FIJI 1990s
GEORGE BALAZS
FILE FOLDER

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NATIONAL MARINE FISHERIES SERVICE
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October 15, 1992 F/SWC2:GHB:JLB
PENI-10L.GHB

Mr. Peni Waqabulabalavu
Box 1451
Labasa, Fiji Islands

Dear Mr. Waqabulabalavu:

Thank you very much for your recent letter regarding the tagged green sea turtle (*Chelonia mydas*) S30, S31, S32, S33 that you captured in the ocean off Labasa on September 29, 1992. I appreciate your taking the time to relay this valuable information to us.

The turtle you caught was originally tagged while laying eggs at Scilly Atoll in French Polynesia. Scilly is about 300 miles northwest of Tahiti. The turtle was tagged on October 19, 1991, during a research expedition conducted by EVAAM, an agency of the French Polynesian Government. The expedition, in which I participated, was also sponsored by the Regional Marine Turtle Conservation Programme of the SPREP (South Pacific Regional Environmental Programme).

Sea turtles in the South Pacific are not as abundant as they used to be. SPREP and EVAAM have been studying ways to promote their conservation to prevent extinction of this valuable resource. As demonstrated by the tag you recovered, green sea turtles in the Pacific region swim great distances between their nesting beaches and places where they normally live and feed on seagrasses or algae (such as in Fiji). The turtle that you captured migrated about 3,000 km (1,900 miles) from Scilly to Labasa. If she had lived, she would have returned again to Scilly next year, or the year after, to nest and lay more eggs.

Sir, I would be very interested to know what the turtle was doing when you first saw her (sleeping on the bottom, or swimming, or feeding?). Was the turtle strong and healthy? How did you catch her? Do you often see other large turtles in this same area? Sometime I would like to visit your island to see where the turtle was captured.

As a small reward, SPREP will be sending you a T-shirt with a turtle logo for reporting the tagged turtle to us. Thank you again for your letter. I look forward to hearing from you again. Please write to me at the address that appears at the top of this letter.

Sincerely,

George H. Balazs
Zoologist

cc: Philippe Siu, EVAAM
SPREP
P. Helfrich, HIMB

STONEFISH

23 October 1992

Attention: George H Balazs
N M F S
Southwest Fisheries Science Center
Honolulu Laboratory
2570 Dole Street
Honolulu, Hawaii 96822 - 2396
U S A

Dear George

Thanks for your letter and information. Robert is currently at sea pole and line fishing as the new season is in full swing.

He is reporting large green turtles mating on the beach at Nuku Cikobia this week.

He is also tagging turtles on behalf of the Fisheries Division. He will be delighted to assist if you require any Fiji data.

Regards

for Jan Stone (Mrs)

STONEFISH CO LTD P. O. BOX 3135, LAMI, FIJI. PHONE: 361283 PACIFIC HARBOUR FAX: (679) 361228

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THE TURTLE AND THE TORTOISESHELL INDUSTRY

By N. Levy.

(Read 30th November, 1942)

It is perhaps not commonly known that it is *Turtleshell* and *not* Tortoiseshell from which such a great variety of articles is manufactured.

There are two types of turtle in Fijian waters, one being called the Greenback or "Vonudina" and the other the Hawksbill or "Taku." The Greenback being a vegetarian is excellent eating, but the shell is useless commercially as the flakes are only of paper thickness. The Hawksbill is carnivorous and is not such good eating but the shell is of high commercial value. It is, therefore, to this species of turtle that the following remarks will be confined.

The back is covered with large scales or flakes, numbering thirteen, consisting of five crown or centre pieces and eight side pieces. The edge pieces or hoofs, number twenty-three. The thickness and size of the flakes and hoofs vary according to the age of the turtle.

Some of the turtle's habits are interesting. For instance, the female makes her way above high-water mark on a sandy beach, and after scooping out a hole in the sand, she will lay approximately 150 eggs, covering them over and disturbing the growth for some distance surrounding the nest, as a camouflage. She will also make four or five false nests in a similar manner as a further means of protection to the real nest. So well does she carry out her deception that it is only by means of pointed sticks speared into the sand over the disturbed areas, that the native in search of eggs, is able to locate them, as when the nest is struck the yolk adheres to the point of the stick.

The eggs, which have a covering of a leathery nature, are round, similar to a ping pong ball in shape and size, with a dent in one side. They require approximately four or five weeks to hatch. The young turtles wriggle through the sand to the surface, and immediately make their way towards the water. For them it is the commencement of a perilous journey, as they are preyed upon by sea birds. After thus running the gauntlet, they are met the the water's edge by the adult turtle who devours them as they come within reach. The few who manage to get past and are fortunate enough to escape the fish, make for driftwood and leaves, under which they shelter to avoid observation. They are very slow growing, and when full grown measure approxi-

mately three feet in length. The small turtles are an exact replica of their elders, though they have proportionately longer flippers. The shell of the young turtle is transparent, and thickens as it grows.

During their breeding season, the Government of Fiji protects the turtle by having a closed season for four months, from November to February.

The shell of the Hawksbill is exceedingly beautiful, with a variably mottled pattern, in colours ranging from black, through deep red, to honey colour and blonde. This mottled colouring forms a protection, affording a likeness to the coral and rocks when viewed from the surface of the water, while the belly of the turtle is blonde in colour and resembles the light on the surface when seen from below.

The methods of capture are varied. One is with nets made of strong fishing cord, having a twelve-inch square mesh. The nets stretch for hundreds of yards, and the fishermen have to be smart when they get a catch, for their old enemy the shark soon gets busy, and the net is ruined.

Another method is that of spearing.

The author has also heard of a Fijian coming across a turtle asleep on the surface of the water, and by quietly swimming up and turning the turtle on its back he is able to keep it in this position until a canoe comes alongside and takes it aboard.

A rather interesting method of capture is practised in the Torres Straits and in the West Indies. The sucking-fish, or Remora, is in this case pressed into the service of the fishermen. Taking advantage of the fishs' natural habit of swimming towards, and adhering fast to, any larger floating object, fishermen go out with specimens kept alive in small wells in the bottoms of their boats. When in pursuit of turtle, a long light line is attached to the fish's tail; and coming within sight of the turtle, the fish, with an abundance of slack or pay-out line, is thrown in the direction of the turtle. The Remora immediately swims towards and adheres firmly to, the under surface of the shell of the turtle, when it will suffer its body to be torn asunder rather than let go its hold. Both the fish and the turtle are dragged with the line back to the boat.

The natives detach the flakes from the back of the turtle by means of steaming, with a sack dipped in boiling water. Beautiful shell may be ruined by lazy methods of placing the shell near a fire to get the heat. In this way it becomes badly scorched and useless.

Apart from exporting turtleshell in large quantities to other parts of the world, we have quite an industry here in Fiji, manufacturing articles such as toilet sets, cigarette cases, jewel boxes, watch bands, and other goods too numerous to detail, right down to the humble saltspoon. In England, very expensive toilet sets

are manufactured, being richly inlaid with platinum or gold, the prices running into hundreds of guineas. The author had an instrument case to repair which was made in England over 100 years ago, and it had withstood wear particularly well. When repaired and polished it looked almost as good as new.

In concluding, little insight into the manufacture of turtle-shell goods may be given. The shell, with treatment, will take a beautiful and lasting lustre. The application of heat renders it ductile, thus enabling it to be worked into all manner of shapes. The making of a cigarette case may be described.

First, a piece of shell of suitable colouring is selected, for no two pieces of shell will be found to have the same marking and colouring. As the thickness of the shell varies, the first step in the manufacture is to bring it to an *even* thickness. If an extra large case is being made, it necessitates the joining of the shell by a secret method. The piece of shell is then placed in a double mould, one half is convex and the other concave. The shell and the moulds are next subjected to heat which makes it ductile. Pressure is then exerted on one half of the mould, causing the shell to take shape. Both the mould and the shell are then cooled off. After removing the shell from the mould it retains its shape. The same process is repeated to form the other half. The two halves are then scraped, sand papered to a fine degree, and roughly polished. The edges are trued up to receive the hinges and catch, the fitting of which requires an expert tradesman. The case is now given its final polish. This completes the manufacture and is followed by a thorough inspection of all parts before being offered for sale.

The Fiji Society of Science and Industry 1942 pp: 147-154.

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BECHE DE MER—TREPANG

By Chas. R. Turbet, B.V.Sc., M.R.C.V.S.

(Read 25th May, 1942)

Bêche-de-mer or trepang is the trade name given to dried *holothurians* used in the preparation of gelatinous soups considered a luxury by the Chinese and other Eastern peoples. The name was not originally French but is gallicized from Portugese bicho-da-mar, sea worm.

Most residents of the country are familiar with the general appearance of the living bêche-de-mer, or trepang, as it is known in Malay. Its sausage-like shape makes it easily recognisable to those who have occasion to visit the reefs. The descriptive term sea-cucumber also aptly describes it, so that, having that name in mind, even the most inexperienced would easily identify the creature.

Zoologically the bêche-de-mer are classified under the Phylum: *Echinodermata* (spiny skinned). Class: *Holothuroidea.*

In the sea-cucumbers the skeleton is represented only by isolated nodules of calcium carbonate. The body wall is highly muscular. The mouth and anus are situated at opposite ends of the body, the mouth being surrounded by a ring of buccal tentacles or feelers. Ambulacral grooves (represented by closed canals) run from near the mouth to the proximity of the anus. Movement is accomplished by means of podia, aided by worm-like contractions of the body.

Another organ which opens into the cloaca is the *Cuvierian organ.* This consists of a number of unbranched tubes. If a sea cucumber is held by the head end and strongly flicked, the thin wall of the cloaca breaks, liberating the tubes of the Cuvierian organ. These secrete a sticky substance capable of ensnaring an enemy. The animal is itself able to bring about the intrusion of these tubes by contraction of its muscular walls. This self mutilation is not necessarily fatal since, if the animal is left alone, it can regenerate the whole of these organs.

The *water vascular system* is a complex arrangement of tubes and spaces by which the turgidity of the body cavity and the action of feelers and podia is controlled.

Sea cucumbers have both nervous and blood systems. The genital organs consist of a single group of branched tubes which converge to a short genital duct which leads to a pore situated on the mid-dorsal line a short distance behind the feelers.

Living sea cucumbers vary in size from six to eighteen inches or more in length, the size in these waters varying with the species. It is unusual to find big variation in the size of individual members of the same species present on the same reef. Some may bear on the skin spicules or prickles of lime, fewer on the better. All the commercial kinds are capable of great extension and contraction of the body.

The food of bêche-de-mer consists chiefly of the microscopic calcareous-shelled animals known as *Formminifera*, which are swallowed in combination with a large percentage of sand and broken fragments of shells and corals. The process of feeding (1) is in all varieties identical and somewhat remarkable. The tufted, mop-like tentacles are one by one swept over the surface of the ground or reef upon which the animal is feeding and in corresponding order they are recurved towards the mouth and thrust with adherent food matter down the creatures throat. In reverse order they are extended to annex more food.

Sea cucumbers are found chiefly in tropical waters on coral reefs as mentioned above. They also occur on the Californian coast where the trade is large. Non-commercial varieties are quite well represented in temperate waters.

The process by which bêche-de-mer is prepared for the market is as follows:—

The "fish" are first collected in sacks by wading on the reef during the low spring tides or by diving over the edge of the reef. Whilst still fresh the fish are taken to a shore curing station or treated on the deck of the fishing vessel.

Salt water is brought to the boil in a cauldron and the whole "fish" is plunged in and boiled for twenty minutes. With the large varieties boiling up to one hour may be necessary. An easy method of determining if sufficiently boiled is to take a "fish" out of the boiler and drop it about six feet onto a board or other smooth surface. If sufficiently boiled it should bounce like a piece of rubber.

Bêche-de-mer (particularly the Sucu Walu) should be boiled as soon as possible after being collected from the sea, otherwise the skin breaks and the prepared fish has a ragged appearance.

The "fish" are taken from the water and split longitudinally along the dorsal surface with a long, sharp-pointed knife. They are then gutted. In order to expose the body cavity the split sides of the "fish" are best held apart by the insertion of wooden splints.

