GEORGE BALAZS
NEW CALEDONIA
FOLDER

CABLE ADDRESS :
" SOUTHPACOM " NOUMEA
TELEPHONE : 26.20.00
TELEX : SOPACOM 139 NM

SOUTH PACIFIC COMMISSION
POST BOX D 5
NOUMEA CEDEX
NEW CALEDONIA

ADRESSE TELEGRAPHIQUE :
" SOUTHPACOM " NOUMEA
TELEPHONE : 26.20.00
TELEX : SOPACOM 139 NM

COMMISSION DU PACIFIQUE SUD
BOITE POSTALE D 5
NOUMEA CEDEX
NOUVELLE-CALEDONIE

5 February, 1980

In reply, please quote PRO 7/14

PLEASE ADDRESS REPLY TO
THE SECRETARY-GENERAL

7/15

Mr. George Balazs
Hawaii Institute of Marine Biology
P.O. Box 1346
Coconut Island
KANEOHE
Hawaii. 96744 USA

Dear George,

I spent last Sunday 3 February on a small island called Ilot Konduyo located on the western coast of New Caledonia, about 70 km north west of Noumea (see copy of the map). This island is visited during the week by people living in La Foa, the closest village. There is a kind of house made of all sorts of material which provides shade and shelter. It belongs to friends of mine. I remember having visited this island one or two years ago and at that time I had noted one track on the beach. From memory it was in November because the water was cooler than now.

When we arrived there the other day, I saw a little girl playing with a hatchling. It was one out of 14 which had emerged at 5 p.m., the previous evening from below the fire the people had made, close to the house (see figure). I had no camera so I could not take any picture. I think they were green turtles. I have arranged to have a photo of a spawning female taken some time ago. The people visit this island almost every week end (weather permitting) and report that a lot of turtles come each year to spawn there as well as on beaches on other islands around. Some of the nests are dug but not all of them.

Then I decided to go around the island. I counted approximately 32 pits, obviously several weeks old and no track. In the bottom of some of the pits, I noted several dried broken egg shells. I had a swim in the lee of the island where there is a large turtle grass area. A friend of mine saw a big turtle, probably a green.

Access to this island is very easy. There is no breaking coastal reef. I did not swim on the weather coast as the wind was blowing at 30 knots.

George, that is all I had to report. I hope this could be interesting. Personally I think that there are more spawning beaches in the lagoon than we saw during the aerial survey. From discussion I had with several persons, the Southern part of the lagoon is full of turtles.

.../..

Regarding thesurvey of the Navy ship to Huon, I was invited for lunch by the Captain of the boat. He promised to do his best. The medical doctor on board will take care of the observation. He is keen to do it. I will let you know the results as soon as I get there.

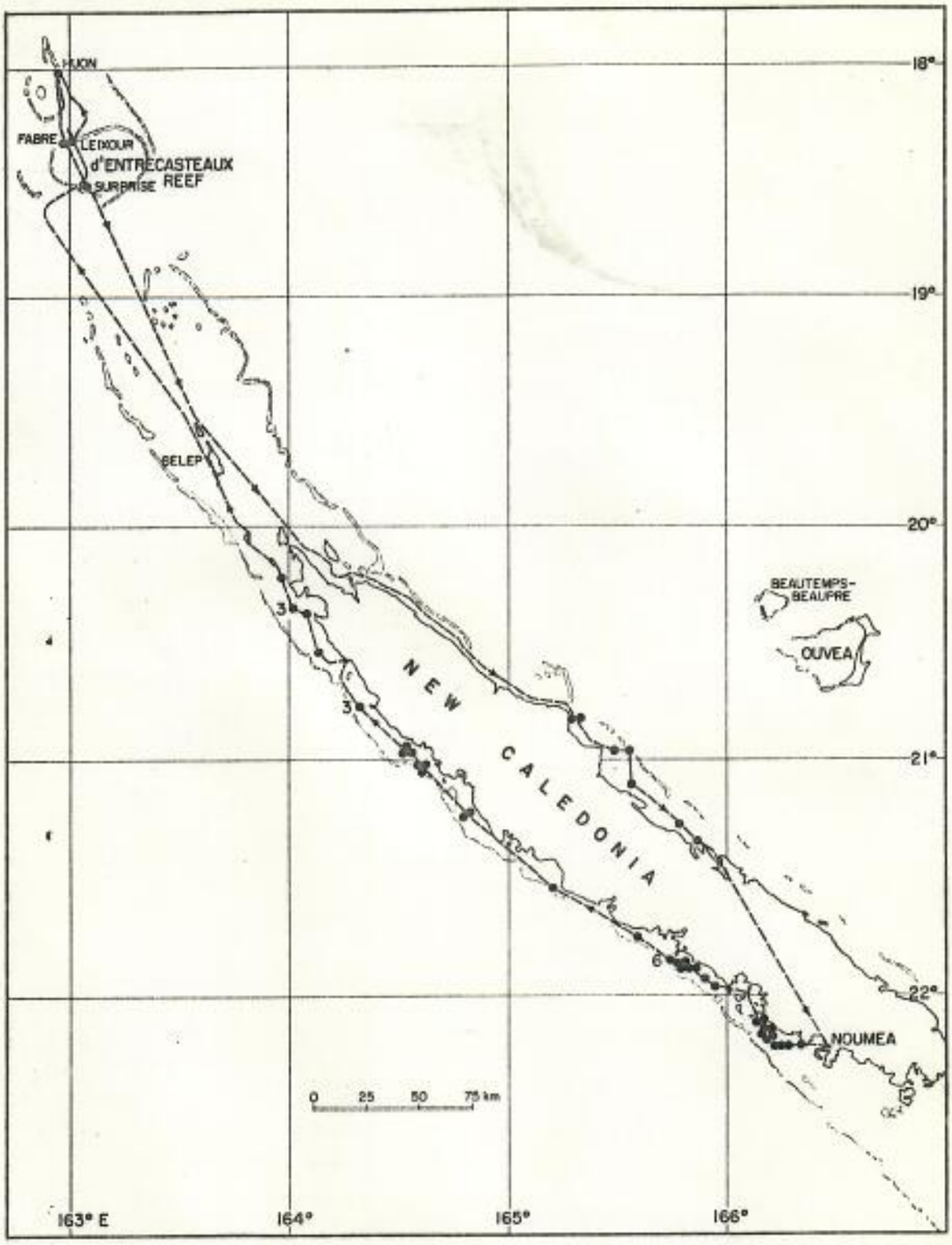
Best personal regards,

Yours sincerely,

René Grandperrin
Fisheries Adviser

cc: Mr. Richard Shomura
Director
South West Fisheries Center
P.O. Box 3830
HONOLULU
Hawaii. 96812 USA

RG/vmr.


HUON
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LEIXOUR
d'ENTRECASTEAUX REEF
SURPRISE
BELEP
BEAUTEMPS-BEAUPRE
OUVEA
NEW CALEDONIA
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21°
22°
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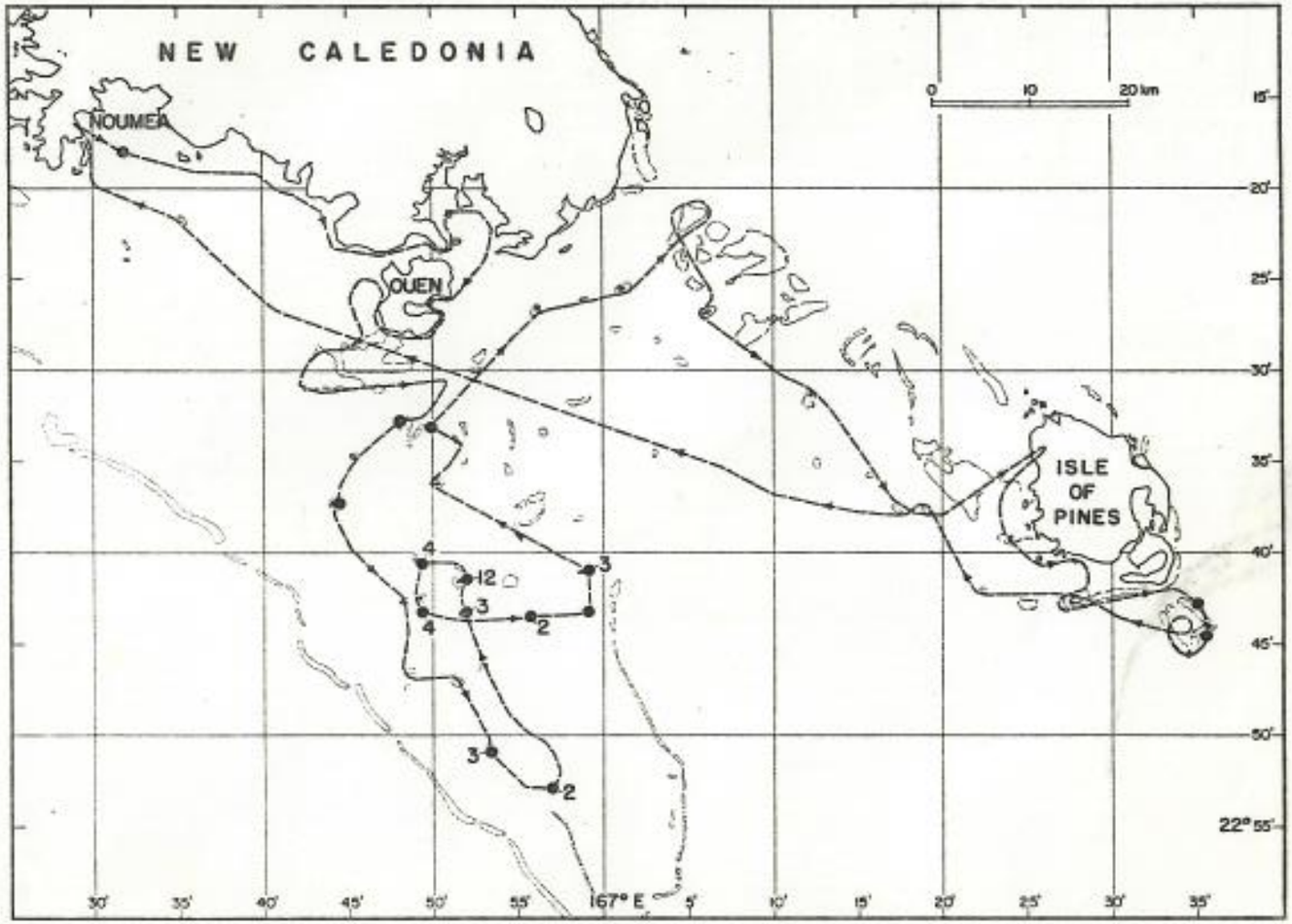
164°
165°
166°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OUEN
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35'
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45'
50'
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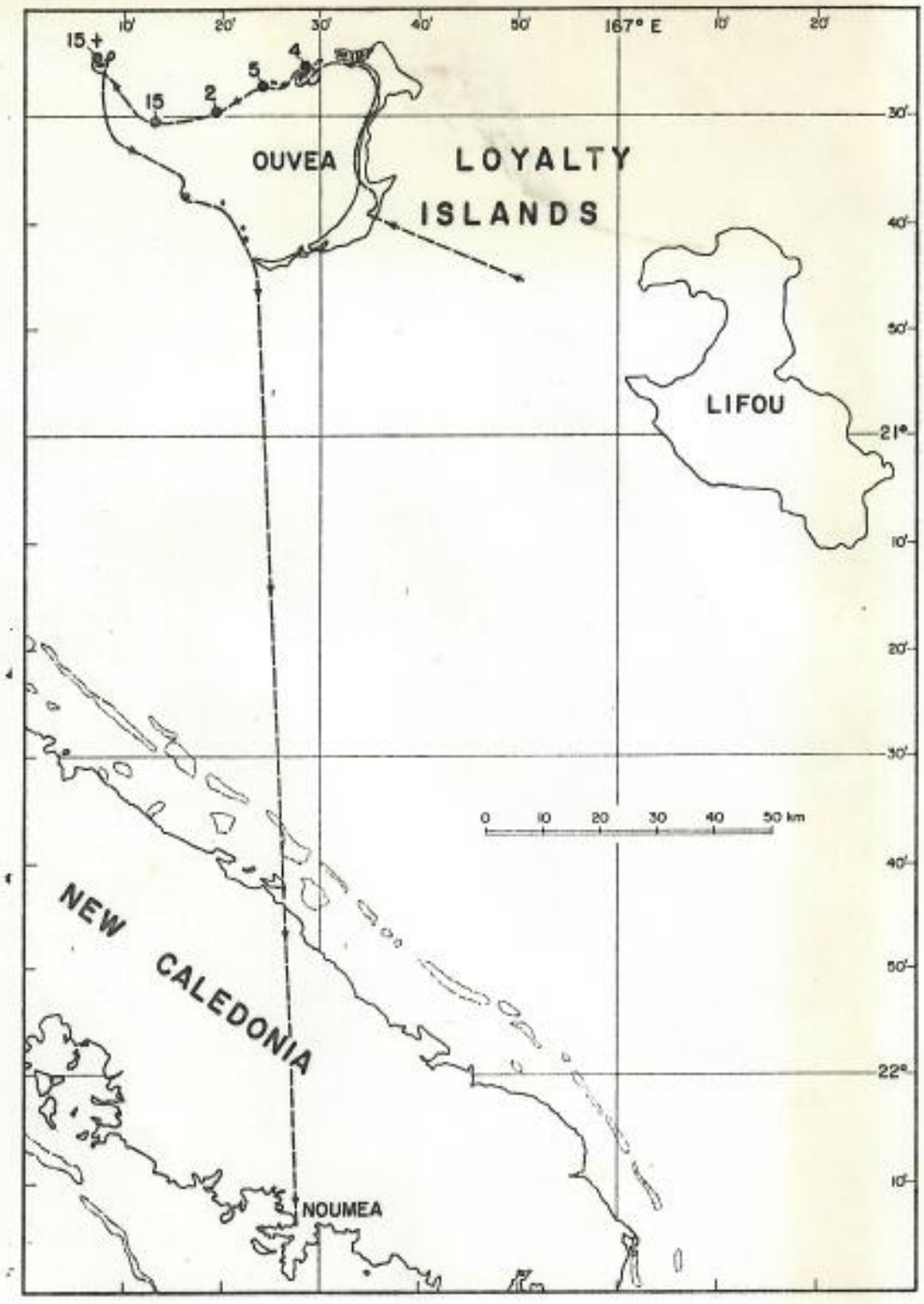
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0 10 20 30 40 50 km
40'
50'
22°
10'
NEW
CALEDONIA
NOUMEA

Beautemps-Beaupre.

The island of Beautemps-Beaupre is situated about 30 miles west of Ouvea, at 20°25' S and 166° 09' E, in a coral reef formation that forms a very attractive lagoon. The island, which is called Eo (or Heo) by the locals, carries the name of the geographer of the expedition of d'Entrecasteaux..

History: In 1793, d'Entrecasteaux, returning from the New Hebrides, nearly wrecked his ship on the reefs of this island. The latter was then the domain of Ndjeoula. Having been despatched by the Wallisian chief Nekelo, to negotiate his marriage with the daughter (or the sister) of the big chief of Mouli, Ndjeola carried off the young lady, married her, and, not daring to return to his tribe, he settled on Eo.

In 1858, 115 people lived on the island of Beautemps-Beaupre. But, later, the population moved off to Ouvea, where they formed the Eo tribe, near Saint-Joseph. For this reason, the collection of copra on the island is still the privilege of the members of this tribe.

According to legend, Eo was considered as the home of the spirits of the dead of Ouvea. These spirits, maintain the locals, penetrated into the bowels of the earth through a hole in the rocks on the west side of the island, which no-one would be bold enough to approach.

It is very difficult to get to Beautemps-Beaupre, because of the lack of regular transportation. If one succeeds in getting there, one finds remains of a village and a chapel. A freshwater well remains, which can only be used by men; it is maintained that the well will dry up if this rule is broken.

North of Eo, 4 or 5 miles away, the small island of Motou-Tapou (a Polynesian name meaning "forbidden island") has large populations of sea birds. Legend has it that only men may go there to capture the birds and collect their eggs, and that it is essential to drop anchor and disembark in total silence, and to carry ashore no other food that a number of coconuts as an offering. If these prohibitions are not respected, the return passage will be bad and the winds contrary.

(Translated from page 243 of The Guide Bleu to Nouvelle Caledonie, iles Loyaute, ile des Pins; Librairie Hachette).

SINCE NINETEEN HUNDRED

"THE VOICE OF CONSERVATION"

Dr. George Balazs
National Marine Fisheries Service
Hawaii Institute of Marine Biology
Coconut Island
Kaneuhe, Hawaii 96744

August 29 1983

Dear George:

Many thanks for sending the New Caledonia material, which I have read with great interest. In case you have not seen the little description of Beautemps-Beaupre in the Guide Bleu, I am sending you a translation on the enclosed sheet. The most important information relates to the size of the former population of the island (not large in absolute terms, but surely sufficient to have placed considerable stress upon the turtle population).

The thought that strikes me on reading through the material you send is that you have assembled excellent background literature-search for a project that has not yet actually taken place. I am honored and delighted that you have asked me to co-author it with you, and perhaps we can indeed proceed, but in terms of the amount of new data in hand (i.e. the aerial sightings of unidentified turtles and the dense nesting tracks on the islands), do you think we have enough to get a refereed journal to accept it? One might make a very nice article for one of the more sophisticated magazines (e.g. Islands) - and earn a dollar or two to boot - but perhaps not Journal of Herpetology. Clearly, we have to try and get there to get some hands-on data!

These are preliminary responses only, and I am fully prepared to be persuaded into a different position. I look forward to hearing from you again.

It was nice to see you and the rest of the gang in Costa Rica - hope our paths cross again soon. I liked your write-up and pictures in International Wildlife.

Best regards,

Peter C.H.Pritchard

FLORIDA AUDUBON SOCIETY
1101 Audubon Way • Maitland, Florida 32751 • (305) 647-2615

THE SOUTH PACIFIC COMMISSION

FISHERIES NEWSLETTER

No. 21
August 1980
South Pacific Commission
B.P. D5, Noumea Cedex
New Caledonia

THE SOUTH PACIFIC COMMISSION FISHERIES NEWSLETTER

Editors:
J. Crossland and
R. Grandperrin
South Pacific Commission
P.O. Box D5, Noumea Cedex,
New Caledonia

No. 21 August 1980

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by James Crossland 26

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872/80

SEA TURTLE CONSERVATION STRATEGY[1]

SITUATION AND OBJECTIVES

Few groups of animals are more valuable and magnificent and at the same time misused than sea turtles. Able to serve as a source of protein for coastal peoples in the tropics, they have been over-exploited most frequently to feed, clothe and adorn the wealthy in Europe, North America, and eastern Asia. Populations are being lost through land development that destroys nesting beaches, through reef destruction, through the accidental drowning of turtles in trawl nets, and through the failure of states to join together to protect species that migrate from areas under one coastal jurisdiction to others. Even states intent on managing the resource wisely have destroyed sea turtle populations by developing management plans that ignored the biological needs of the species. Very few populations of sea turtles remain undiminished. The majority are depleted. Many are extinct. Six of the seven species are endangered.

The objective of this strategy is to develop conservation action based on the biology of the species that will return sea turtles to former abundance while allowing controlled exploitation for the benefit of generations of humans yet to come.

THE PROBLEM

The fate of the sea turtles in the modern world is being determined by the interaction of many factors. These include: 1) the use of sea turtles as food by peoples who live where sea turtles are found; 2) the use of sea turtle products in local commerce (for example, sea turtle eggs sent to local markets); 3) the international trade in sea turtle products; 4) the differing attitudes towards conservation in different countries; 5) the incidental destruction of sea turtles that occurs during the fishing of other species; 6) the effects of nesting beach alteration or destruction; 7) the effects of marine and land-based pollution; and 8) the natural recovery rates of the various sea turtle populations under different conditions of exploitation and incidental stress. The biological constraint (8) is in turn determined by such variables as growth rate, food resources, migratory habits, the fixity of nesting behaviours (including preference for certain nesting sites) and others.

Of these eight factors (there may be more) that determine the fate of sea turtles, only one, the biological factor, is non-negotiable in a conservation strategy. Sea turtles, even the most resilient of the species, mature very slowly compared with most commercially important species, and when mature their reproduction is vulnerable to disruption by many kinds of human activity in addition to ordinary turtle fishing. Among other widely exploited marine species, only the great whales, and possibly the sturgeons, show similar biological constraints on exploitation. In determining a conservation strategy, this ultimate limitation must be kept constantly in mind.

SEA TURTLE CONSERVATION POLICY

This document sets forth, in outline format, policy considerations for the conservation of sea turtles.

Habitat protection

Habitat conservation can be achieved through a variety of management techniques. These may include the creation of protected areas such as national parks or reserves, management efforts, or simple limitation of access or activities in specific areas at specific times. Management techniques need to be carefully evaluated for particular areas so that the measures selected are most appropriate. Habitats that should be protected are both terrestrial (nesting beaches, basking sites) and aquatic (inter-nesting areas, migration routes, feeding grounds, wintering grounds).

---

1. This is an abridged version of a paper produced by the participants as a culmination to the World Conference on Sea Turtle Conservation held in Washington D.C., U.S.A. in November 1979.

Management

For the egg stage the best policy is simply protection. If intervention is necessary because of heavy predation, human exploitation or physical damage to the nesting beach, the least manipulative techniques are best. Thus it is preferable to protect the eggs *in situ*, rather than transplanting them to another site or to a hatchery.

For hatchlings the nesting sites should be protected by limiting beach traffic and disturbance at the vulnerable pre-emergence and emergence stages.

Adults and subadults require complete protection and prevention of interference with reproductive activities on nesting beaches and in internesting habitats. Prevention, reduction and control of exploitation are needed on migratory routes and in feeding and wintering grounds.

Control of exploitation

A. Commercial. As long as sea turtles remain endangered, the ending of commercial exploitation of all sea turtle products is a long-range goal or ideal of the conservation strategy. Turtles are listed as endangered species[1] in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1973 and 1976 and trade in turtle products is prohibited. However, not all countries are party to the treaty or implement it adequately. At the moment, highest priority should be given to ending:

1. The leather trade.
2. The trade in tortoiseshell.
3. The collection of eggs for sale in distant markets.
4. The trade in stuffed juvenile turtles.

