5.52 hours were spent conducting aerial surveys. A Cessna 172 was used to conduct these surveys. The entire coastline of Suriname was flown over at least twice. The surveys were made at an altitude of 250 feet and at an airspeed of 100 miles per hour. All flights were made so that the observer could see the coastline on his right. During the flights fresh turtle tracks were counted, beach vegetation and other characteristics were recorded.

Daily countlngs:

Since 1964 till up to now daily countings of turtle nests have been taking place. It is done by permanent beach guards stationed on the nesting beaches.

Personal interviews

Personal interviews with beach guards were conducted in order to obtain data about poaching, predators, incidental turtle catch by fishermen.

Visits to beaches

Beaches were visited first of all to talk with the beach guards and secondly to get information about beach characteristics and vegetation.

Consultation of literature

A great deal of the data for this report has been synthesized from the book “Sea turtles nesting in Surinam" by Dr. J.P. Schulz (1975) and other reports published on see turtle research done (or still in progress) In Suriname.

RECOMMENDATIONS

As already has been pointed out in the previous section, great attention is being paid to the protection of the sea turtle species nesting in Suriname. However, whatever the relative condition for survival of the sea turtle species nesting in Suriname may be, it is beyond argument that the present world situation is alarming for all the seven species of sea turtles.

It is in this view that I would like to propose the following recommendations which I believe could make a positive contribution to the survival of the sea turtles.

1. To call upon all countries where sea turtles are present to initiate effective conservation measures, and where conservation measures already exist, to possibly improve and enforce those measures.
2. To conduct nest relocation program in order to prevent eggs, which are endangered by tides of beach erosion to be washed away.
3. To conduct effective anti-poaching programs.
4. To develop region-wide education programs to advance conservation principles.
5. To continue and intensify sea turtle research to learn mode about the life of sea turtles.
6. To develop methods to minimize the damage done through incidental catch by fishermen.
7. To develop and stimulate international cooperation between countries which share sea turtle populations.
8. To develop and implement sea turtle conservation so that it will be of benefit to the local people.

TABLE 1. GEOGRAPHIC INVENTORY

Length of Coastline*	400 Km
Km^2 of Continental Shelf Area	
Seaward Extent of Jurisdictions	
Territorial Sea	321.9 Km**
Extended Economic Zone	321.9 Km**
Fisheries Jurisdiction	321.9 Km**
Other (Describe)	

* Coastline length is the measurement of the national seaward boundary of a country; i.e., the distance from border to border for a coastal country and the distance around an island country.

** *Editor's note (2009):* Values originally entered in miles (200); editor converted to kilometers.

TABLE 2. COASTAL HABITAT INVENTORY OF MARINE SHORELINE

	Km of Shoreline		
Marine Shoreline Characteristics*	Undeveloped	Developed**	Total
1. Sand Beach (Total)	62.2		62.2
A. High Energy	11.8		11.8
B. Low Energy	50.4		50.4

2. Reef (exposed)			
3. Rocks			
4. Cliffs			
5. Vegetation (Total)	370.0	15.0	385.0
A. Vines			
B. Grasses	44.3		44.3
C. Mangroves	298.7		298.7
D. Coconut Trees			
E. Other Trees or Shrubs	16.0		16.0
F. Marshes	11.0		11.0
6. Mouths of Lagoons, Rivers, Canals	15.0		15.0
7. Total Shoreline	***447.2	15.0	***462.2

* Refer to SEA TURTLE MANUAL (Aerial Survey)
** Human development or use (See MANUAL)
*** *Editor's note (2009):* Editor changes the Total Shoreline values (385.0 for the Undeveloped and 400.0 for the Total Values) cited in the original National Report to reflect accuracy in summed totals.

TABLE 2A. MARINE HABITAT INVENTORY OF BOTTOM TYPES. (Supplementary page)

Habitat Bottom Types	Km^2 of Habitat	
	Inside 25m (shoreward)	Outside 25m (shoreward)
1. Sand	Unknown	Unknown
2. Mud	Unknown	Unknown
3. Rocks	None	None
4. Submerged Vegetation	None	None
5. Reefs (Total)	None	None
A. Fringing Reefs	None	None
B. Patch Reefs	None	None
6. Other:		

TABLE 3. NESTING BEACH INVENTORY

List beaches in geographic sequence. Provide additional information on following page.

Name of Beach	Length In Km	Species Nesting (use abbreviations)*	Months of Recorded Nesting
1. Galibi	3.0	Cm, D, Lo	January-August
2. Baboensanti	3.0	Cm, D, Lo	January-August
3. Eilanti	1.9	Cm, D, Lo	January-August
4. Krofajapasi & Motkreek	11.0	Cm, D, Lo	January-August
5. Matapica	5.0	Cm, D, E, Lo	January-August
6. Katkreek & Dianastrand	7.9	Cm, D, E, Lo	February-August

Species*	Abbreviation
Caretta caretta	Cc
Chelonia mydas	Cm
Dermochelys coriacea	D
Eretmochelys imbricata	E
Lepidochelys kempi	Lk
Lepidochelys olivacea	Lo

TABLE 3A.1. SUPPLEMENTAL DATA ON BEACHES	
Name of beach	Galibi
Energy beach classification of beach	Low
Description of sand characteristics	Medium sand
Vegetation	A thin grove of mangrove on the sandy beach
Level of human development and/or impact	
Estimated nesting activity	Major (> 5)
General comments	An extensive sand bank is situated in front of the beach. Water is brackish to almost fresh in the rainy season. Predominantly visited by *Chelonia mydas* (green turtles).

TABLE 3A.2. SUPPLEMENTAL DATA ON BEACHES	
Name of beach	Baboensanti
Energy beach classification of beach	Moderate
Description of sand characteristics	Medium sand
Vegetation	Creeping plants (*Canavalia, Ipomoea*)
Level of human development and/or impact	
Estimated nesting activity	Major (> 5)
General comments	Wide, high-crested beach with a slightly steeper slope; very suitable nesting beach. Predominantly *Dermochelys coriacea* (leatherback)

TABLE 3A.3. SUPPLEMENTAL DATA ON BEACHES	
Name of beach	Eilanti
Energy beach classification of beach	Low
Description of sand characteristics	Medium sand
Vegetation	Creeping plants (*Canavalia, Ipomoea*) and a thin growth of mangrove on the sandy beach.
Level of human development and/or impact	
Estimated nesting activity	Major (> 5)
General comments	An extensive mudbank is situated in front of the beach. Important beach for *Lepidochelys kempii* and *Lepidochelys olivacea* (ridleys)

TABLE 3A.4. SUPPLEMENTAL DATA ON BEACHES	
Name of beach	Krofajapasi & Motkreek
Energy beach classification of beach	Moderate
Description of sand characteristics	Medium sand with abundant shell fragments
Vegetation	Creeping plants (*Canavalia, Ipomoea*); grasses
Level of human development and/or impact	
Estimated nesting activity	Major (> 5)

General comments	The Krofajapasi beach is the seaward side of a large sandspit parallel with the mainland. The west end of the spit is still being elongated by the deposits of sand, while the east end is in a state of erosion. Mostly visited by the *Dermochelys coriacea*. There are also fisherman's camps on the spit. Motkreek beach is thinly grown by mangrove and is in a state of erosion. It is an important beach for *Lepidochelys kempii* and *Lepidochelys olivacea.*

TABLE 3A.5. SUPPLEMENTAL DATA ON BEACHES	
Name of beach	Matapica
Energy beach classification of beach	Moderate
Description of sand characteristics	Medium to coarse sand with abundant shell and shell fragments
Vegetation	Grasses, creeping plants, *Batis*, and *Sesuvium*
Level of human development and/or impact	
Estimated nesting activity	Major (> 5)
General comments	This beach is also being elongated at the west end and eroding at the east end. Predominately visited by *Dermochelys coriacea*.

TABLE 3A.6. SUPPLEMENTAL DATA ON BEACHES	
Name of beach	Katkreek & Dianastrand
Energy beach classification of beach	Moderate
Description of sand characteristics	Medium sand
Vegetation	A thin growth of mangrove with scattered creeping plants and grasses
Level of human development and/or impact	
Estimated nesting activity	Major (> 5)
General comments	There is a mudbank in front of the beach of Katkreck. Predominately visited by *Dermochelys coriacea*.

TABLE 4.1. NESTING CENSUS FOR BEACH: Galibi

Table summarizes census data for each beach listed in Table 3. Tables numbered sequentially.

Species	Number of Nests		Dates of collection
	Nest/Night (average)	Nest/Season (estimated)	
Caretta caretta			
Chelonia mydas	8.1*	982	January-August 1982
Dermochelys coriacea	3.5**	299	January-August 1982
Eretmochelys imbricata			
Lepidochelys kempi			
Lepidochelys olivacea	?	43	April-August 1982

* Peak in March, April, May

** Peak in May, June, July.

TABLE 4.2. NESTING CENSUS FOR BEACH: Baboensanti			
Table summarizes census data for each beach listed in Table 3. Tables numbered sequentially.			
Species	Number of Nests		Dates of collection
	Nest/Night (average)	Nest/Season (estimated)	
Caretta caretta			
Chelonia mydas	14.0*	1584	January-August 1982
Dermochelys coriacea	18.8**	1980	January-August 1982
Eretmochelys imbricata			
Lepidochelys kempi			
Lepidochelys olivacea	?	220	April-August 1982
* Peak in March, April, May			
** Peak in May, June, July.			