If the weather is favourable, sun drying until most of the moisture has evaporated is economical and tending toward the production of a good quality article. It may be necessary, however, in Fiji, owing to the likelihood of rain, to commence to dry the "fish" in a smoke house. The latter may be of corrugated iron, timber or thatch construction, ten to twelve feet high

and fitted in its upper half with two or three tiers of wire netting upon which the bêche-de-mer is laid in single layers, insides downward.

The wood most suitable for the smoking process is the Tiri or Mangrove *Rhizophora mucronata.*

If the "fish" are placed in the smoke house after preliminary sun drying, twenty-four hours is a sufficient period for this operation. If, however, the "fish" are passed directly into the smoke house after gutting they should remain in for forty-eight hours. If sunshine becomes available it is a good plan to expose the bêche-de-mer to further drying after smoking to expell the last possible moisture. The spreader sticks should be removed before the "fish" becomes too dry so that it may neatly curl up again into its original shape.

From three to four hours should be a sufficient period before removing the wooden spreaders. At this time it is advisable to mould the slug between the hands as it is then comparatively soft. If this is done the bêche-de-mer will keep fairly straight during the subsequent smoking. It is imperative that the "fish" are cured straight and not crooked.

Great care is necessary in the smoke drying otherwise the fish is liable to become scorched and blistered. In fact the greatest care and attention is required during the whole curing process if the best price is to be obtained: they should be properly boiled, neatly cut, well dried and smoked.

Before being bagged bêche-de-mer should be quite cold and it is wise to tip them out and expose them to the air and sun as much as possible. An essential matter that demands the attention of those engaged in the bêche-de-mer industry is the maintenance of the cured "fish" in a thoroughly dry condition. The prepared product readily absorbs water: should it get wet or have been insufficiently cured it has a tendency to dissolve into a tenacious glue-like mass of the most repulsive aspect and abominable odour.

As bêche-de-mer is sold in China, usually in small retail shops, it naturally follows that the best cured specimens bring good prices and badly cured fish (badly cut, ragged, twisted up like the sole of an old boot) must be sold very cheaply.

When the fish are cured and dry they shrink to about one-eighth their size and weight when fresh.

The "fish" are found in all the reef protected waters of the Fiji Group. Calmer waters are preferred. Large areas of comparatively shallow waters such as found along the north coast and western end of Vanua Levu are favourable localities as well as the waters between the Tailevu coast and the main ocean reef extending south from Ovalau. Sand covered patches are frequented by the "fish."

VARIETIES.

Sucu Walu: Teat Fish. This is the most valuable species. It is brown in colour, large. The presence of eight tubercles or podia on either side is responsible for its name, eight-teats. It is found on the sandy bottoms at a depth of from three to eight fathoms.

Dri Loa: Large Black Fish. This also a valuable species. It is jet black in colour even when taken from the sea. Sandy bottoms in water from three to eight fathoms are favourite locations for this fish.

Dri Dina: This fish is found on and under the reef.

Tarasea: A small variety, reddish in colour, ranking slightly below the first two mentioned in value.

Vula: Whitish-yellow in colour when taken from the sea, this fish with only slight pressure emits large quantities of sticky white threads. It is very common on the surface of the reef but also occurs in deeper water. Live fish are fairly large but on curing the size shrinks very considerably and greater than other commercial varieties.

Dairo-Volovoto: This is a small, black fish with prickles or spiny protuberances. Fairly common and occurs in shallow water on top of the reef. It has no value as bêche-de-mer, but Fijians occasionally use it.

Loli: Very plentiful on shore reefs. In colour it is greyish. Little commercial value, although it is sometimes prepared and offered for sale as bêche-de-mer. Local Chinese are said to use the varieties and the Fijians boil the fresh "fish" for food.

In regard to the first historical record concerning the quest for trepang in the Fijis, Captain Aikin on the 13th May, 1805, two or three weeks after his return to Sydney after a voyage to New Caledonia in quest of trepang, addressed a memorial to Governor King of New South Wales asking for permission to depart from Sydney in an American vessel ostensibly in quest of sandalwood and "Beechleymar" among the islands of Fiji. Governor King addressed a despatch on the 30th April to Earl Camden setting out the circumstances of Captain Aikin's voyage in quest of bêche-de-mer. Although they failed in their quest, the presence of sandalwood in the Fiji Islands, a group hitherto not much known, was brought to light.

Between 1805 and 1813 a flourishing trade in sandalwood developed. So great were the profits that Lockerby described the trade as being equal to the coining business. The connection with the coastal natives made through this sandalwood trade enabled an immediate change over to bêche-de-mer collection possible on the breakdown of the former industry. In this connection I quote from *The Journal of William Lockerby*, edited by Im Thurn and Wharton:—

"The year 1813 is memorable for the visit of the East India ship *Hunter*, Captain James Robson having with him Peter Dillon: for this visit lead to an affray with the natives of Wailea, so serious that it finally put an end to the already dwindling chance of successful trade for sandalwood with the Fijians."

This fact lead to the masters of ships engaged in the sandalwood trade to turn their attention to the collection and preparation of bêche-de-mer for the China market. The narrative goes on and after some detail of their adventure appears the following passage:—

"But the Waileans bringing in sandalwood only very slowly: there was little work for the boat hands to do on the ship, and these were therefore taken over and placed at 'a place called Camba,' near the island of Bow to procure bêche-de-mer . . ."

It should be noted that the *Hunter* is the first European ship recorded as having approached and touched at the south-eastern corner of Viti Levu: also that this camp of bêche-de-mer hunters is the first known instance of Europeans, other than the few beach-combers who got to Bau from wrecks in the Lau Islands, remaining, even for a brief period, anywhere on the mainland of Viti Levu.

Historical.

In the following years the bêche-de-mer trade appears to have largely supplanted sandalwood collection. Passing the interim years to 1829 I quote from the volume *Wrecked Among the Cannibals of the Fijis*, Endicott-Jenkins, Salem, Massachusetts.

"On the 24th (Nov., 1829) . . . the Captain contacted with one of the principal chiefs to build three houses on shore for the purpose of curing bêche-de-mer* at a place called Sub-a-sub (Savu Savu). On the 10th December the First and Third Officers went ashore with ten men and commenced purchasing the bêche-de-mer.

"We employed great numbers of natives, frequently upwards of 80 canoes averaging 10 men each, besides great numbers on shore procuring wood (of which we used great quantities) and assisting us in curing the cargo [purchased by trade articles].

"We also purchased a kettle of Captain Kinsman (ours being too small to make any progress). On 21st December the brig *Quill* sailed for Manilla, having on board 800 piculs of bêche-de-mer. [Picul = 140 lbs.]

Illustrating the difficulties which beset the early bêche-de-mer fishermen, the account continues:—

"We continued curing bêche-de-mer on shore, whilst those on board were putting the ship in order and nothing particular

* *Wrecked Among Cannibals in the Fijis*, Endicott-Jenkins, Marine Research Society, Salem, Massachusetts.

occurred until the 30 January (1830) when the natives on shore maliciously set fire to our houses and destroyed 60 piculs of bêche-de-mer.

"The next morning we discovered that they had broken our kettles for the purpose of getting our wrought iron . . . on the 2nd February we recommenced curing fish, in the houses of the King, the blacksmith having mended the kettles.

"On the 10th February as the bêche-de-mer began to grow scarce on the reefs, it was determined on the advise of the King to go to another bay, about 40 miles distant (Ngaloa) and build new houses and employ the natives in that place . . . We found on April 9th that we had upwards of 1,000 peculs of bêche-de-mer, 350 tortoise shell and some sandalwood so we settled with the natives and burned our houses" [so that they would not be used by other traders].

The life of the early bêche-de-mer fishermen was hard and often fraught with much danger.

After William Endicott had spent the night in the witnessing of the horrors of a cannibal feast he recorded in his diary "about sunrise, I went to the bêche-de-mer house and set myself to work collecting the bêche-de-mer on the battens (*vatas*) in readiness to be put into the bags when the boat came off."

Development of the Trade.

From the book *The Cruise of the "Curacoa"* I quote:—

"The disputes which took place latterly between the fishermen on the coast of Macuata have diminished the yield of bêche-de-mer, nevertheless the price is good being 1,200 dollars per picul of 140 pounds and for inferior, 1,000 dollars."

Statistical records of the trade are wanting, however, until 1875 when the publication of export trade figures in the *Blue Book of Fiji* became available. There follows a table of average annual trade figures for ten-year periods.

Period	Quantity Tons	Value £
1876-1885	45	2,111 annually
1886-1895	36	1,852 "
1896-1905	17	1,180 "
1906-1915	6	480 "
1916-1925	34	3,952 "
1926-1935	62	6,368 "
1936-1942		

During these sixty-seven years boom periods have occurred as follows:—

Period	Quantity Tons	Value £
1875	113	3,411
1920	116	17,545
1930	133	13,886
1931	143	16,045
1932	103	8,801

Since the commencement of the Sino-Japanese war the trade has fallen off to negligible proportions. Apart from the difficulty of trade during war time there is a peculiar and characteristic Chinese reason for this. Previously a considerable proportion of the bêche-de-mer consumed in China was Japanese produce. When Japan attacked China, the latter placed an embargo on trade with Japan and since there was no means by which the Chinese citizen could differentiate the Japanese product from that produced elsewhere, the Chinese refused to consume bêche-de-mer from any source, so that today they do without this luxury as a war effort.

Curing.

Great care must be taken in all stages of curing bêche-de-mer. All foreign matter such as sand and shell has to be cleared, it is then boiled and the " innards " taken out, and then dried over a slow fire. Wire netting or a grille of bamboo is used to hold the bêche-de-mer over the fire. Sun drying is too slow. Expert attention is required, for if selection of quality is careless, or if boiling is too little or too long, it will not dry but remain a pulpy mass whch soon begins to rot and smell, and has to be discarded.

After proper curing, and if kept in a dry place, it will remain in good condition for several years.

Food Value.

As a food, opinion differs amongst the Chinese, but in any case it is not considered to be an aristocrat dish like bird's nest, shark fin, or eel tripe soup.

It is not used by itself, since it has no culinary taste of its own, but is used as one of the ingredients, giving its name to the dish, when making soup or pork or poultry, and it simply helps to bring out or improve the taste of these two meats. The dish is served up hot in bowls on the table, the bêche-de-mer, chicken, pork and all ingredients swimming in the soup. The guests to the dinner help themselves to the liquid, but eat very sparingly of the bêche-de-mer. But the left-overs of all courses of the dinner is carefully retained by the chef, and next day an all-in mixture is prepared again, which is very palatable (compare chop suey, rissoles and hash). The bêche-de-mer by this time has borrowed and absorbed all the flavours of the remains of the other courses, and now is exceedingly tasty.

The guests having eaten their dinner the day before, of course, do not partake in this hash dish, but the host often sends a portion of it to his relatives and intimate friends, and it is very much welcome.

Preparation.

The bêche-de-mer is placed in water and brought to a boil. Then a stiff brush is used to clean away the foreign matter clinging thereto. The bêche-de-mer is then cut up into small slices and put in to another change of water and boiled again. This boiling takes several hours and some chefs prefer to do it overnight.

Another change of water is made for the final process, and pieces of pork and poultry, and probably some bamboo shoots, and the usual seasoning are added to it. The whole is then boiled again until everything becomes tender. The whole process from start to finish takes about ten hours. No great skill is required, but some patience is desirable.

Great care is taken in preparing bêche-de-mer for food, and it is well sterilised and cleaned of foreign matter in several changes of boiling water before the final cooking takes place. Being a sea product, there is every reason to think that it possesses health-giving properties, something like kelp, for its phosphorous and iodine content must be substantial. The popularity of sea food amongst the Chinese in the maritime provinces may explain the reason for the small incidence of goitre.

Economic Value.

Some years ago, Fiji bêche-de-mer found good markets in China. It was shipped to Hongkong, but the bulk of it was not consumed in Hongkong or Canton, but actually went to markets in Shanghai and north China.