After the demonstrated recovery of abundance of sea turtles, some level of exploitation may be possible. However, this must be based on the best available biological information and in accordance with national and international law.

B. Non-commercial hunting. This is defined as a traditional way of obtaining food for people living in a subsistence economy. It can be a valid activity, nevertheless some turtle populations are endangered even by legitimate non-commercial hunting. In these cases self-regulation and biologically sound conservation practices should be encouraged. Where non-commercial hunting is valid, subsistence users have first right to the resource.

C. Farming. It has been claimed that as well as marketing sea turtle products, farming has incidental conservation benefits. However, others feel farming can create the risk of increasing pressures on wild populations. At the present time more data are needed on the feasibility (biological and economic) of complete, closed-cycle farming with no dependence on wild populations for eggs or adult breeders. Turtle farming may create new markets and demand for turtle products. The establishment of new turtle farms must therefore be discouraged until it is certain that such operations will not cause, directly or indirectly, a further decline in turtle populations.

Incidental catch

This is a major threat to many sea turtle populations and must be eliminated or reduced to very low levels. Action to be taken should include restrictions on fishing in zones of high turtle concentrations, development of fishing techniques precluding the incidental catch of turtles, collection of data on the size of the incidental catch and the incorporation of appropriate regulations in international fishery conventions.

---

1. Except some Australian - Papua New Guinea populations.

Research and population assessment

Data are needed on the location and sizes of all sea turtle populations. Information is also required on all aspects of basic biology such as age and growth, and on the effect of management techniques.

Conservation education

Local conservation organizations in different countries should be supplied with information on sea turtles. This will assist them to organise their own political and educational campaigns and to gather information on sea turtle populations and trade in sea turtle products.

Legislation

A. National. A worldwide inventory of turtle conservation laws is needed. Where gaps exist legislation should be enacted and implemented. Effective means for enforcement should be developed, including control of entry points for international commerce and the strengthening of penalties for breaches of national legislation.

B. International. All states should become parties to CITES without reservation, and vigorously implement their obligations. All states through whose jurisdiction sea turtles pass should enter into cooperative conservation programmes with particular emphasis on regional conventions. Existing conventions should be strengthened.

Cooperative efforts

The exchange of information and the development of joint conservation programmes among the many disparate and often isolated organizations and states should occur.

IMPLEMENTATION OF THE STRATEGY

A Standing Committee should be established to monitor and facilitate the further development and the implementation of the Sea Turtle Conservation Strategy.

This Committee should be associated with the Marine Turtle Specialist Group of the Survival Service Commission of the International Union for Conservation of Nature and Natural Resources (IUCN), and should include representatives from the various regions of the world. The IUCN and the World Wildlife Fund are requested to accept responsibility for the overall coordination of this Standing Committee; the active cooperation of the various elements of the IUCN, including the TRAFFIC Specialist Group, the Commission on Natural Parks and Protected Areas, and the Commission on Environmental Policy, Law, and Administration is essential.

International and national non-governmental organisations should assist with implementing the Strategy, as appropriate, and especially with public information and education and with the promotion of necessary governmental action.

Participation in the Action Plan by governmental agencies, and particularly those involved with marine turtle research and conservation, is requested, because such participation is essential to the successful implementation of the Action Plan. The United Nations Environment Programme and the United Nations Food and Agriculture Organization are encouraged to provide financial and programmatic support to this global conservation programme.

For the purpose of preparing a report assessing the progress made in implementing the Strategy, the Standing Committee should meet with the IUCN Survival Service Commission at its meeting immediately prior to the 3rd Conference of the Parties to CITES, in the first quarter of 1981.

ACTION PROJECTS

The full document goes on to list 141 action projects for the conservation of sea turtles. Those specific to the SPC region are:

46. Urge the South Pacific Commission to develop regional conservation programmes for the Pacific marine turtle populations for the sustained benefit of local people[1].

60. Encourage Australia and Papua New Guinea to conserve the marine turtle resources of the Torres Strait region for the local use of the indigenous people and to continue to prohibit any export trade to other regions.

61. Commend the government of Papua New Guinea for its marine turtle conservation, management and education programme, and encourage expansion of this work to include tagging projects.

85. Urge France to declare Scilly Atoll (French Polynesia) an inviolate breeding sanctuary.

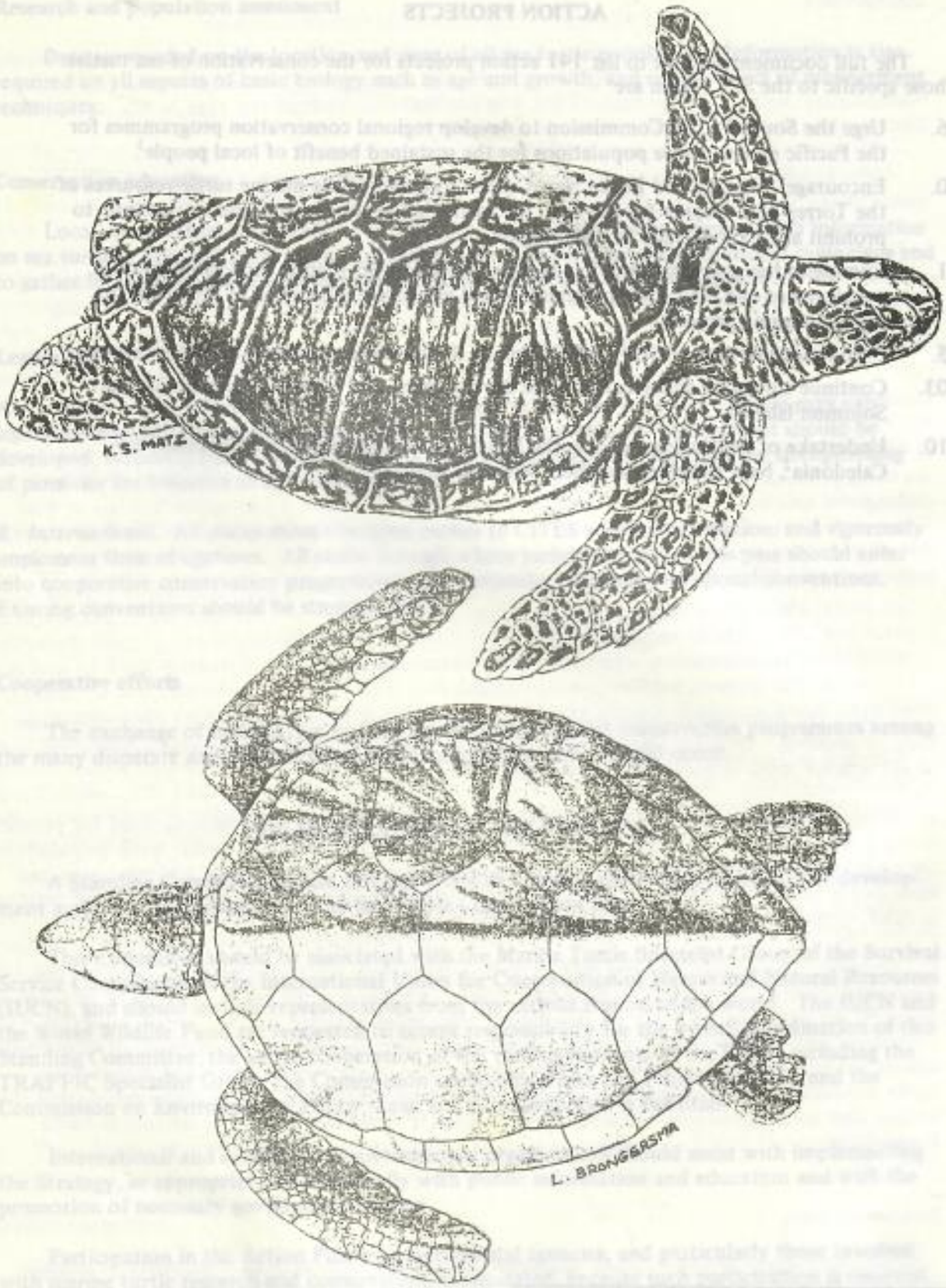
103. Continue surveying and accelerate the development of a conservation plan for the Solomon Islands.

110. Undertake or continue surveys in the South Pacific (e.g., French Polynesia, New Caledonia[2], New Hebrides, northern Marshall Islands).

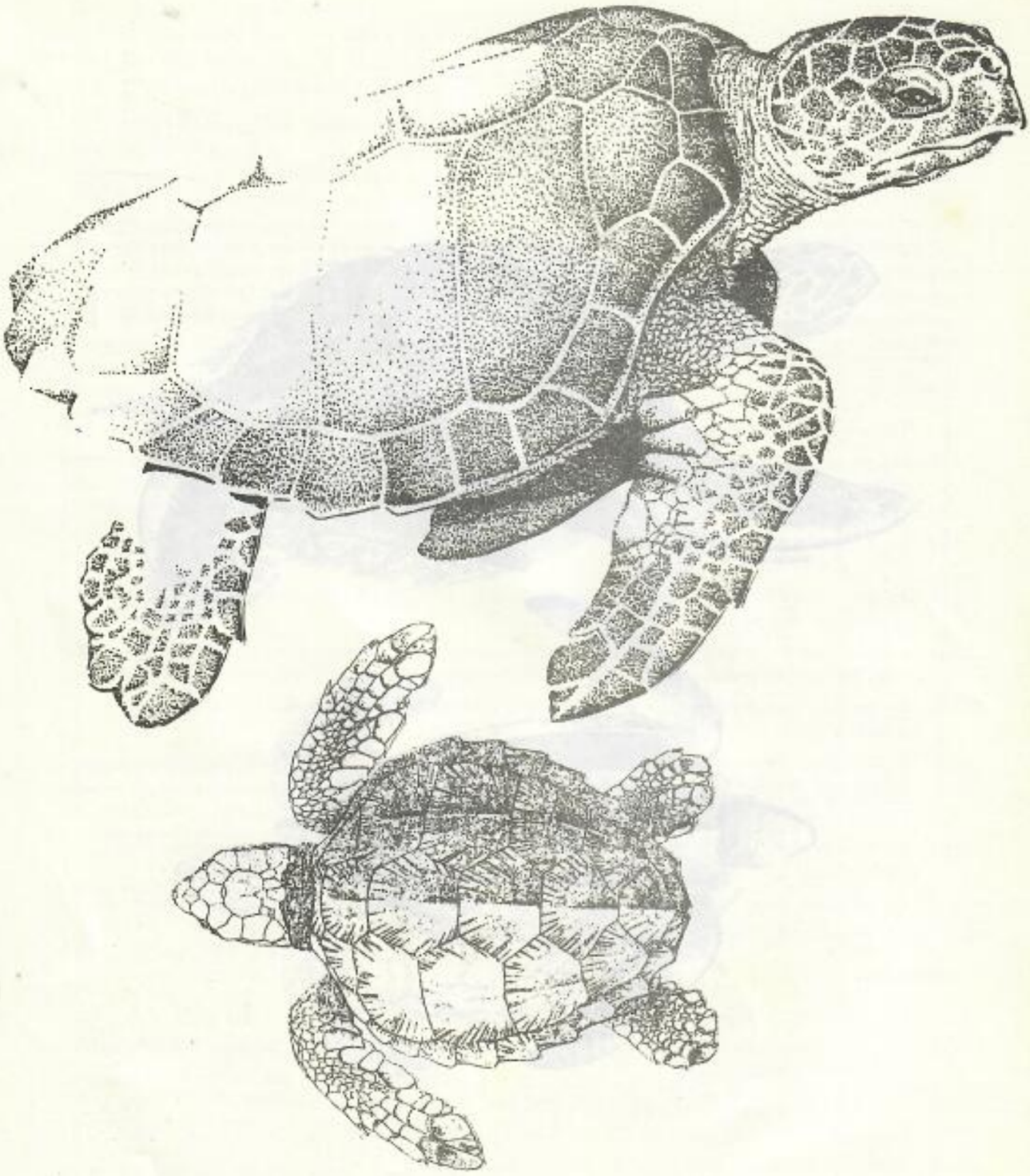
---

1. The South Pacific Regional Environment Programme began in January 1980. If countries of the region identify turtle conservation as requiring regional action it could be included in this programme. In June 1979 SPC produced a set of environmental education materials, including 42 *Environmental Mini-lessons* for schools. One of these lessons (No. 33) is devoted to sea turtles.

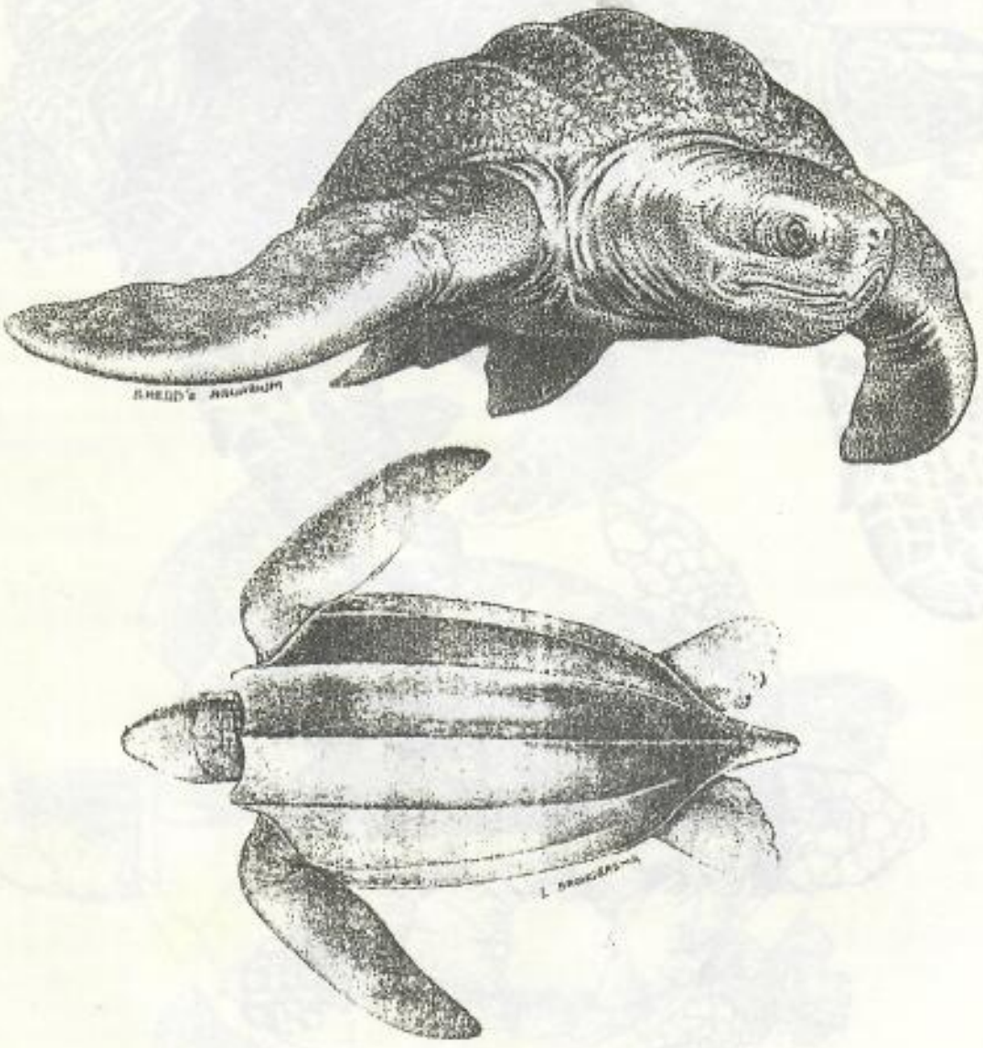
2. At the conclusion of the 1979 SPC/NMFS Workshop on Marine Turtles (see *Fisheries Newsletter* 20) a three day aerial survey of New Caledonia and its adjacent islands was made. Several important nesting areas were located.



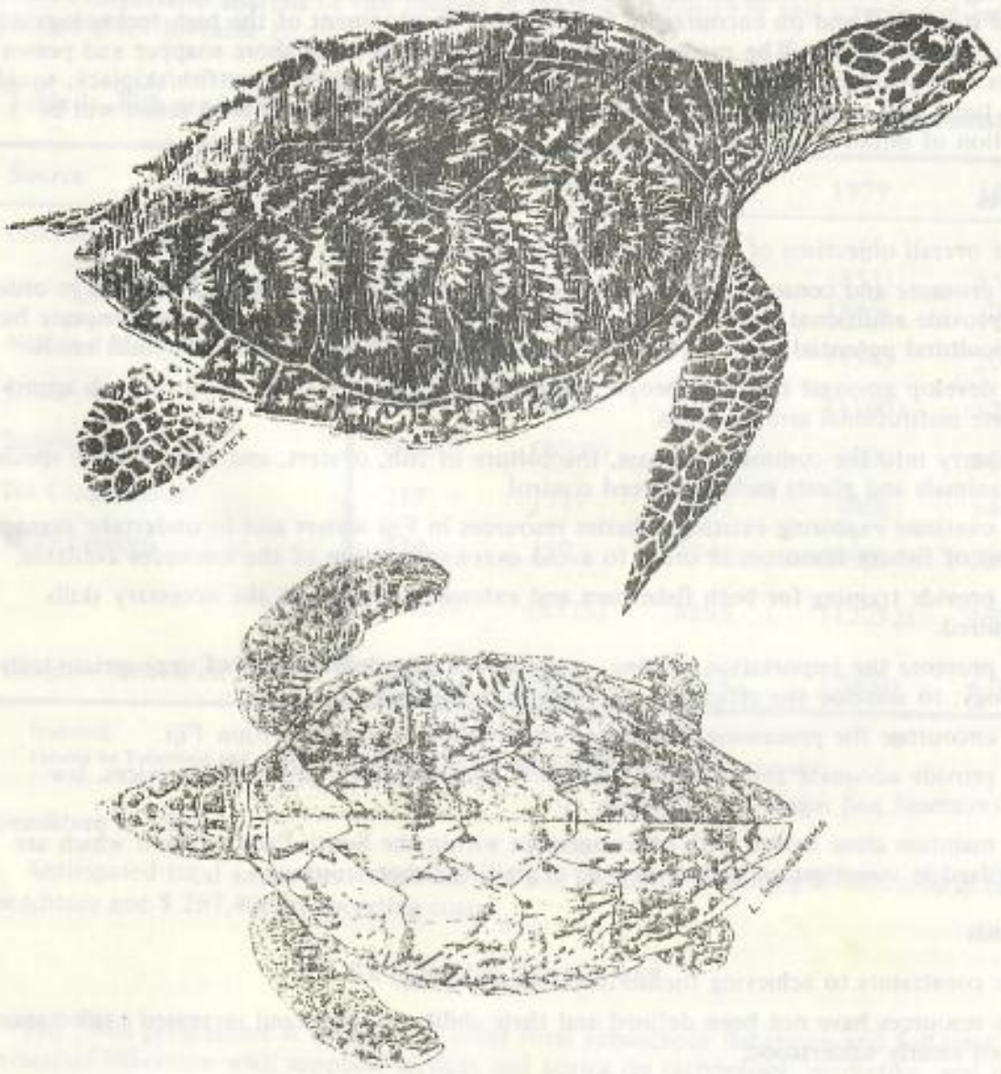
Green turtle
(Chelonia mydas)



Loggerhead turtle
(Caretta caretta)



Leatherback turtle
(Dermochelys coriacea)



Hawksbill turtle
(Eretmochelys imbricata)

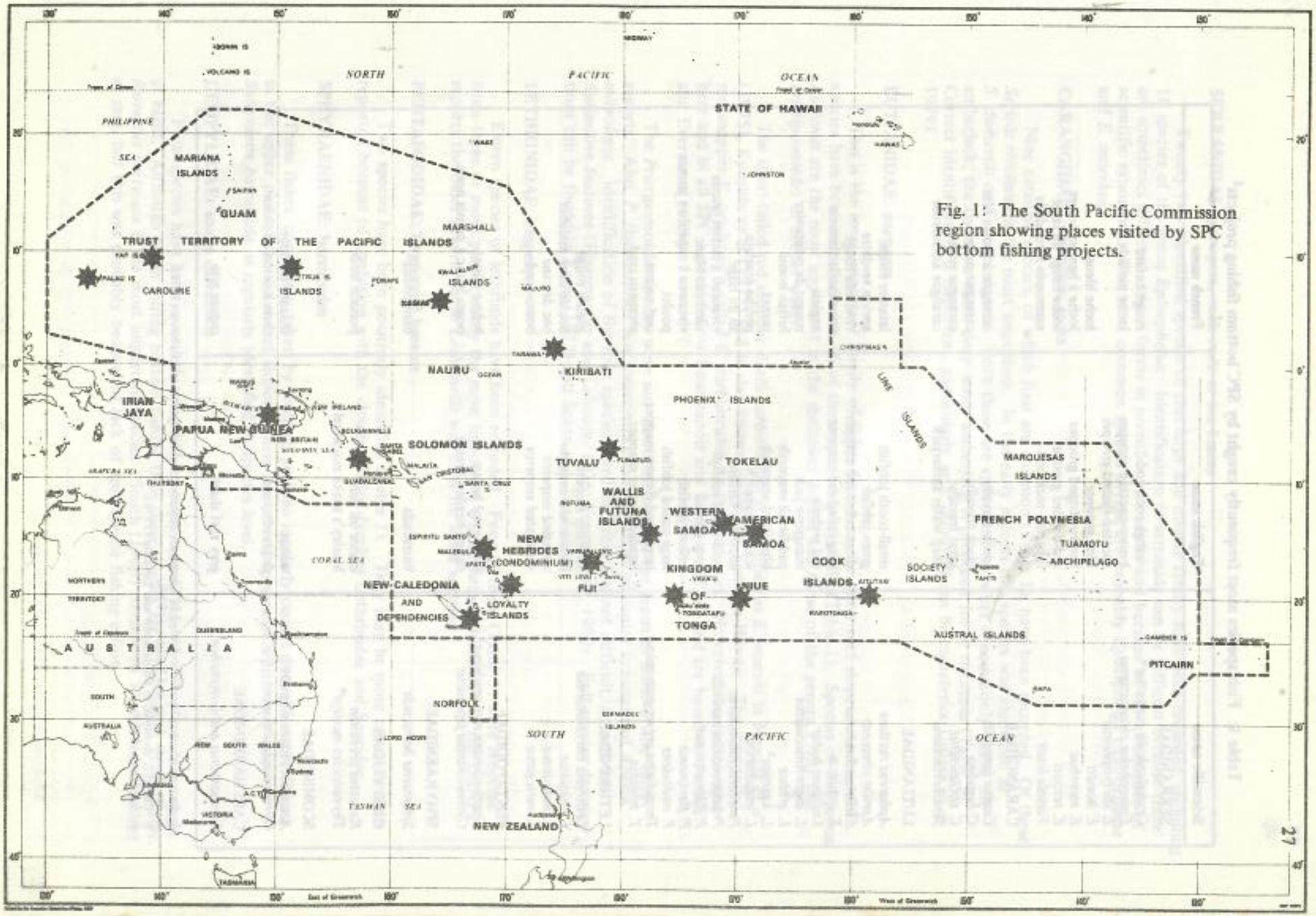


Fig. 1: The South Pacific Commission region showing places visited by SPC bottom fishing projects.