TABLE 4.3. NESTING CENSUS FOR BEACH: Eilanti			
Table summarizes census data for each beach listed in Table 3. Tables numbered sequentially.			
Species	Number of Nests		Dates of collection
	Nest/Night (average)	Nest/Season (estimated)	
Caretta caretta			
Chelonia mydas	7.5*	781	January-August 1982
Dermochelys coriacea	2**	81	January-August 1982
Eretmochelys imbricata			
Lepidochelys kempi			
Lepidochelys olivacea	?	401	April-August 1982
* Peak in March, April, May			
** Peak in May, June, July.			

TABLE 4.4. NESTING CENSUS FOR BEACH: Krofajapasi & Motkreek			
Table summarizes census data for each beach listed in Table 3. Tables numbered sequentially.			
Species	Number of Nests		Dates of collection
	Nest/Night (average)	Nest/Season (estimated)	
Caretta caretta			
Chelonia mydas	5.1*	982603	January-August 1982
Dermochelys coriacea	5.6**	671	January-August 1982
Eretmochelys imbricata	?	4	April-August 1982
Lepidochelys kempi			
Lepidochelys olivacea	?	222	April-August 1982
* Peak in March, April, May			
** Peak in May, June, July.			

TABLE 4.5. NESTING CENSUS FOR BEACH: Matapica

Table summarizes census data for each beach listed in Table 3. Tables numbered sequentially.

Species	Number of Nests		Dates of collection
	Nest/Night (average)	Nest/Season (estimated)	
Caretta caretta			
Chelonia mydas	1.2*	48	January-August 1982
Dermochelys coriacea	3.4**	356	January-August 1982
Eretmochelys imbricata	?	2	April-August 1982
Lepidochelys kempi			
Lepidochelys olivacea	?	34	March-August 1982

* Peak in March, April, May

** Peak in May, June, July.

TABLE 4.6. NESTING CENSUS FOR BEACH: Katkreek & Dianastrand

Table summarizes census data for each beach listed in Table 3. Tables numbered sequentially.

Species	Number of Nests		Dates of collection
	Nest/Night (average)	Nest/Season (estimated)	
Caretta caretta			
Chelonia mydas	1.2*	62	February-June 1982
Dermochelys coriacea	2.3**	259	January-August 1982
Eretmochelys imbricata	?	7	April-August 1982
Lepidochelys kempi			
Lepidochelys olivacea	?	73	April-August 1982

* Peak in March, April, May; ** Peak in May, June, July

TABLE 5. AERIAL BEACH SURVEY SUMMARY

Give any additional information available from aerial surveys. Information should include ground truth observation if conducted.

Date	Beaches Surveyed	Numbers of Nesting Tracks						
		Cc	Cm	D	E	Lk	Lo	NO ID
02 June 1982	Galibi		2	5				7
02 June 1982	Baboensanti		9	24				33*
02 June 1982	Eilanti		1	1				2
02 June 1982	Krofajapasi & Motkreek		4	26				30
02 June 1982	Matapica			3				3
02 June 1982	Katkreek & Dianastrand			6				6

Species	Abbreviation
Caretta caretta	Cc
Chelonia mydas	Cm
Dermochelys coriacea	D
Eretmochelys imbricata	E
Lepidochelys kempi	Lk
Lepidochelys olivacea	Lo

* *Editor's note (2009):* Total corrected (originally 23) to reflect accuracy in summed total.

TABLE 5. AERIAL BEACH SURVEY SUMMARY

Give any additional information available from aerial surveys. Information should include ground truth observation if conducted.

TABLE 6. ESTIMATED POPULATION SIZE OF NESTING FEMALES

Summarize the estimated number of nesting females for the years indicated and describe methods of estimation on the next page.

Species	Year						
	1982	1981	1980	1979	1978	1977	Average Year Estimates
Caretta caretta							
Chelonia mydas	3,500	6,000	4,000	4,500	7,200	4,800	
Dermochelys coriacea	2,500	1,300	1,000	2,700	1,500	3,900	
Eretmochelys imbricata	?	?	?	?	?	?	
Lepidochelys kempi							
Lepidochelys olivacea	500	600	550	400	450	550	

TABLE 6A. ESTIMATED POPULATION OF NESTING FEMALES (supplementary page)

Please give brief details on methods of estimation for Table 6.

The population size has been calculated as follows:

The total number of nests laid during one season has been divided by the average number of nests a female lays during one season. This number has then been multiplied by the average interbreeding interval.

$$\frac{\text{(Total number of nests in one season)}}{\text{(average number of nests of one female in one season)}} \times \text{average interbreeding interval}$$

TABLE 10. NATURAL MORTALITY

Life Stage Unit	Species (abbrev.)*	Causes	Extent of Mortality (% of unit)
Nests/eggs	Cm, D	Erosion, ghost crabs	37
Hatchlings	Cm, D, Lo	Ghost crabs, seabirds, vultures, catfish, sharks	?
Juveniles			
Adults (in water)	Cm, D, Lo	Shrimp trawlers	?
Nesting females	Cm	Jaguar	<1

Species*	Abbreviation
Caretta caretta	Cc
Chelonia mydas	Cm
Dermochelys coriacea	D
Eretmochelys imbricata	E
Lepidochelys kempi	Lk
Lepidochelys olivacea	Lo

TABLE 15. OFFICIAL STATISTICS OF TURTLE PRODUCTION: Species *Chelonia mydas*					
Complete one of these tables for each species taken in the fishery.					
	Year				
Turtle Product	1982	1981	1980	Current Market Price/Unit	Method of Data Collection
No. of eggs	250,000	250,000	250,000	$0.06-$0.07	The collecting and selling is in the hands of STINASU*
Meat (kg)**					
Shell No./Wt. (kg)					
Skins No./Wt. (kg)					
Stuffed Juveniles					
Other					
TOTAL					
* Foundation for Nature Preservation in Suriname					

TABLE 16A. EMPLOYMENT DEPENDENT ON TURTLES (supplementary page)

In addition to marketed products, it is estimated that the following are taken annually from beaches or at sea for subsistence use:

A: Subsistence exploitation
1. Estimated number of eggs: 250,000
2. Estimated number of nesting females
3. Number of turtles caught at sea

B: Social aspects
In addition to the described fishery activities, exploitation of turtles may be permitted in some countries according to special rights or privileges extended to certain groups of people. If such specialized turtle exploitation exists, please give details (i.e., beach rights, ethnic traditions, specific seasons of the year, special permits, etc.).

TABLE 17.1. TURTLE MARICULTURE OPERATIONS. Year: 1982								
This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc. Prepare separate table for each year of available data.								
Species	Hatchery Operations					Holding Live Turtles		
	Eggs Collect	Eggs Hatch	No. Release	Age at Release	No. Retain	No. of Juvs.	Adult Females	Adult males
Caretta caretta								
Chelonia mydas	26,780	19,304	11,582	Within 3 days after hatching	7,722			
Dermochelys coriacea								
Eretmochelys imbricata								

Lepidochelys kempi								
Lepidochelys olivacea								

TABLE 17.2. TURTLE MARICULTURE OPERATIONS. Year: 1981

This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc. Prepare separate table for each year of available data.

Species	Hatchery Operations					Holding Live Turtles		
	Eggs Collect	Eggs Hatch	No. Release	Age at Release	No. Retain	No. of Juvs.	Adult Females	Adult males
Caretta caretta								
Chelonia mydas	39,865	26,785	15,110	Within 3 days after hatching	11,420			
Dermochelys coriacea								
Eretmochelys imbricata								
Lepidochelys kempi								
Lepidochelys olivacea								

TABLE 17.3. TURTLE MARICULTURE OPERATIONS. Year: 1980

This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc. Prepare separate table for each year of available data.

Species	Hatchery Operations					Holding Live Turtles		
	Eggs Collect.	Eggs Hatch	No. Release	Age at Release	No. Retain	No. of Juvs.	Adult Females	Adult males
Caretta caretta								
Chelonia mydas	50,131	33,614	22,112	Within 3 days after hatching	11,502			
Dermochelys coriacea								
Eretmochelys imbricata								
Lepidochelys kempi								
Lepidochelys olivacea								

TABLE 17.4. TURTLE MARICULTURE OPERATIONS. Year: 1979

This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc. Prepare separate table for each year of available data.

Species	Hatchery Operations					Holding Live Turtles		
	Eggs Collect.	Eggs Hatch	No. Release	Age at Release	No. Retain	No. of Juvs.	Adult Females	Adult males
Caretta caretta								
Chelonia mydas	52,317	35,064	30,505	Within 3 days after hatching	3,996			
Dermochelys coriacea	1,174	835	835					
Eretmochelys imbricata								
Lepidochelys kempi								
L. olivacea	1,632	702	702					

TABLE 17.5. TURTLE MARICULTURE OPERATIONS. Year: 1978

This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc. Prepare separate table for each year of available data.