Japanese fishermen, whether at home or in other places where bêche-de-mer abounds, make a good livelihood fishing for and curing this product, and the Chinese public long had the idea that it was a Japanese product. When the wave of nationalism passed over China some years ago, the public opinion called for a boycott of Japanese goods. Fiji bêche-de-mer was also adversely affected, as the Chinese thought that all bêche-de-mer was a product of Japanese enterprise.

Acknowledgments.

My special thanks are due to Mr. P. R. Whysall of Suva, Mr. L. Dietrich of Levuka and to Mr. G. D. Hill of Suva for notes on the species encountered in Fiji and for the method of preparation for market. To Mr. Cheng for notes on food and economic value and preparation of bêche-de-mer soup. I am indebted to Mr. Honson for the samples of bêche-de-mer demonstrated.

Species of turtle face extinction

FEARS that two common species of turtles may become extinct has led the Fisheries Department to issue a strong warning to poachers.

The two species which have almost become extinct are the Green Turtle known in Fijian as Vonudina and the Hawksbill turtle known as Taku.

The two species were once abundant in Fiji waters but are slowly becoming extinct as people hunt for the shell backs, skin and oil.

The eggs and meat are also considered delicacies, and the backs are sold as tortoise shell to tourists. The skin is used for leather.

Turtle oil is used for cosmetics, and its lubrication calipee is used for soup.

A viscera found in turtle is used for animal food.

Demand for these has led to the virtual extinction of turtles.

The breeding season begins between the months of November and February.

People face heavy fines under the Fisheries Act for killing or even molesting turtles during the breeding season.

Under the regulations people are not allowed to dig, take or destroy turtle eggs during the breeding season.

The regulations also forbid the killing or molesting of any species of turtle if the shell is less than 18 inches in length.

This applies all year round whereas the killing of turtle is completely forbidden during the breeding season between November and February.

A MARKET vendor with turtle shells at Lautoka market. Turtle shells are sold for about $70 each.

There is also a complete ban on sale or export of turtle shells which are less than 18 inches long.

A spokesman for the Fisheries Department said turtles go to remote sandy beaches to lay their eggs in November every year.

They dig out holes in the sand and lay up to 200 eggs in each.

The sandy beaches they choose are mostly on offshore cays.

Nesting beaches often have barrier reefs with coral, rocks, debris, fine to thick sand and thick vegetation.

The Turtles leave their eggs covered with sand to incubate without parental care.

The sand on the beach helps prevent desiccation and protects the eggs from predation.

Nesting seasons vary around the world but mostly coincide with the rainy season when the wind velocity is low.

Turtles are usually found nesting during the day although some have been known to nest at the night.

They mate on the surface in shallow waters adjacent to the nesting beaches.

Turtles mature at about threee years when they are about 13.5kg in weight.

Fish poisoning: Its cures and symptoms

THROUGHOUT the islands of the Pacific fish remains a readily available and cheap source of protein. Poisoning following consumption of toxic fish is therefore not uncommon.

The clinical syndrome produced by eating toxic fish is well recognised in Fiji and fish poisoning over the years has become an increasingly important medical problem. Epidemics of fish poisoning occur when either an unknown species of fish or a species previously known to be non-poisonous is eaten.

Fish poisoning in some areas has been associated with the annual rising of the Nereid worm (Eunice viridis) commonly known as "balolo", after which many of the fish in the surrounding area are found to be toxic. However concrete evidence associating balolo with fish poisoning is yet to be given.

In Fiji five types of fish poisoning are recognised. They are:

a) poisoning by puffer fish (tetradon poisoning)
b) poisoning by clupeids (also known as daniva poisoning and including anchovy and sardines)
c) scombrid poisoning (tuna and mackerel)
d) mullet poisoning
e) ciguatera poisoning (ciguatera toxicity is caused by a number of unrelated fishes ecologically associated in narrow regions or reef-areas).

Poisoning following consumption of fish is not only an annoyance to the otherwise healthy victim whose routine work may be interfered with, but reports of deaths after consumption of poisonous fish have also been made.

In Fiji deaths due to fish poisoning have never reached an alarming level. The earliest reported death from fish poisoning was in 1974 when two people died. 1975 to 1977 had no deaths and in 1978, two more people were reported dead after consumption of poisonous fish.

In Fiji ciguatera poisoning represents 98.4 percent of all documented cases of marine food poisoning. The total number of cases during 1975 — 1983 was 926 and the annual rate reported per 100,000 population varied from three-57. Because the figure represented only persons who sought medical treatment the actual incidence rate would be much higher than this.

In spite of the very high morbidity rate, in comparison to all other forms of marine food poisoning, only few people have died from ciguatera poisoning after several days of hospitalisation.

A recent interview with the Principal Fisheries Officer, Mr Surendra Sewak, indicated that since the consumption of fish has increased, fish poisoning cases may increase as well. However, he said that with proper methods of cleaning, storing and cooking such incidents can be avoided.

Symptoms of fish poisoning largely depend on the amount of toxic material a person is liable to assimilate after consumption of the fish. One should bear in mind that toxicity of fish, even within one species, varies remarkably from individual to individual, from region to region and from year to year. The viscera, especially the liver are far more toxic than the flesh and the body, but little evidence is available at present on the relative toxicity of the various organs.

The onset of systems are as follows:

The digestive system whereby a person complains of severe abdominal pain and diarrhoea (the stool is very watery after the first few motions).

*Paul Holthus SPREP-SPC

REGIONAL FISHERY SUPPORT PROGRAMME

FAO/UNDP PRIVATE MAIL BAG
SUVA, FIJI

FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

UNITED NATIONS
DEVELOPMENT PROGRAMME

HQ REF: DP9/ RAS/87/002
YOUR REF:
OUR REF: SAM 1, RAS 1.6
LETTER NO: 062

CABLE: UNDEVPRO SUVA
FAX: (379) 300029
TELEX: 2512 "FAOFIS" FJ
TELEPHONE: 300802, 300677

23 January, 1990

George,

A firm in Samoa, Samoa Marine, acquired a lease on an island off Aleipata and an adjacent 42 acres of sea area for the purpose of a clam farm and turtle hatchery. They wrote me recently for information about turtles. Specifically, they would like to know about care of eggs, raising of young turtles and tagging. As you are the recognized authority on Pacific Island turtles, perhaps you could offer some suggestion to Peter Meredith, Samoa Marine, Box 4700, Apia, Western Samoa, fax (685) 20087, tel 22721.

Regards,

Robert Gillett
Fisheries Development Adviser

Mr. G. Balazs
Honolulu Laboratory F/SWC2
Southwest Fisheries Center
National Marine Fisheries Service
NOAA, U.S. Dept. of Commerce
2570 Dole Street
Honolulu
HAWAII 96822-2396

c.c. P. Meredith, Samoa Marine, Apia, Western Samoa

Fisheries Division
PO BOX 358, Suva, Fiji

Tel:361122
Tlx:2290
Fax:351079
Date:10/09/90
File:34/4/7

George H. Balazs,
National Marine Fisheries Service,
Southwest Fisheries Center,
2570, Dole St.,
Honolulu,
Hawaii 96822-2396
U.S.A

Dear George,

RE: TAGGED TURTLES

Thank you very much for your letter of 23rd August, with the contents of your Fiji file. I am sorry to be so late in acknowledging, but the information has been very useful in helping me to rewrite my Cabinet paper on turtle conservation.

Indeed, the whole meeting at SPREP was very useful, particularly in bringing me up to date on what was happening in the field and around the region. I was particularly interested in the efficacy (or otherwise) of headstarting since I had the feeling it was likely to be a waste of time, but I didn't have the information to back up that feeling. I have been asking around, and it there is a rumour that someone is already running a kind of farming project on one of the outer islands.

Sometime, real soon now, I plan to put out another press article on the state of play, and soliciting further public interest. The tag-return information from Fiji, scanty though it may be, will be of great benefit in providing a local angle. Along the same lines, it would be very useful if we could buy, or be given, a few tags from your laboratory so we could make a quick start on opportunistically tagging any individuals that come our way.

I am not sure of how to go about putting a project together for SPREP, beyond requesting some appropriate literature, since headstarting appears to be ruled out. Obviously, our first priority is a survey of turtle nesting beaches with head-counts during the nesting season. Some of that we can do from our Makogai field station, and on routine trips, without requiring additional financial input, but the most useful information is likely to come from reports from the general public.

An aerial survey of those areas where turtles have been reported previously to nest might give us a broad idea of what is going on. Turtle Airways is still running, I believe, so it may be good publicity for them. Colin reckoned that the peak nesting season for Green turtle in the South Pacific was the last 2 weeks in December. Is the Hawksbill peak season

similarly defined? Most of the reports of turtle nesting in Fiji appear to relate to Hawksbill.

Ono, Kadavu, (different from Ono-i-Lau) still appears to have several Hawksbill nesting beaches, and our Giant Clam project staff have noted nesting at 3 sites on Makogai. Namenalala, a resort island south of Vanua Levu, regularly reports turtle nesting (Mrs.Moody, the owner keeps records, I believe) and there was a hatching earlier this year (May?) which coincided fortuitously with a visit by a party of divers from the US branch of the Cousteau Society.

I will do what I can to mobilise public interest before the next peak nesting season, and a great deal of information could possibly come from outer-island schoolkids during their summer vacation. For the 1991/92 season, we should have enough information to pick some key sites, and station volunteers for a couple of weeks to count heads and tag nesting females.

The cabinet paper I was talking about suggests some revisions to the Fisheries Act to plug some of the loopholes hampering our enforcement of the existing law. They will include a ban on the export of unprocessed shell, prohibiting the sale of turtle products in the closed season, and a requirement to have a permit for turtles kept as "pets". I see these measures as stopgap only until we can (socioeconomically) justify a complete ban on the commercial turtle meat trade, restricting turtle for ceremonial purposes only.

Most outer islanders are already behind such a move, but other key Ministers remain to be convinced. We have to demonstrate that outer island economies will not be affected (turtle meat sales were a useful emergency source of revenue as well as supporting several dedicated turtle fishermen in the past); that the tourist industry will not be affected (people come to SEE turtles, not to eat them) and that the turtle shell resulting from the ceremonial catch will not be "wasted", but can be absorbed profitably by the local jewellery cottage industry. We also have to define allowable "ceremonial" purposes, together with a permit system, and refine size-limits, closed seasons etc. I would also like to see it tied in with the effective protection of key turtle nesting beaches.

Altogether, a fairly hefty task, but an aim that will tie in well with the duration of the SPREP project, and be given continued direction and impetus by same.

Yours sincerely,

Tim Adams

(Dr.T.Adams)
acting Director of Fisheries

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396

October 17, 1990 F/SWC2:GHB
ADAMS-7L.GHB

Dr. Tim Adams
Fisheries Division
Ministry of Primary Industry & Co-operatives
P.O. Box 358
Suva, Fiji

Dear Tim,

As requested, I am pleased to be able to send you 50 tags, an applicator, tagging instructions, and tagging forms for Fijian sea turtles. The tags are numbered X951-X999. If you have the need for more tags, just let me know.

I would appreciate receiving a brief note from you indicating that this package has reached you safely.

Best regards.

Sincerely,

George H. Balazs
Zoologist

Enclosures

MINISTRY OF PRIMARY INDUSTRIES

TEL. NO. REF. NO.

DATE:

Fisheries Division
PO BOX 358, Suva, Fiji

George H. Balazs,
National Marine Fisheries Service,
Southwest Fisheries Center,
2570, Dole St.,
Honolulu,
Hawaii 96822-2396
U.S.A

Tel:361122
Tlx:2290
Fax:351079
Date:29/10/90
File:34/4/7

Dear George,

RE: TURTLE TAGS

Thank you very much for the turtle tagging kit. I don't know how soon SPREP will be able to get their own tags organised, and your kit will enable us to at least make a start during the forthcomng peak breeding season. I will send details of the tags as soon as we apply them.

We finally got our paper read by Cabinet (last Thursday), and they have agreed to an amendment in the Fisheries Act Regulations to prohibit the export of raw shell (see below for wording). It will not officially be law until published in the Fiji Republic Gazette, and will not come into force until 1st January, 1991, but that is not something that we want to publicise too widely.