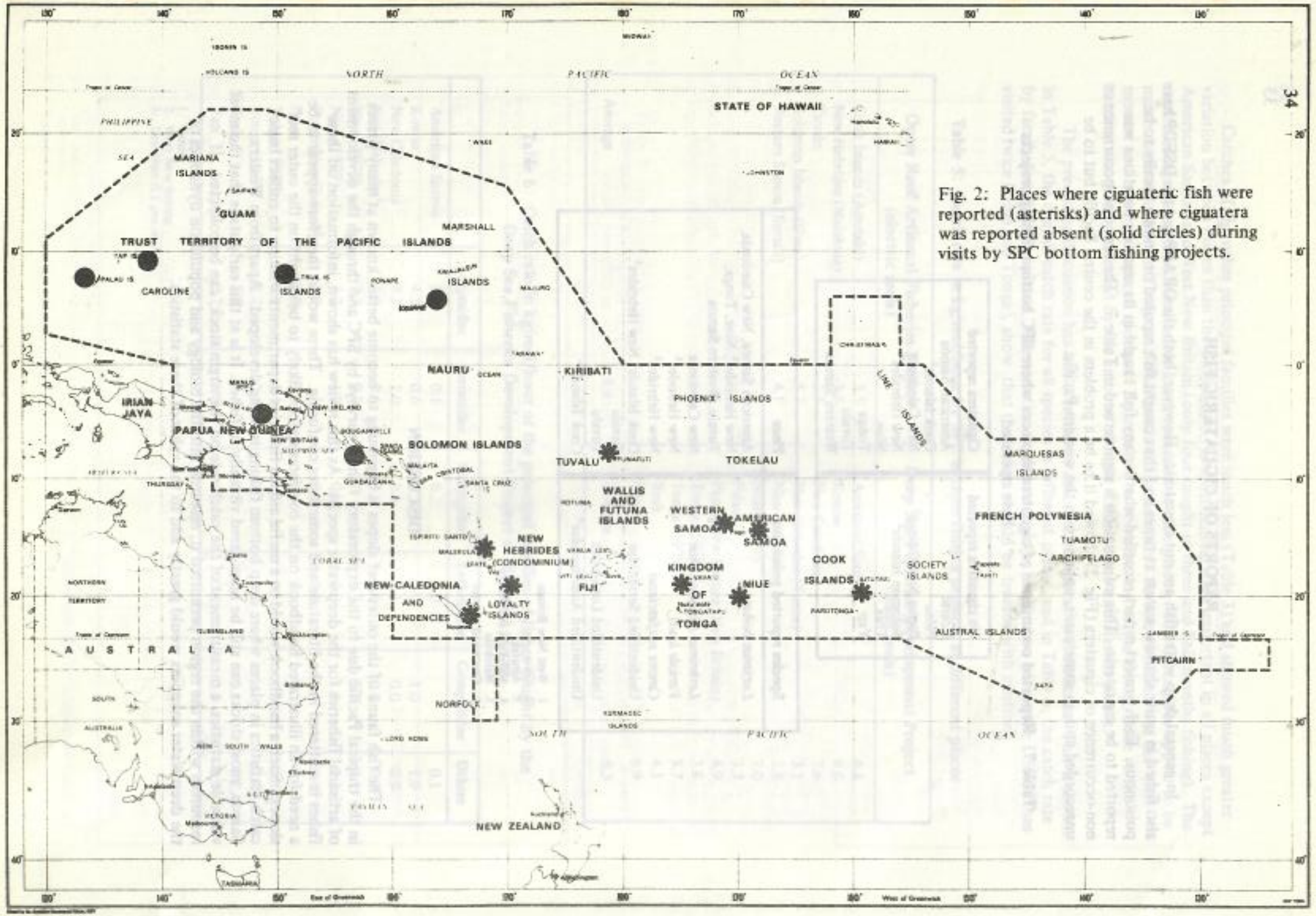


Fig. 2: Places where ciguateric fish were reported (asterisks) and where ciguatera was reported absent (solid circles) during visits by SPC bottom fishing projects.

ASSOCIATION POUR LA SAUVEGARDE DE LA NATURE NÉO-CALÉDONIENNE

50, rue Anatole France - B.P. 1772
NOUMÉA - NOUVELLE-CALÉDONIE
Tél. 28.32.75 - C.C.P. 86-89 C

CAMPAGNE POUR LA PROTECTION DES TORTUES MARINES EN NOUVELLE-CALEDONIE

organisée par

1' ASSOCIATION POUR LA SAUVEGARDE DE LA NATURE NEO-CALEDONIENNE

---.---

Par délibération en date du 16 juillet 1985, la Commission Permanente de l'Assemblée Territoriale a renforcé les mesures de protection des tortues marines en Nouvelle-Calédonie.

Afin de mieux informer la population, et particulièrement les jeunes, de l'importance de la protection de ces animaux menacés et des mesures qui ont été prises, l'A.S.N.N.C. a décidé de lancer une grande campagne de sensibilisation.

Celle-ci a débuté le 1er avril pour se terminer le 31 octobre 1986, période pendant laquelle, malheureusement, la capture est autorisée sous certaines conditions ; l'Association espère ainsi, pendant ces mois-là, dissuader les pêcheurs éventuels, en leur faisant prendre conscience qu'ils participeraient ainsi à la disparition de ces animaux.

La campagne s'est déroulée de la façon suivante :

- présentation d'informations concernant les tortues marines par l'intermédiaire des médias,
- distribution auprès des enseignants d'une fiche technique pouvant être exploitée en classe,
- lancement de divers jeux et concours :
  - . concours de contes, poèmes ou rédactions s'adressant d'une part aux scolaires, d'autre part aux adultes,
  - . concours de fabrication de tortues en matériaux les plus divers (exposition le 23 avril au cours de l'Assemblée Générale de l'A.S.N.N.C.),
  - . concours d'auto-collants réservé aux jeunes : ceux-ci devront chercher à se procurer, à travers le monde, des auto-collants représentant des tortues,
  - . jeu-concours à l'aide de cartes numérotées fixées à des tortues chiffons qu'on pouvait se procurer auprès de l'Association ou par l'intermédiaire des coopératives scolaires. Des tirages au sort avaient lieu tous les quinze jours, permettant de gagner des tortues-chiffon et des voyages à l'Ile des Pins,
- distribution d'affiches et d'auto-collants.

IMP. GRAPHOPRINT

SPC
Noumea

4 Dec. 1980

Dear George,

Many thanks for your letter of 29 October and the very interesting enclosure. Excuse me for not replying sooner but we have been "up to our eyeballs" with the annual fisheries meeting. You will be pleased to know we now have a new Fisheries Advisor, Mr Barney Smith who will take up his appointment in February.

Yes, you are quite right, it was entirely due to the diplomacy of René that the turtle workshop was held. Fortunately I am now much more familiar with the way things work here at SPC and am confident that we will be able to publish info. on turtles in the Fisheries Newsletter. However they feel about turtles (and their attitude is I suppose understandable considering the Cook Islands debacle) SPC is obliged to publish this information because it was a formal recommendation of the Workshop that this should be done.

Unfortunately I haven't had any word from Peter Pritchard — although as I understand it he should be here now. I would certainly be interested to receive a copy of his project proposal. sent

I hope your trip to Rose Atoll was successful. When you go to W. Samoa, Bill Travis can be contacted C/O Fiddlers' Green Fishing Company, Apia. You will find Bill is very subdued these days due to various financial difficulties.

Regards

Mark Geale.

PS — over page

A Samoan man has just told me that the W. Samoan Fisheries dept. believes one of its hawksbills has been positively identified & caught in Tonga. The Tongan fisheries people know nothing about it unfortunately. All these reports (like Alphonso's assertion that hatchery reared ♀'s have come back and laid eggs) rest on the assumption of course that nothing the shell gives a tag that can be positively identified after several years.

Association pour la Sauvegarde de
la Nature Néo-Calédonienne
37 rue G. Clemenceau
B.P. 1772 - NOUMEA

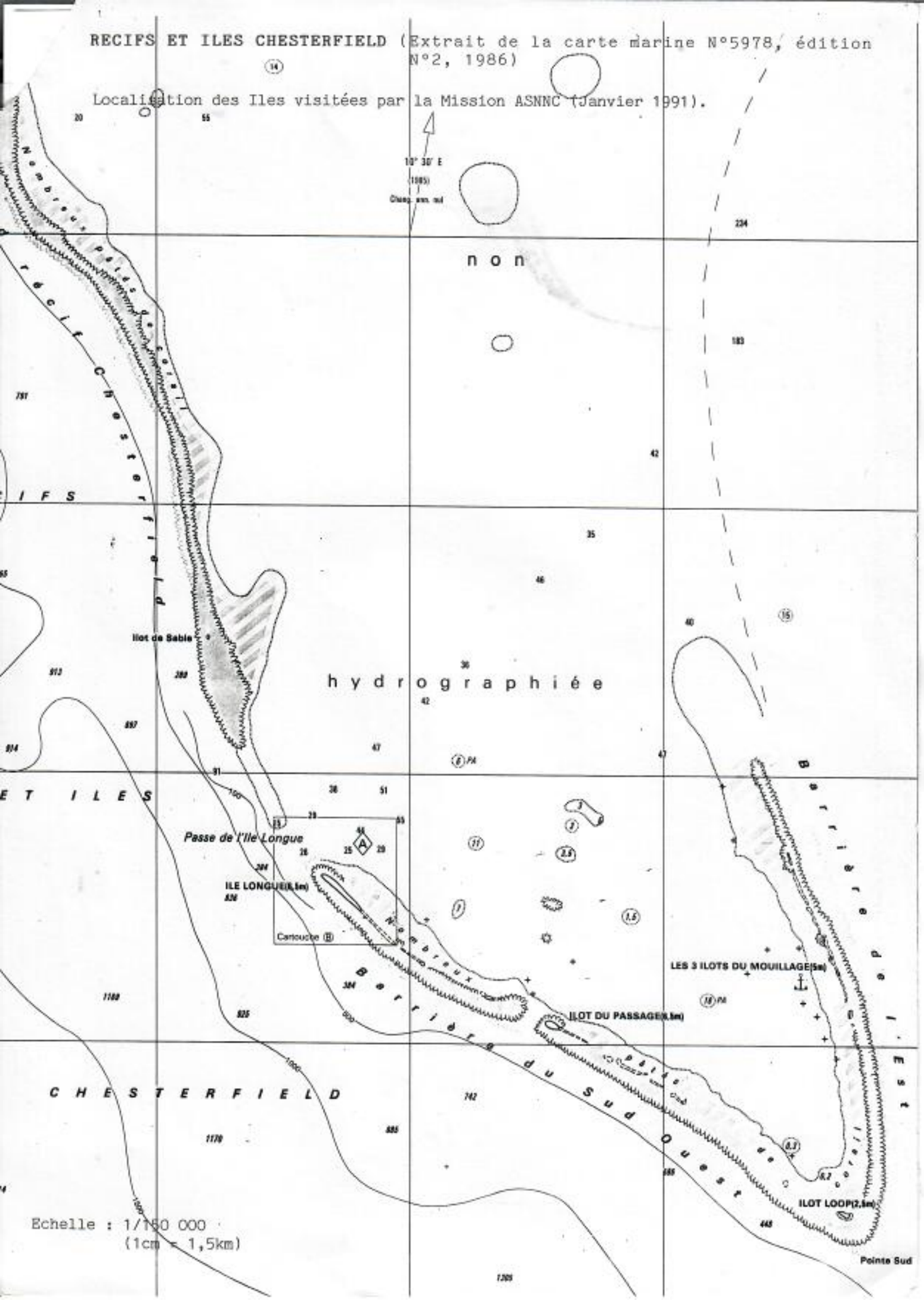
RAPPORT MISSION D'OBSERVATION

DU 21 AU 25 JANVIER 1991

AUX ILES CHESTERFIELD

RECIFS ET ILES CHESTERFIELD (Extrait de la carte marine N°5978, édition N°2, 1986)

Localisation des Iles visitées par la Mission ASNNC (Janvier 1991).



Un des centres d'intérêt majeurs de l'A.S.N.N.C. est actuellement l'étude et la protection des tortues marines. Suite à une invitation émanant de la Marine Nationale elle a envoyé six personnes en mission aux Chesterfield, îles dans lesquelles la présence de tortues a été signalée au cours de voyages antérieurs, mais où elles n'ont pas, jusqu'ici, fait l'objet d'études systématiques.

L'originalité de cette dernière mission était, non seulement l'étude la plus précise possible des activités des tortues, mais leur baguage après la ponte, dans le cadre du RMTP, ou "Regional Marine Turtle Conservation and Management Programm".

Il apparait nécessaire de préciser tout d'abord que toutes les études réalisées dans le monde, depuis une décennie au moins montrent une diminution rapide du nombre des tortues marines dans la plupart des régions qu'elles fréquentent.

Or, si l'adoption de mesures législatives de protection de cette espèce en danger de disparition représente un premier pas vers sa protection, les spécialistes sont d'accord pour reconnaitre qu'actuellement une démarche plus dynamique s'impose : l'efficacité de la protection voulue passe obligatoirement par une meilleure connaissance du mode d'existence des tortues, en particulier de leurs déplacements. En effet, on cite des déplacements sur une distance de 3000 Kms, entre les lieux de ponte et les régions où ces animaux trouvent habituellement leur nourriture.

Une action concertée s'impose donc entre les pays concernés du Pacifique et c'est pourquoi l'ASNNC se trouve en relation notamment avec des spécialistes américains, les professeurs Peter Pritchard (Floride) et G.H. Balazs, du "Sea Turtle Tag Center of the Pacific", à Honolulu. A Nouméa même, Monsieur Peter Thomas, du Programme Régional Océanien de l'Environnement auprès de la C.P.S., a fourni à la mission un matériel de baguage de tortues et mis sa documentation à sa disposition.

Participants à la Mission :

- SIRGOUANT Serge
- JACQUIER André
- BONNEROT Jean
- LEDUCQ Yves
- COUZY Claude
- SINTES René

En plus de ces six personnes envoyées par l'ASNNC, la Marine Nationale a transporté aux Chesterfield trois chercheurs de l'ORSTOM, chargés de l'exécution d'un programme indépendant.

Programme de la Mission A.S.N.N.C.

Dans le cadre esquissé plus haut, les membres de la mission étaient chargés de remplir des fiches techniques d'observation des tortues marines rencontrées : données précises sur le lieu et le temps, l'espèce, le nombre et éventuellement la ponte.

D'autre part, toute tortue rencontrée à terre devait être mesurée, baguée et toutes les données de l'opération consignées sur des fiches spéciales.

Ces tâches devant être effectuées, selon toute probabilité, de nuit, la journée allait être utilisée au comptage des traces de tortues, à leur classement par degré d'ancienneté, ainsi qu'à l'étude du potentiel végétal et ornithologique des îles touchées. Enfin il était prévu la plantation d'une trentaine de cocos sur deux îlots différents.

La réalisation du programme prévu devait obéir aux exigences de temps et de lieu imposées par les données météorologiques et par les objectifs militaires du navire transporteur.

Le transport :

Le voyage et les différents déplacements dans l'archipel ont été assurés par le patrouilleur "LA MOQUEUSE", commandant Pistor.

Il faut souligner ici l'aide fournie (à cette occasion et déjà à plusieurs reprises) par la Marine pour une meilleure connaissance de la Nature du Territoire et par conséquent pour sa conservation.

A leur retour les membres de la mission ont tous insisté sur l'hospitalité à bord, la gentillesse et la disponibilité de tout l'équipage ainsi que l'intérêt porté à leur action. Nous remercions ici très vivement la Marine Nationale, le Commandant Pistor et ses hommes sans lesquels la mission n'aurait pu avoir lieu.

Chronologie :

Lundi 21 Janvier 1991 : Appareillage à 7h00 précises

Mardi 22 Janvier 1991 : - Arrivée dans le lagon des Chesterfield vers 9h00
- 12h30 : transport de quatre membres de la mission et du matériel sur l'ilôt Loop. Les deux autres membres partent avec leur propre zodiac vers les îlots du Mouillage en vue d'une reconnaissance rapide.
- A 18h00, ils arrivent à l'Îlot Loop.
- de jour : comptage des traces de tortues et revue de la végétation et des différentes espèces d'oiseaux présents, en particulier des sternes, fous et noddis.
- plantation de 23 cocotiers sur l'Îlot Loop
- plantation de 13 cocotiers sur les îlots du Mouillage
- nuit sur l'Îlot Loop, observation complète de la ponte d'une tortue verte (Chelonia mydas) et baguage.

Mercredi 23 Janvier 1991 : - retour à bord de la Moqueuse et appareillage à 8h30
- à 13h00, débarquement sur l'ile Longue (température 34°)
- jusqu'à 15h30 : tour de l'Île, comptage des traces de tortues, traversée de l'Île, vue d'ensemble des oiseaux et de la végétation.
- 16h15 départ de l'Île Longue et retour au mouillage antérieur.
- 18h30 : débarquement aux Îlots du Mouillage
- nuit sur un des ilôts, 2 tours des îlots, vers 20h00 et vers 3h00 du matin ; comptage des traces de tortues. Vue générale de la végétation et des oiseaux.

Jeudi 24 Janvier 1991 : - 10h30 - 11h00 : retour à bord et départ pour Nouméa en début d'après-midi.

Vendredi 25 Janvier 1991 : arrivée à Nouméa (Pointe Chaleix) vers 16h00.

Observations et remarques :

1/ L'étude des Tortues marines, priorité de la mission, a, sur chaque île, commencé par l'examen et le dénombrement des traces laissées dans le sable des plages. Dans le tableau ci-dessous, les traces ont été classées en trois rubriques : très récentes (de moins de 2 jours), fraîches (moins de 7 jours) et anciennes. Il a paru opportun également de séparer celles situées côté océan de celles qui se trouvaient côté lagon.

	Côté Lagon	Côté Océan	Total
- ILE LOOP			
. en notre présence	2	0	2
. anciennes	2	2	4
			6 traces

.../...

	Côté Lagon	Côté Océan	Total
- ILE LONGUE			
. très récentes	13	41	54
. fraîches	21	30	51
. anciennes	120	116	236
			341 traces
- 3 ILOTS DU MOUILLAGE			
. en notre présence	2	0	2
. très récentes	20	4	24
. fraîches	38	6	44
. anciennes	6	2	8
			78 traces

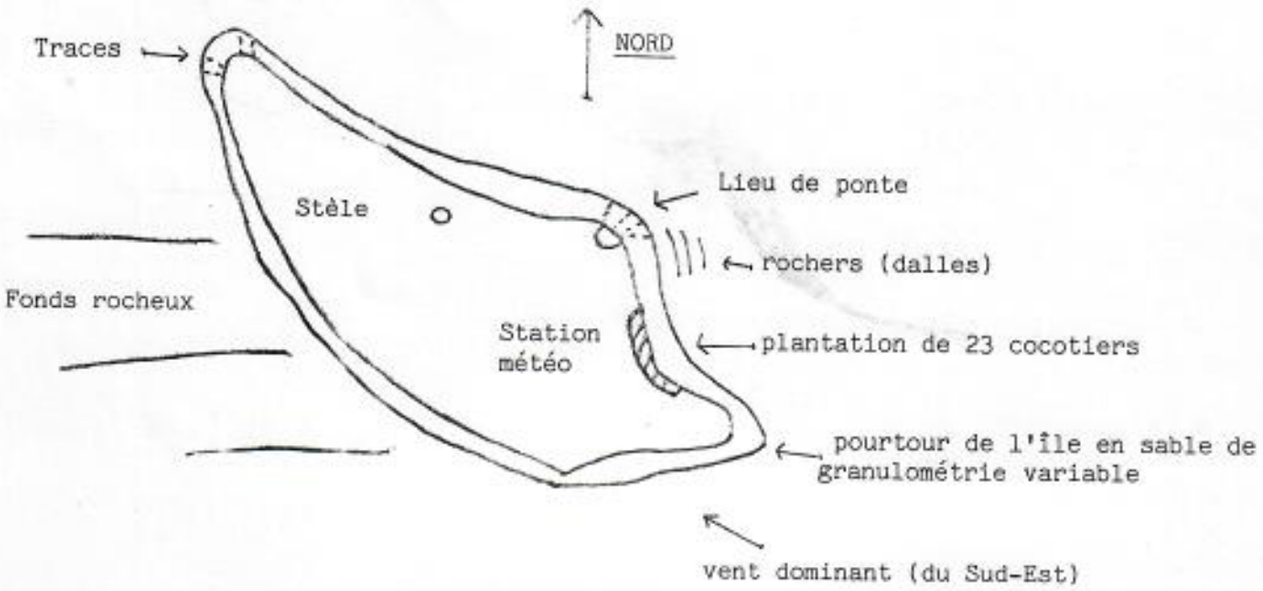
Le total général des traces, sans distinction de leur ancienneté, atteint 425 traces, réparties entre côté lagon : 224 traces
côté océan : 201 traces
Que peut-on déduire de ces chiffres ?
D'abord qu'ils représentent un minimum, étant donné que les fortes pluies tombées sur les Chesterfield les mardi 22 et mercredi 23 Janvier ont du effacer un certains nombre de traces vieilles de plusieurs semaines.
Ce sont donc au moins 212 tortues qui sont montées à terre en l'espace de moins d'un mois. Contrairement à ce qui semble s'être produit dans des pays voisins cette année, les tortues sont venues aux Chesterfield, à raison de 7 à 10 tortues en moyenne par nuit et pour les trois îlôts visités par la mission. Il est difficile de conclure qu'elles ont toutes pondu.
S'agissant maintenant de la répartition des traces entre les côtés lagon et océan, nos observations donnent une importance en gros égale aux deux expositions. Ces résultats ne concordent donc pas avec ceux de Mrs SUPRIN et KUSSER, dans leur rapport du 14 février 1990 sur une mission effectuée en décembre 1989 aux Chesterfield. Page 7, il y est remarqué, au sujet de l'ile Longue : "les traces sont comme sur l'ile Loop toujours du côté océan. Coté lagon, on n'en dénombre que quelques-unes"
Ce qui nous a semblé déterminant pour la localisation des traces et, pour l'essentiel, des nids, c'est la configuration de la plage. En général, une plage de sable en pente relativement douce (égale ou inférieure à 20%) et prolongée sous l'eau par des fonds sableux ou de dalles sans grosses aspérités parait avoir la préférence des tortues. Enfin, un facteur de localisation non négligeable pourrait être celui de l'amplitude des marées : à la pointe Sud-Est de l'Ile Longue par exemple, côté océan, quelques rares traces indiquent que les tortues ont dû passer par dessus des chaos de blocs rocheux afin d'atteindre leurs lieux de ponte. A nos yeux, cette prouesse n'a été possible que lors de marées de vives eaux.