Species	Hatchery Operations					Holding Live Turtles		
	Eggs Collect.	Eggs Hatch	No. Release	Age at Release	No. Retain	No. of Juvs.	Adult Females	Adult Females
Caretta caretta								
Chelonia mydas	38,545	20,548	25,118	Within 3 days after hatching	2,434			
Dermochelys coriacea								
Eretmochelys imbricata								
Lepidochelys kempi								
L. olivacea								

TABLE 19. SANCTUARIES AND REFUGES

Name and Location	Area Km^2	Reason(s) for Protection	Type and effectiveness of Enforcement
Galibi Nature Reserve	4	Sea turtle nesting beaches	Daily and nightly beach patrols and anti-poaching patrols
Matapica/ Krofajapasi	?	Sea turtle nesting beaches	Daily and nightly beach patrols and anti-poaching patrols

TABLE 20. REGULATORY AUTHORITY			
Indicate all entities with statutory responsibilities (e.g., Fisheries Departments and Ministries, Police, Coast Guard, etc.)			
Name and Address of Organization	Budget Allocation to Turtles	No. of Staff Assigned to Turtles	Comments on Levels of Enforcement
Surinam Forest Service (Ministry of Natural Resources and Energy)	$24,188*	10**	
STINASU*** (Ministry of Natural Resources and Energy)	$24,188*	10**	
* Combined budget for the Surinam Forest Service and STINASU.			
** Combined assigned staff for the Surinam Forest Service and STINASU.			
*** Foundation for Nature Preservation in Surinam.			

TABLE 20A. REGULATORY AUTHORITY (supplementary page)

Please list National, regional, and local legislation concerning turtle management and conservation. List title, date, and stated purpose.

1. The Nature Preservation Ordinance (1981) and Nature Preservation Decree (1966). Provide the basis for the establishment of Nature Reserves by decree. According to the Ordinance public lands are eligible for reserve status if they are of scientific, aesthetic, or cultural value.

   It was by this Ordinance therefore possible to establish, among others, Galibi Nature Reserve in 1969 and the Wia-Wia Nature Reserve in 1961 with important sea turtle nesting beaches within it.

2. The Game Ordinance (1954) and the Game Decree (1970).
   The Game Ordinance protects all wild mammals, birds, sea turtles, with the exception of those designated by Decree as “special species”, domestic animals (e.g., cage birds), or “predominantly harmful species”.

   The Game Decree lists the sea turtles under the game species, but prohibits anyone to take, kill, possess, mutilate, sell or offer for sale any sea turtle or part of it in the area to which the Ordinance applies, but permits the collecting, transport and sale of eggs from March 1st to May 31st.

TABLE 21. NATIONAL RESEARCH PROJECTS			
List turtle research activities funded within your country.			
Project Title	Date		Name and Address of Institution & Chief Investigator
	Start	End	
Surinam Turtle (Sea turtle ranging project)	1977		c/o STINASU* Chief investigator: H.A. Reichart, M.Sc.
University of Toronto	1979	1983	Funded by the University of Toronto with additional financial and logistical support from STINASU
* Foundation for Nature Preservation in Suriname.			

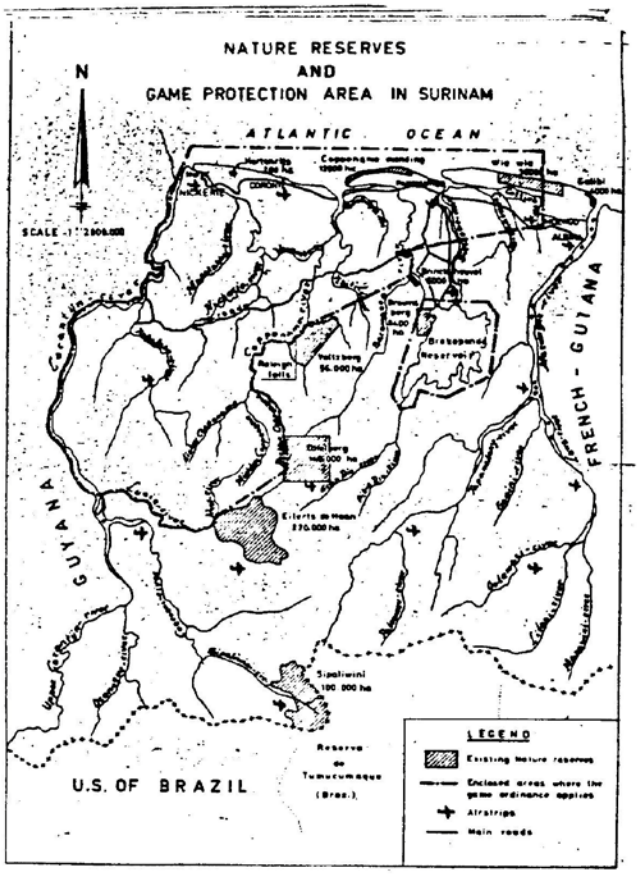
REPORTS AND PUBLICATIONS

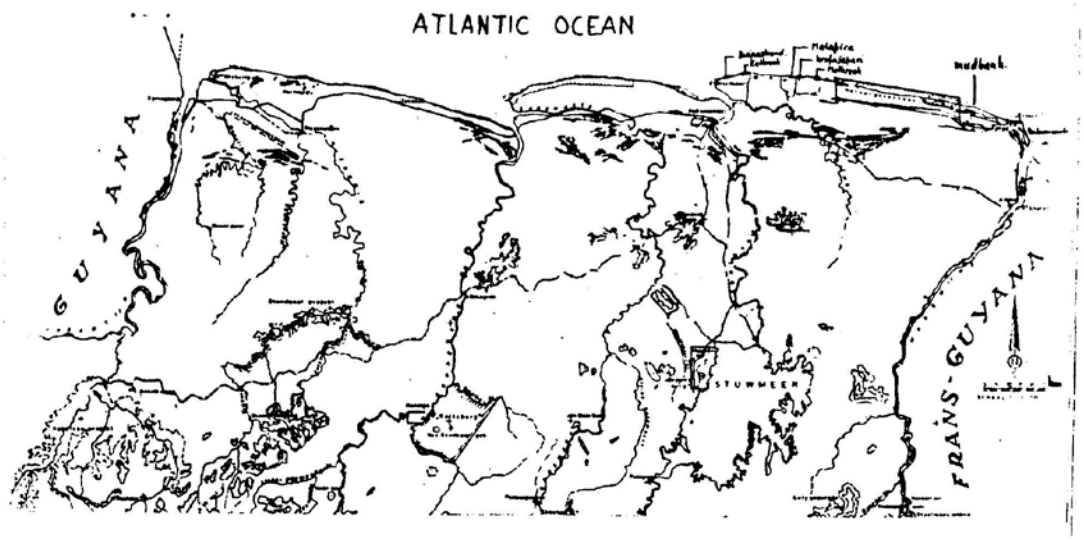
The following is a list of the major reports and publications concerned with national turtle resources (list author, date, title, and publisher).

1. Schulz, J.P. 1975. Sea Turtles Nesting in Surinam. Surinam Forest Service.

2. Whitmore, C. and P. Dutton. 1981. Surinam Sea Turtle Expeditions. (Preliminary report)

Suriname – W.A.T.S. National Report Study Area.[1]

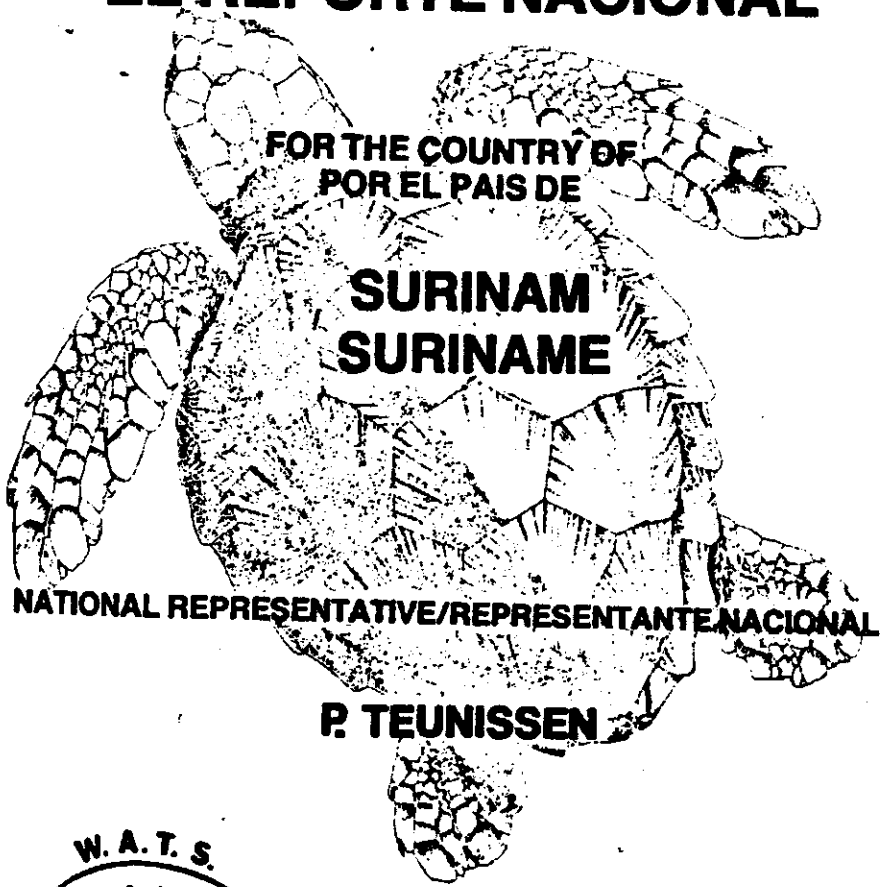




Northern part of the Republic of Suriname.
showing the location of the turtle nesting beaches and the mudbanks.