Experience has shown that our export record figures (from Customs) for turtleshell are unreliable, and the Japanese import figures from Fiji are up to twice the exports that Fiji records. For what it is worth, Customs recorded 507kg of turtleshell exported from Fiji (Jan-Aug 1990) at a total value of F$77,206.

Anyway, good luck in Nagasaki, and I hope this letter reaches you in time. It's a pity that NMFS does not include a FAX number on the letterhead.

Yours sincerely,

Tim Adams

(Dr.T.Adams)
acting Director of Fisheries

PS. I was just this minute talking to a long-time Fiji fisherman who says he has caught several tagged turtles over the past decade. "Tagged in Fr. Polynesia & Hawaii" according to return address. Unfortunately (!) he did not return the tags & has now lost them - his home was wiped out in a hurricane. Name of Tui Fagalele. Sounds like SPREP could usefully mount a publicity campaign on value of tags.... Tim

29/10/90

Fiji Cabinet approved additional legislative measures relating to turtle on 25/10/90 as follows (new measures underlined).

"Export of Fish

26. No person shall export from Fiji--
(a) live fish of any kind whatsoever;
(b) turtle flesh;
(c) turtle shell unless worked into jewellery or otherwise processed into a form approved by the Permanent Secretary for Primary Industries and Cooperatives."

"Turtle

20. (1) No person shall at any time dig up, use, take, sell, offer or expose for sale, or destroy turtle eggs of any species or in any way molest, take, sell, offer or expose for sale, or kill any turtle the shell of which is less than 18 inches in length. No person during the months of January, February, November or December in any year shall in any way molest, take, sell, offer or expose for sale, or kill any turtle of any size. This regulation shall not apply to turtles kept as pets or in aquaria with the written permission of the Director of Fisheries.
(2) No person shall be in possession of, sell, offer or expose for sale or export any turtle shell the length of which is less than eighteen inches."

...and further endorsed research working towards justifying a total ban on the commercial exploitation of turtle (restricting to ceremonial indigenous use), and a legal framework for enforcement which effectively protects both the breeding population and nesting beaches, within two years.

(Dr.T.Adams)
acting Director of Fisheries

GCB VISA
check FAX #
call EJ
SS

Giant turtle

FISHERMEN and auxiliary staff at the Labasa fisheries terminal hoist a giant black turtle which has been drawing hundreds of viewers since Friday night. The turtle which will have to be weighed at the Labasa Mill weighbridge, was caught by a group of Kia fishermen in Yaro Passage on Friday. According to islander Veresi Masicola, it took fishermen nearly two hours to kill the turtle. They had to seek the help of more people to help tow the reptile ashore. Acting senior fisheries officer Northern, Chain Singh, said he had never seen anything like it. He said it looked like one of the rare leather-back species which do not have a hard back like ordinary turtles. A biologist is expected at Labasa today to examine it. Mr Masicola said he could remember a turtle of the same size and species being caught in the same passage 35 years back. The Fiji Times could not obtain more information on the creature from biologists at USP yesterday. Turtles have been brought under partial protection by the government. — Picture by JOSEFA DIMURI

- PM hits C'wealth rule — Page 2
- 2 die in Sigatoka crash — Page 2
- Bus drags Suva mother — Page 3
- Training for soccer coaches — Back Page

FORECAST: Isolated showers. Map and details on Page 18.

FIJI TIMES Dec 11, 1990


Par avion
Air Mail
AIR MAIL
PAR AVION
TO AVOID DELAY IN DELIVERY
PLS HAVE YOUR MAIL ADDRESSED
TO CORRECT STREET AND NUMBER,
ZIP CODE, PO BOX OR
GENERAL DELIVERY. THANK YOU!
1376
54c
KUŠALIA
FIJI
To,
HIMB.
UNIVERSITY HAWAII 96744
HAWAII
Air Mail
Par avion

INTO THE FUTURE

FIJI 1991

DATE 24-2-92

ANASA. TAWAKE
C/- FIJIAN HOTEL
PRIVATE MAIL BAG
NADI AIRPORT
FIJI ISLAND

SIR,

2/17/92 A TURTLE FOUND BY MY MOTHER LAST WEEK WAS BADLY WOUNDED, AND WAS STILL DRAGGING THE SPEAR GUN WITH IT. MY MUM WAS FISHING WHEN SHE SAW THE TURTLE LYING CARELESSLY ON THE REEF.

THE REASON WHY I AM WRITING IS THAT IT WAS CARRING THREE NUMBERS. THE NUMBERS WERE: 6821, 6822, 6825, AND THIS WERE WRITTEN ON THE OTHER SIDE: WRITE HIMB, UNIVERSITY HAWAII 96744.

THATS ALL I HAVE TO SAY, I WOULD BE VERY HAPPY IF YOU COULD GIVE ME ~~MORE~~ SOME INFORMATION ABOUT THE TURTLE.

YOURS FAITFULLY
A-TAWAKE

10/13/88
6821, 22, 23
CCL = 38.25
NESTING Rose Islet
by D. Forsell, R. Bauer
and W. Knowles

TAG 519

SIGHTING INFORMATION TURTLE AND SEAL

Animal sighted (circle): (Turtle) Seal
Number of animals: (1) Type, if known: HAWKSBILL (?)
Date: 23 MARCH, 1992 Observer: LOUIS CONNICK
Address & phone BOX 855, OLD LYME, CT. 06371
Time: PM (optional): (203) 434-8443
Location: TOBORUA ISLAND NEAR SUVA, FIJI
Observed from (circle): (shore) boat (name: TAKEN IN NET),
while skin or SCUBA diving (on surface or at _____ feet deep).
Estimated size (length): HEAD TO TAIL (C) 56 inches ; 30 inches across.
Comments: (such as color pattern; injuries; scar patterns; tumors; whether flipper tags are present(Y/N); color and number of the tag(s); bleach marks (number/letter); behavior; and weather)
SOME BARNACLE(?) SCARS ON UNDERSIDE, OTHERWISE IN EXCELLENT CONDITION, PHOTO TAKEN. ISLANDER WHO NETTED WILL SEND TAG TO HIMB. CONTACT MICHAEL DENNS TOBORUA ISLAND RESORT, SUVA, FIJI. TAG NO. (519)

Seals and sea turtles are protected under Federal and State law.

DO NOT DISTURB.

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Fisheries Center Honolulu Laboratory
2570 Dole St., Honolulu, HI 96822-2396

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National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Fisheries Center Honolulu Laboratory
2570 Dole Street
HONOLULU HI 96822-2396

203-434-5443

LOUIS CONNICK
BOX 855
OLD LYME, CONNECTICUT 06371-0855

3 April 1992

Dear George -

I was delighted to talk with you while I was in Honolulu and to realise the information I had about SI9 was helpful. The material you sent me on the program and the writers themselves was fascinating. The tumor problem must be a real worry.

It was a coincidence that one of the staff in the office of my Hawaiian host was to go boating with you. I gave her the photo I had taken of SI9. I still have the negative if you should want it.

Good luck with the valuable work you are doing. Increasing the support is building to save endangered species and habitats. Hope it isn't too late

Warm regards,

Lou.

LOUIS CONNICK
BOX 855
OLD LYME, CONNECTICUT 06371-0855

203-434-5443

LOUIS CONNICK
BOX 855
OLD LYME, CONNECTICUT 06371-0855

April 17, 1992

Dear George -

How stupid can I get! I didn't keep the negative of the turtle pix, thinking that the snaps I forwarded to you would be sufficient! Sorry about that.

I sent your letter on to Michael Dennis (Toberua Island Resort, Suva, Fiji) asking him to send measurements and any additional info. he might have on the green turtle. I'm stunned hear something - at least I hope so!

all the best for now, Lou

TEL. NO. 361122

MINISTRY OF PRIMARY INDUSTRIES & CO-OPERATIVE

Fisheries Division
P O Box 358
Suva

REF. NO.

DATE 23/4/92

George H Balazs
National Marine Fisheries Service
South West Fisheries Science Centre
Honolulu Laboratory
2570 Dole Street
Honolulu
HAWAII - 96822-2396

Dear George

Good to hear from you. Enclosed please find the 2 tags S18 and S19. This turtle was caught off Toberua Island. (about 25 miles from Suva) on 24/3/92 by one

Mr Livai Tabanivesidrau
c/- Fisheries Division
Nausori
Fiji Islands

The only other information supplied was length 4 feet 5 inches and the turtle was caught using a turtle net.

Best wishes & hope to hear from you.

[K Swamy]
FO (Environment)

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396

March 10, 1992 F/SWC2:GHB:JLB
ANASA-9L.GHB

Anasa Tawake
c/o Fijian Hotel
Private Mail Bag
Nadi Airport
Fiji

Dear Anasa Tawake:

Thank you very much for your letter of February 24, 1992, reporting the tagged turtle 6821, 6822, and 6823. Your mother's sighting of this turtle is extremely important, and we very much appreciate the effort you made to send the information to us. Under separate cover I am sending you and your mother a special T-shirt with a turtle logo as a symbol of our appreciation.

The turtle you found was tagged on October 13, 1988, while laying eggs on Rose Island in American Samoa. Rose Island is an important breeding site for the green sea turtle, *Chelonia mydas*, but unfortunately there are not as many turtles nesting there during recent years.

I would like to know if the turtle died from the spear gun wound, or did it live and swim away? Do you see other turtles in this area?

Sincerely,

George H. Balazs
Zoologist

INTO THE FUTURE

FIJI 1991

DATE: 1-5-92

ANASA TAWAKE
FIJIAN HOTEL
P.M BAG
NADI AIRPORT
FIJI ISLAND

DEAR SIR,

THANK YOU VERY MUCH FOR REPLYING MY LETTER OF FEBRUARY 24, AND I WOULD LIKE TO THANK YOU ALSO FOR THE T-SHIRTS YOU HAVE SEND TO US.

WHEN MY MOTHER FOUND THE TURTLE, IT WAS DYING FROM THE SPEAR GUN WOUND, AND BEFORE SHE COULD FIND HELP, THE TURTLE WAS DEAD. MY MOTHER FELT SORRY FOR THE TURTLE, BECAUSE IT WAS TAGGED, AND SHE KNEW IT MUST HAVE BELONG TO SOMEONE.

MY VILLAGE IS NEXT TO THE FAMOUS SIGATOKA SAND DUNES AND MY GRANFATHER USE TO TELL ME WHEN THEY WERE YOUNG MEN THERE WERE HUNDREDS OF TURTLES COMING UP TO THE SAND TO LAY EGGS. BUT NOWDAY'S ITS HARD TO FIND ANY TURTLE IN THIS AREA MAYBE ITS BECAUSE OF THE LARGE NUMBER OF FISHERMAN THAT MUST HAVE SCARE THEM AWAY. BUT MOST OF THEM ARE FOUND IN DEEP SEA, WATER'S.

I HAVE RECENTLY RECEIVE A LETTER FROM SUZIE GEERMANS, A MARINE TURTLE CONSULTANT FOR THE "SPREP", AND SHE ALSO SEND TO ME A T-SHIRT AND SOME POSTERS.

ONCE AGAIN, ~~I WOULD~~ THANK YOU VERY MUCH FOR THE POSTERS AND THE T-SHIRTS, "NI SA MOCE" (GOOD-BYE)

SINCERELY,
A. TAWAKE.


Par avion
AIR MAIL
PAR AVION
Air Mail
fiji
10c
fiji
35c
fiji
10c
To,
GEORGE H. BALAZS
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES SCIENCE CENTER
HONOLULU LABORATORY
2570 DOLE STREET
HONOLULU, HAWAII 96822-2396
Air Mail
Par avion

X951 - X999
Oct 90 to Tim Adams

X996

361122

FISHERIES DIVISION
P O BOX 358
SUVA
FIJI ISLANDS

18/08/92

The Director
Hawaii Institute of Marine Biology
University of Hawaii
P O Box 1346
Coconut Island
Kaneohe
HAWAII

Dear Sir

An Hawskbill Turtle bearing Tag numbers X996 on the right wing and X996 on the left wing was caught over the weekend, Saturday the 16th August 1992.