Nous n'avons observé, en dépit de multiples "rondes" nocturnes, que la ponte d'une seule tortue, de l'espèce verte (Chelonia mydas). Sur la fiche de mensuration et de baguage figurent les renseignements suivants : (Ile Loop, mardi soir 22 Janvier)

Temps total de la montée à terre : 2h10
Sortie : 20h20 (marée basse à peine montante, léger clair de lune)
Début du creusement du nid : 20h55
Durée de la ponte : 21h40 à 21h54 (14')
Retour à la mer : 22h30
Espèce : tortue verte
Mensuration : 98cm X 98 cm
Profondeur du nid : 40 cm
Marquage : gauche A1
droite A3 à l'arrière des pattes antérieures, dont l'une (la droite) est amputée d'un tiers, probablement par morsure de requin.
Nombre d'oeufs pondus : 102
Les bagues et le matériel de baguage ont été fournis par ~~Writo~~ Himb University Hawaii, Georges Balazs, Honolulu Laboratory.

.../...

Schéma de localisation du lieu de ponte sur l'îlot Loop



Echelle : 1 / 2.000

Remarque : le fait de n'avoir rencontré qu'une seule tortue en action de ponte, en dépit des nombreuses traces dénombrées, conduit à supposer que les faibles amplitudes des marées (Om80 maximum pendant notre séjour) ne sont pas favorables à la montée des tortues, ni d'ailleurs l'heure tardive de la marée haute (vers 2-3h du matin) qui pouvait obliger la tortue à révéler l'emplacement de son nid à d'éventuels prédateurs et à souffir des premiers rayons solaires.

Enfin, la fin Janvier pourrait être une période trop tardive pour une mission ultérieure sur les mêmes lieux.

PROPOSITIONS :

a/ il est évident que cette expérience d'observation et de marquage des tortues marines aux Chesterfield devrait être répétée si l'on veut commencer à avoir connaissance de quelques caractéristiques de la vie de cet extraordinaire animal et donc à mieux le protéger. Cependant, il serait souhaitable de prévoir :

- une durée de mission plus longue, de l'ordre de 8 à 10 jours
- un calendrier indépendant d'influences extérieures. Malgré leur extrême disponibilité et compréhension, les marins doivent réaliser un programme qui ne peut cadrer complètement avec celui de chercheurs de l' A.S.N.N.C.
- une date moins tardive semble t-il et
- des marées plus importantes, avec des heures de haute mer dans la première partie ou au milieu de la nuit.

b/ Pour des raisons tout à fait identiques à celles exposées par Monsieur Bernard SUPRIN dans son rapport et dans son article publié dans les Nouvelles Calédoniennes du 27 mars 1990, nous croyons urgent de recommander la création d'une réserve spéciale de faune qui comprendrait l'ensemble de l'archipel des Chesterfield.

Monsieur SUPRIN proposait la création d'une seule réserve ornithologique. Nous voudrions que les tortues marines y bénéficient de la même protection totale:

-d' abord, parce que chacun sait maintenant qu'il s'agit d'une espèce en danger de disparition, l' homme en étant devenu parfois le prédateur principal; déjà sans son intervention, seulement 2 à 3 pour mille au maximum des jeunes parviennent à l' âge adulte (Rancurel, Nature Calédonienne N°7).

- ensuite parce qu'il faut constituer partout où cela est possible (et c'est tout à fait possible aux Chesterfield), un des rares sanctuaires de la planète où l'intrusion de l'homme sera réglementée, afin de ne pas compromettre le fragile équilibre de l'écosystème océanique et de conserver ainsi des espèces dont on commence à peine à découvrir le fabuleux monde d'existence.

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- Articles parus dans les "Nouvelles-Calédoniennes" :
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. "La Dunkerquoise aux Iles Chesterfield" (17 Juillet 1980)
. "Mission météorologique, hydrographique.... avec la Dieppoise" (19 Janvier 1983)
. "Les Chesterfield", en une série de 4 articles, Mars 1990 -par Bernard Suprin-
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ASSOCIATION POUR LA SAUVEGARDE DE LA NATURE NÉO-CALÉDONIENNE

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NOUMÉA - NOUVELLE CALÉDONIE
Tél. 28.32.75 — C.C.P. 86-89 C

- FICHE D'OBSERVATIONS -

TORTUES MARINES

(A retourner à l'Association pour la Sauvegarde de la Nature Néo-Calédonienne)
Indiquer les renseignements connus ou cocher la case correspondante.

. DATE : ..... HEURE : .....

. LIEU : .....

LONGITUDE : ..... LATITUDE : .....
ORIENTATION : .....
LONGUEUR DE LA ZONE : ..... LARGEUR : .....
NATURE DU SOL : .....

. RENSEIGNEMENTS METEO :

VENT : FORCE..... DIRECTION.....
TEMPERATURE : MER..... AU SOL.....
CIEL : BLEU (ou étoilé) ☐ NUAGEUX ☐
MER : CALME ☐ AGITEE ☐ FORTE ☐

. ESPECE DE TORTUES OBSERVEES

VERTE ☐ CAOUANNE ☐ IMBRICATA ☐ LUTH ☐

. NOMBRE DE TORTUES

SUR TERRE : ..... EN MER : .....
EN ACTION DE PONTE : .....
TRACES : .....
ANCIENS NIDS : ..... SITUATION : .....
NOUVELLES TRACES (entre 2 marées basses) : .....

. PARTICULARITES :

ANIMAL MORT (ou échoué) ☐ BLESSURES :..... CICATRICES : .....

. PONTE

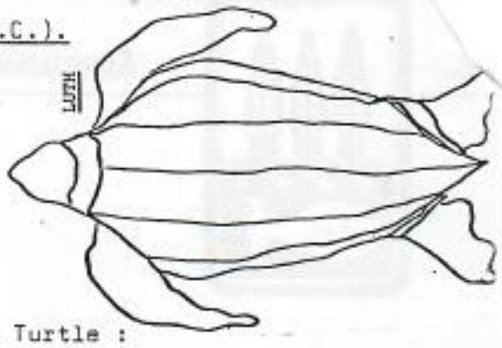
HEURE DE MONTEE : ..... HEURE DE MISE A L'EAU : .....
TEMPS POUR TROUVER L'EMPLACEMENT : .....
CREUSER LE TROU :.....
PONDRE : .....
FERMER LE TROU :.....
EFFACER LES TRACES :.....
RETOURNER A L'EAU :.....
NOMBRE D'OEUFS :.....
NID : DIAMETRE :..... DISTANCE A LA MER : .....
SITUATION : SABLE ☐ HERBES ☐ ARBRE ☐
AUTRE :.....
LA TORTUE A-T-ELLE CREUSE UN FAUX NID ? OUI ☐ NON ☐

. BAGUES :

	GAUCHE	DROITE
ANCIENNES : (REFERENCES) :		
NOUVELLES : (REFERENCES) :		

IDENTIFICATION DES TORTUES MARINES (N.C.).

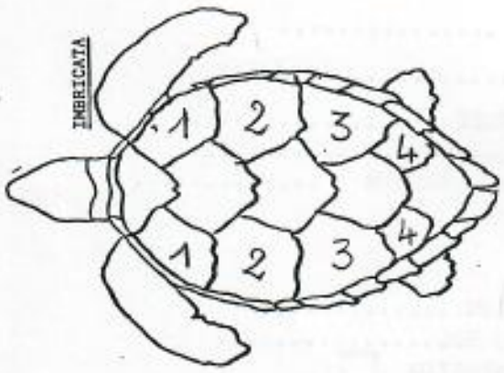
1/ TORTUE LUTH (Dermochelys coriacea) Leatherback Turtle :

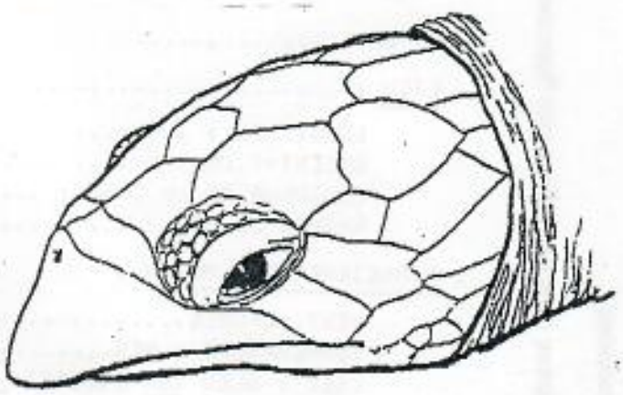


- tête, membres et carapace sans écailles
- carapace divisée longitudinalement par 7 (ou 5) carènes
- dos de couleur sombre et moucheté
- dimensions maxi : longueur 190cm, tête 25cm, poids 600 Kgs.

2/ TORTUE BONNE ECAILLE (Eretmochelys imbricata) Hawksbill Turtle :

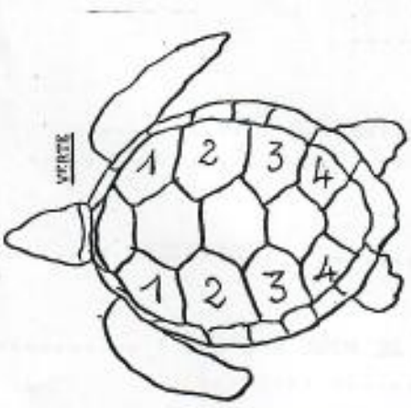
- écailles imbriquées dont 4 paires latérales
- couleur dorsale variable, souvent marron avec raies ou points clairs ou foncés
- dimensions maxi : longueur 90cm, tête 12cm, poids 80 Kgs.

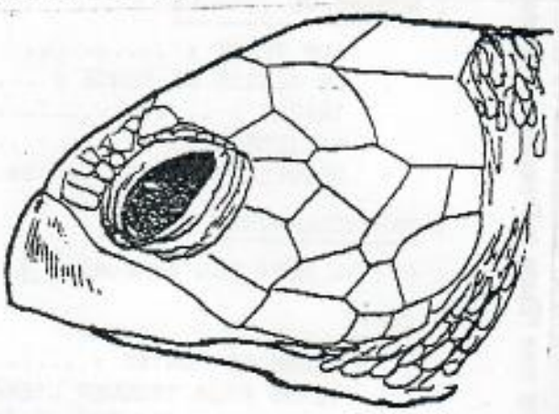




3/ TORTUE VERTE (Chelonia mydas) Green Turtle :

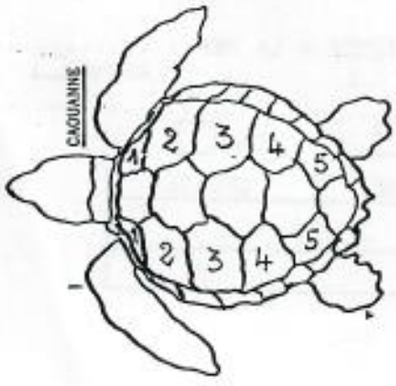
- carapace à écailles non imbriquées ; 4 paires latérales
- couleur variable : brun clair à presque noir
- dimensions maxi : longueur 125cm, tête 15cm , poids 230 Kgs.

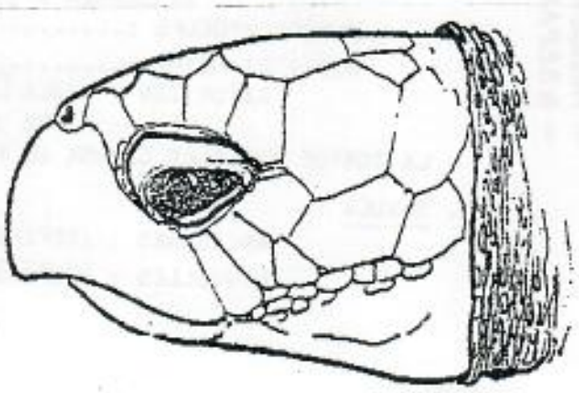




4/ TORTUE CAOUANNE (Caretta caretta) Loggerhead Turtle

- carapace à écailles non imbriquées, 5 paires d'écailles latérales,
- couleur : brun-rougeâtre, dimensions maxi : longueur 120cm, tête 25cm, poids 200 Kgs.





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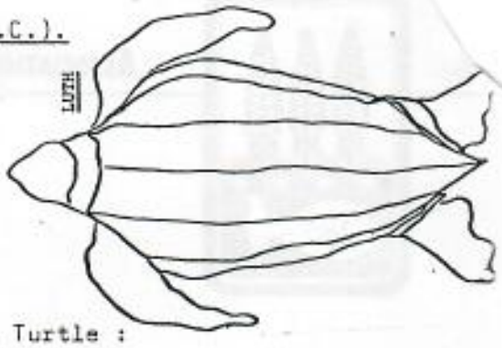

- tête, membres et carapace sans écailles
- carapace divisée longitudinalement par 7 (ou 5) carènes
- dos de couleur sombre et moucheté
- dimensions maxi : longueur 190cm, tête 25cm, poids 600 Kgs.

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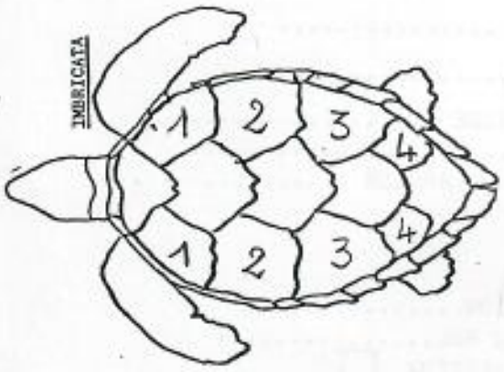
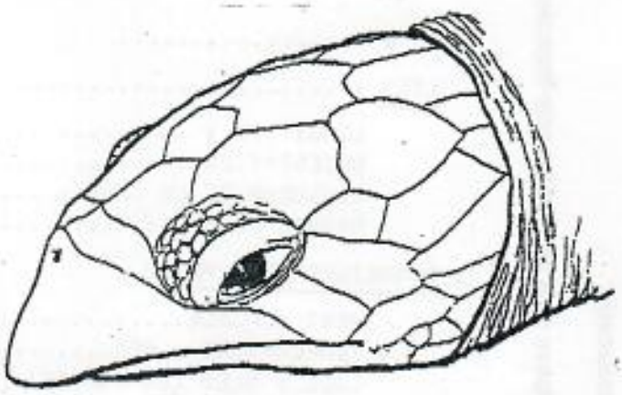
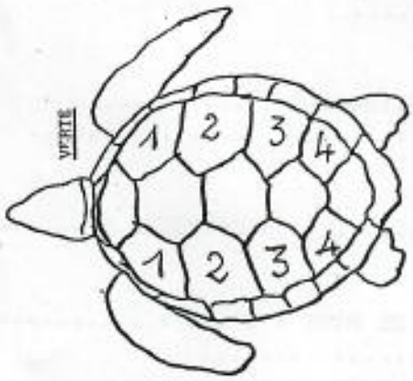
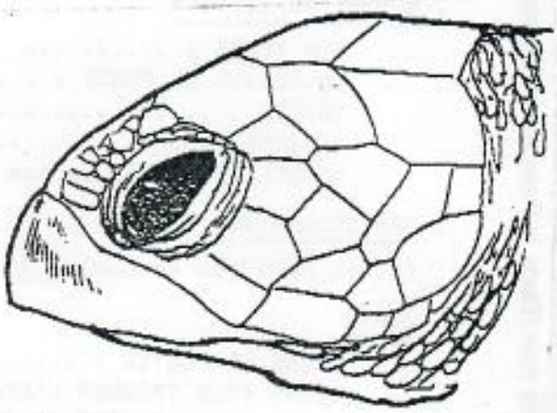




3/ TORTUE VERTE (Chelonia mydas) Green Turtle :

- carapace à écailles non imbriquées ; 4 paires latérales
- couleur variable : brun clair à presque noir
- dimensions maxi : longueur 125cm, tête 15cm , poids 230 Kgs.





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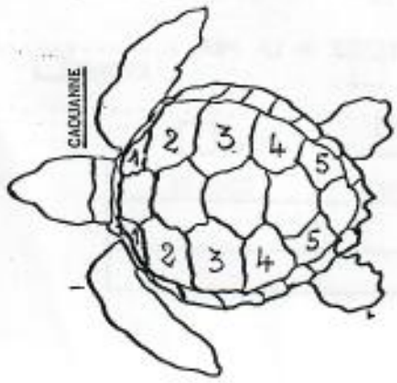

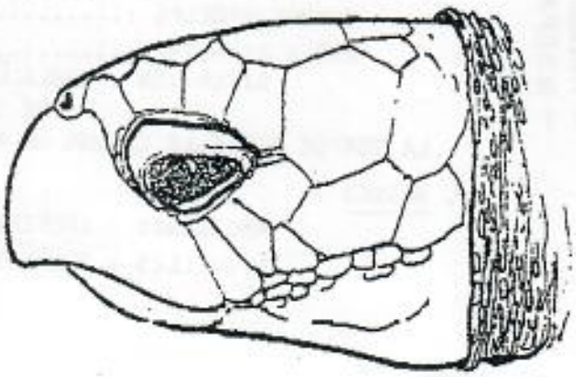

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- FICHE DE BAGUAGE ET DE MENSURATION - (TORTUES MARINES)

(A retourner à l'Association pour la Sauvegarde de la Nature Néo-Calédonienne)

- A REMPLIR AU CRAYON DE PAPIER -

DATE : ..... HEURE : ..... LIEU : .....

ESPECE :

VERTE ☐ CAOUANNE ☐ IMBRICATA ☐ LUTH ☐

SEXE (si connu) : MALE ☐ FEMELLE ☐

MENSURATIONS : LONGUEUR :..... LARGEUR : .....

BAGUES :

	GAUCHE	DROITE
ANCIENNES : (REFERENCES) :		
NOUVELLES : (REFERENCES) :		

ACTIVITES DE LA TORTUE : .....

OBSERVATIONS : .....

DATE : ..... HEURE : ..... LIEU : .....

ESPECE :

VERTE ☐ CAOUANNE ☐ IMBRICATA ☐ LUTH ☐

SEXE (si connu) : MALE ☐ FEMELLE ☐

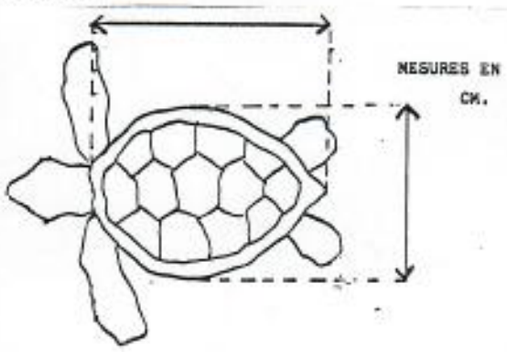
MENSURATIONS : LONGUEUR :..... LARGEUR : .....

BAGUES :

	GAUCHE	DROITE
ANCIENNES : (REFERENCES) :		
NOUVELLES : (REFERENCES) :		

ACTIVITES DE LA TORTUE : .....

OBSERVATIONS : .....



SEA TURTLES IN NEW CALEDONIA

Peter C. H. Pritchard, Ph.D.

REPORT OF A LITERATURE SURVEY AND FIELD INVESTIGATION

1. BACKGROUND

New Caledonia is an Overseas Territory ("Territoire d'Outre-mer") of the Republic of France. The principal island, or "Grand Terre," is about 400 km in length and up to 50 km in width, and is thus one of the largest oceanic islands of the Pacific Ocean. The island is situated obliquely (in a northwest-southeast direction) in the southwestern Pacific, between latitudes 18 and 22 degrees south, and longitudes 163 and 168 degrees west. The island of Grand Terre has an area of 16,750 sq. km., but the entire complex (including the Loyalty Islands of Lifou, Tiga, Maré, Ouvea, and Beautemps-Beaupré; Walpole Island; the Iles du Nord (Belep, Huon, Surprise, Fabre, and Leleizour), and Ile Huon and the Ile des Pins in the south) has a combined area of 19,103 sq. km.A mountain chain that includes some of the world's most important reserves of nickel runs the length of the island, with many peaks of over 1000 meters, and with two of over 1600 meters.

The island is entirely tropical, but the southern extremity lies sufficiently close to the south temperate zone to be subject to surprisingly cool spells during the southern winter months. Different parts of the island are subject to quite different rainfall regimens, the northeastern slopes in general being much moister than those of the southwest. The warmest months are December to February, and the coolest July to September. Tropical cyclones, sometimes of great intensity, are liable to strike the islands during the late summer months. Twenty-nine cyclones were registered during the last hundred years, with more in March than in any other month.

The island complex has a population of about 150,000, of which the "Kanaks" or native Melanesians comprise about 46%; Europeans (nearly all French) comprise about 41%; and the remainder is composed principally of Wallisians, Tahitians, and Indonesians.

The islands of New Caledonia are encircled by a prodigious reef system that, to the northwest, extends well beyond the limits of Grand Terre. The two principal barrier reefs paralleling the coasts of New Caledonia have an aggregate length of over 800 km, and the passes are few and narrow enough as to make extremely strict demands upon accurate navigation by ships approaching New Caledonia from the open Pacific. To the north, the barrier reefs are replaced by extensive, meandering atoll formations in the d'Entrecasteaux system. The Loyalty Islands lie well outside the boundaries of the New Caledonia reef. The larger Loyalties are somewhat elevated and geologically complex, but the northwestern islands of Ouvea and Beautemps-Beaupré are irregular atolls, in the latter case with only a miniscule island and a sandbar emergent above the sea.