[1] *Editor's note (2009):* Maps and figures are reprinted exactly as they appear in the original WATS I Proceedings (Bacon et al. 1984); we regret the poor quality exhibited in some cases.

THE NATIONAL REPORT
EL REPORTE NACIONAL



FOR THE COUNTRY OF
POR EL PAIS DE

SURINAM
SURINAME

NATIONAL REPRESENTATIVE/REPRESENTANTE NACIONAL

P. TEUNISSEN

W. A. T. S.
S. T. A. O.

Western Atlantic Turtle Symposium
Simposio de Tortugas del Atlantico Occidental

17-22 July/Julio 1983
San Jose, Costa Rica

3-386

W. A. T. S.
S. T. A. O.

WESTERN ATLANTIC TURTLE SYMPOSIUM

San Jose, Costa Rica

July 1983

NATIONAL REPORT FOR THE COUNTRY OF

Republic of Suriname

NATIONAL REPORT PRESENTED for
P. Teunissen by H.A. Reichart
The National Representative

Address: Surinam Forest Service
Corn. Jongbawstr. 10 P.O.Box 436
Paramaribo - Suriname

NATIONAL REPORT PREPARED BY

K. Mohadin with assistance of
Mr. H.A. Reichart. M.Sc.

DATE SUBMITTED: 27 November 1982.

! Please submit this NATIONAL REPORT no later than 1 December 1982 to: IOC Assistant Secretary for IOCARIBE, % UNDP, Apartado 4540, San Jose, Costa Rica.

Introduction.

This National Report has been prepared for the Western Atlantic Turtle Symposium (W.A.T.S.) to be held in July 1983 in San Jose, Costa Rica.
A great deal of the data for this report has been synthesised from reports published on seaturtle research done (or still in progress) in Suriname.

I prepared this report in the hope that the data in the report will contribute to the survival of the endangered marine turtle species and that mankind will benefit from these animals as they constitute an important source of protein.

II. Background.

General Geographic description of the Republic of Suriname.

The Republic of Suriname, a former Dutch colony, is situated between 2° and 6° North latitude and 54° and 58° West Longitude, on the Northeastern part of South America, bordering on the Atlantic Ocean to the North, on Guyana to the West, on French Guiana to the East.
The size is about 160.000 square kilometers and with the total population of about 355.000 (31,3% Creoles, 37,6% of Hindustani descent, 15,2% of Indonesian descent, 9,5% Bushnegroes, 2,1% Amerindians, 1,6% Chinese and 1,1% European and 1,6% others).
Suriname is one of the most thinly populated countries in South America. The annual main temperature is 80°F.
(the warmest month is September: 83°F and the coolest month is January: 78° F.)
The annual rainfall varies from 1500 mm in the coastal region to about 3000 mm in the mountainous hinterland.
Heavy rains usually fall from mid-April to mid-July.
The periods February - March and mid August to November are relatively dry, especially the latter period.
About 80% of the country is covered with uninhabited and undisturbed Neotropical rain forest.
In the North and the extreme South there are a variety of unusual savanna types.
Along almost the entire coast mangrove forest occurs, with scattered sandbeaches here and there.
The mangrove forest covers about 4% of the total landsurface.

Coastline and offshore areas.

The coast lies alternately in de NE tradewind belt and the SE tradewind belt, or on the division between the two.
From December to the beginning of April the NE tradewind are blowing strongly onto the coast. In these month the swells are the heaviest, and the surf the strongest. The most important movements of the sandy beaches occur between December and February. From April to June, the wind becomes more variable and the sea becomes much calmer.

From June to August the SE tradewind is weak and variable.
In the November to December period it gives way to the more definite and stronger NE tradewind which causes the heavy swells during winter and spring.

Along the coast of Suriname the Guiana Current flows in a WNW direction. It is the continuation of the Northern Equatorial Current, and travels along the north coast of Brazil and the Guianas, dividing at the Lesser Antilles into the Caribbean Current and the northwest directed Antillean Current.
The water along the coast is brown due to mud particles in the water. At 20-30 km from the coast the brown color of this muddy water suddenly changes into a blue-green color of much clearer water. At 50-70 km offshore the water is blue. There is a very marked tidal difference along the coast of Suriname, which clearly has an influence on the nesting periodicity of sea turtles. At Eilanti, where an extensive mudbank is located, the tide determines the accessibility of the nesting beach.

One of the characteristics of the Surinam coast is the continuous alteration of the shoreline. The radical changes have a cyclic nature: accretion and erosion are succeeding each other alternately. The slow westward directed N. Equatorial Current carries along the Guiana coast, a large amount of mud, part of which is deposited in the Surinam mudbanks. The Amazon is held to be the source of this very mobile mud.
The mudbanks are separated by sections along which generally narrow sand and/or shell beaches are present. Deposition of mud on the one hand, and of sand and shells on the other takes place separately. The combination of sea current and the wave action, results in a cyclical erosion on the east side of the mudbanks and a silting up of the west side. Therefore mudbanks and consequently the intermediate sections of the coast continually migrate to the west. The cycle is believed to repeat itself approx. every 35 years. The beaches are built up of sand, shells and shell debris in all possible combinations, varying from pure sand to pure shell material.

History and Knowledge of sea turtles in Suriname.

The earliest account of sea turtle nesting in Suriname is found in the narrative of a Labbadist expedition (Anonymous, 1686, Knappert: 1926). In Stedman's narrative (1796), comments about the consumption of turtle meat in the colony are found; he also reported having observed off the Cayenne coast on January 30 of the year 1773 one or two large turtles, floating past the ship's side. Stedman stated further that in Suriname . . . . "The turtles are generally distinguished by the names of Calipee or green turtle, and carett". The first name may be a corruption of the local name krapé and "carett" probably refers to the warana (Lepidochelys olivacea). It seemed that, except for a short period before the second world war, sea turtles on the Surinam coast were never killed for food on a large scale.
At the present day sea turtle meat is not appreciated by the Caribs living near the principal nesting places.
According to Kloos (1971) the Maroni Caribs say that they do not like the smell of the meat, but he mentions another probable reason, now forgotten: their fear to become as stupid as the animal from which the flesh is eaten. The meat of other turtles was probably seldom or never eaten. Capture of hawksbill for tortoise shell was probably never important, presumably because this species is not numerous here and, according to Kappler, because American tortoise shell was worth less than that from Asia.

Geijskes (1945) records the following about use of the meat of the green turtle. Before 1940, green turtles were caught for export. This business was in the hands of a Mr. Berkeley at Albina. How long this trade had already been going on, and no what scale, is not mentioned. No information is given about of capture. Information obtained from the Caribs says that the turtles were caught as they came ashore to nest.
The late Mr. Lijkwan, who for many years worked for the Honourable' Berkeley, mentions an average of approx. 600 female turtles killed by the Indians for Berkeley for export during the period 1935 to 1940. According to Geyskes this estimate is on the low side. He mentions a number of 1000 greenturtles and 1500 ridleys each year.

In 1938 and 1939 for example, he had caught at least 3000 green turtles. In 1968, a year in which more green turtles nested than in previous years, only ca 1000 came ashore in this region. This means that thirty years ago many green turtles and ridleys nested on the beaches near the mouth of the Marowijne.

After 1940 the slaughter of turtles for export came almost to an end. Yet many turtles were still being killed on the beach by, among others, the fishermen, as appears from Geyskes remarks. About the hawksbill Geyskes reported in 1945 that people in Suriname mostly do not recognise this species and kill the turtle only for the meat which, however, cannot be particularly tasty as the Caribs consider it to be poisonous.
Collecting of eggs (mostly ridley and green turtle) seems to have been quite important. This was a tradition of the coastal Caribs- at least during the last century - chiefly in and near the Marowijne estuary. According to Geyskes '(1945) report, eggtaking in the forties was more intensive than in the previous century, due to the increased demand by chinese and other people of Asiatic orgin, especially Javanese. The eggtakers kept the daily proceeds of eggs in their camps, until enough were collected to load a boat (17000 tot 100.000). In those days the eggs were taken to Paramaribo, the Commewijne district, and also to St. Laurent (French Guiana). No figures are mentioned for the total number of eggs taken per year. In 1954 a big change occurred in the fate of sea turtles nesting in Suriname. In that year the Game Ordinance and the Nature Preservation Ordinance came into force, followed by the Game Decree and the Decree that declared the Bigi-santi breeding beach. (once one of the most important nesting beaches of the leatherbacks, now washed away a Nature Reserve.
These legislative measures prohibited the killing of marine turtles and limited the collection of their eggs along part of the coast. But the turtles did not immediately benefit from these measures, as the most important beaches near the Marowijne estuary remained outside the area to which the regulations apply.
Since 1964, the policy of turtle management aims at complete protection of the nesting animals on the beaches and the harvesting of a "justifiable" quota of the eggs of the green turtle.