The Turtle was caught by a village fisherman by the name of Mr. Laisiasa Taukena of the village of Navunievo, on Province of Bua in the Fiji Islands.

Fisheries Division's field extension Officer, Senior Fisheries Assistant Alivereti Senikau who is stationed in the area received the report on Monday 17th August 1992 and relayed the following information to the undersigned.

This morning Tuesday the 18th August after visiting the village again yesterday, to make further enquiry on the Turtle, the following further information was obtained:-

Length of the Shell = 12"
Live weight of the Turtle = 4.7 Kg
Information on the tag = Writehimb No 96744/University-Hawaii

The Turtle was released yesterday 17/08/92 on his sea journey to an unknown destination. We are not sure which organisation was responsible for the turtle release and since the tag bears the University of Hawaii, we thought of sending this information to Hawaii Institute of Marine Biology - maybe you would be in a position to relay this information to the appropriate people responsible.

We request if you could get us information on the details of the date the turtle was released, where was it released from, and its weight for our records.

Thank you for your assistance.

Yours faithfully

(S. Tuilaucala)
Principal Fisheries Officer (Extension)
for Director of Fisheries

Thursday's (1st Oct) paper

THE tagged turtle outside Labasa Market yesterday. Jonacani Misikini, 17, (left) and Isei Tilly, 17, take a closer look. Picture: SAMSONI PARETI

Giant Hawaii turtle caught off Labasa

HAWAII may be far away from Labasa, but not to a turtle.

This giant turtle was caught by Labasa fisherman Peni Waqabulabalavu in waters off the Labasa coast on Monday night.

A tag on its flippers proved its origin – Hawaii.

Inscription on the tag reads: "Write – Himb University, Hawaii, 96744".

"When I shone the torch on the turtle, the reflection from the alumunium tag caught my eye.

"My initial thought was that this turtle has been identified by the fisheries department as part of its fish migration study."

He estimated the turtle's weight to be over 150kg.

He sold it to the Hotel Takia for $120.

Send via Elizabeth / MSB 212

University of Hawaii
School of Ocean & Earth Science & Technology
Hawaii Institute of Marine Biology

Date 10/9/92
To George Balazs
From Phil Helfrich
Needed By /

- ☐ Comments/Suggestions
- ☐ Approve
- ☐ Draft Reply
- ☐ Signature
- ☑ Appropriate Attention/Action
- ☐ Call Me
- ☐ See Me
- ☑ For Your Info
- ☑ Note And File
- ☐ _____

Comments_____

Fiji October 1st 1992

Dear sirs,

Enclosed newspaper clipping from the Fiji Times of today.

We are a cruising family and we've been cruising since 1984 full time.

We are environmental oriented and things like this really are hard to understand.

If you need any cooperation with your University we'll be glad to do so.

Vielfredo is a photographer and underwater video camera men.

Our address until end of October is

S/Y GUAPOS - V. H Schürmann
MCYC - Musket Cove Yacht Club
Private Bag - Nadi Airport
Fiji Islands.

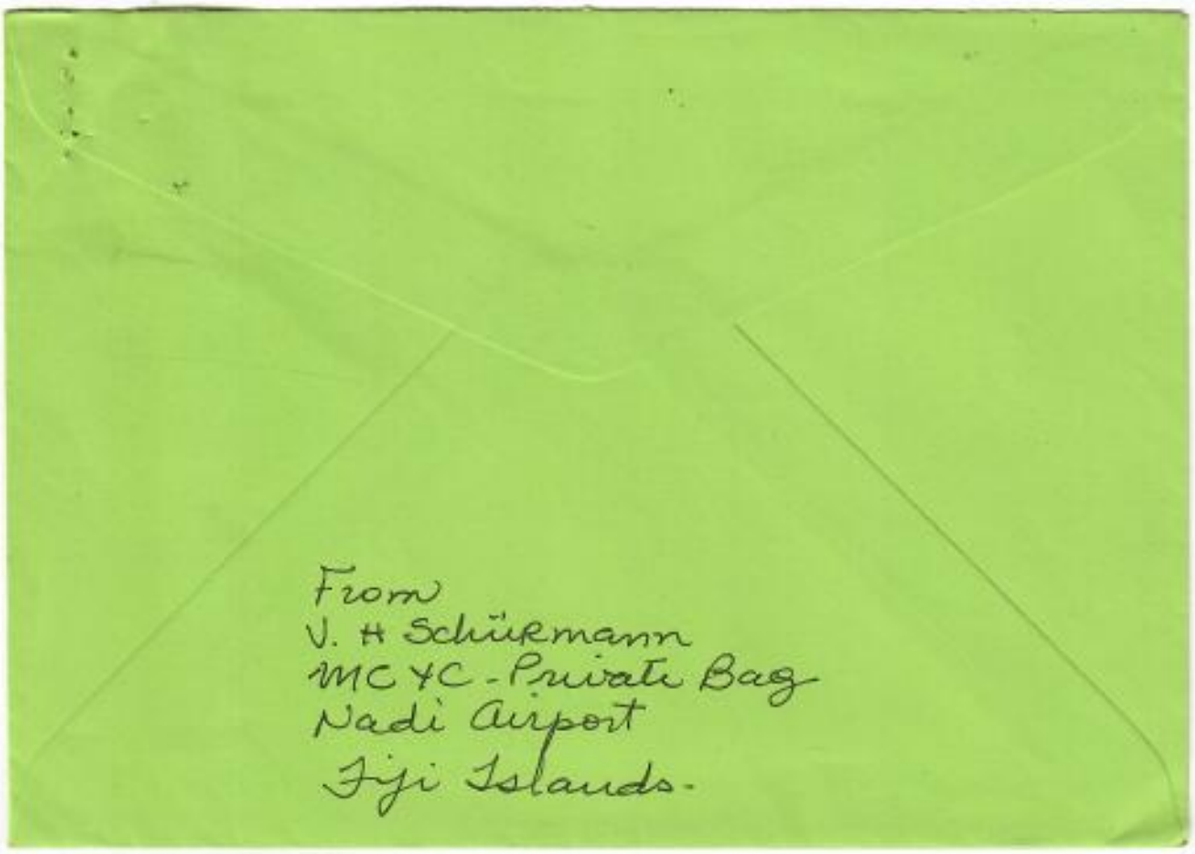
Sincerely yours

H Schürmann

10069Z PM. ***** GMT :

To
Hemb University
Hawaii 96744

AIR MAIL


From
V. H Schürmann
MCYC - Private Bag
Nadi Airport
Fiji Islands.

S-30 S-32
S-31 S-33

Box 1451
Labasa (LABASA)
Fiji Islands
5th Oct, 1992

To whom it may concern,

Enclosed is a cutting from Fiji Times Thursday issue. My name is Peni Waqabulabalavu and I'm the diver that caught your tagged turtle.

It was caught on Tuesday night (29th Sept) about 10.00pm in a passage near Labasa (Vanua Levu) It's about 58 inches long and 34 inches wide. The tags number S-30, S-31, S-32 and S-33 were on the turtle.

I'm sorry if I had done wrong in selling it but the distance and time doesn't allow me to contact you first and also I was needing money.

So here sir I'm writting as your tag said and believe I me I'm sorry if I had done wrong in selling it before letting you know first.

Thank you sir! Ni sa moce from Fiji. Hoping to hear from you again and the details of the turtle.

Sincerely yours,
Peni Waqabulabalavu
PENI WAQABULABALAVU

10/19/91 TAGGED AT
MOTU HONU, SCILLY - FRENCH POLYNESIA
CURVED CARAPACE LENGTH = 103 CM

- Catch often
- depth
- what doing sleeping?
- Food in stomach

2-30 2-32
2-31 2-33

Hilo University
Hawaii 96744
Hawaii
U.S.A.

THE tagged turtle outside Labasa Market yesterday. Jonacani Misikini, 17, (left) and Isei Tilly, 17, take a closer look. Picture: SAMISONI PARETI

Giant Hawaii turtle caught off Labasa

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Inscription on the tag reads: "Write – Himb University, Hawaii, 96744".

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"My initial thought was that this turtle has been identified by the fisheries department as part of its fish migration study."

He estimated the turtle's weight to be over 150kg.

He sold it to the Hotel Takia for $120.

The Fiji Times OCT 1ST 1992

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Science Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396
(808)943-1221 • Fax: (808)943-1290

October 15, 1992 F/SWC2:GHB:JLB
PENI-10L.GHB

Mr. Peni Waqabulabalavu
Box 1451
Labasa, Fiji Islands

Dear Mr. Waqabulabalavu:

Thank you very much for your recent letter regarding the tagged green sea turtle (*Chelonia mydas*) S30, S31, S32, S33 that you captured in the ocean off Labasa on September 29, 1992. I appreciate your taking the time to relay this valuable information to us.

The turtle you caught was originally tagged while laying eggs at Scilly Atoll in French Polynesia. Scilly is about 300 miles northwest of Tahiti. The turtle was tagged on October 19, 1991, during a research expedition conducted by EVAAM, an agency of the French Polynesian Government. The expedition, in which I participated, was also sponsored by the Regional Marine Turtle Conservation Programme of the SPREP (South Pacific Regional Environmental Programme).

Sea turtles in the South Pacific are not as abundant as they used to be. SPREP and EVAAM have been studying ways to promote their conservation to prevent extinction of this valuable resource. As demonstrated by the tag you recovered, green sea turtles in the Pacific region swim great distances between their nesting beaches and places where they normally live and feed on seagrasses or algae (such as in Fiji). The turtle that you captured migrated about 3,000 km (1,900 miles) from Scilly to Labasa. If she had lived, she would have returned again to Scilly next year, or the year after, to nest and lay more eggs.

Sir, I would be very interested to know what the turtle was doing when you first saw her (sleeping on the bottom, or swimming, or feeding?). Was the turtle strong and healthy? How did you catch her? Do you often see other large turtles in this same area? Sometime I would like to visit your island to see where the turtle was captured.

As a small reward, SPREP will be sending you a T-shirt with a turtle logo for reporting the tagged turtle to us. Thank you again for your letter. I look forward to hearing from you again. Please write to me at the address that appears at the top of this letter.

Sincerely,

George H. Balazs
Zoologist

cc: Philippe Siu, EVAAM
SPREP
P. Helfrich, HIMB

Ovabett / MSR 212

THE tagged turtle outside Labasa Market yesterday. Jonacani Misikini, 17, (left) and Isei Tilly, 17, take a closer look. Picture: SAMISONI PARETI

Giant Hawaii turtle caught off Labasa

HAWAII may be far away from Labasa, but not to a turtle.

This giant turtle was caught by Labasa fisherman Peni Waqabulabalavu in waters off the Labasa coast on Monday night.

A tag on its flippers proved its origin – Hawaii.

Inscription on the tag reads: "Write – Himb University, Hawaii, 96744".

"When I shone the torch on the turtle, the reflection from the alumunium tag caught my eye.

"My initial thought was that this turtle has been identified by the fisheries department as part of its fish migration study."

He estimated the turtle's weight to be over 150kg.

He sold it to the Hotel Takia for $120.

The Fiji Times Oct 1st 1992

AIR MAIL

Dorin Agnain Shaif
c/. Ahmad Shaif
P.O. Box 105, P.W.D.
Labasa.
1-10-92
Fiji islands.

The principal
Himb University
Hawaii, 96744

My main purpose of writing this letter is to know about the Himb University. In today's Fiji times (news-paper) I read that a Fiji fisherman caught a turtle and on it's they found a iron metal and on it the address of Himb University was written.

I would be very grateful to you if you could tell me something about your University and also about the strange turtle.

Thank you

Yours faithfully
Dorin Agnain Shaif.


Form III Student

FACIMILE MESSAGE

Ministry of Primary Industries
Fisheries Division
P O Box 358
Suva, FIJI

Phone : (679)361122 362448 362449

Fax : (679)361184

From : **KRISHNA SWAMY**

To : George Balazs

Subject: Turtle tags

Date : 09.11.92 **Page : 1**

Dear Balazs

I have sent you the information on the turtle caught in Vanua Levu. The Fisheries Division have now in possesion the 4 tags found on the turtle. Do you want me to send you the tags?