2. SEA TURTLE SPECIES PRESENT

Within the waters of New Caledonia, three species of sea turtle are seen frequently. These are: The Green Turtle or Tortue Verte (Chelonia mydas); the Hawksbill or Tortue des Bonnes-Ecailles (Eretmochelys imbricata); and the Loggerhead of Grosse-Tête (Caretta caretta). Definite records are lacking for other genera, although Lepidochelys olivacea, Dermochelys coriacea, and Natator depressus all occur in Australian waters (although only Natator abundantly), 1500 km to the west.

A single observation hints at the possibility of massed nesting by Lepidochelys olivacea in the New Caledonia system. R.A. Childers (Pers.

comm.) reported to me some observations made by J. Yates of an estimated 20,000 sea turtles, each about 60 cm in length, in a massive flotilla near Ouvea, in the Loyalty Islands,in November 1975. Conceivably, these turtles could have been L. olivacea aggregating in preparation for an arribada, or massed nesting emergence. The estimated size corresponds to that of adult L. olivacea, and no other sea turtle species is known to gather in anything like these numbers.

3. HISTORICAL RECORDS OF SEA TURTLES IN NEW CALEDONIA.

The important turtle nesting islands of New Caledonia lie well north of Grand Terre, in the vast and complex d'Entrecasteaux reef system. The reef was explored by, and named after, Admiral d'Entrecasteaux, who discovered the islands of Surprise and Huon in July, 1792, and described the associated reef as the most dangerous he ever saw. Ile Surprise, an oval, forested island measuring about 600 m by 400 m, was so named by d'Entrecasteaux because he thought he had already passed the last islands of the New Caledonia complex as he navigated northwards. In fact, there are three small islands still farther north, all important for turtle nesting. These were named North, Middle, and South Huon (after Huon de Kermadec, Commander of the "Esperance") by d'Entrecasteaux, but only the northernmost retains the name Huon today. The other two have been called Fabre (after the pilot G. Fabre, 1841-1891), and Leleizour (after the pilot A. L. Leizour, 1834-1886), respectively.

A critical early account of the turtles of the d'Entrecasteaux Islands is that of Billings (in Chimmo, 1856). Billings was the master of a junk, the Ningpo, that sailed from Hong Kong on April 15 1854, and subsequently ran aground on a reef about six miles from Leleizour and Fabre on July 28. Few turtles were found at first, but the shipwrecked party was forced to

stay on the islands until rescue came on October 26. Around or after August 27, "every preparation was now made for a long sojourn on the island by keeping a vigilant look-out for turtle, which now began to come on shore in great numbers. Two large pens were built, and upwards of eighty, weighing on an average 5 cwt, were put into them.

"The pens being full they commenced drying the flesh of others to provide against the time when they would desert these shores; which they do during the months of November and December, after depositing their eggs, and return as early as July, increasing daily from this period. They were so numerous in September that the master turned twenty-seven one morning without wetting his feet, and he counted eighteen more asleep in about six inches of water, which could have been captured without difficulty."

The rescue ship, H.M.S. "Torch," was also victualled in part by turtles; McDonald (in Chimmo, 1856) reported that during this ship's stay in the Huon Islands, "we had rather extensive practice in turtle turning; these animals coming up in considerable numbers to reconnoiter the ground for depositing their eggs."

The turtles seen by Billings and by McDonald were green turtles (Chelonia mydas), although there are some discrepancies in the account -- for example, the average weight ("5 cwt" = 254 kg) seems excessively high, and the reported nesting season seems to be earlier than that of today. Nevertheless, during the subsequent century, no further reports were made, and Parsons (1962), in his book "The Green Turtle and Man," simply presented a few lines summarizing Billings' observations, and added the words: "One wonders whether they still haul up there today, and in what numbers."

The turtles are still there. In December 1979 I was part of an aerial

survey group that overflew the reef at low altitude, and we confirmed that on all four of the islands in question (i.e. Surprise, Leleixour, Fabre, and Huon), turtles were still nesting in large numbers. In fact, the islands gave the appearance of being nested to capacity, with the beaches and dunes covered with their tracks and nest pits. No turtles were seen on land at the time of our survey, and it is possible that the daytime basking habit either occurs at other times of the year or has been abandoned, but there were many turtles swimming in the adjacent shallows, and these appeared to be green turtles.

Shortly after our aerial survey. but probably rather close to the end of the nesting season, the French Navy ship "La Dunkerquoise" visited Huon Island on 10-11 February 1980. In the ensuing report (Anon, 1980), Huon Island was described as about 3 km in length (including the elongate sandbanks), a maximum of 200 m wide, and with only 12 of the 200 ha surface with any vegetation (a single species of creeper). The latter appears to represent an even more reduced flora than that encountered by McDonald (in Chimmo, 1856), who found that "the few herbaceous plants to be seen are only such as love a dry and sandy soil, and the spare foliage of the stunted trees scarcely afford any shelter to the young of the fish-hawk, booby, and noddy..." Nevertheless, turtle nesting density was impressive; 20 ha were used for nesting, of which a single 50 x 50 m sample contained approximately 140 nest pits, about 25 percent of which were 48 hours old or less. There was abundant evidence of hatchling emergence (i.e. suggesting major nesting about two months earlier), and about fifteen dead and decaying adult turtles were seen on the island. Around the shores of the island, fresh tracks (24-48 hours old) were situated

at an average density of 25 per 100 meters. Clutch sizes were reported to be 60 ± 20 -- surprisingly few.

Calculations based upon these figures suggest 25 x 60 = 1500 emergences over the entire 6-km perimeter of the island over a 2-night period. The numbers of nests in the same period, calculated from the area mentioned above, would be 35 x 4 x 20 = 2800. However, actual observations during a 4-hour period one night revealed only about 50 nesting emergences. It therefore appears likely that the nests and tracks had accumulated over more than 24-48 hours. The reported average size of the turtles (carapace length approximately 1.4 m; width approximately 0.9 m) is entirely compatible with Billings' account of an average weight of 5 cwt, but this is still enormous -- comparable to the record known size for a green turtle anywhere, and greatly in excess of the average size for any known population -- and confirmation is needed. If they are not actually measured and weighed, it is very easy to overestimate the size and weight of large sea turtles.

Richer de Forges and Bargibant (1985) reported on an oceanographic mission to the d'Entrecasteaux Reefs in February-March 1985, aboard the N.O. "Vauban." They commented upon the serious errors in existing charts of this region, most of which are derived from "Carte Marine du S.H. No. 4310 est" (1/300,000), prepared in 1888. The chart provided in their fig. 1 represented a considerable improvement; it had been prepared by the ORSTOM Geophysical Laboratory in collaboration with the Mission Océanographique du Pacifique, using aerial photography and satellite imagery. Richer de Forges and Bargibant made only brief comments upon turtles, but observed that nesting occurred in the islands from November to February. However,

nesting was almost finished during their visit at the end of February, with only eleven fresh tracks on Huon and only two on Surprise. But hatching was in progress on Huon, and a number of hatchlings were found in the vegetation in the center of the island.

3. RESULTS OF CURRENT INVESTIGATION

On February 17 1987 I chartered a twin-engined Cessna 310 aircraft in Nouméa in order to conduct an aerial survey of the d'Entrecasteaux Reef islands. Aymeric de Surmont of the Service de la Marine Marchande accompanied me, and we left Magenta Airport (Nouméa) in clear, sunny weather at 11.40 a.m. We arrived and landed at Ile Belep at 1.12 p.m., by which time low cloud cover was almost complete.

About two hours later we took off and flew north for the aerial survey. However, despite extensive searching with both a professional French pilot and a traditional Melanesian navigator aboard the aircraft, we failed to find any of the islands. After about three hours circling over featureless waters we returned to Belep, navigating by the radio beacon on the island. In retrospect, I believe this disappointment stemmed from several causes: the pilot utilized a chart of too small a scale (he used a standard aerial navigation chart whose coverage extended from Australia to Vanuatu); existing charts for the most part do not plot the positions of the islands accurately; the weather was very cloudy by the time we left Belep, and this greatly restricted the lateral span of ocean that could be surveyed from a given flight path; and although the Melanesian navigator probably knew where we were at all times -- and also where the islands were -- it is difficult, under the stressful

and noisy conditions of a small aircraft, to debate the merits of different courses in a foreign tongue, or to convince a French pilot that he may have made a mistake.

Nevertheless, I believe the data gathered from the interviews were more important than anything we could have seen from the air. We were, by all recent accounts, well past the peak of the nesting season in February, and it would have been essentially impossible to derive useful quantitative population data from the confusion of old nest pits and relatively few fresh tracks that we would probably have seen.

On Belep, we interviewed two leaders of the Belemas Tribe (Commune de Belep), Wahouo Gerard and Thale Phillippo. The latter was captain of the Albatros, a motor vessel provided by the French Government to the community, and which was used, among other purposes, for voyages to the d'Entrecasteaux Islands. Information garnered from these two individuals about turtle nesting in Belep and the d'Entrecasteaux Islands may be summarized as follows:

In the waters around Belep itself, three species of sea turtle are found (species and vernacular names as given above). These are reportedly of comparable abundance, and juveniles (from about 40 cm) up to adult sizes are found. The green turtle and the hawksbill are considered excellent eating, while the loggerhead is thought distinctly inferior.

On Ile Art itself (i.e. the principal island of the Belep group), some nesting occurs in November and December, but not much. Nesting there only occurs at night (contrasting with the day or night nesting on Ile Surprise). Some of the older men of the village claim to be able to distinguish the species of sea turtles by their eggs, but in general

younger men could not. (Eggs of the green turtle should be distinguishable by size alone from those of the loggerhead and hawksbill, but the eggs of the latter two species are very similar). On Ile Surprise, nesting is primarily by green turtles, but a few loggerheads and hawksbills may be seen also.

Travel to the northern islets from Belep has been made much easier by the availability of the motor vessel Albatros, donated to the Community of Belep by the government. Nevertheless, only occasional trips were made, and few turtles were collected. Two trips to Ile Surprise had been made in late 1985, and one at the end of 1986. The expeditions took the form of a "community outing," with several families, totalling 20-25 people, travelling; but only one turtle was collected by each family. In his early years, the informant had only been to Ile Surprise once (by sailboat).

Ile Surprise has adequate turtles to supply all possible demand in Belep, but the more distant islands of Leleizour, Fabre, and Huon are visited occasionally, largely for traditional reasons (since the islands are also the property of the Belemas Tribe of Belep) rather than for strictly utilitarian purposes. Towards the north, the numbers of nesting turtles increase progressively. December is the best month for nesting, and on one December night Phillippo had seen as many as 200 turtles nesting between 8 p.m. and midnight. He reported that nesting turtles often dig out or destroy earlier nests.

Fuel for the Albatros is nowadays always available from Poum, near the northern tip of Grand Terre. The trip from Belep to Surprise takes about ten hours, and the continuation to Huon takes about three hours

more.

People from Belep take the turtles back to Belep alive. However, dead turtles are often seen on the islands (especially on Huon), and whilst the majority of these are evidently animals that simply died (possibly from insolation or exhaustion) after nesting, in other cases the animals had clearly been butchered. The Belep people blame this (probably accurately) on the crews of Taiwanese and Japanese fishing vessels operating illegally in these waters, although only in one case did an informant claim to have seen such a vessel (six or seven years ago).

Generally, the parties stayed for two or three days on Ile Surprise, passengers sleeping on shore (there being no mosquito problem) but the crew remaining on the boat. Surprise has large sea bird populations; the most important nesting species are the Greater Frigatebird (Fregata minor); the Red-tailed Tropic Bird (Phaeton rubricauda roseotincta); the White-capped Noddy (Anous minutus); the Brown Booby (Sula leucogaster plotus); the Masked Booby (Sula dactylatra personata); and the Red-footed Booby (Sula sula rubripes). However, exploitation of these bird populations comes under the heading of traditionally forbidden activities for Belep people, although some birds may occasionally be brought back to Belep as "pets."

The importance of the turtle resource lies in the fact that other red meat is generally unavailable, there being no cattle, goats, or large native mammals on Belep. No meat from the turtles brought into Belep is sold outside the island, and generally turtle is a ceremonial rather than an everyday food. For example, a wedding was due to be held on the Saturday following the interview, and several turtles (to be caught locally, in the waters near Belep) would be needed for this. Official

permits are requested in such cases (see discussion below).

Other products than the meat of the turtles achieve little use. However, the inverted carapace of the green turtle may be used as a cooking vessel or cauldron, and occasionally the shells of small hawksbills may be sold to visitors (tourists or naval personnel). But the rarity of such visits reduces such sales to insignificant levels.

4. MARINE TURTLES ELSEWHERE IN NEW CALEDONIA

Sea turtles are generally plentiful in the waters within the encircling reef of New Caledonia, and may be seen frequently at any time of the year by boaters. But nesting concentrations are few, and there appear to be none on the shores of Grand Terre itself. Nevertheless, loggerheads (Caretta caretta) appear to nest regularly, although not in high concentrations, on many of the beaches of the uninhabited or sparsely inhabited islands near to or south of Nouméa; this was documented by interviews on Ile des Pins; by a "home movie" seen in Nouméa in 1980; and by a 12.5 cm loggerhead that had been raised in captivity in a garden pond in Ouvea (Loyalty islands) seen on the 1987 visit. This turtle was one of two taken from a nest a few months earlier on an island near Nouméa. Nevertheless, the population of this species in New Caledonia cannot yet be quantified, even roughly. However, it would be extremely desirable to do so, since loggerheads are essentially unknown amongst the other oceanic islands of the Pacific, although rare sightings have been made in the Solomon Islands (McKeown, 1977) and Tonga (Hirth, 1971). On the other hand, loggerheads exist in relatively large populations along some of the western shorelines of the Pacific basin (e.g. in southern Queensland, Australia; and in Japan).

The only other major nesting ground identified in the New Caledonia complex is that on the island of Beautemps-Beaupré, in the Loyalty Islands. This very small island, about 48 km west of the northern part of Ouvea and about 1.5 km in length, is the traditional property of the Tribe of Eo, now living around St. Joseph in the northern part of Ouvea. Large numbers of turtle tracks were seen on the island during our 1979 aerial survey, principally on the northern beach. However, my efforts to visit this island have been frustrated on two occasions by unavailability of boats or fuel or by rough sea conditions.

Some information about Beautemps-Beaupré may be found in Anon (1972), summarized thus:

The native name for the island is Eo or Heo; the name Beautemps-Beaupré derives from the name of Admiral d'Entrecasteaux' geographer. The island had a population of 115 persons in 1858, but apparently this population had departed by the 1930's. Today, it is reported, some vestiges of a settlement may be seen on the island, including traces of a village and a chapel, and a freshwater well. Much mythology and superstition surrounds the island. For example, the well, it is claimed, will dry up if it is ever used by women. The island as a whole is considered to be haunted by ghosts of the dead from Ouvea. These ghosts are especially associated with a rocky hole in the ground on the western side of the island, which should never be approached. The sandbar of Motou-Tapou (i.e. "The Forbidden Island," in Polynesian), 4 or 5 miles north of Eo, has important seabird colonies. However, women are prohibited from landing there to collect birds or eggs, and it is also essential to bring no food other than coconuts to the island, and one must anchor and come

ashore in absolute silence. Breach of these interdictions is likely to be punished by rough seas and contrary currents on the return journey.

Several tribal chiefs on Ouvea were interviewed about turtles in the Ouvea lagoon and islands, and especially about Beautemps-Beaupré.

Underwood Joseph, Chief of the Eo Tribe, said that turtles could often be found at Ounés, although did not nest there. Nesting occurred on many of the islands of the Pleiades du Nord, a chain of small islets extending westwards from the northern tip of Lifou, and forming part of the rim of the Lifou Atoll. All three species (Chelonia, Caretta, and Eretmochelys, distinguished by the usual vernacular names), were found in the lagoon and nested in the area.

Another tribal chief on Ouvea, Jean-Baptiste Mindia of the Banout Tribe of Fayaouhe, reported nesting in the area from December to March. He reported Caretta to be plentiful, and to nest on Beautemps-Beaupré as well as on various islets of the Pleiades du Nord, with some hawksbills nesting in the same places. All three species occur in the Ouvea Lagoon. They sometimes swim along the shoreline, parallel to the beach, as if looking for a place to nest, but do not actually come ashore. He estimated that five turtles might nest in a typical night on Beautemps-Beaupré.

The most detailed information was obtained from Grand Chef Pierre in extreme southern Ouvea, at Mouly. He was familiar with two species, the hawksbill and the loggerhead. The former, locally known as Mataisusua, was the more plentiful. It nested from October to January. Strong tribal rules governed the capture of turtles and distribution of turtle meat. Any turtles taken, on beaches or in the water, must be brought before the Grand Chef of the tribe that owns the islands on or near which the turtles were taken. No permits from the Maritime authorities were required

in the Loyalty Islands, he said, only on Grand Terre. Grand Chef Pierre reported that turtle nesting was very rare on the beaches of Ouvea itself, but on the island with which he was most familiar (Animata, in the Pleiades du Sud), one or two turtles nested each night during the season -- mostly loggerheads. He reported no significant difference in taste between the different species. He was emphatic that all take of turtles was traditional, and was never for commercial purposes.

Turtles were sometimes caught accidentally in 50-meter nets set for fish. The eggs were widely eaten, and their collection was not constrained by traditional laws. Pierre was less familiar with Beautemps-Beaupré than with Animata, but he thought the numbers of nesting turtles was comparable on the two islands, with about two each night around the time of the interview (February 19). He felt that turtles in general were actually increasing in the Ouvea area, although he was not sure if this applied to all species. But he had observed that turtles of one kind or another were seen with increasing frequency close to shore on the lagoon side of Ouvea. He considered shark predation to be the main problem for the young turtles, although turtles had not been found in the stomachs of sharks caught for food by local people. Pierre also estimated that only a small proportion of the eggs laid on the islets was collected, the majority of nests hatching successfully. He could not distinguish between the eggs of the different species, but thought that the typical clutch lay between 80 and 200 eggs.

5. TURTLE MIGRATIONS

It is interesting that New Caledonia not only offers some extraordinarily important nesting beaches for sea turtles (especially in the d'Entrecasteaux

Islands), but also apparently offers foraging habitat for turtles whose nesting grounds lie both to the east and the west. Turtles from Australia, where large numbers of Chelonia mydas have been tagged on nesting beaches, especially on Raine island, Bramble Cay, and Heron Island, sometimes are caught in New Caledonia, although to date only turtles tagged in the southern Great Barrier Reef (Capricorn/Bunker Group, mainly Heron Island) have been recovered in New Caledonia. Turtles from the much larger Northern Reef populations (especially from Raine Island) have been caught principally in the Torres Strait, or as far west as the Sir Edward Pellew Islands (Limpus and Reed, 1985). Limpus (1980) documented the recapture of five turtles, tagged on Heron and adjacent islands, in New Caledonia -- two from the northern tip of Grand Terre, one from the southern tip, and two from the west coast. The recaptures continue (R. Grandperrin, pers. comm.), but a complete inventory of such is not currently available.

Anon. (1979) documents the recapture of ten green turtles (including two males) that had been tagged on Scilly Atoll in French Polynesia (Society slands). These turtles had been kept in captivity for up to four months after nesting in Scilly, having been fed upon green plants before release in the lagoon. All the recaptures were of animals that migrated to the west -- Tonga, Fiji, Vanuatu, and New Caledonia. The two New Caledonia recoveries, both of mature females, were made 2-2½ years after tagging; one had no recorded locality within New Caledonia, but the other was taken at Baie de Gomen, just south of Koumac near the northern end of the western coast.

The destinations of turtles that nest in New Caledonia remain completely unknown. A tagging program is necessary to gather data on this important subject.

6. TURTLE MANAGEMENT IN NEW CALEDONIA — POLICY AND PRACTICE

Sea turtles in New Caledonia receive substantial protection under Regulation No. 17 of July 16, 1985 (in translation):

Article 1. The capture of all species of sea turtle, by any and all means, is prohibited from November 1 to March 31, throughout the entire extent of the Territory of New Caledonia and its dependencies and adjacent waters.

Article 2. The following are prohibited at all times: Destruction of marine turtle nests, or the collection, possession, or sale of turtle eggs.

Importation, offering for sale, sale, purchase, or export for commercial purposes of sea turtles in either a living or dead condition, as well as all parts and products of these animals.

Article 3. Variances from the prohibition described in Article 1 above may be issued by the Chef of the Service de la Marine Marchande et des Pêches Maritimes, for traditional festivals or for scientific purposes, upon receipt of adequate justification.

Article 4. The Chef of the Service de la Marine Marchande et des Pêches Maritimes may authorize variances to the provisions of Article 2 above, permitting the collection of marine turtle eggs for scientific purposes or for restoration of turtle populations.

Article 5. Infractions of the terms of these rules are punishable by the "Class V" Provisions.

Products taken, transported, kept, bought, sold, or exported in infraction of the present regulations shall be seized upon discovery, and, according to the discretion and initiative of the agent involved, and according to the circumstances, shall be returned to the sea, destroyed, or transfered to the charge of a scientific or cultural organization, or to appropriate social and welfare establishments or to needy persons.

The costs of the release of the animals to the sea, or the destruction or transfer of seized products, shall be charged to the infracting party.

Article 6. This deliberation supercedes Rule No. 220 of the Permanent Commission of August 3 1977, regulating fisheries and commercialization of marine turtles in New Caledonia.

It may be noted that these domestic regulations are fully compatible with the provisions of the CITES Convention in prohibiting all international trade in marine turtles in New Caledonia.

It should also be noted that, in the Loyalty Islands, terms of these regulations are not fully understood, it being the opinion there that permits for the take of sea turtles for traditional feasts were only required on Grand Terre, and that it is legal to collect the eggs of sea turtles. It might be added, though, that the present system of strong control by traditional chiefs in the Loyalty Islands may be more enforceable and realistic than the regulations issued from Nouméa. The situation is closely parallel to the relationship between Federal Regulations

issued from Washington D.C. and the management of sea turtles in the Territories of Micronesia (now progressively becoming independent). There, federal regulations apply in a technical sense, but in reality the restraints demanded by the traditional chiefs provide the only real controls.