Eggs of other species are not collected and will not be collected in the near future. In 1969, the Galibi area was declared a Nature Reserve which includes all the nesting beaches of the Marowijne estuary, thus effectively protecting the rookeries there.
The primary reason for the decision to harvest some of the eggs of the green turtle is the intention to attempt a rational exploitation of the eggs, on a sustained - yield basis, as a cheap part of the protein requirement in the diet of the population. Apart from this, an abrupt, total ban on the collecting of eggs of all species probably would have met with such strong resistance, both from the side of the egg collectors and from the consumers that it could have jeopardized the entire project from the start.
Yearly a quota of approx. 250.000 eggs are collected, which are sold in Paramaribo and in the various districts of Suriname.
The major portion of these eggs are removed from beach sections where nests were endangered by erosion or were laid below high tide level. Many of these socalled "doomed eggs" are also relocated in man-made nests on higher reaches of the beach, or they are hatched out in styrofoam nest boxes at the fieldstation.
Upon emergences, these hatcling are released to the sea.
The logistics of collecting and selling the eggs is in the hands of the Surinam Foundation for Nature Preservation (STINASU), a organization with the purpose to stimulate, coordinate and inance scientific exploration in the Nature Reserves and to stimulate public awareness of nature conservation. Some of the green turtle eggs are also being used for a green turtle ranching project. Part of these captive-reared turtles are released at various age classes while the others are kept in the turtle Ranch at Matapica for future commercial use. The turtle ranch at Matapica which so for is only a feasibility study was founded in 1977 to investigate the edea that captive-raised sea turtles can contribute to the socioéconomic development of a country as well as and protect and possible increase the wild populations.

In the past little scientific attention has been paid to sea turtles nesting in Surinam. Kappler's observations were the only ones that were published before the present research was commenced in 1913.

In 1963 an 1964, six expeditions were made by personnel of the Forest Service with the primary intention of locating the nesting places of the sea turtles in Suriname. Among others, group nesting ("arribada") of the olive ridley (Lepidochelys olivacea) was discovered. During these expeditions it was also established that in Suriname most sea turtles come ashore near the mouth of the Marowijne River. In 1965 and 1966 only occasional observations were made. In 1966 tagging of turtles was begun by students from the University of Florida, led by P.C.H. Pritchard, and a number of turtles were weighed and measured. In 1967, surveillance and the systematic collecting of quantitative data about nesting was resumed by a permanent staff at Bigisanti, and commenced at Eilanti. The daily counting of nests was carried out along similar lines as in 1964. Also more data were collected about incubation periods and hatching percentages of eggs, including those in relocated nests. Daily countings of the nests were continued at Bigisanti in 1968, as well as at Eilanti. Up to now daily countings are taking place and on all known nesting beaches. On the basis of observations on returns of previously tagged turtles, the first data about breeding cycles were collected. M. Mrosovsky (University of Toronto) began research into the stimuli that affect leather back young as they travel from the nest to the sea.

In the following years, Mrosovsky continued these studies, and in 1971 the Dutch Zoologist J.T. Wildschut devoted four months to ethological experiments will hatchlings.
Pritchard continued tagging, and his reports on weights of ridleys and green tyrtles have been published (Pritchard, 1969, 1969 a).
In 1969-1973, the work of previous years was continued and intensified with considerable assistance from R.L. Hill (1969-1971), A British Zoologist. In 1969 and 1971, respectively D.J. Green and J.T. Wildschut assisted in research activities. Data collected concerning internesting intervals, incubation periods, size of clutches and hatching succes of turtle nests show the following:

a. inter nesting intervals: Green turtles seem to return to nest in a 1-, 2-, 3 or 4-year cycles and while the biennial cycle probably predominates. The ridley shows a predominance of 1-year intervals and the leatherback a predominance of 2-year intervals.

b. incubation periods:

The incubation period of green turtle, as well as that of the Olive ridley and the leatherback varies from an average of 52 days during February-March to 58 days during the raining season. (April-May). Transplanted nests show about the same incubation time as natural nests.

c. Size of clutches.

The average number of eggs per nest for the green turtle is 134, for the Olive ridley 116, for the leatherback 85 and for the hawksbill 146. This is an average taken from a 5 year period.

d. Hatching success.

The hatching success in wild nests for the green turtle is around 84%, for the leatherback 50%, and for the olive ridley 60%. Replanted nests show a lower percentage of hatchlings: for the green turtle around 58%, for the leatherback around 35% and for the ridley around 50%.
The low emergence percantage in the nests of the leatherback is due to a high percentage of small, infertile eggs in the nests.
The leatherback clutches contain on the average 30% small, infertile eggs in the nests. The leatherback clutches contain on the average 30% small, infertile eggs. A study done by C. Whitmore and P. Dutton of the University of Stirling in Scotland to get more data about clutch size, hatching success and incubation period in natural nests (in total 39) of the green turtle show the following:
- average clutch size: 131 eggs.
- hatching success 89,14%
- incubation period 56,4 days.

This study was done on the Krofajepasi beach during April-June 1981.
As mentioned above, some eggs are also hatched in styrofoam boxes. For the green turtle the average emergence in these boxes is nearly as high as in the natural nests (around 86% vs 84%) and for the leatherback even higher (54% vs 30%).
The incubation period in the boxes however is a some what longer than in the natural nests, which is probably due to the lower ambient temperature in the boxes. From 1969 onward, about 4500 turtles have been tagged, making a total of 9676 turtles tagged in Suriname.

Up to 1973, 130 captures at sea of Surinam-tagged turtles were reported which give us the following information:

a. The migratory patterns: green turtles nesting in Suriname forage on the feeding grounds centered off the coast of Ceará (Brazil); recoveries of tagged olive ridleys span roughly 4500 km of coastline, extending from Natal in Brazil to the Gulf of Venezuela, with secondary concentration occurring in the area around the Island of Margarita and in the Gulf of Paria; one leatherback tagged in Suriname was caught at Salt Pond, Ghana, while four leatherbacks tagged in French Guiana were recovered at sea, at locations off the coast of Campeche (Mexico), Texas, S. Carolina and New Jersey (Pritchard, 1973a). These recoveries confirm that at least part of the leatherbacks nesting in our area comes from northern temperate waters.

b. number of clutches per season: it seems that most of the olive ridleys nest once per season, while the green turtle and the leatherback have an average of 3 to 4 nests per season. (pers. information from beachguards).

c. the decree of attachment of the turtles to a particular nesting beach: it seems that sea turtles of all species use the same nesting beaches year after year.

Other studies on sea turtle to be mentioned are:

- Norbert Pilz and assistant (1979): comparison of the temperature in natural nests and styrofoam boxes. This study has been done on the Babonsanti beach.

- Peter Dutton and Clare Whitmore (1979-1982): a) collect data on the sand characteristics including salinity, moisture content, grain type, rootlet content and a temperature profile.
  b) determine the size and weight of the leatherback hatchlings artificially incubated in the styrofoam boxes. This study has been done on the Krofajapasi beach.

- Dr. A.H. Granda (1980):neurological studies on green turtle and leatherback hatchlings.

- Prof. N. Mrosovsky: Effect of temperature on sex determination in hatchlings.

- Clare Whitmore (1981): Electron microscopic studies of sea turtle egg shells.

An other project on sea turtle that should be mentioned is the Surinam - Brazil green turtle population project.
The aim of this project is an attempt.

a. To better direct and implement the management of natural populations which are to be exploited on a sustained-yield basis as a renewable natural resource.
b. To determine if operation "headstart" is an additional means to build up natural sea turtle populations where necessary.

III Methods

Data for this national report has been obtained by:

1. beach aerial survey
2. the ongoing daily countings of nests on all nesting beaches
3. personal interviews with beachguards
4. visits to the beaches
5. consulting literature.

Aerial surveys

A total of 5,52 hours were spent conducting aerial surveys. A Cessna 172 was used to conduct these surveys. the entire coastline of Suriname was flown over at least twice. The surveys were made at an altitude of 250 feet and at an airspeed of 100 miles per hour. All flights were made so that the observer could see the coastline on his right. During the flights fresh turtle tracks were counted, beach vegetation and other characteristics were recorded.

Daily countings:

Since 1964 till up to now daily countings of turtle nests have been taking place. It is done by permanent beachguards stationed on the nesting beaches.

Personal interviews

Personal interviews with beachguards were conducted in order to obtain data about poaching, predators, incidental turtle catch by fishermen.

Visits to beaches

Beaches were visited first of all to talk with the beachguards and secondly to get information about beach characteristics and vegetation.

Consultation of literature

A great deal of the data for this report has been synthesized from the book "Seaturtles nesting in Surinam" by Dr. J.P. Schulz. (1975) and other reports published on sea turtles research done (or still in progress) in Suriname.

Recommendations

As already has been pointed out in the previons section, great attention is being paid to the protection of the sea turtle species nesting in Suriname.
However, whatever the relative condition for survival of the sea turtle species nesting in Suriname may be, it is beyond argument that the present world situation is alarming for all the seven species of sea turtles.
It is in this view that I would like to propose the following recommendations which I believe could make a positive contribution to the survival of the sea turtles.

1. To call upon all countries where sea turtles are present to initiate effective conservation measures, and where conservation measures already exist, to possibly improve and enforce those measures.
2. To conduct nest relocating program in order to prevent eggs, which are endangered by tides of beach erosion to be washed away.
3. To conduct effective anti poaching program.
4. To develop a region wide public education program to advance conservation principles.
5. To continue and intensify sea turtle research to learn more about the life of sea turtles.
6. To develop methods to minimize damage done through incidental catch by fishermen.
7. To develop and stimulate international cooperation between countries which share sea turtle populations.
8. To develop and implement sea turtle conservation so that it will be of benefit to the local people.