A fisherman also caught a turtle in the Western Vitilevu which has both Hawaii and SPREP address. The information is as follows:-

Tag no. X669 Hawaii
RMTP 483 SPREP
Date caught 22/10/92 ,,2000 hrs by hand-diving on Cakau Tasi reef. (Western Vitilevu). Please let me know if I should send the tags to you? The fisherman did not measure the turtle. Please let me know if you require any other information?

Regards

Krishna Swamy

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Science Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396
(808)943-1221 • Fax: (808)943-1290

November 10, 1992 F/SWC2:GHB:JLB
SWAMY-10L.GHB

Mr. Krishna Swamy
Ministry of Primary Industries
Fisheries Division
P.O. Box 358
Suva, Fiji

Dear Krishna,

Thank you for your recent fax reporting the recapture of *Chelonia mydas*, tags X669 and RMTP483, on October 22, 1992, at Cakau Tasi Reef, Western Viti Levu. I greatly appreciate receiving this important information.

This young turtle was tagged and released at Scilly Atoll, French Polynesia, on October 15, 1991. Philippe Siu, Jean-Pierre Landret, and I participated in the release. The turtle had been captured two months earlier in a fish trap maintained at Scilly by chief resident Mr. Rene Taputu. The turtle measured 51 cm over the curve (along the midline of the carapace) at the time of release. Fourteen other small turtles, reared from hatchlings at Scilly, were also tagged and released into the lagoon at the same time.

I am sending a copy of this letter to Mr. Siu and also SPREP so they will be aware of the contribution of information you have made. If you can provide me (or SPREP) with the mailing address of the person who caught the turtle, a T-shirt will be sent to him for reporting the tags. Of, if you prefer, it can be forwarded through your office.

I will accept your kind offer to send me the six tags that have recently been recovered from the two turtles tagged at Scilly. It will be worthwhile for me to carefully examine them for signs of wear. I assume that the most recent turtle was captured for food and is now deceased.

With each new tag recovery, we seem to be learning that Fiji is a very important foraging area for sea turtles in the South Pacific region. Additional research in your area is definitely needed.

Sincerely,

George H. Balazs
Zoologist

cc: Mr. Philippe Siu
SPREP

P.O. Box 1451
Labasa
Fiji Islands
17.11.92

George H. Balazs,
Honolulu,
Hawaii.

Dear Sir,

Bula Vinaka! Greetings once again. Aloha! Sir I would like to thank you so much for the t-shirt (from Aussie) and the valuable information about turtle. I have given some to our fisheries department here and they're really glad. The bad news is that I can't wear the t-shirt because I will be a laughing stock of our town. This people know that I'm the only one who is responsible for catching of many turtles around here.

So sir we are two opposite people but I'm so very glad that your and your associates are preserving turtles because at times I just want to stop on all this. I really feel pity about them but I really have no choice. I'm hoping to find another job and to work with you to preserve the turtle and to be on the same side as you are. Only then I can happily wear my t-shirt.

I'm glad that we're having ~~[illegible]~~ tabu season for turtle it will

Honolulu,
Hawaii.

Dear Sir,

Bula Vinaka! Greetings once again. Aloha! Sir I would like to thank you so much for the t-shirt (from Aussie) and the valuable information about turtle. I have given some to our fisheries department here and they're really glad. The bad news is that I can't wear the t-shirt because I will be a laughing stock of our town. This people know that I'm the only one who is responsible for catching of many turtles around here.

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I'm glad that we're having ~~tabl~~ taboo season for turtle, it will only last 4 months.

Now, regarding the turtle. It was a really healthy one. I think it was sleeping when I saw it. That place alone, if I can recall well, I think I've killed more than 50 turtles there. It is sandy at the bottom with plenty sea weeds, it will be better if you come and see it for yourself. Here are plenty turtles caught around here. Sir, I have special hook made to catch turtle.

Here we have 3 common turtle, Green turtle, Loggerhead + Hawksbill. Only a few years ago one leatherback was caught. This is a rare species here. Most of us saw it for the first time in their whole life, if not all. From the information I gathered only one was caught long time ago in Viti Levu, a few hundred miles from here. The most common turtle is the green turtle. + Hawksbill
The Olive Ridley + Flatback are not so many like other three.

Sir, I want to thank you for the chart about turtle and the information as well. I gave some to our local fisheries and they're so glad. I'm just wondering if I have to write to Angie Greenmans of SPREP, may be you can help me with this Sir.

This is where I have to say Ni Sa more Sir, believe me, I'm so glad that you cared about turtles and I will be always glad to help you. If you need more information, Sir, you can always count on me. God bless!

Peni. Waqabulabulau

I think I've killed more than 20 turtles there. It is sandy at the bottom with plenty sea weeds, it will be better if you come and see it for yourself. There are plenty turtles caught around here. Sir, I have special hook made to catch turtle.

Here we have 3 common turtle, Green turtle, Loggerhead + Hawksbill. Only a few years ago one leatherback was caught. This is a rare species here. Most of us saw it for the first time in their whole life, if not all. From the information I gathered only one was caught long time ago in Viti Levu, a few hundred miles from here. The most common turtle is the green turtle. + Hawksbill
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Pene. Wagabulabalavu

George H. Balazs
National Marine Fisheries Service
Southwest Fisheries Science Center
Honolulu Laboratory
2570 Dole Street
Honolulu, Hawaii 96822-2396.

VIA AIR MAIL

PAR AVION CORREO AEREO

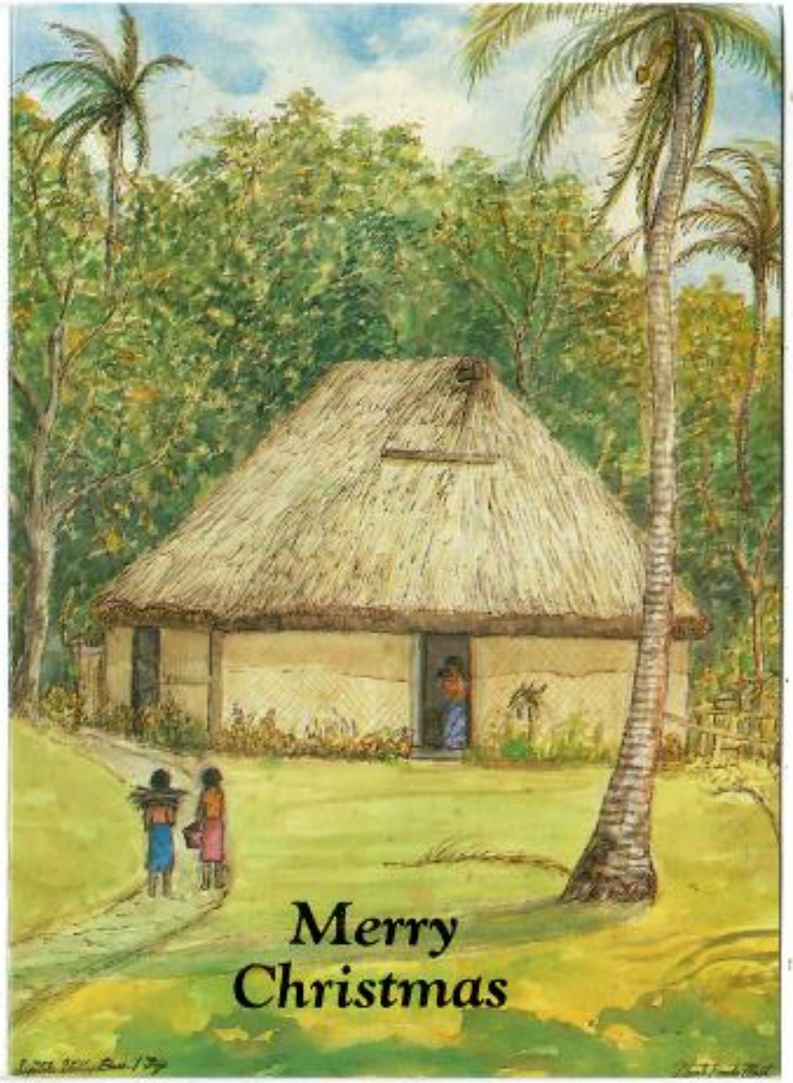
George. H. Balazs
National Marine Fisheries Service
South West Fisheries Science Center
Honolulu Laboratory, 2570 Dole Street
Honolulu, Hawaii 96822-2396.

© BURE IN THE VILLAGE

X951 - X999 10/90 Tim Adams

NATS CARDS

Distributed by: Nats, Box 338, Sigatoka, Fiji. (Ph.: 500064).



07/12/92

Dear Mr. Hinb,

I would like to introduce myself. My name is MITI VELA. I would like to notify in here that we found your turtle. Tag. NO. X-990 X-991.

I am staying in Suva mainland, VITI LEVU. I was visiting one of the villages in the other mainland, VANUA LEVU if you check the map. The turtle is well kept. I have taken a photo of it and the film is in process. The turtle was caught in a fishing nett on the 20/10/92. I am living you the address of the old man who caught it.

RATU EMITAI SAUMAIBULU
NAISOGODRALA
NASAVU
WAINUNU
BUA
REPUBLIC OF FIJI

Wishing You
a Merry Christmas
and a
Happy New Year

But If you want to contact me. this is my address: PO BOX 4736 Samabula, Suva Republic of Fiji

My Name: MITI VELA

Residence adress if you are thinking to come to Fiji:
23 Namuka Street
Samabula
SUVA, Republic of Fiji.

PAR AVION

AIR MAIL

7.12.92 FIJI

FIJI

POSTAGE PAID $0.59

RN 86

To:

Mr. Wright Himb (96744)
University of Hawaii
Hawaii

George Balazs
NMFS
Honolulu Lab

HIMB

DEC 15 1992

MITI VELA
Box 4736
Samabula
Suva
Republic of Fiji

Turtle tag no.
- X990
- X-991

Box 1451,
Labasa,
Fiji Islands
25th Dec, 92.

Dear George,

Merry Christmas Sir, Bula vinaka once again, greetings from Fiji.

Thank you so very much for my lovely t-shirt. Thank you so much for your kind and caring heart. I have nothing to give you but I promise to help you in any way I can also I am looking forward to seeing you here in Fiji.

About the best time for turtle when they're seen, I'm still unsure of that but they're still plenty where there is no diver. About [illegible] can find them almost everyday but now they're a bit ~~rare~~ rare.

About 3 years back a few people from a village near Labasa were admitted in hospital, because they were poisoned by eating hawksbill turtle. I heard from some people that it also happened like that many years back where people died.

I guess this where I have to say good-bye for now. Once again I want to thank you again for your kindness. I know you had a lovely Christmas holiday and may 1993 brings you many blessings and [illegible] dear. Mick!

Merry Christmas Sir, Bula
vinaka once again, greetings from Fiji.

Thank you so very much for my lovely t-shirt. Thank you so much for your kind and caring heart. I have nothing to give you but I promise to help you in any way I can also I am looking forward to seeing you here in Fiji.

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About 3 years back a few people from a village near Labasa were admitted in hospital, because they were poisoned by eating hawksbill turtle. I heard from some people that it also happened like that many years back where people died.

I guess this where I have to say good-bye for now. Once again I want to thank you again for your kindness. I know you had a lovely Christmas holiday and may 1993 brings you many blessings and also a prosperous year. Moce!

A friend
Peni Waqabulabula

George Balazs
National Marine Fisheries Service
Southwest Fisheries Science Laboratory
2570 Dole St, Honolulu Hawaii
96822-2396

P. O. Box 1451
Labasa
Fiji Islands
14th March, 93

Dear George,

A very big 'Bula Vinaka' once again from the Fiji Islands to you my friend George. My prayer is that this letter will find you in the very best of health.

It's a long time since I receive a letter from you and I guess the last letter I wrote must have missed you because I gave it to my daughter to post it and she misplaced the stamp.

As I've said it my previous letters I'm very glad to assist you in anyway I can and also I'm looking forward to your coming to my Island.

This letter I'm writing to you from Suva as I'm diving for fish over here (Suva is our capital on the island of Viti Levu). I always go home at the end of every month. I'm here trying to get a boat to get it back home in Labasa. Hopefully I will be able to get one so I can take it back.