Relatively few applications are received for variances from the seasonal ban on sea turtles for traditional feasts, and in view of this low number of applications, it appears that all such requests have been granted since the Rules were established in 1977. Actual numbers of permits issued, and total numbers of turtles taken, for the years between 1978 and the present are as follows:

Year	Number of Permits Issued	Total Number of Turtles
1978	9	68
1979	10	39
1980	6	44
1981	5	32
1982	5	20
1983	9	37
1984	5	25
1985	3	24
1986	3	24

These figures are very low, but permits are only required during the nesting months, and no means are available to quantify the illegal take, so the actual annual totals of turtles taken in New Caledonia may be much higher. Nevertheless, the overall situation is quite unlike

that of the French Départments of the Caribbean, such as Guadeloupe and Martinique, in which, despite local prohibitions or restrictions, turtle products are widely and publicly offered, in substantial quantities and without official restraint. New Caledonia has the advantage of an alert private conservation group, the Association pour la Sauvegarde de la nature Néo-Calédonienne, which established the marine turtles as their special conservation theme for the year 1986. Members of the Association are quick to report to the authorities the occasional instance of sea turtle shells or other products displayed in shops or offered to the public, and the enforcement authorities of Affairs Maritimes have made appropriate response when such reports have been made.

During 1986, the Association, recognizing that an open season on turtles still existed during the period April 1 to October 31, embarked upon a program of attempting to dissuade fishermen from taking turtles during those months. Components of the awareness campaign mounted by the Association included the following elements:

1. Presentation of information concerning marine turtles through the mass media.
2. Distribution to teachers of a technical pamphlet which can be used in classrooms.
3. Organization of various games and competitions: a) writing competitions (e.g. poems, stories, or other compositions) for children and adults; b) competitions for making turtles out of diverse materials; c) competitions for making self-adhesive posters (reserved for the young); d) games -- numbered cards will be attached to turtles made of rags that can be found at the Association or at school co-ops and drawings for a lottery will take place

every two weeks allowing people to win the turtles made of rags and a trip to the Isle of Pines; e) competition in drawing for the design of a stamp entitled "Let's protect the Marine Turtles."

4. Distribution of posters and stickers to promote awareness of marine turtles.

This program is described by d'Auzon (1986).

7. OVERALL STATUS AND REGIONAL IMPORTANCE OF TURTLE STOCKS IN NEW CALEDONIA

Although detailed data are clearly lacking, we can detect no evidence of overall decline in the sea turtle populations of New Caledonia. Such a situation is distinctly unusual in the Pacific Islands, and may stem from several causes, including:

i) The extreme remoteness of the nesting grounds (especially those of the d'Entrecasteaux Islands), and the rarity of visitation and very low take of turtles from these islands by tribal people.

ii) The nature of the New Caledonian economy, which not only includes substantial tourism and major mining operations, but also numerous direct and indirect subsidies from metropolitan France. This tends to raise the standard of living to a somewhat "middle class" level, and thus reduces the take of turtles for subsistence purposes.

iii) Relatively intact tribal cultures, especially in the northern extreme of Grand Terre and in the Loyalty Islands, which place great authority in the hands of the traditional chiefs for controlling the exploitation of sea turtles.

iv) The absence of historical commercial take of marine turtles in the Territory.

v) The presence of an alert Nature Protection Society that is well regarded

that of the French Départments of the Caribbean, such as Guadeloupe and Martinique, in which, despite local prohibitions or restrictions, turtle products are widely and publicly offered, in substantial quantities and without official restraint. New Caledonia has the advantage of an alert private conservation group, the Association pour la Sauvegarde de la nature Néo-Calédonienne, which established the marine turtles as their special conservation theme for the year 1986. Members of the Association are quick to report to the authorities the occasional instance of sea turtle shells or other products displayed in shops or offered to the public, and the enforcement authorities of Affairs Maritimes have made appropriate response when such reports have been made.

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by government agencies.

The future cannot be regarded as entirely secure for the turtles, as there have been political clashes between the "Kanaks" and the "Metropolitaines" in recent years, with some (but not all) of the former demanding independence. Nevertheless, it may be hoped that, even in the event of major political change, the authority of the traditional chiefs will not falter, and indeed even the occasional turtle collecting trips made to the d'Entrecasteaux Islands might be much more difficult if the outside subsidy of boat and fuel provided to the people of Belep were no longer available.

Available data are far too scant to allow the calculation of even a rough population estimate for any species of sea turtle in New Caledonia. The scientific parties that have visited the most important green turtle nesting island (Huon), reported above, reported 50 nesting emergences in four hours on February 10-11, and eleven nests in one night at the end of February 1985. Nevertheless, these figures were both recorded towards the end of the nesting season, and for the peak season, probably corresponding roughly to the time of our survey flight of December 1979, a considerably greater nightly total may be expected. We thus have no reason to doubt the native report, heard on Belep, of 200 nestings during the period 8 pm to midnight for a single December night on Ile Huon. With somewhat lesser but still substantial additional nesting on the other three islands of the group (Leleizour, Fabre, and Surprise), it appears that the islands of New Caledonia have the largest nesting populations of Chelonia mydas in the oceanic Pacific, comparable to the much more dispersed nesting of Chelonia agassizi on the hundreds of beaches of the Galapagos Archipelago in the tropical Eastern Pacific. Among the few other major nesting islands for the green turtle in the Pacific

Islands are the two islets of Rose Atoll, in American Samoa, where Hirth found 35 and 301 nests, respectively, on a visit on October 7 1970.

On the other hand, the green turtle populations of Queensland, Australia, are much larger still. While nesting occurs in many areas near the southern and northern extremes of the Great Barrier Reef, the extraordinary numbers nesting on Raine island alone reduce those of the other islands to relative insignificance. Limpus (1981) reported wildly fluctuating numbers of green turtles nesting in different years on the 1.7 km beach of Raine Island, from as few as about 100 turtles per night in the 1975-76 nesting season to an extraordinarily observation of 11,000 nesting turtles ashore simultaneously when the island was visited during the 1974-75 season. Thus, unless the 11,000 turtle observation was some freakish, never-to-be-repeated phenomenon, it appears that Raine Island (and other Queensland rookeries such as Pandora Cay, the Diamond Islets, and the Capricorn-Bunker Islands) together constitute a considerably more important nesting ground for the green turtle than does New Caledonia.

At present we have no means of establishing any quantification for the hawksbill populations of New Caledonia. This species appears to be in generally satisfactory status there, but no specific areas of concentration -- certainly not of nesting activity -- have been identified.

8. RESEARCH RECOMMENDATIONS

Although information on the marine turtles of New caledonia is gradually becoming more detailed, no field studies, apart from aerial surveys and local interviews, have ever been conducted. The dense nesting colonies of the d'Entrecasteaux Islands offer a major opportunity for important

field work, but their remoteness makes them unsuitable for general biological studies on the green turtle since other colonies are so much more easily accessible. The information most urgently needed pertains to the size of the nesting populations, and to the migratory destinations of the turtles nesting in these islands. Progress could be made towards both of these goals by an intensive tagging program occupying several weeks of the peak season (i.e. December). The islands could be reached using the vessel "Albatros" from Belep, if appropriate liaison is established with the Commune de Belep, and especially with the Mayor, who controls use of the vessel. Such an operatiuon would require a supply of thousands of tags (preferably of titanium). Each of the four islands is small enough that it should be possible for a crew of two or three people to tag virtually every turtle that nested. An appropriate return address (e.g. ORSTOM de Nouméa, if appropriate arrangements are made) should be put on the tags. With the general assumption that green turtles return to nest after an interval of about two weeks, some minimum projections for the single-season nesting population could be made by tagging all individuals that nested during such a period at peak season. The success of the attempt to determine the migratory destinations would depend upon the frequency with which the turtles were caught, but given the potential for tagging very large numbers of individuals, and given the hunting pressure on green turtles in most areas of the southern and western Pacific (Australia and New Caledonia itself largely excepted), it is anticipated that adequate returns would be made.

9. LOCAL LIAISON

Future field work on the marine turtles of New Caledonia would require the permission and cooperation of the authorities in Nouméa, and much help has already been offered by them. Expatriate personnel in key positions in such agencies usually are reassigned and leave the Territory within a few years, but currently the following persons would need to be consulted for any future work:

Philippe de Kouedic de Kergoaler
Chef, Service de la Marine Marchande
B.P. 36, Nouméa
Nouvelle Caledonie
Phone: 27-26-26

Aymeric Desurmont
Service de la Marine Marchande
B.P. 36, Nouméa
Nouvelle Caledonie
Phone: 27-26-26

Rene Grandperrin
ORSTOM
Centre de Nouméa
BP A5, Nouméa
Nouvelle Caledonie
Phone: 26.10.00; home: 27.24.59.

Jean-Louis d'Auzon
Président, Association pour
la Sauvegarde de la Nature
Néo-Calédonienne,
BP 1772, Nouméa
Nouvelle Caledonie
Phone: 28.32.75; 27.22.12.

Charles Haudra
Association pour la Sauvegarde
de la Nature Néo-Calédonienne
BP 4166, Nouméa
Nouvelle Caledonie
Phone: 27.46.10

Thale Phillippo
Capitaine de l'Albatros
Commune de Belep
Ile Art
Nouvelle Caledonie
Phone: 2.

10. LITERATURE CITATIONS

Anon, 1972. Nouvelle Caledonie. Iles Loyauté. Ile des Pins. Les Guides Bleues Illustrés, Librairie Hachette. 255 pp.

Anon, 1979. Tagging and rearing of the green turtle Chelonia mydas conducted in French Polynesia by the Department of Fisheries. Paper presented at joint SPC-NMFS Workshop on Marine Turtles in the Tropical Pacific Islands, Nouméa, New Caledonia, 11-14 December 1979. Manuscript, 21 pp.

Anon, 1980. Observation on marine turtles on Huon Island (New Caledonia) by the Navy ship "La Dunkerquoise" (February, 1980). Manuscript, 2 pp., 2 maps.

Chimmo, W. 1856. Narrative of the loss of the Chinese junk "Ningpo" on d'Entrecasteaux Reefs, near New Caledonia, with an account of the reefs. Nautical Magazine and Naval Chronicle, March 1856: 113-121.

d'Auzon, J.-L. 1986. New Caledonia: Campaign for Awareness. Marine Turtle Newsletter, 38: 2-3.

Hirth, H.F. 1971. South Pacific Islands -- Marine Turtle Resources. Report to Fisheries Development Agency Project, FAO. Manuscript, 33 pp.

Limpus, C. J. 1980. The green turtle in eastern Australia. In Management of Turtle Resources. Applied Ecology Inc., Research Monograph 1: 5-22. James Cook Univ. (North Queensland).

_____ 1981. The status of Australian sea turtle populations. In Bjorndal, K., ed., Biology and Conservation of Sea Turtles. Smithsonian Institution. Pp. 297-303.

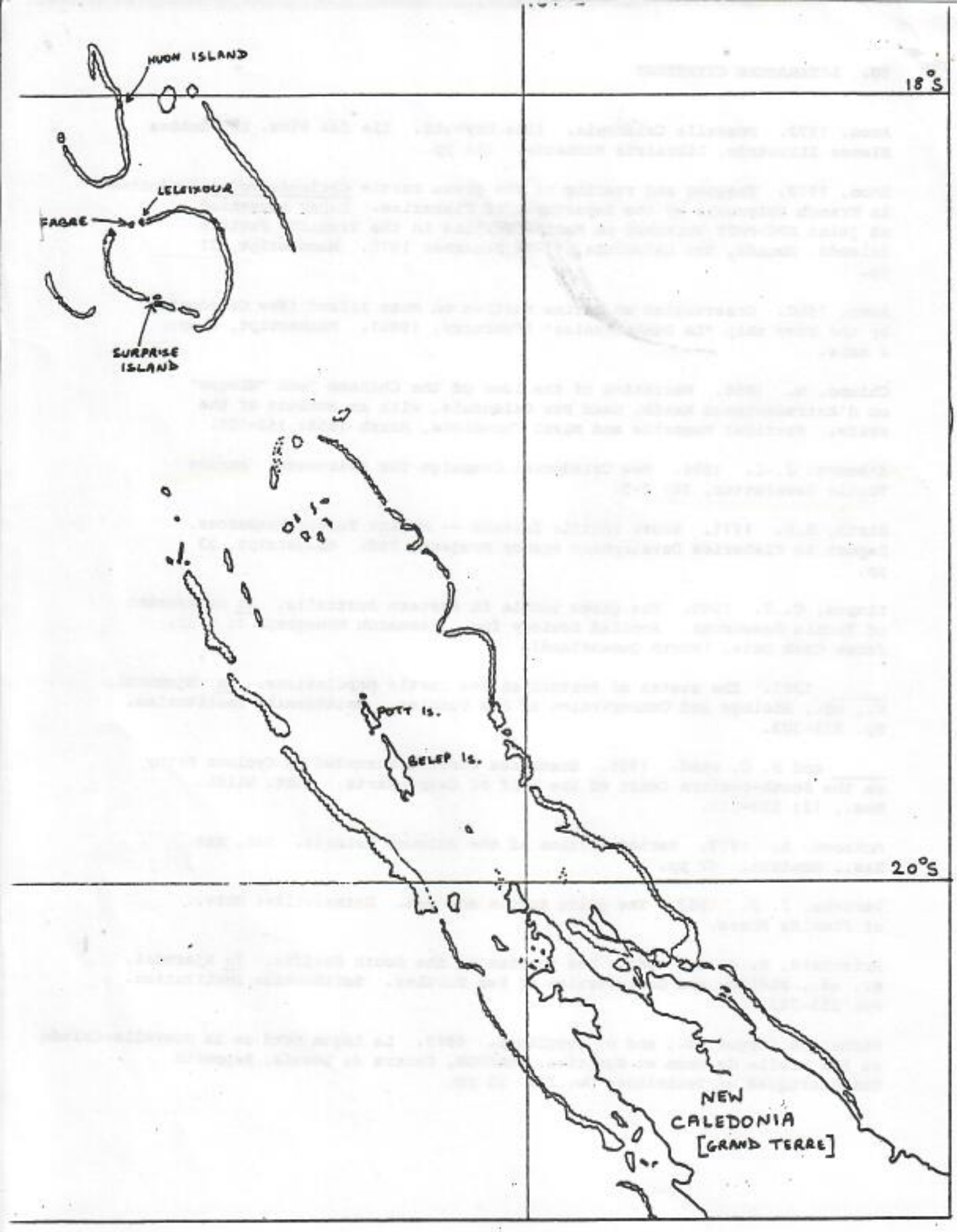
_____ and P. C. Reed. 1985. Green sea turtles stranded by Cyclone Kathy on the South-Western Coast of the Gulf of Carpentaria. Aust. Wildl. Res., 12: 523-533.

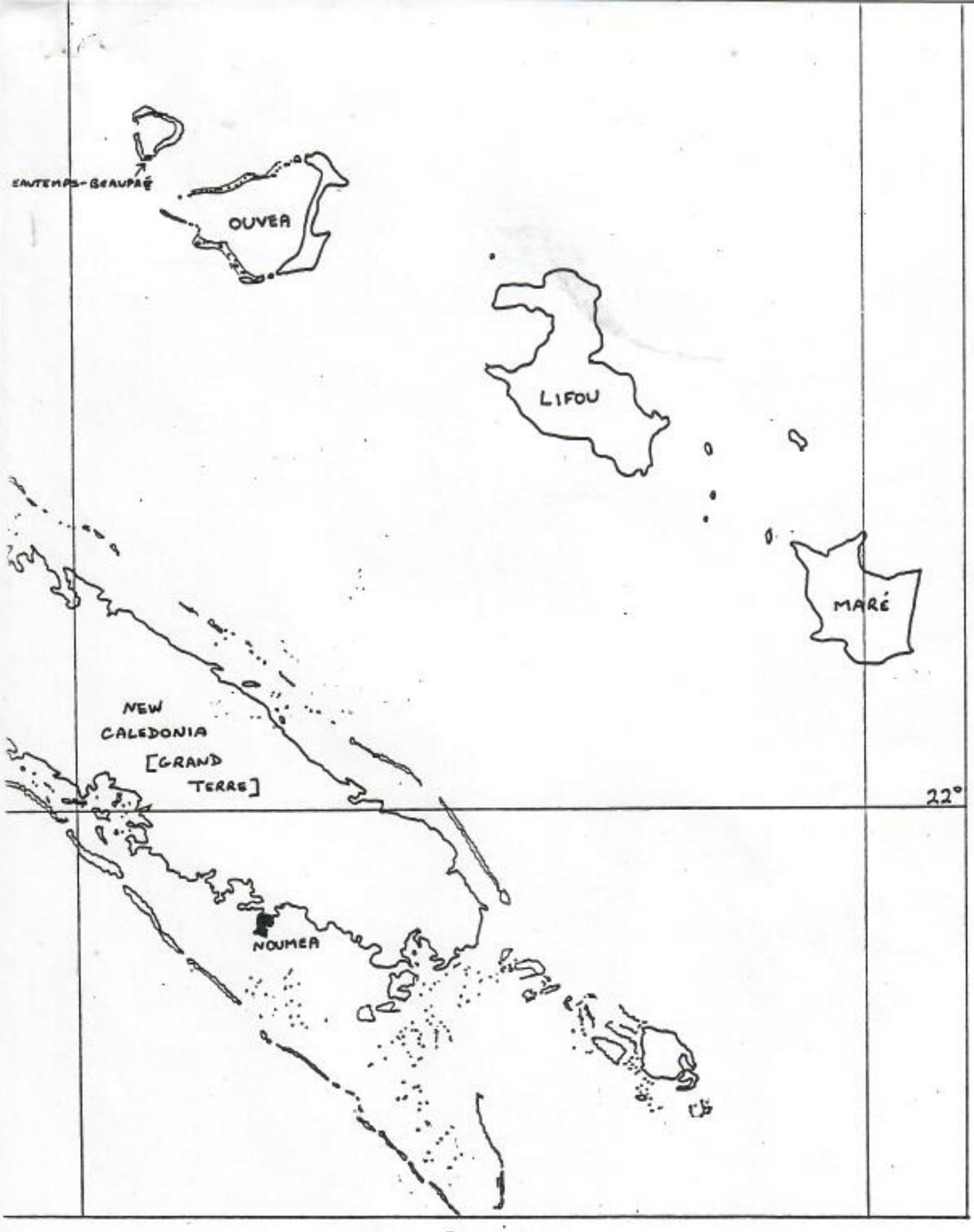
McKeown, A. 1977. Marine turtles of the Solomon Islands. Min. Nat. Res., Honiara. 47 pp.

Parsons, J. J. 1962. The green turtle and man. Gainesville: Univ,. of Florida Press.

Pritchard, P. C. H. 1981. Sea turtles of the South Pacific. In Bjorndal, K., ed., Biology and Conservation of Sea Turtles. Smithsonian Institution. Pp. 253-262.

Richer de Forges, B., and G. Bargibant. 1985. Le lagon nord de la Nouvelle-Caledo: et les atolls de Huon et Surprise. ORSTOM, Centre de Nouméa, Rapports Scientifiques et Techniques No. 37. 23 pp.


HUON ISLAND
18°S
LELEIXOUR
FAGAE
SURPRISE ISLAND
POTT Is.
BELEP Is.
20°S
NEW CALEDONIA [GRAND TERRE]


ENTEMPS-BEAUPRÉ
OUVEA
LIFOU
MARÉ
NEW
CALEDONIA
[GRAND
TERRE]
22°
NOUMEA

('80)

Name of Applicant: Pritchard (Last) Peter Charles Howard (First, Middle)

Florida Audubon Society, P.O.Drawer 7, Maitland, Florida 32751
Address and telephone number (including area code)
(305) 647-2615 Home: (305) 365-6347

Date: May 12 1981

Return to:

Committee for Research and Exploration
National Geographic Society
17th and M Streets, N.W.
Washington, D. C. 20036

Applications must be typewritten within the margins on one side of page only with heavily inked ribbon. The application must be limited to these seven pages. If additional materials are essential to a full understanding of the project, they may be attached and will be kept in the office of the Committee Secretary where they may be consulted by Committee members.

1. Project title (ten words or less):
MARINE TURTLE SURVEY IN OFFSHORE ISLANDS OF NEW CALEDONIA

a. Under what major field of science do you classify this project? Scientific Exploration; Herpetology

b. Funds requested from National Geographic Society (U.S.A. currency) $ ~~$15,400~~ 16,630

c. Expected duration of the project. (Specify dates of field and laboratory study). Two months in field
(December 1981-January 1982)

d. Location of field work New Caledonia (South-Western Pacific Ocean)

e. Abstract of Proposed Research.

It is proposed to conduct the first field study of the major colonies of the green turtle, loggerhead, and possibly other sea turtle species that nest on offshore islands of New Caledonia, especially on the d'Entrecasteaux Islands (Surprise, Leleixour, Fabre, and Huon), and on Beautemps-Beaupré Atoll in the Loyalty Islands. This study will include species identification, evaluation of order-of-magnitude of population sizes, morphometric characteristics relevant to taxonomic studies, nesting and hatching success, and any other aspects that present themselves, including predation by birds, crabs, fish, and possibly humans. The work will take place during the height of the next nesting season - December 1981 to January 1982.

f. Significance of Research.

This will be the first study of some of the most concentrated and least accessible sea turtle populations in the world. Despite the brief duration of the proposed work, it is anticipated that critical information on species present, nesting success and predation, population sizes, and quantitative information on size and fecundity of turtles will be gathered, and enough turtles tagged to present a significant possibility of elucidation of migration destinations.

Name of Applicant: Peter C. H. Pritchard

2. Biographical information and qualifications of the applicant:
(In addition, please attach curriculum vitae for committee files)

a. Present position (institution and rank): Senior Vice President and Vice President for Science and Research, Florida Audubon Society; Adjunct Professor at University of Central Florida and Florida Atlantic University.

b. Place and date of birth: Hemel Hempstead, Hertfordshire, England; 26 June 1943

c. Education and degrees with institutions and dates: B.A. (Honours) and M.A.in Chemistry, Oxford University, England; B.A. received 1965, M.A. received 1968.
Ph.D. in Zoology, University of Florida (Gainesville), 1969.

d. Special qualifications of applicant for proposed research (experience, languages, etc.):

i) Reasonably fluent French (spoken language of New Caledonia)

ii) Extensive experience in study of marine turtles under arduous conditions, including western Pacific (virtually entire coast of Papua New Guinea, all major districts of Micronesia, as well as most of the Galapagos Islands). Also worked extensively on marine turtles in French Guiana, Surinam, and on both coasts of Mexico.

iii) Already visited New Caledonia twice, overflown proposed study islands, and obtained necessary contacts and permission for all phases of proposed work.