Country Republic of Suriname

Length of Coastline* ..... 400 Km

Km² of Continental Shelf Area ..... ___ Km

Seaward Extent of Jurisdictions:

Territorial Sea ..... 200 Km Miles

Extended Economic Zone ..... 200 Km Miles

Fisheries Jurisdiction ..... 200 Km Miles

Other (Describe) _____ ... ___ Km

TABLE 1. GEOGRAPHIC INVENTORY

* Coastline length is the measurement of the national seaward boundary of a country; i.e., the distance from border to border for a coastal country and the distance around an island country.

MARINE SHORELINE CHARACTERISTICS*	Km OF SHORELINE		
	UNDEVELOPED	DEVELOPED**	TOTAL
1. Sand Beach (Total)	62.2		62.2
Moderate			
A. High Energy	11.8		11.8
B. Low Energy	50.4		50.4
2. Reef (exposed)			
3. Rocks			
4. Cliffs			
5. Vegetation (Total)	370	15	385
A. Vines			
B. Grasses	44.3		44.3
C. Mangroves	298.7		298.7
D. Coconut Trees			
E. Other Trees or Shrubs	16		16
F. Marshes	11		11
6. Mouths of lagoons, rivers, canals	15		15
7. Total Shoreline	385	15	400

TABLE 2. COASTAL HABITAT INVENTORY OF MARINE SHORELINE * Refer to SEA TURTLE MANUAL (Aerial Survey) ** Human development or use (See MANUAL)

HABITAT BOTTOM TYPES	Km² OF HABITAT	
	INSIDE 25m (SHOREWARD)	OUTSIDE 25m (SEAWARD)
1. Sand	UNKNOWN	UNKNOWN
2. Mud	UNKNOWN	UNKNOWN
3. Rocks	NONE	NONE
4. Submerged Vegetation	NONE	NONE
5. Reefs (Total)	NONE	NONE
A. Fringing Reefs	NONE	NONE
B. Patch Reefs	NONE	NONE
6. Other		

TABLE 2A. MARINE HABITAT INVENTORY OF BOTTOM TYPES

NAME OF BEACH	LENGTH IN Km	SPECIES NESTING (Use abbreviations)*	MONTHS OF RECORDED NESTING
1. Galibi	3.0	Cm, D, Lo	Jan, Febr, Mrch, Apr, May, June, July, Aug.
2. Baboensanti	3.0	Cm, D, Lo	Jan, Febr, Mrch, Apr, May, June, July, Aug.
3. Eilanti	1.9	Cm, D, Lo	Jan, Febr, Mrch, Apr, May, June, July, Aug.
4. Krofajapasi & Midwoud	11.0	Cm, D, Lo	Jan, Febr, Mrch, Apr, May, June, July, Aug.
5. Matapica	5.0	Cm, D, Lo, E	Jan, Febr, Mrch, Apr, May, June, July, Aug.
6. Kathreek & Diamantveld	7.9	Cm, D, Lo, E	Febr, Mrch, Apr, May, June, July, Aug.
7.			
8.			
9.			
10.			

TABLE 3. NESTING BEACH INVENTORY
List beaches in geographic sequence.
Provide additional information on following page.

Species Abbreviations:

Caretta caretta	Cc
Chelonia mydas	Cm
Dermochelys coriacea	D
Eretmochelys imbricata	E
Lepidochelys kempi	Lk
Lepidochelys olivacea	Lo

SPECIES	NUMBER OF NESTS		DATES OF DATA COLLECTION
	Nests/Night (Average)	Nests/Season (Estimated)	
Caretta caretta			
Chelonia mydas	8.1 peak in March, Apr, May	(982) 982	Jan - Aug 1982
Dermochelys coriacea	3.5 peak in May, June, July	299	Jan - Aug 1982
Eretmochelys imbricata			
Lepidochelys kempi			
Lepidochelys olivacea	?	43	Apr - Aug 1982

TABLE 4 - __ NESTING CENSUS FOR BEACH Galibi.
(name)

Please complete one of these tables to summarize census data for each beach listed in Table 3. Number tables sequentially (4-1, 4-2, 4-3, etc.) as enumerated in Table 3.

SPECIES	NUMBER OF NESTS		DATES OF DATA COLLECTION
	Nests/Night (Average)	Nests/Season (Estimated)	
Caretta caretta			
Chelonia mydas	14.9 peak in March, Apr, May	1584	Jan - Aug 1982
Dermochelys coriacea	10.8 peak in May, June, July	1980	Jan - Aug 1982
Eretmochelys imbricata			
Lepidochelys kempi			
Lepidochelys olivacea	?	220	Apr - Aug 1982

TABLE 4 - __ NESTING CENSUS FOR BEACH Baboensanti.
(name)

Please complete one of these tables to summarize census data for each beach listed in Table 3. Number tables sequentially (4-1, 4-2, 4-3, etc.) as enumerated in Table 3.

SPECIES	NUMBER OF NESTS		DATES OF DATA COLLECTION
	Nests/Night (Average)	Nests/Season (Estimated)	
Caretta caretta			
Chelonia mydas	7.5 peak in March, Apr, May	781	Jan - Aug 1982
Dermochelys coriacea	2 peak in May, June, July	81	Jan - Aug 1982
Eretmochelys imbricata			
Lepidochelys kempi			
Lepidochelys olivacea	?	401	Apr - Aug 1982

TABLE 4 - __ NESTING CENSUS FOR BEACH Eilanti
(name)

Please complete one of these tables to summarize census data for each beach listed in Table 3. Number tables sequentially (4-1, 4-2, 4-3, etc.) as enumerated in Table 3.

SPECIES	NUMBER OF NESTS		DATES OF DATA COLLECTION
	Nests/Night (Average)	Nests/Season (Estimated)	
Caretta caretta			
Chelonia mydas	5.1 peak in March, Apr, May	603	Jan - Aug 1982
Dermochelys coriacea	8.6 peak in May, June, July	671	Jan - Aug 1982
Eretmochelys imbricata	?	4	Apr - Aug 1982
Lepidochelys kempi			
Lepidochelys olivacea	?	222	Apr - Aug 1982

TABLE 4 - __ NESTING CENSUS FOR BEACH krofajapasi & Mothreek
(name)

Please complete one of these tables to summarize census data for each beach listed in Table 3. Number tables sequentially (4-1, 4-2, 4-3, etc.) as enumerated in Table 3.

SPECIES	NUMBER OF NESTS: Nests/Night (Average)	NUMBER OF NESTS: Nests/Season (Estimated)	DATES OF DATA COLLECTION
Caretta caretta			
Chelonia mydas	1.2 peak in March, Apr, May	48	Jan.-Aug 1982
Dermochelys coriacea	3.4 peak in May, June, July	386	Jan.-Aug 1982
Eretmochelys imbricata	!	2	Apr.-Aug 1982
Lepidochelys kempi			
Lepidochelys olivacea	?	34	March-Aug 1982

TABLE 4 - __ NESTING CENSUS FOR BEACH Matapica.
(name)

Please complete one of these tables to summarize census data for each beach listed in Table 3. Number tables sequentially (4-1, 4-2, 4-3, etc.) as enumerated in Table 3.

SPECIES	NUMBER OF NESTS: Nests/Night (Average)	NUMBER OF NESTS: Nests/Season (Estimated)	DATES OF DATA COLLECTION
Caretta caretta			
Chelonia mydas	1.2 peak in March, Apr, May	62	Febr.-June 1982
Dermochelys coriacea	2.3 peak in May, June, July	259	Jan.-Aug. 1982
Eretmochelys imbricata	?	7	Apr.-Aug 1982
Lepidochelys kempi			
Lepidochelys olivacea	?	73	Apr-Aug 1982

TABLE 4 - __ NESTING CENSUS FOR BEACH Kathreek & Dianastrand
(name)

Please complete one of these tables to summarize census data for each beach listed in Table 3. Number tables sequentially (4-1, 4-2, 4-3, etc.) as enumerated in Table 3.

DATE	BEACHES SURVEYED	NUMBERS OF NESTING TRACKS: Cc	Cm	D	E	Lk	Lo	NO I. D.
2-6-82	Galibi		2	5				7
"	Babunsanti		9	24				23
"	Gilanti		1	1				2
"	Kwajajapasi & Kathreek		4	26				30
"	Matapica			3				3
"	Kathreek & Dianastrand			6				6

TABLE 5. AERIAL BEACH SURVEY SUMMARY
Give any additional information available from aerial surveys. Information should include ground truth observation if conducted.

Species Abbreviations:
Caretta caretta Cc
Chelonia mydas Cm
Dermochelys coriacea D
Eretmochelys imbricata E
Lepidochelys kempi Lk
Lepidochelys olivacea Lo

SPECIES \ YEAR	1982	1981	1980	1979	1978	1977
Caretta caretta						
Chelonia mydas	3500	6000	4000	4500	7200	4800
Dermochelys coriacea	2500	1300	1000	2700	1500	3900
Eretmochelys imbricata	?	?	?	?	?	?
Lepidochelys kempi						
Lepidochelys olivacea	900	600	650	400	450	550

TABLE 6. ESTIMATED POPULATIONS OF NESTING FEMALES.
Summarize the estimated number of nesting females for the years indicated and describe methods of estimation on the next page.

TABLE 6. ESTIMATED POPULATIONS OF NESTING FEMALES.
(Supplementary page)

Please give brief details on methods of estimation for Table 6.

The population size has been calculated as follows:

the total number of nests laid during one season has been divided by the average number of nests a female lays during one season. This number has then been multiplicated by the average interbreeding interval.