My friend George this is where I have to say good-bye once again. I'm really looking forward to hear from you soon. My best regards to you, your family + friends. God bless!

This Isa Moce from Fiji

Your friend,
Pani. Waqabulabala
Box 1451
Labasa

George H. Balazs
National Marine Fisheries Service
Southwest Fisheries Science Center
2570 Dole Street, Honolulu
Hawaii 96822-2396

Suzie Geermans
South Pacific Regional Environment Programme
C/- Queensland Department of Environment & Heritage
PO Box 155
Brisbane Albert Street
Brisbane QLD 4002
AUSTRALIA

Ph : (617) 227.7437
Fax : (617) 227.6386

29 January 1993

Krishna Swamy
Ministry of Primary Industries
Fisheries Division
PO Box 358
Suva
FIJI

Dear Krishna

I refer to the turtle tagged RMTP 483 and X669 which was captured at Cakau Tasi Reef, Western Viti Levu on 22 October 1992 by a fisherman.

Any more information you can supply regarding the capture of this turtle would be greatly appreciated. For example: Was the turtle eaten or released? How was the turtle captured (spear, net)?

Enclosed are some turtle identification sheets and a t-shirt to be given to the fisherman who captured the turtle.

Regards

Suzie Geermans

Suzie Geermans
Turtle Conservation Consultant
South Pacific Regional Environment Programme (SPREP)

cc. Adrienne Farago, SPREP, Western Samoa
George Balazs, NMFS, Hawaii
Philippe Siu, EVAAM, French Polynesia

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Science Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396
(808)943-1221 • Fax: (808)943-1290

November 10, 1992 F/SWC2:GHB:JLB
SWAMY-10L.GHB

Mr. Krishna Swamy
Ministry of Primary Industries
Fisheries Division
P.O. Box 358
Suva, Fiji

Dear Krishna,

Thank you for your recent fax reporting the recapture of *Chelonia mydas*, tags X669 and RMTP483, on October 22, 1992, at Cakau Tasi Reef, Western Viti Levu. I greatly appreciate receiving this important information.

This young turtle was tagged and released at Scilly Atoll, French Polynesia, on October 15, 1991. Philippe Siu, Jean-Pierre Landret, and I participated in the release. The turtle had been captured two months earlier in a fish trap maintained at Scilly by chief resident Mr. Rene Taputu. The turtle measured 51 cm over the curve (along the midline of the carapace) at the time of release. Fourteen other small turtles, reared from hatchlings at Scilly, were also tagged and released into the lagoon at the same time.

I am sending a copy of this letter to Mr. Siu and also SPREP so they will be aware of the contribution of information you have made. If you can provide me (or SPREP) with the mailing address of the person who caught the turtle, a T-shirt will be sent to him for reporting the tags. Of, if you prefer, it can be forwarded through your office.

I will accept your kind offer to send me the six tags that have recently been recovered from the two turtles tagged at Scilly. It will be worthwhile for me to carefully examine them for signs of wear. I assume that the most recent turtle was captured for food and is now deceased.

With each new tag recovery, we seem to be learning that Fiji is a very important foraging area for sea turtles in the South Pacific region. Additional research in your area is definitely needed.

Sincerely,

George H. Balazs
Zoologist

cc: Mr. Philippe Siu
SPREP

Suzie Geermans
South Pacific Regional Environment Programme
C/- Queensland Department of Environment & Heritage
PO Box 155
Brisbane Albert Street
Brisbane QLD 4002
AUSTRALIA

Ph : (617) 227.7437
Fax : (617) 227.6386

29 January 1993

Mr Ratu Emitai Saumaibulu
Naisogedrala
Nasavu
Wainunu
Bua
FIJI

Dear Mr Saumaibulu

I refer to the turtle tagged X990 and X991 which was captured in a fishing net on 20 October 1992.

This is a juvenile hawksbill turtle which was tagged on 23 April 1992 at Mokogai Island, Fiji.

The South Pacific Regional Environment Programme (SPREP) are involved with the conservation and management of sea turtles within the South Pacific Region. Therefore any information you can give us regarding tagged turtles is very important to our understanding of these animals.

I hope the turtle has now been released back into the ocean.

Enclosed are some turtle identification sheets and a t-shirt as a reward for sending in the information.

Regards

Suzie Geermans

Suzie Geermans
Turtle Conservation Consultant
South Pacific Regional Environment Programme (SPREP)

cc. Krishna Swamy, Fisheries Division, Fiji
Adrienne Farago, SPREP, Western Samoa
George Balazs, NMFS, Hawaii

FACSIMILE MESSAGE

Ministry of Primary Industries
Fisheries Division
P O Box 358
Suva, FIJI

Phone : (679)361122 362448 362449 Fax : (679)361184

From : **Krishna Swamy**

To : **George Balazs**

Subject: **Turtle Tag**

Date : January 7, 1993 Page : 4

Received your fax in the height of a major disaster caused from cyclone Kina. Any way my best regards to you for this new year. The tags sent to Tim Adams has been used by Fisheries Division. Please find 3 data sheets. Tag 990-991 was used on a 34cm animal on 23th April,92 at Mokogai Is. I will be contacting Mr Saumaibulu. I would expect a SPREP T-Shirt to be sent to this person. I should let you know more about this turtle once I contact this person.

Till then cheerio

Krishna

hawksbill

Suzie -
Apparently they had a group of headstarted hawksbill to tag and release. My smaller tags fit, so were all used. That's fine. I pleased to finally have the data.

PAGE 2
KRISHNA SWAMY

07/12/92

Dear Mr. Hinb,

I would like to introduce myself. My name is MITI VELA. I would like to notify in here that we found your turtle. Tag. No. X-990 / X-991 J.

I am staying in Suva mainland, VITI LEVU. I was visiting one of the villages in the other mainland, VANUA LEVU if you check the map. The turtle is well kept. I have taken a photo of it and the film is in process. The turtle was caught in a fishing nett on the 20/10/92. I am living you the address of the old man who caught it.

RATU EMITAI SAUMAIBULU
NAISOGODRALA
NASAVU
WAINUNU
BUA
REPUBLIC OF FIJI

Wishing You
a Merry Christmas
and a
Happy New Year

But if you want to contact me this is my address: P.O. Box 4736 Samabula, Suva Republic of Fiji

My Name: MITI VELA

Residence address if you are thinking to come to Fiji:
23 Namuka Street
Samabula
SUVA, Republic of Fiji.

SEA TURTLE TAGGING FORM

ID numbers of new tags attached and any old tags already present[1]		Species[2] and sex (if known)	Date and time	Place-name location (or latitude and longtitude)	Activity of the turtle[3]	Curved carapace length[4]
Left front flipper	Right front flipper			MOKOGAI IS, DALICE BAY		
X 969	X 968		28/4/92	DALICE BAY. MOKOGAI IS		26.5 cm
X 967	X 966		″	″		26.5 cm
X 965	X 964		″	″		30.8 cm
X 963	X 962		″	″		30. cm
X 961	X 960		″	″		29. cm
X 959	X 958		″	″		28.2 cm
X 957	X 956		″	″		28.6 cm
X 955	X 954		″	″		26.7 cm
X 953	X 952		″	″		27.1 cm
X 951			″	″		26. cm
			″	″		
			″	″		
			″	″		
			″	″		
			″	″		
			″	″		

[1] *If old tags are present, please carefully record the ID number and the complete address inscription. Indicate if the tag is made of metal or plastic. Use the back of this form if more space is needed to provide details on each turtle handled. Two tags should be applied to all turtles handled.*

[2] *CM = Chelonia mydas (green turtle), EI = Eretmochelys imbricata (hawksbill), CC = Caretta caretta (loggerhead), LO = Lepidochelys olivacea (olive ridley), DC = Dermochelys coriacea (leatherback), ND = Notator depressa (Australian flatback).*

[3] *Activities include (for example) nesting on the beach, swimming or resting in the sea, injured or found sick, etc.*

[4] *Measured with a flexible tape along the curvature of the midline of the upper shell (carapace).*

Name and address of person filling out this form:

E. Ledua
Fiji Fisheries
Box 358, Suva

RETURN TO: G. BALAZS

HONOLULU LABORATORY
Southwest Fisheries Center
2570 Dole Street
Honolulu, HI 96822-2396

02 FISHERIES FIJI 351079 08/01 '92 11123

SEA TURTLE TAGGING FORM

11 Accidentally killed 4/93 George TURAGA Box 36 KOROVOU FIJI

ID numbers of new tags attached and any old tags already present[1]		Species[2] and sex (if known)	Date and time		Place-name location (or latitude and longtitude)	Activity of the turtle[3]	Curved carapace length[4]
Left front flipper	Right front flipper						
X 999	X 998	HAWKSBILL	28/9/92	5. Pm	NAVOSORI TS (DALICE BAY)		36 cm
X 997	X 996	✓	"	✓	" ✓		35cm
X 995	X 994	✓	"	✓	" ✓		36cm
X 993	X 992	✓	4/3/92	✓	" ✓		33cm
X 991	X 990		"	✓	" ✓		34 cm
			24/4/92		"		
X 989	X 988		"		"		36.5cm
X 987	X 986		"		"		31.cm
X 985	X 984		"		"		29.7cm
X 983	X 982		"		"		29.5 cm
X 981	X 980		"		"		24.5 cm
X 979	X 978		"		"		36. cm
X 977	X 976		"		"		26. cm
X 975	X 974		"		"		26.6 cm
X 973	X 972		"		"		28.5 cm
X 971	X 970		"		"		28.5 cm

[1] *If old tags are present, please carefully record the ID number and the complete address inscription. Indicate if the tag is made of metal or plastic. Use the back of this form if more space is needed to provide details on each turtle handled. Two tags should be applied to all turtles handled.*

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[4] *Measured with a flexible tape along the curvature of the midline of the upper shell (carapace).*

Name and address of person filling out this form:

E Lalua
Fiji Fisheries
Box 358, Suva.

RETURN TO: G. BALAZS

HONOLULU LABORATORY
Southwest Fisheries Center
2570 Dole Street
Honolulu, HI 96822-2396

SEA TURTLE TAGGING FORM

ID numbers of new tags attached and any old tags already present[1]		Species[2] and sex (if known)	Date and time	Place-name location (or latitude and longtitude)	Activity of the turtle[3]	Curved carapace length[4]
Left front flipper	Right front flipper					
R 1857	1858	MALE MALE	31/1/92 5.00Pm	~~31/1/92~~ MAKOGAI ISLAND ~~5.00Pm~~ DALICE BAY		2ft 3inches 68cm
R 1860	R 1862		14/5/92 12.30 pm	LEVUKA		17 1/3

[1] *If old tags are present, please carefully record the ID number and the complete address inscription. Indicate if the tag is made of metal or plastic. Use the back of this form if more space is needed to provide details on each turtle handled. Two tags should be applied to all turtles handled.*

[2] *CM = Chelonia mydas (green turtle). EI = Eretmochelys imbricata (hawksbill). CC = Caretta caretta (loggerhead). LO = Lepidochelys olivacea (olive ridley). DC = Dermochelys coriacea (leatherback). ND = Natator depressa (Australian flatback).*

[3] *Activities include (for example) nesting on the beach, swimming or resting in the sea, injured or found sick, etc.*

[4] *Measured with a flexible tape along the curvature of the midline of the upper shell (carapace).*

Name and address of person filling out this form: E. Iduna
Fiji Fisheries

To: G. Balazs
HONOLULU LABORATORY
Southwest Fisheries Center
2570 Dole Street
Honolulu, HI 96822-2396

FAXED 01-04-93
2 PG. OK
3:30 PM yall

TRANSMITTAL SHEET

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396
Commercial: (808) 943-1221
Telefax: (808) 943-1290

TELEFAX FOR: MR. KRISHNA SWAMY DATE: 4 JANUARY 1993

FROM: GEORGE BALAZS TELEPHONE EXT: (808)943-1240

FAX 808-943-1290

NUMBER OF SHEETS TRANSMITTED (including this page) TWO (2)

MESSAGE: DEAR KRISHNA: I SEND YOU MY BEST REGARDS FOR THIS NEW YEAR OF 1993. I TRUST THAT IT WILL BE FILLED WITH HEALTH AND SUCCESS. I AM FAXING YOU TODAY BECAUSE ANOTHER TAG RECOVERY HAS BEEN REPORTED TO ME FROM A SEA TURTLE CAPTURED IN FIJI. THE TAG (X990, X991)TURTLE IS APPARENTLY BEING HELD ON VANUA LEVU BY RATU EMITAI SAUMAIBULU (SEE ACCOMPANYING LETTER RECEIVED FROM MITI VELA OF SAMABULA). NO INFORMATION WAS PROVIDED ON THE SIZE OR SPECIES OF TURTLE.