If others are to participate in this project, please give the same biographical information and qualifications for each person in the space below:

Applicant's wife, Sibille Pritchard, will serve as field assistant. She has fulfilled this responsibility successfully in many remote parts of the world, including French Guiana and the Galapagos Islands.

It is proposed to invite two other persons to participate. The first option will be offered to representatives of the New Caledonia Conservation Society (Association pour la Sauvegarde de la Nature Néo-Calédonienne), but a definite invitation will not be extended until funding for the work has been assured.

Name of Applicant: Peter C. H. Pritchard

3. Books and papers published by the applicant and others who will participate in the proposed research. (A statement such as the following is satisfactory: I have published _____ books and _____ articles (give number), but only the following are on topics directly related to the proposed research.) (Please attach complete bibliography for committee files.)

Books published by the applicant include: Living Turtles of the World (1967; 288 pp)
Encyclopedia of Turtles (1979; 896 pp).
Turtles of Venezuela (an in-depth monograph) is in an advanced stage of preparation

A full list of titles of research papers and articles published is included in the attached curriculum vitae. Those most relevant to the work proposed here are:

Sea Turtles of the South Pacific (In press, Proceedings of the World Sea Turtle Conference).
Turtles of Micronesia: Survival Status and Recommendations (Chelonia Press, San Francisco, 1977; 83 pp).
Marine turtles of Papua New Guinea: Report on a Consultancy. Mimeographed. 122 pp.
Galapagos Sea Turtles: Preliminary Findings. Journal of Herpetology 1971 5 (1-2): 1-9.
Vernacular Names of New Guinea Turtles. Journal of the Polynesian Society, 1980, Vol. 89 No. 1: 105-117 (Co-authored with A. Rhodin and S. Spring).
The C onservation of Sea Turtles: Practices and Problems. American Zoologist, 1980, 20: 609-617.

4. Method of publication of scientific results of proposed study:
A scientific report will by published in a major refereed journal, probably Copeia. Popular and semi-technical articles on the work will be produced for wide-circulatior magazines that accept color photographs. I would of course be happy to produce an article for National Geographic if this is requested.

Name of Applicant: Peter C. H. Pritchard

5. Budget

a. Total budget for the project: $ 26,670 (including salary and Florida Audubon Society overhead)

If funds have been requested from other sources, attach budgets. Contributions from investigator's home institution should be listed under Item 6.

b. Amount requested from National Geographic in U.S.A. currency: $ 16,630

c. Budget for funds requested from National Geographic Society. Please specify: e.g., equipment, assistants, field work, travel, services, supplies, etc. The Committee requires that budget items be given with precision and in detail. Two columns may be used. Include on pages 6-7 justification for any items that are not clear. (IMPORTANT: No charge for overhead is allowed. If any capital items are purchased with Society funds, the items or their salvage value are to be returned to the Society upon completion of the project.)

Salary for field assistant - two months @$500 per month	$1000
Travel, two round-trip fares Orlando, Florida to Noumea, New Caledonia plus round trip to Ouvea, Loyalty Islands	$4000
Charter of Schooner - fifteen days @ $400 per day	$6000
(15.5 meter hull, twin diesel engines, with radar and fathometer)	
Per diem expenses in Noumea - 15 days @ $80 per day (estimated figure for applicant and wife in shared accomodations)	$1200
Field provisions, Beautemps-Beaupré and islands in New Caledonia lagoon south of Noumea; 28 days @ $35 per day	$980
Charter of small vessels for trips to southern islands and Loyalties (estimated)	$1800
Camping gear	$700
Customary gifts to local chiefs	$50
Purchase of turtle tags and applicators	$150
Photographic expenses	$750
	$16630

58 days total
26% (15 days) of time at d'Entrecasteaux Reef

d. Person or institution (with address) to whom payment should be made: Florida Audubon Society
P.O.Drawer 7
Maitland
Florida 32751

e. Schedule of payments desired:
Request entire sum in advance of project if possible (around October or early November 1981).

Before the application is considered, the Society must be informed that all necessary permits for field work (collecting or excavating) and laboratory, museum, or library study have been obtained; and that if foreign travel is involved, the participants have valid passports and required visas.

see next page

Name of Applicant: Peter C.H.Pritchard

(item 5e) Both applicant and assistant have valid passports and do not require visas for New Caledonia. The project has received permission from the authorities in New Caledonia and a copy of the letter of permission is appended.

6. Amount and nature of institutional or other contributions toward this work. (If you are receiving no aid on this project from a university or other organization, or other individual, please explain):

Principal Investigator's salary and Florida Audubon Society overhead will be met from other sources. Salary plus benefits equals $4706, 25% overhead $5334.

= 28,236 year

Can't determine how this was arrived at

#4706 + 5334 = #10,040

#10,040 + 16,630 = #26,670

7. Previous grants (date, source and amount) received for this work, grants now available, or applications to other organizations which are now pending. State whether they are alternative to your request to the Society. If another request for a grant is made after this proposal is sent to the Society, please notify the Society at once.

Expenses for the 1979 visit to New Caledonia on which the aerial survey was made were covered by the South Pacific Commission and National Marine Fisheries Service, Honolulu (approximately $2500 from SPC; aerial survey charge billed directly to NMFS - I have not seen bill).
Expenses for 1980 visit to New Caledonia (to make necessary contacts and to obtain permission for proposed work) paid by Fish and Wildlife Service. Approximately $2500.

8. Previous grants from the National Geographic Society for any project. (List project title, date and amount.)

None.

9. Names and addresses of at least three individuals competent to pass judgment upon your qualifications and/or your project. (Note: The Society will get in touch with your referees. In addition, the Committee has its own sources of information, and the referees you suggest may or may not be consulted.)

Dr. Harold Jefferson Coolidge, Honorary President, International Union for the Conservation of Nature; 35 Standley Street, Beverly, Massachusetts 01915
Dr. Roger Wood. Stockton State College, Pomona, New Jersey 08240 (at present on Sabbatical at Florida Audubon Society, P.O.Drawer 7, Maitland, Florida 32751).
Dr. Llewelyn Ehrhart. Zoology Department, University of Central Florida, Orlando, Florida.

10. If the grant requested here is approved, the applicant pledges himself to present a preliminary report on the project to the National Geographic Society on March 30 1982 (give date) and a final formal report suitable for publication in the Society's Research Reports on August 1 1982 (give date).

Signature: Peter C.H.Pritchard

Typed name: Peter C.H.Pritchard Ph.D.

Describe the proposed research in some detail on pages six and seven. Relate what you propose to do to previous and current work on the subject by yourself or others. (Cite references to published work.) Include a description of any special techniques that will be used.

The World Sea Turtle Conservation Conference held in the State Department Building, Washington DC, in November 1979 identified not only those turtle colonies that were in vital need of conservation because of depleted status, but also urged identification and permanent protection of sea turtle colonies that were still abundant so that appropriate action could be taken in advance of any threat. These major colonies could then provide "insurance" against world-wide extinction of entire species at the same time that active conservation steps were being taken to restore threatened colonies.

Preliminary information, much of it gathered by the applicant, suggests that the islands of New Caledonia, in particular the d'Entrecasteaux Reef Islands to the north and Beautemps-Beaupré Atoll in the Loyalty Islands, as well as some of the scattered islands south of Noumea in the New Caledonia Lagoon, harbor populations of nesting sea turtles of densities that would qualify as "major colonies" on a world-wide scale. Information available on turtles in these islands may be summarized as follows:

i) Billings (1856), whose junk the "Ningpo" ran aground on d'Entrecasteaux Reef in 1854, reported green turtles so abundant that 27 were turned one morning on land, and 18 more were asleep in six inches of water. This account has been quoted ever since, but never followed up until our efforts listed below.

ii) In December 1979 the applicant was part of a party that chartered an aircraft in Noumea, and conducted an aerial survey of the d'Entrecasteaux Reef Islands. The four islands were all observed from a low altitude and photographed. They appeared still to be nested to capacity by sea turtles, the entire sandy parts of these tiny islands being literally covered with fresh tracks and nests. Turtles seen in the water around the islands were identified as green turtles, Chelonia mydas.

iii) In February 1980 a French Patrol Ship the "Dunkerquoise" visited Huon Island in the d'Entrecasteaux Group and found a fresh turtle track every four yards, on average, around the periphery of the island. Only the night of February 10 was spent on shore, but dozens of turtles nested and evidence of much hatching was visible, indicating that nesting had been taking place for at least two months.

iv) No information has been published on the turtles of the Atoll of Beautemps-Beaupré. This small island has been uninhabited since the 1930's, but it is still owned by the St. Joseph Tribe on the neighboring island of Ouvea. Permission has been received from tribal leaders to work on Beautemps-Beaupré for a turtle study. Our flight in December 1979 revealed intensive nesting on the south-eastern beach of Beautemps-Beaupré, though it was not possible to determine the species. A letter received by the applicant in May 1977 referred to an observation of a massive flotilla of an estimated 20,000 turtles in a small area near the southern part of the Ouvea Atoll, just outside Passe de Styx. These turtles may have been olive ridleys (Lepidochelys olivacea), judging by their reported size and shape, habit of floating at the surface, and their being grouped in an enormous flotilla. If so, they represent the only observation of a massive group of this species in the western Pacific, though such aggregations are known in Mexico, Costa Rica, and India. It is possible that these are the turtles that were nesting on Beautemps-Beaupré but it will be necessary to go there to find out.

v) Information received from the maritime authorities in New Caledonia (in the letter giving permission for the project) suggests that the loggerhead turtle, Caretta caretta, locally known as "grosse-tête", nests in numbers on many of the small islands in the lagoon south of Noumea. This may be the only nesting colony of loggerheads of any size on any of the oceanic islands of the Pacific (though loggerheads nest on subtropical mainland shores of the western Pacific in Australia and Japan). This needs further investigation.

I propose to visit all of the major or suspected turtle islands listed above during a two-month period (December 1981 and January 1982), which should coincide with the period of abundant nesting and hatching (New Caledonia is quite cool during the southern winter, June-July etc., and turtle nesting is therefore strongly seasonal).

Visiting the d'Entrecasteaux Islands is extremely difficult. The reefs are uncharted or extremely inaccurately charted, 15,000 square miles in extent, and an extremely sophisticated vessel equipped with radar, fathometers, and other equipment is necessary to make the journey safely. Moreover, the turtle nesting takes place during the cyclone season, so there must be a capacity to receive and respond to cyclone warnings. Such as vessel has been identified - the "Nataniel", owned by M. Hans Jobbert of Noumea, and arrangements have been made to charter this boat. The fee of $400 per day is cheap by New Caledonia standards for a boat of this kind; the fee includes provisions. A party of four will be taken to the islands, two of them dropped off on the first island (Isle Surprise), while the other two will make brief visits to Isles LeLeixour and Fabre, and then proceed to Huon Island for approximately one week. Both parties will tag all adult turtles seen with serially numbered Monel metal tags, and will record species, numbers of turtles nesting each night, clutch size (where this can be determined without excavating nests), sizes of adult and hatchling turtles, predation and loss of adult turtles, eggs and hatchlings, and any other factors of special interest that present themselves. An attempt will be made to estimate the successful hatchling productivity of these apparently virgin green turtle colonies; this information will be of great value in evaluation of restoration efforts of highly stressed green turtle populations in other parts of the world. Despite the short time anticipated on the d'Entrecasteaux Islands themselves, the two parties should be able to gather information on most of the basic population parameters desired during this time; more turtles will be handled in one week, I anticipate, than many successful turtle researchers handle in years.

It will not be necessary to have a boat standing by at all times at Beautemps-Beaupré, since this island is larger, well-wooded, and need not be vacated in the unlikely event of a moderate cyclone. Since there will not be the expense of a boat waiting at all times, we can stay for three weeks on this island, working in exactly the same way as on the others.

I also propose to charter a small boat in Noumea and spend one week visiting loggerhead nesting islands in the Noumea Lagoon. One night can be spent ashore on each of seven islands, tagging and counting turtles and obtaining morphometric and other field data. It is quite possible that a complimentary (Government) boat can be obtained for this part of the survey.

CITATIONS

Anon. 1980. Observations of marine turtles on Huon Island (New Caledonia) by the Navy ship "La Dunkerquoise" (February 1980). ms. 2 pp. + 2 maps.

Chimmo, W. 1856. Narrative of the loss of the Chinese junk "Ningpo" on d'Entrecasteaux Reefs, near New Caledonia, with an account of the reefs. Nautical Magazine and Naval Chronicle, March 1856: 113-121.

Translation

SEA TURTLES IN FRENCH OVERSEAS DEPARTMENTS AND TERRITORIES

November 1979

Sea turtles frequent the coasts of all of our Overseas Departments and Territories, and this places France among privileged nations, that is to say, exceptionally well placed to observe these animals. In fact, the geographical spread of our Overseas Departments and Territories (D.O.M. - T.O.M.) (from the coast of Guyana to the Pacific, as well as the Caribbean and the Indian Ocean) makes possible a very complete ecological study of these reptiles by setting up numerous observatories in the four corners of the world.

With very few exceptions, all species of sea turtles may be found along our tropical coastlines, with, of course, noticeable quantitative differences according to the zones. For example, Guiana has an exceptionally large number of Luth turtles (*Dermochelys coriacea*) and it is in fact the place in the world where they lay eggs in the greatest numbers.

Alarming reports by numerous specialists of the world concerning their extinction have naturally come to the attention of SEPANRIT and, as is well known, its first concrete action was to start a publicity campaign in Cayenne to prevent local massacres.

The polemics concerning a few farms or breeding stations in the world, particularly the one set up in Saint Leu on Reunion Island, have not left our Association indifferent. This has led us to begin consultations with the authorities of the "Corail" firm in Metropole and on Reunion Island as well.

It was suitable then that we summarize as exactly as possible these subjects so as to present, in a short document, the fundamental principals for the Protection and Study of sea turtles in the D.O.M.-T.O.M. This document constitutes, until its eventual revision, the propositions of SEPANRIT.

I. General Considerations Concerning Sea Turtles

It is very difficult to give a clear and precise picture of the current state of populations of the diverse species existing in the world. Specialists sometimes have contradicting opinions concerning population dynamics, for the figures put forth are often different, determined by non-comparable methods; sometimes they are false. It is important to emphasize the extreme difficulty in studying these animals in the oceans where they spend practically all their lives (particularly the males).

The short periods of nesting allow for only brief and seasonal observations. One may understand why the knowledge that we have is essentially of an anatomical, embryological and biogeographical order, whereas the whole biological, physio-pathological and ethological side still remains obscure.

Specialists are unanimous in recognizing the disappearance of spawning places everywhere in the world. This is very serious in the Caribbean where

the combined effects of tourism and development have greatly marred the coastline.

The idea of using sea turtles goes back to previous centuries, to periods when the need for meat, for raw materials and for "alchemical" exoticism led to the destruction of numerous living species of the biosphere. Today sea turtles may represent three types of resources, which should be kept in mind throughout this article. They may be considered as responsible for:

- scientific resources: biological, physio-pathological, and ecological findings in relation to the study of the marine milieu;

- aesthetic touristic resources: spawning sites, initiation to nature, discovery of the marine world, etc...;

- purely material resources: shells, nutrituion protein, decorative objects, leather, etc...

The study of sea turtles promises many discoveries which serve to reinforce the effective protection of the species. This cannot be done without solid international cooperation.

II. In Guiana: A Model Station

French Guiana has two large spawning sites where, between March and September, all species may be found, with a predominance of Luth turtles. We are referring to the beaches at Mana where the Galibi Indians live, and to a few beaches on Cayenne Island.

After the publicity campaign of 1970, the massacres of turtles during spawning periods have practically disappeared. They happen only infrequently today. The nests and the young at birth are threatened by various predators:

- Man for his consumption and his expropriation of the sands.

- Crabs, birds of prey, crab-rats, etc.

- Feral dogs: They constitute a veritable scourge for which a solution must be found if the authorities want to effectively protect the spawning sites. On Mana it seems that the attempts at surgical sterilization of the female dogs has been unsuccessful. A veterinary mission must necessarily be sent to the areas before any official attempt to create natural reserves, so as to find a solution along with the herpetologists and the Indian village authorities. Otherwise the largest of the three coastal reserves in Guiana will be but an administrative illusion.

The scientific team which has been studying this site for several years (National Museum of Natural History - Mr. Lescure and Mr. Fretey) has acquired solid experience on the terrain and is accumulating very valuable observations over the years; the creation of a hatchery is being considered, modeled after the one in Surinam (60% success) but without any commercial goals in mind. To the ecologists it would be important to add veterinarians, an embryologist and

a pathologist specializing in animal diseases. Thus a multidisciplinary biological observation station should be set up in Guiana, at the spawning sites.

We might add that Guiana's meager tourism could usefully benefit from the hatching spectacle, were it properly set up by the scientists in charge. This would serve to create respect for the turtles among local populations. To this end, SEPANGUY would be able to propose certain educational activities, as for example the creation of informational plaques or posters. Signs of this type set up by the Museum team have unfortunately been stolen by tourists (proving thus the interest they have in this subject). An infrastructure for reception is being studied by the WWF - France and by SEPANGUY. The Guiana tourist office has edited a pamphlet concerning the sea turtles, their protection, their identification, their spawning sites and proper behavior in their presence.

III. The Antilles: The Scandal

We are currently witnessing, not only in the French zone but throughout the Caribbean islands, a veritable organized massacre.

Spawning sites have long since disappeared from the French islands except for a few rare beaches such as Caravelle in Martinique. They are systematically pillaged. Aves Island, belonging to Venezuela, is a primary site within this region but no true effort of protection is preventing the massacres. The mass occupations of the island coastlines by human communities, the development of sport activities and boating, have obviously reduced the number of spawning sites.

Today, the hunting of adult turtles is the most serious fact for which the various West Indies states may be reproached. An enormous tourist effort has considerably multiplied the sale of souvenirs. There is a feeble local artisanry, under-developed and of poor quality, but with a remarkable aptitude for carving up turtles and destroying coral.

In the French Antilles, the worst is attained by the turtle shell industry officially given over to the penitentiary administration. The excessive exploitation of the shells (one may buy them anywhere) and of the meat (restaurants) makes France complicit in the large scale massacre going on in the Caribbean area.

It seems proper then to immediately prohibit any sale of turtle, in any form whatsoever. This measure should be linked to effective control of airports (prohibiting the exportation of turtle shells from any French territory) and to a solemn call for international solidarity.

Collaboration among the various nations of the Caribbean to this effect, should be planned.

We might add that these apparently severe measures would only add to the indispensable effort to protect the Antilles coastlines which Associations for the Protection of Nature have been seeking for a long time (SEPANMAR - AAPNGE*).

*SEPANMAR: Societe pour l'Etude, la Protection et l'Amenagement de la Nature en Martinique. Office du Tourisme. Fort-de-France (Martinique).

*AAPNGE: Association des Amis du Parc Naturel de Guadeloupe et de l'Environnement. B.P. 286 - Basse-Terre (Guadeloupe).

IV. The Islands of the Indian Ocean: A Necessary Scientific Coordination

There exist in this region of the world, islands traditionally recognized for their nesting sites. These islands are currently the object of political ambition, particularly those belonging to France. The Glorieuses, Europa, Juan de Nove, and Tromelin have long been studied and protected by people from the scientific or technical worlds (ISTPM, Meteorology, R. Hughes, Oceanographic Research Institute).

Observations concerning all sea turtles are abundant; they testify to the seasonal but irregular nature of laying and hatching. They confirm the ecologically important role of natural predators. Efforts at setting up protected areas (Europa) have unfortunately been aborted by the massacres of young or old animals committed on the coasts of Madagascar in a traditional fashion. It would be more effective, in this respect, to create an interest among young zoologists, at the universities in Madagascar, in turtle ecology and to integrate them into French teams at the spawning sites--rather than to engage in diplomatic discussions with this country. Political problems are in fact acute in this region of the world.

It seems, furthermore, that French naturalist scientists are divided concerning the methods of observation appropriate to the work being done on these islands. There is then a real risk of confusion concerning the interpretation of ecological data, particularly as concerns culture, the importance of which we shall discuss further on.

We are asking that work teams on Indian Ocean turtles be constituted as quickly as possible, which would insure the cohesion among various groups and which would allow for concrete knowledge and effective control of the spawning sites.

V. Reunion: A Unique Project

Bourdon Island, due to its primarily rocky coasts, has no major spawning sites.

It is on Saint-Leu that the Corail firm chose to set up culture centers for green turtles (*Chelonia mydas*) after receiving authorizations, recommendations, and credits.

Faced with local interest in such a project, (jobs, resources, etc.) the authorizations, pushed for by locally elected officials, were rapidly obtained. One might even mention that what began as a study project (1976) became a concrete realization situated in Saint-Leu.

The recommendations were those, cooperatively, of the Maritime Affaires Service and the Nature protectors (SREPN* - SEPANRIT). It should be emphasized

*SREPN: Societe Reunionaise d'Etude et de Protection de la Nature B.P. 1012 - Saint-Denis (Ile de la Reunion).

that the French Herpetological Society had accepted the pilot phase of this farm under certain conditions that were never respected, and which we list here:

- the formation of a supervisory Scientific Committee with experts chosen by the Herpetological Society;

- the limitation, to three years, of the pilot phase, at the end of which, after conclusions from scientifically controlled data concerning the evolution of turtle populations on the keys, a favorable or unfavorable decision concerning continuation of the project would be given - and adhered to;

- the progressive replacement of captured turtles in their natural milieu by young turtles produced in captivity;

- placing at the disposal of the experts from the Scientific Committee the concrete means to supervise and control all the operations;

- the financial participation of the S.O.M.D.I.A.A. corporation in local as well as international campaigns for the protection of sea turtles.

During a meeting at the Saint-Denis Prefecture (June 1976) it was strongly advised that the following be studied before any move to further development:

- the coastal currents of Saint-Leu in order to determine what would become of the farm effluents;

- spawning in places where newly born turtles were previously taken for stock. (We have seen above what one should think of that).