($\frac{\text{total number of nests in one season}}{\text{average number of nests of one female in one season}}$ × average inter-breeding interval)

LIFE STAGE UNIT	SPECIES (abbrev.)	CAUSES*	EXTENT OF MORTALITY (% of unit)
Hatchlings	Cm, Dc	Erosion, ghostcrabs	33%
Hatchlings	Cm, Dc, Lo	ghostcrabs, seabirds, vultures, Caiman, thunder	?
Juveniles			
Adults (in water)	Cm, Dc, Lo	shrimp trawlers	?
Nesting females	Cm	jaguar	2.1%

TABLE 10. NATURAL MORTALITY

* Natural mortality agents may include: Beach erosion of nesting area and/or nesting predation by crabs, wild animals, sea birds, etc.; disease; sharks and other predators at sea; etc.

Species abbreviations:
Cm Chelonia mydas
Dc Dermochelys coriacea
Ei Eretmochelys imbricata
Lo Lepidochelys olivacea

TABLE 7A (SUPPLEMENT DATA ON BEACHES)

NAME OF BEACH: Krofajapasi + Mothreek.

ENERGY BEACH CLASSIFICATION OF BEACH (CIRCLE): HIGH (MODERATE) LOW

DESCRIPTION OF SAND CHARACTERISTICS: Medium sand with abundant shell fragments.

VEGETATION: creeping plants (Canavalia, Ipomoea) grasses.

LEVEL OF HUMAN DEVELOPMENT AND/OR IMPACT: NONE LIGHT MODERATE HEAVY

ESTIMATED NESTING ACTIVITY: (MAJOR More Than 5) REGULAR(Less Than 5) INCIDENTAL

GENERAL COMMENTS: The Krofajapasi beach is the seaward side of a large sand spit parallel with the mainland. The west end of the spit is still being elongated by deposits of sand, while the east end is in state of erosion. Mostly visited by the leatherbacks. There are also fishermen's camps on the spit. Mothreek beach is thinly grown by mangrove and is in state of erosion. Is an important beach for ridleys.

NAME OF BEACH: Matapica

ENERGY BEACH CLASSIFICATION OF BEACH (CIRCLE): HIGH (MODERATE) LOW

DESCRIPTION OF SAND CHARACTERISTICS: Medium to coarse sand with abundant shell and shell fragments.

VEGETATION: Grasses, creeping plants, Batis, seauvium

LEVEL OF HUMAN DEVELOPMENT AND/OR IMPACT: NONE LIGHT MODERATE HEAVY

ESTIMATED NESTING ACTIVITY: (MAJOR More Than 5) REGULAR(Less Than 5) INCIDENTAL

GENERAL COMMENTS: This beach is also being elongated at the west end and eroding at the east end. Predominantly visited by leatherbacks.

NAME OF BEACH: Katkreek & Diamastrand

ENERGY BEACH CLASSIFICATION OF BEACH (CIRCLE): HIGH (MODERATE) LOW

DESCRIPTION OF SAND CHARACTERISTICS: Medium sand

VEGETATION: A thin growth of mangrove with scattered creeping plants and grasses.

LEVEL OF HUMAN DEVELOPMENT AND/OR IMPACT: NONE LIGHT MODERATE HEAVY

ESTIMATED NESTING ACTIVITY: (MAJOR More Than 5) REGULAR(Less Than 5) INCIDENTAL

GENERAL COMMENTS: There is a mudbank in front of the beach of Katkreek Predominantly visited by the leatherbacks.

TABLE 7A (SUPPLEMENT DATA ON BEACHES)

NAME OF BEACH: Galibi

ENERGY BEACH CLASSIFICATION OF BEACH (CIRCLE): HIGH MODERATE (LOW)

DESCRIPTION OF SAND CHARACTERISTICS: medium sand

VEGETATION: A thin growth of mangrove on the sandy beach

LEVEL OF HUMAN DEVELOPMENT AND/OR IMPACT: NONE LIGHT MODERATE HEAVY

ESTIMATED NESTING ACTIVITY: (MAJOR More Than 5) REGULAR(Less Than 5) INCIDENTAL

GENERAL COMMENTS: an extensive sand bank is situated in front of the beach. Water is brackish to almost fresh in the rainy season. Predominantly visited by green turtles.

NAME OF BEACH: Saboen santi

ENERGY BEACH CLASSIFICATION OF BEACH (CIRCLE): HIGH (MODERATE) LOW

DESCRIPTION OF SAND CHARACTERISTICS: medium sand

VEGETATION: Grasses Creeping plants (Canavalia, Ipomoea)

LEVEL OF HUMAN DEVELOPMENT AND/OR IMPACT: NONE LIGHT MODERATE HEAVY

ESTIMATED NESTING ACTIVITY: (MAJOR More Than 5) REGULAR(Less Than 5) INCIDENTAL

GENERAL COMMENTS: wide, high crested beach with a slightly steeper slope, very suitable nesting beach. Predominantle Leatherback.

NAME OF BEACH: Zilanti

ENERGY BEACH CLASSIFICATION OF BEACH (CIRCLE): HIGH MODERATE (LOW)

DESCRIPTION OF SAND CHARACTERISTICS: Medium sand

VEGETATION: Creeping plants (Canavalia, Ipomoea) and thin growth of mangrove on the sandy beach.

LEVEL OF HUMAN DEVELOPMENT AND/OR IMPACT: NONE LIGHT MODERATE HEAVY

ESTIMATED NESTING ACTIVITY: (MAJOR More Than 5) REGULAR(Less Than 5) INCIDENTAL

GENERAL COMMENTS: An extensive mudbank is situated in front of the beach. Important beach for the ridleys.

TURTLE PRODUCT	YEARS			CURRENT MARKET Price/Unit	METHODS OF DATA COLLECTION
	1982	1981	1980		
No. of eggs	250.000	270.000	250.000	$0.06-0.07	The collecting and selling is in the hands of STINASU (Foundation for Nature Preservation in Suriname).
Meat (Kg)					
Shell No./Wt.					
Skins No./Wt.					
Stuffed Juveniles					
Other					

SPECIES Green turtle (Chelonia mydas)

TABLE 15.___ OFFICIAL STATISTICS OF TURTLE PRODUCTION
Complete one of these tables for each species taken in the fishery.

TABLE 16. EMPLOYMENT DEPENDENT ON TURTLES
(Supplementary page)

In addition to marketed products, it is estimated that the following are taken annually from beaches or at sea for subsistence use:

A: Subsistence exploitation

1. Estimated number of eggs: 250 000
2. Estimated number of nesting females: ______
3. Number of turtles caught at sea: ______
4. Other: ______

B: Social aspects

In addition to the described fishery activities, exploitation of turtles may be permitted in some countries according to special rights or privileges extended to certain groups of people. If such specialized turtle exploitation exists, please give details (i.e., beach rights, ethnic traditions, specific seasons of the year, special permits, etc.).

SURINAME

SPECIES	HATCHERY OPERATIONS					HOLDING LIVE TURTLES		
	EGGS COLLECT.	EGGS HATCHED	NO. RELEASED	AGE AT RELEASE	NO. RETAINED	NO. OF JUVS.	ADULT FEMALES	ADULT MALES
Caretta caretta								
Chelonia mydas	26.780	19304	11.582	within 8 days after hatching	7.722			
Dermochelys coriacea								
Eretmochelys imbricata								
Lepidochelys kempi								
Lepidochelys olivacea								

YEAR 1982

TABLE 17 -___ TURTLE MARICULTURE OPERATIONS
This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc.
Prepare separate table for each year of available data.

SURINAME

SPECIES	HATCHERY OPERATIONS					HOLDING LIVE TURTLES		
	EGGS COLLECT.	EGGS HATCHED	NO. RELEASED	AGE AT RELEASE	NO. RETAINED	NO. OF JUVS.	ADULT FEMALES	ADULT MALES
Caretta caretta								
Chelonia mydas	28.065	26.785	15.110	within 8 days after hatching	11.420			
Dermochelys coriacea								
Eretmochelys imbricata								
Lepidochelys kempi								
Lepidochelys olivacea								

YEAR 1981

TABLE 17 -___ TURTLE MARICULTURE OPERATIONS
This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc.
Prepare separate table for each year of available data.

SURINAME

SPECIES	HATCHERY OPERATIONS					HOLDING LIVE TURTLES		
	EGGS COLLECT.	EGGS HATCHED	NO. RELEASED	AGE AT RELEASE	NO. RETAINED	NO. OF JUVS.	ADULT FEMALES	ADULT MALES
Caretta caretta								
Chelonia mydas	60.151	33.644	22.112	within 6 days after hatching	11.908			
Dermochelys coriacea								
Eretmochelys imbricata								
Lepidochelys kempi								
Lepidochelys olivacea								

YEAR 1980

TABLE 17 - ___ TURTLE MARICULTURE OPERATIONS
This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc.
Prepare separate table for each year of available data.

SURINAME

SPECIES	HATCHERY OPERATIONS					HOLDING LIVE TURTLES		
	EGGS COLLECT.	EGGS HATCHED	NO. RELEASED	AGE AT RELEASE	NO. RETAINED	NO. OF JUVS.	ADULT FEMALES	ADULT MALES
Caretta caretta								
Chelonia mydas	82.317	36.064	30.068	within 6 days after hatching	5996			
Dermochelys coriacea	1174	835	835					
Eretmochelys imbricata								
Lepidochelys kempi								
Lepidochelys olivacea	1632	702	702					

YEAR 1979

TABLE 17 - ___ TURTLE MARICULTURE OPERATIONS
This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc.
Prepare separate table for each year of available data.