Today this installation has abandonded the idea of breeding the turtles and prefers to perfect raising the young taken elsewhere. Small green turtles are taken at birth from Europa Island, by agents of ISTPM according to quotas established by local observers. Part of them are let loose in the sea. The other part are raised on Saint-Leu in modern installations, using nutrients perfected by "Grands Moulins de Paris". A mortality rate of about 37% has been recorded for the whole of annual arrivals. It is important to note the seriousness of an epidemic illness which strikes all the turtles; an illness linked possibly to the herpes virus which attacks the cutaneous covering and results in veritable mutilations, which are then aggravated by the other factors. Local measures and pathological studies could be undertaken to get rid of this breeding disease which is not necessarily mortal, but bothersome for many reasons.

The existence of a sea turtle farm would be a model for administration of a natural resource if this farm were run in a truly "ecological" fashion, that is if the species were not imperiled by this activity and if the environment sustained no damage due to harvesting or pollution.

In Reunion, this establishment must receive authorizations for samplings, as a function of variable quotas according to spawning seasons. This presupposes the serious permanent, scientific monitoring of the island turtles.

Collection should in no way be the responsibility of the breeding establishment. In a parallel manner it is absolutely necessary that research by the

scientists present be oriented toward attempts at true reproduction in the Saint-Leu installations. This should logically result, in benefit to all concerned, in a total protection of spawning sites; but it constitutes a long term project.

VI. New Caledonia: Favorable Evolution

In the Pacific great spawning sites have long been known. New Caledonia has never been the object of a precise study on this subject but a few beaches have been accounted for where observations are regularly made.

This is the case for Bourrail where effective protection is maintained by the local police and through encouragement by the Nature Preservation Association.

We may be quite satisfied that the efforts at protection have been pushed to the point of eliminating all shell products from souvenir stores. No turtle shells are offered to tourists at all, which is precisely what we would hope to do in the Antilles.

Conclusion

We are asking French authorities in charge of Overseas Departments and Territories to become aware of the serious problems posed concerning sea turtles, and which place our country in a conspicuous position. We would like to obtain their cooperation in order to:

- develop research on sea turtles;

- encourage knowledge of these reptiles by the public;

- restrain carefully their current commercialization.

To do this we recommend the following measures:

1) To maintain a team of herpetologists in Guiana and to add to it the men and means to fight against stray dogs. To create a hatchery to save numerous nests threatened by erosion; and to allow for ecological tourism at Hattes Point.

2) To prohibit all commercialization and exportation of turtles in Martinique and Guadeloupe and to enforce these prohibitions.

3) To create a work group in the Indian Ocean, bringing together numerous specialists and authorities in order to define, then exercise control over, possible harvesting at spawning sites.

4) To attach to the Corail farm a center for biological research on sea turtles, and to encourage this enterprise so as to make it economically efficient, in case turtle breeding should eventually be undertaken.

5) To consider the development of the Corail enterprise as necessarily a single isolated exercise with the aim of protecting the species.

6) To ask neighboring foreign states in the Caribbean and the Indian Ocean to participate in an international effort for the protection of sea turtles.

7) To begin an inventory of spawning beaches on New Caledonia and satellite keys, to study the frequency in these zones of nesting by the different species and the means of protecting them.

Translation

Domont, le 12 Mars 1981

Monsieur le President de l'Union
Internationale pour la Conservation
de la Nature
Avenue du Mont Blanc
1196 Gland
Suisse

Dear Mr. President:

Having received no answer to my long letter of last January 29, I am sending a second for fear that you didn't receive the first letter.

The President of SEPANRIT, Mr. Paulian, and I had hoped to meet with the appropriate representatives of IUCN in order to examine together the following three points which constitute the primary activities of SEPANRIT this year.

1) The SEPANRIT congress at Noumea in November 1981. All of the Associations for the Protection of Nature from France's overseas departments and territories, as well as numerous foreign dignitaries who have collaborated with us in previous years, will be attending this congress in New Caledonia. This congress will take place only a few days from the international congress of the IUCN in New Zealand and we would be very happy to establish relations with those who will participate in your meeting (the New Caledonia Association, constituting SEPANRIT will be present in New Zealand, as it is a member of the IUCN).

2) The mission to Brazil that we are to begin in May 1981 to establish relations with certain dignitaries or with the Associations for the Protection of Nature in this country bordering on French Guyana. Any advice which you could provide or any contacts in this country would be extremely valuable to us.

3) The diffusion of the small report on sea turtles in French overseas departments and territories which we have prepared in consultation with all the proper authorities in our country. This document constitutes the point of view of the SEPANRIT for a two-year period because we plan to put our opinion into effect based on the biological fluctuations of the sea turtle populations (we will also take into account the sociological fluctuations of the countries involved).

In hope, Mr. President, that our visit may take place at the IUCN head office and that it will serve to mark our desire for collaboration in the wonderful work you are doing in the world, I address to you my ecological greetings.

Dr. Michel Martin
Secretary General
SEPANRIT
Centre d'Etudes de Geographie Tropicale
Domaine Universitaire de Bordeaux
33405 Talence, France

UNIVERSITY OF FLORIDA
GAINESVILLE, 32611

DEPARTMENT OF ZOOLOGY
223 BARTRAM HALL
904-392-1107

April 20, 1981

Dr. Michel Martin
Secretary General
SEPANRIT
Centre d'Etudes de Geographie Tropicale
Domaine Universitaire de Bordeaux
33405 Talence, France

Dear Dr. Martin:

Mr. William Duke of IUCN has sent me a copy of your letter to him with the enclosed assessment of sea turtle problems in French overseas territories. This is an extraordinarily constructive document, and I hope it will receive the attention that it deserves, particularly in the Caribbean.

In only one regard do I have reservations regarding the views that you express. This is in respect to turtle farming, and your suggestion that if farms are self-supporting as regards new stock, and if they cause no direct environmental disruption, they should logically be endorsed by conservationists. To me, the most serious and inescapable adverse effect of turtle farming is the extension of markets, and the resulting stimulus to poaching wild populations and smuggling products derived from them. Until laws and enforcement are effective everywhere, farms and international commerce can only increase the pressure on wild species, and weaken the efforts of IUCN, CITES and other organized efforts to protect them.

But the purpose of this letter is not to air a difference of opinion about turtle culture. It is rather to express admiration and gratitude for your thoughtful and forceful analyses of the status of marine turtles in strategic parts of their range. If the Marine Turtle Specialist Group can be of any assistance in implementing the changes for which you reveal a need I hope you will let me know.

Sincerely yours,

Archie Carr

Archie Carr
Chairman, Marine Turtle Specialist Group, IUCN
Technical Director, Caribbean Conservation Corporation

Collaborative New Caledonia – Hawaii Satellite Tracking Research Project
S. South Pacific Stock
Loggerheads
" Grosse Tet "

Rene Gradpeau & SPC 1979 + NMFS Hawaii
Jean-Louis Society for the Protection of Nature N.C.

– Bycatch
Hawaii Fishery BASED

People More Partnerships

Fisheries

FISHERIES OCEANOGRAPHY

Turtles on the edge: movement of loggerhead turtles (*Caretta caretta*) along oceanic fronts, spanning longline fishing grounds in the central North Pacific, 1997-1998

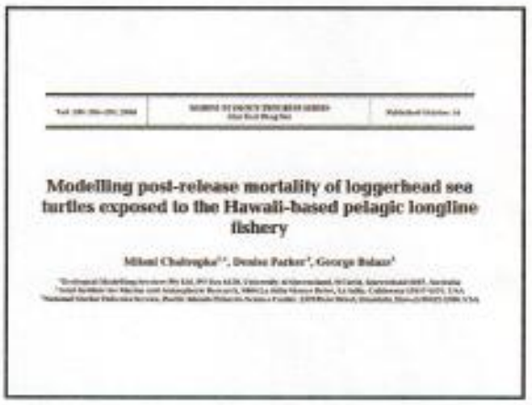
JEFFREY J. POLOVINA,[1]* DONALD R. KOBAYASHI,[2] DENISE M. PARKER,[2] MICHAEL P. SEKI[1] AND GEORGE H. BALAZS[1]

[1]Honolulu Laboratory, Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 2570 Dole Street, Honolulu, Hawaii, USA 96822-2396
[2]Joint Institute for Marine and Atmospheric Research, University of Hawaii, 1000 Pope Road, Honolulu, Hawaii, USA 96822

Fish. Bull. 101 (1):189–193 (2003).

Dive-depth distribution of loggerhead (*Caretta caretta*) and olive ridley (*Lepidochelys olivacea*) sea turtles in the central North Pacific: Might deep longline sets catch fewer turtles?

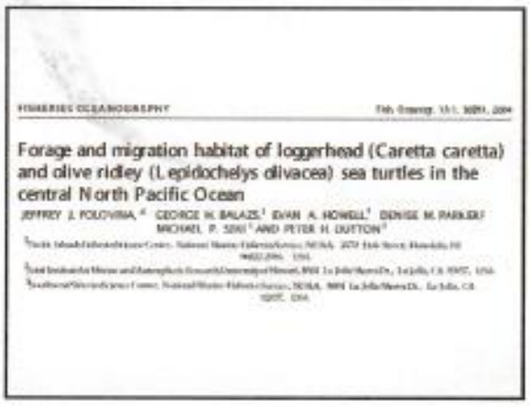
Jeffrey J. Polovina
Evan Howell
Denise M. Parker
George H. Balazs



Modelling post-release mortality of loggerhead sea turtles exposed to the Hawaii-based pelagic longline fishery

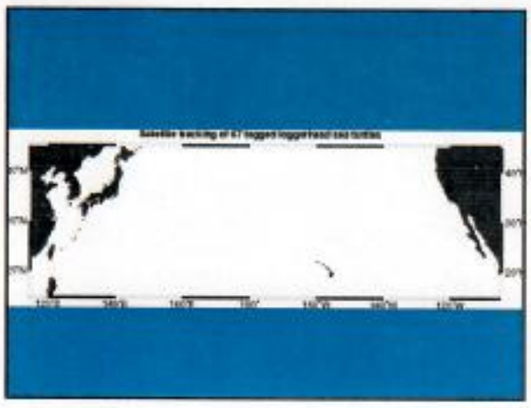
Milani Chaloupka[1,*], Denise Parker[2], George Balazs[3]

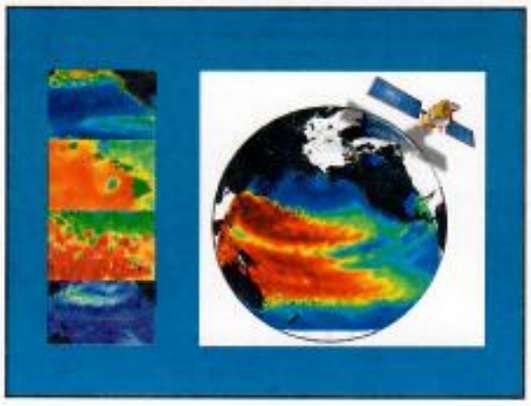
Diet of oceanic loggerhead sea turtles (Caretta caretta) in the central North Pacific

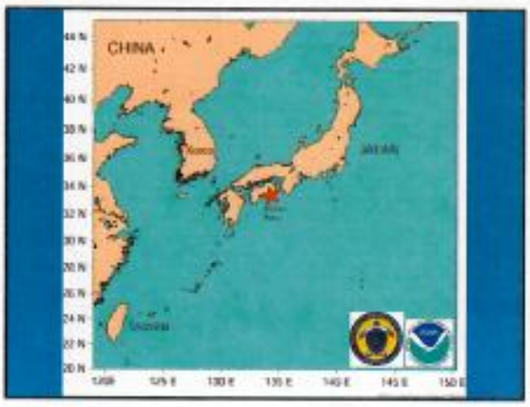


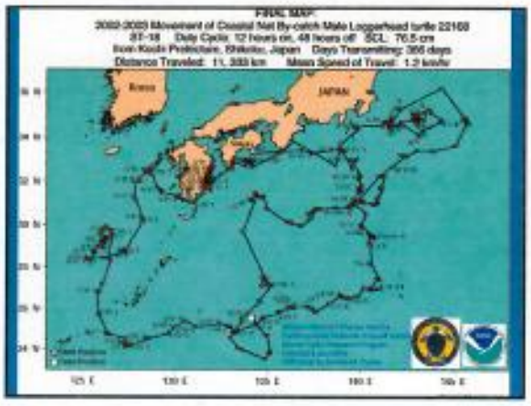
Forage and migration habitat of loggerhead (Caretta caretta) and olive ridley (Lepidochelys olivacea) sea turtles in the central North Pacific Ocean

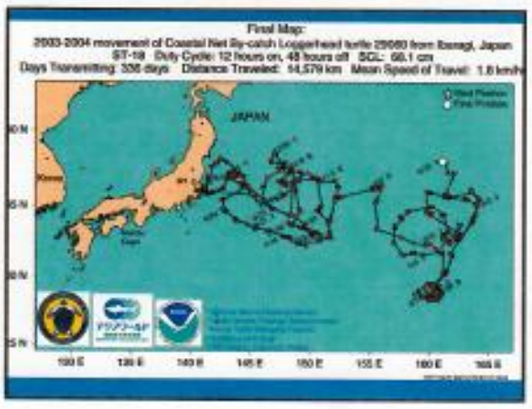
JEFFREY J. POLOVINA, [4] GEORGE H. BALAZS,[1] EVAN A. HOWELL,[1] DENISE M. PARKER,[2] MICHAEL P. SEKI,[1] AND PETER H. DUTTON[3]

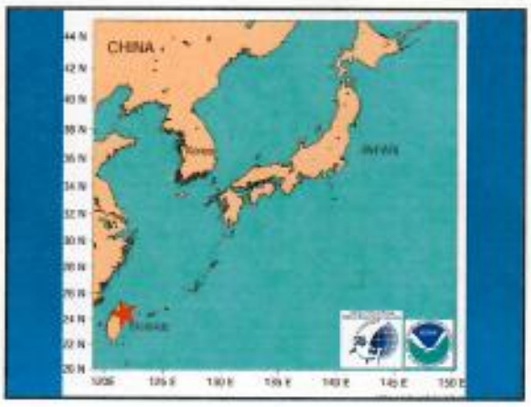


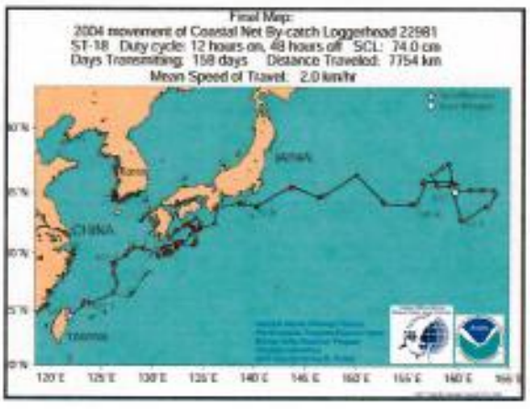


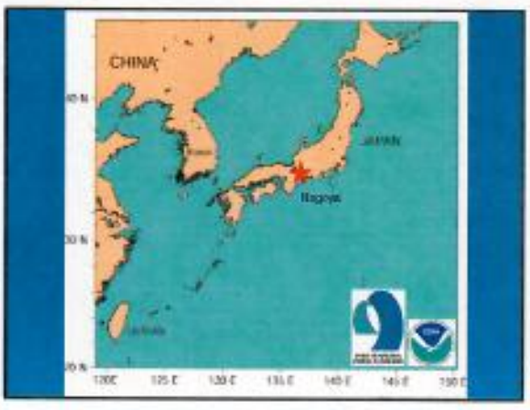



FINAL MAP:
2002-2003 Movement of Coastal Net By-catch Male Loggerhead turtle 22168
ST-18 Duty Cycle: 12 hours on, 48 hours off SCL: 76.5 cm
Iwan-Kouto Prefecture, Shikoku, Japan Days Transmitting: 366 days
Distance Traveled: 11, 333 km Mean Speed of Travel: 1.2 km/hr
JAPAN

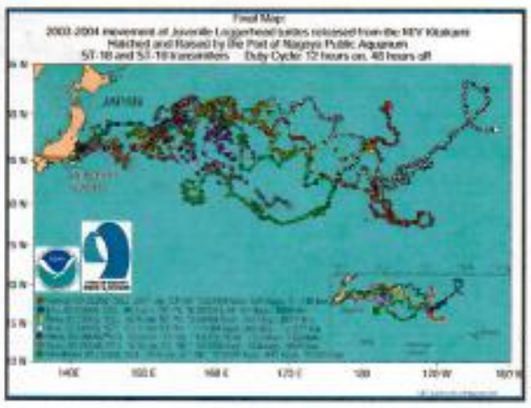

Final Map:
2003-2004 movement of Coastal Net By-catch Loggerhead turtle 25060 from Ibaragi, Japan
ST-18 Duty Cycle: 12 hours on, 48 hours off SCL: 66.1 cm
Days Transmitting: 336 days Distance Traveled: 14,579 km Mean Speed of Travel: 1.8 km/hr
JAPAN


CHINA
JAPAN

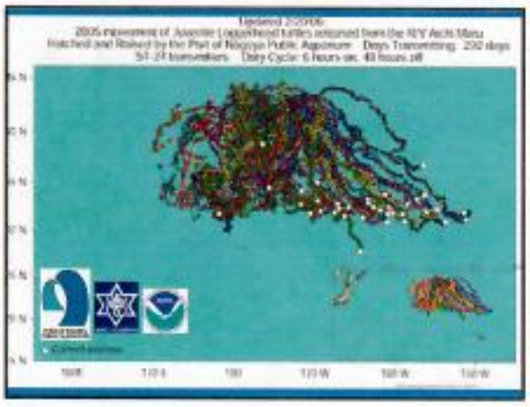

Final Map:
2004 movement of Coastal Net By-catch Loggerhead 22981
ST-18 Duty cycle: 12 hours on, 48 hours off SCL: 74.0 cm
Days Transmitting: 158 days Distance Traveled: 7754 km
Mean Speed of Travel: 2.0 km/hr
JAPAN
CHINA

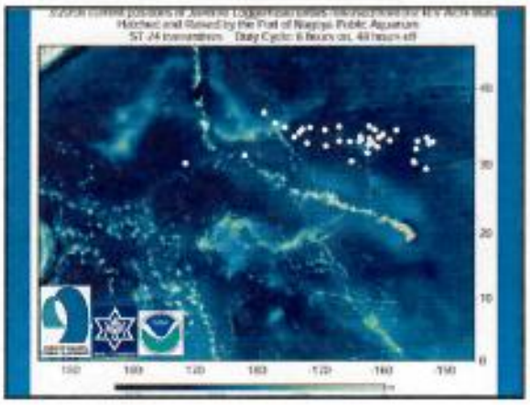

CHINA
JAPAN
Nagoya

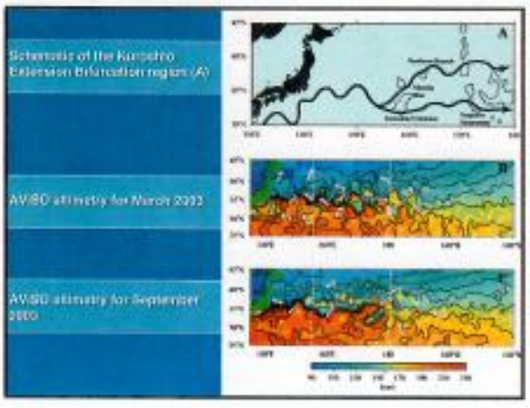

名古屋 仙台 苫小牧
TOMAKOMAI
名古屋 仙台 苫小牧

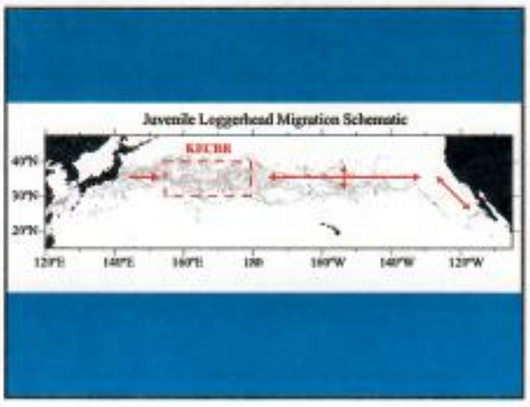

Final Map:
2003-2004 movement of Juvenile Loggerhead turtles released from the NEV Kitakami
Hatched and Raised by the Port of Nagoya Public Aquarium
ST-10 and ST-10 transmitters Duty Cycle: 12 hours on, 48 hours off

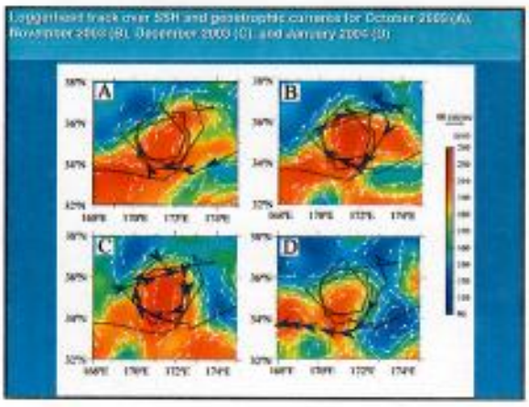

ALOHA 愛知丸
愛知県立三谷水産高等学校
WELCOME TO HAWAII


Updated 2/2006
2005 movement of Juvenile Loggerhead turtles released from the NOV Aoshi Maru
Hatched and Raised by the Port of Nagoya Public Aquarium Days Transmitting: 232 days
ST-24 transmitters Duty Cycle: 6 hours on, 48 hours off


Hatched and Raised by the Port of Nagoya Public Aquarium
ST-24 transmitters Duty Cycle: 6 hours on, 48 hours off


Schematic of the Kuroshio Extension Bifurcation region (A)
AVISO altimetry for March 2002
AVISO altimetry for September 2002


Juvenile Loggerhead Migration Schematic
KECBR
40°N
30°N
20°N
120°E
140°E
160°E
180
160°W
140°W
120°W



Summary

- KECBR an important habitat for loggerheads
- They use KEC in winter, spring, and fall and the TZCF in summer
- They use cyclonic and anticyclonic eddies
- They actively navigate this energetic area
- Some turtles may use KECBR for their entire juvenile period
- KECBR important international fishing ground – need to document and reduce threats to loggerheads in that region

Marine Turtle Newsletter

First Confirmed Occurrence of Loggerhead Turtles in Peru

NEW CALEDONIA/Hawaii Project