SURINAME

SPECIES	HATCHERY OPERATIONS					HOLDING LIVE TURTLES		
	EGGS COLLECT.	EGGS HATCHED	NO. RELEASED	AGE AT RELEASE	NO. RETAINED	NO. OF JUVS.	ADULT FEMALES	ADULT MALES
Caretta caretta								
Chelonia mydas	30.945	20.948	18.118	within 6 days after hatching	2934			
Dermochelys coriacea								
Eretmochelys imbricata								
Lepidochelys kempi								
Lepidochelys olivacea								

YEAR 1978

TABLE 17 - ___ TURTLE MARICULTURE OPERATIONS
This table quantifies activities concerned with turtle culture for either conservation, population enhancement experiments, or commercial use. Activities to be included are "headstarting", re-nesting, incubation and release, etc.
Prepare separate table for each year of available data.

NAME AND LOCATION	AREA km^2	REASON (S) FOR PROTECTION	TYPE AND EFFECTIVENESS OF ENFORCEMENT
Galibi Nature Reserve	4	Sea turtle nesting beaches	-Daytime beach patrol -Nightly beach patrol -Antipoaching patrol
Matapica/Krofajapasi area (special management areas)	?	Sea turtle nesting beaches	

TABLE 19. SANCTUARIES AND REFUGES

NAME AND ADDRESS OF ORGANIZATION	BUDGET ALLOCATION TO TURTLES	NO. OF STAFF ASSIGNED TO TURTLES	COMMENTS ON LEVELS OF ENFORCEMENT
Suriname Forest Service - (Min. of Natural Resources and Energy.)	$ 24.188	10	
STINASU (Foundation for Nature Preservation in Suriname - (Min of Natural Resources and Energy.)			

Suriname

TABLE 20. REGULATORY AUTHORITY
Indicate all entities with statutory responsibilities (e.g., Fisheries Departments and Ministeries, Police, Coast Guard, etc.)

PROJECT TITLE	DATES START	DATES END	NAME & ADDRESS OF INSTITUTION & CHIEF INVESTIGATOR
Suriname TURTLE (Sea turtle ranging project)	1977		c/o STINASU. Chief investigator: H.A. Reichart M.Sc.
University of Toronto	1979	1983	Funded by the University of Toronto with additional financial and logistic support from STINASU.

TABLE 21. NATIONAL RESEARCH PROJECTS
List turtle research activities funded within your country.

Suriname

TABLE 20. REGULATORY AUTHORITY
(Supplementary page)

Please list National, regional, and local legislation concerning turtle management and conservation. List title, date, and stated purpose.

1. The Nature Preservation Ordinance (1954) and Nature Preservation Degree (1966): provide the basis for the establishment of Nature Reserves by Degree.
According the Ordinance public lands are eligible for reserve status if they are of scientific, aestetic or cultural value.
It was by this Ordinance therefore possible to establish, among others, the Galibi Nature Reserve in 1969 and the Wia-Wia Nature Reserve in 1961 with important sea turtle nesting beaches within it.

2. The Game Ordinance (1954) and the Game Degree (1970).
The Game Ordinance protects all wild mammals, birds and sea turtles, with the exception of those designated by Degree as 'game species', 'domestic animals' (i.e. cage birds) or 'predominantly harmful species'.
The 'Game Degree' lists the sea turtles under the game species, but prohibits anyone to take, kill, possess, mutilate, sell or offer for sale any sea turtle or part of it in the area to which the Ordinance applies, but permits the collecting, transport and sale of eggs from March 1st to May 31st.

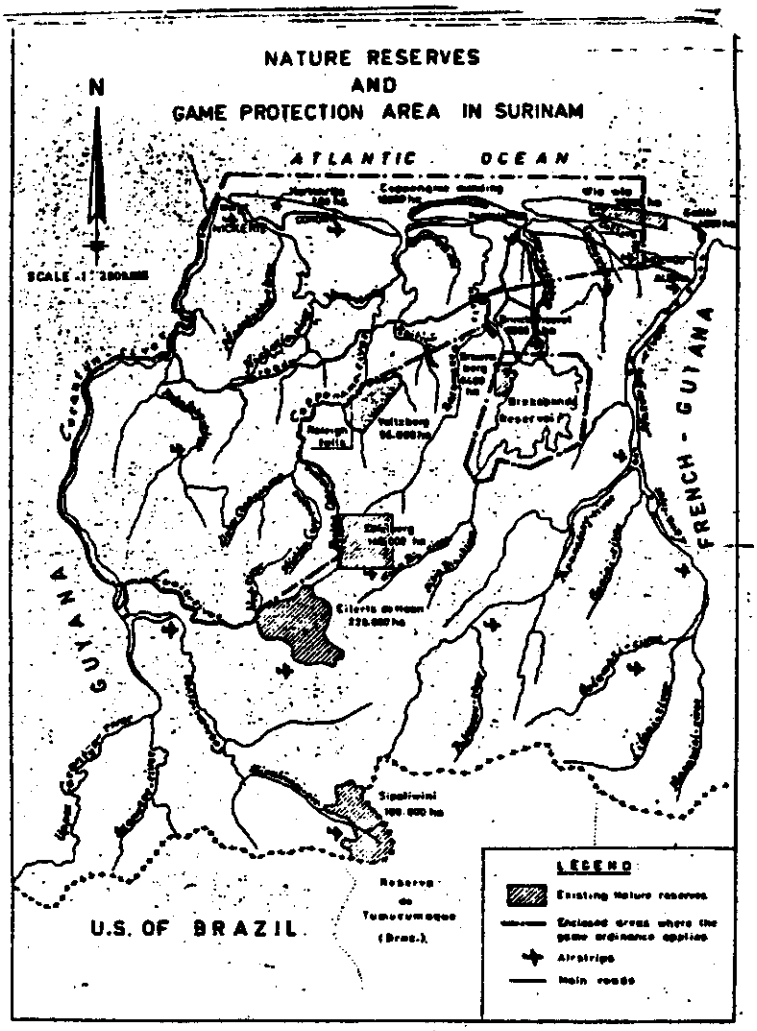
REPORTS AND PUBLICATIONS

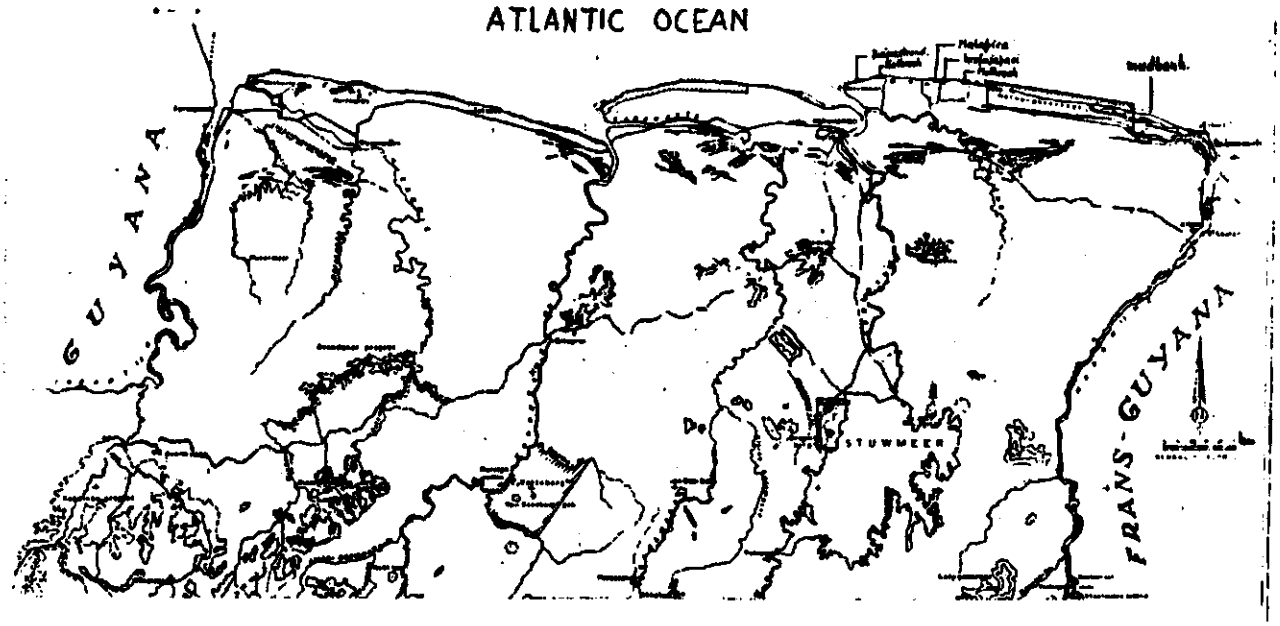
The following is a list of the major reports and publications concerned with national turtle resources (list author, date, title, and publisher).

1. Schulz, J.P., 1975. Sea turtles nesting in Suriname. Stichting Natuurbehoud Suriname.

2. Whitmore, C and P. Dutton, 1981, Suriname sea turtle expedition (preliminary report).

3.





Northern part of the Republic of Suriname.
showing the location of the turtle nesting beaches and the mudbanks.