THESE TAGS X990 AMD X991 CARRY THE UNIVERSITY OF HAWAII ADDRESS. THEY ARE PART OF A GROUP I SENT TO TIM ADAMS IN OCTOBER OF 1990. THEY CONSIST OF NUMBER X951 - X999. THEY WERE SENT TO FIJI BEFORE SPREP HAD TAGS MADE FOR DISTRIBUTION IN THE REGIONAL MARINE TURTLE PROGRAM. UNFORTUNATELY, I HAVE NEVER RECEIVED ANY INFORMATION AS TO WHEN AND WHERE THE TURLTLES WERE TAGGED. PERHAPS TIM APPLIED THEM TO TURTLES HIMSELF. I SIMPLY DO NOT KNOW. IF YOU HAVE DATA ABOUT THE USE OF TAGS X951 - X999, WOULD YOU PLEASE SEND ME COPIES? I WOULD BE MOST APPRECIATIVE. WERE ALL OF THE TAGS USED? IF NOT, WHERE ARE THE REMAINING TAGS? THANK YOU KINDLY FOR WHATEVER ASSISTANCE YOU CAN GIVE TO THIS REQUEST. TAG RECOVERIES CAN YIELD VALUABLE INFORMATION FOR SEA TURTLE MANAGEMENT, SO IT IS CRITICAL TO KNOW WHEN AND WHERE TURTLES ARE TAGGED.

I LOOK FORWARD TO HEARING FROM TO SOLVE THIS MYSTERY. IN THE MEANTIME I WILL NOT WRITE TO RATU EMITAI SAUMAIBULU, OR MITI VELA, BECAUSE I WOULD NOT BEABLE TO GIVE THEM FACTS ABOUT THE TURTLE.

SINCERELY,

GB

CC DR. TIM ADAMS SPC

FACSIMILE MESSAGE

Ministry of Primary Industries
Fisheries Division
P O Box 358
Suva, FIJI

Phone : (679)361122 362448 362449 Fax : (679)361184

From : **Krishna Swamy**

To : **George Balazs**

Subject: **Turtle Tag**

Date : January 7, 1993 Page : 4

Received your fax in the height of a major disaster caused from cyclone Kina. Any way my best regards to you for this new year. The tags sent to Tim Adams has been used by Fisheries Division. Please find 3 data sheets. Tag 990-991 was used on a 34cm animal on 23th April,92 at Mokogai Is. I will be contacting Mr Saumaibulu. I would expect a SPREP T-Shirt to be sent to this person. I should let you know more about this turtle once I contact this person.

Till then cheerio

PAGE 2
KRISHNA SWAMY

07/12/92

Dear Mr. Hinb,

I would like to introduce myself. My name is MITI VELA. I would like to notify in here that we found your turtle. Tag- NO. X-990 X-991.

I am staying in Suva mainland, VITI LEVU. I was visiting one of the villages in the other mainland, VANUA LEVU if you check the map. The turtle is well kept. I have taken a photo of it and the film is in process. The turtle was caught in a fishing net on the 20/10/92. I am living you the address of the old man who caught it.

RATU EMITAI SAUMAIBULU
NAISOGODRALA
NASAVU
WAINUNU
BUA
REPUBLIC OF FIJI

keep smiling

Wishing You
a Merry Christmas
and a
Happy New Year

But if you want to contact me this is my address: PO BOX 4736 Samabula, Suva Republic of Fiji

My Name: MITI VELA

Residence address if you are thinking to come to Fiji:
23 Namuka Street
Samabula
SUVA, Republic of Fiji.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Science Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396
(808)943-1221 • Fax: (808)943-1290

April 27, 1993 F/SWC2:GHB:JLB
TUR-11L.GHB

Mr. George Turaga
Box 36
Korovou, Tailevu
Fiji Islands

Dear Mr. Turaga:

Thank you very much for taking the time to report turtle X993 that was accidentally killed near your shore. We greatly appreciate receiving this valuable information.

The turtle you found was a young hawksbill that had been tagged and released from captivity by the Fiji Fisheries Division on April 23, 1992. It was released at Dalice Bay on Mokogai Island. Two tags were attached to the turtle, X992 and X993.

We would be very interested to learn exactly how the turtle was accidentally killed. Also, if the upper shell was saved, could you please tell me its length, measured over the curve right along the midline? Did the turtle appear to be in good physical condition? Do you often see other turtles near your shore? Have you ever seen other turtles with metal tags?

As a small reward for reporting this tagged turtle to us, I have enclosed a shirt with a sea turtle logo. You will also be receiving a "thank you" letter and another shirt from the Regional Marine Turtle Conservation Programme of the South Pacific Regional Environmental Programme. I look forward to hearing from you again at your earliest convenience.

Sincerely,

George H. Balazs
Zoologist

cc: Fiji Fisheries Division
A. Farago, SPREP
S. Geermans

Mokogai
Is. Bay
Fiji

4/23/92
x992 x993

4/93 Box 36
Korovou
Tailevu
Fiji Is.

TO WHOM IT MAY CONCERN

I'm sending this TAG x993
to you, It was found
tagged to a Turtle which
it was accidently Killed
near our shore.
I'm marking the place
where it was Killed on
small map of Fiji Is.

Thank you.

Yours Faithfully

GEORGE JURAGA

G Juraga.

The Fiji Society of Science and Industry 1942 pp: 147-154.

15

BECHE DE MER—TREPANG

BY CHAS. R. TURBET, B.V.Sc., M.R.C.V.S.

(Read 25th May, 1942)

Bêche-de-mer or trepang is the trade name given to dried *holothurians* used in the preparation of gelatinous soups considered a luxury by the Chinese and other Eastern peoples. The name was not originally French but is gallicized from Portugese bicho-da-mar, sea worm.

Most residents of the country are familiar with the general appearance of the living bêche-de-mer, or trepang, as it is known in Malay. Its sausage-like shape makes it easily recognisable to those who have occasion to visit the reefs. The descriptive term sea-cucumber also aptly describes it, so that, having that name in mind, even the most inexperienced would easily identify the creature.

Zoologically the bêche-de-mer are classified under the Phylum: *Echinodermata* (spiny skinned). Class: *Holothuroidea*.

In the sea-cucumbers the skeleton is represented only by isolated nodules of calcium carbonate. The body wall is highly muscular. The mouth and anus are situated at opposite ends of the body, the mouth being surrounded by a ring of buccal tentacles or feelers. Ambulacral grooves (represented by closed canals) run from near the mouth to the proximity of the anus. Movement is accomplished by means of podia, aided by worm-like contractions of the body.

Another organ which opens into the cloaca is the *Cuvierian organ*. This consists of a number of unbranched tubes. If a sea cucumber is held by the head end and strongly flicked, the thin wall of the cloaca breaks, liberating the tubes of the Cuvierian organ. These secrete a sticky substance capable of ensnaring an enemy. The animal is itself able to bring about the intrusion of these tubes by contraction of its muscular walls. This self mutilation is not necessarily fatal since, if the animal is left alone, it can regenerate the whole of these organs.

The *water vascular system* is a complex arrangement of tubes and spaces by which the turgidity of the body cavity and the action of feelers and podia is controlled.

Sea cucumbers have both nervous and blood systems. The genital organs consist of a single group of branched tubes which converge to a short genital duct which leads to a pore situated on the mid-dorsal line a short distance behind the feelers.

Living sea cucumbers vary in size from six to eighteen inches or more in length, the size in these waters varying with the species. It is unusual to find big variation in the size of individual members of the same species present on the same reef. Some may bear on the skin spicules or prickles of lime, fewer on the better. All the commercial kinds are capable of great extension and contraction of the body.

The food of bêche-de-mer consists chiefly of the microscopic calcareous-shelled animals known as *Foraminifera*, which are swallowed in combination with a large percentage of sand and broken fragments of shells and corals. The process of feeding (1) is in all varieties identical and somewhat remarkable. The tufted, mop-like tentacles are one by one swept over the surface of the ground or reef upon which the animal is feeding and in corresponding order they are recurved towards the mouth and thrust with adherent food matter down the creatures throat. In reverse order they are extended to annex more food.

Sea cucumbers are found chiefly in tropical waters on coral reefs as mentioned above. They also occur on the Californian coast where the trade is large. Non-commercial varieties are quite well represented in temperate waters.

The process by which bêche-de-mer is prepared for the market is as follows:—

The "fish" are first collected in sacks by wading on the reef during the low spring tides or by diving over the edge of the reef. Whilst still fresh the fish are taken to a shore curing station or treated on the deck of the fishing vessel.

Salt water is brought to the boil in a cauldron and the whole "fish" is plunged in and boiled for twenty minutes. With the large varieties boiling up to one hour may be necessary. An easy method of determining if sufficiently boiled is to take a "fish" out of the boiler and drop it about six feet onto a board or other smooth surface. If sufficiently boiled it should bounce like a piece of rubber.

Bêche-de-mer (particularly the Sucu Walu) should be boiled as soon as possible after being collected from the sea, otherwise the skin breaks and the prepared fish has a ragged appearance.

The "fish" are taken from the water and split longitudinally along the dorsal surface with a long, sharp-pointed knife. They are then gutted. In order to expose the body cavity the split sides of the "fish" are best held apart by the insertion of wooden splints.

If the weather is favourable, sun drying until most of the moisture has evaporated is economical and tending toward the production of a good quality article. It may be necessary, however, in Fiji, owing to the likelihood of rain, to commence to dry the "fish" in a smoke house. The latter may be of corrugated iron, timber or thatch construction, ten to twelve feet high

and fitted in its upper half with two or three tiers of wire netting upon which the bêche-de-mer is laid in single layers, insides downward.

The wood most suitable for the smoking process is the Tiri or Mangrove *Rhizophora mucronata*.

If the "fish" are placed in the smoke house after preliminary sun drying, twenty-four hours is a sufficient period for this operation. If, however, the "fish" are passed directly into the smoke house after gutting they should remain in for forty-eight hours. If sunshine becomes available it is a good plan to expose the bêche-de-mer to further drying after smoking to expell the last possible moisture. The spreader sticks should be removed before the "fish" becomes too dry so that it may neatly curl up again into its original shape.

From three to four hours should be a sufficient period before removing the wooden spreaders. At this time it is advisable to mould the slug between the hands as it is then comparatively soft. If this is done the bêche-de-mer will keep fairly straight during the subsequent smoking. It is imperative that the "fish" are cured straight and not crooked.

Great care is necessary in the smoke drying otherwise the fish is liable to become scorched and blistered. In fact the greatest care and attention is required during the whole curing process if the best price is to be obtained: they should be properly boiled, neatly cut, well dried and smoked.

Before being bagged bêche-de-mer should be quite cold and it is wise to tip them out and expose them to the air and sun as much as possible. An essential matter that demands the attention of those engaged in the bêche-de-mer industry is the maintenance of the cured "fish" in a thoroughly dry condition. The prepared product readily absorbs water: should it get wet or have been insufficiently cured it has a tendency to dissolve into a tenacious glue-like mass of the most repulsive aspect and abominable odour.

As bêche-de-mer is sold in China, usually in small retail shops, it naturally follows that the best cured specimens bring good prices and badly cured fish (badly cut, ragged, twisted up like the sole of an old boot) must be sold very cheaply.

When the fish are cured and dry they shrink to about one-eighth their size and weight when fresh.

The "fish" are found in all the reef protected waters of the Fiji Group. Calmer waters are preferred. Large areas of comparatively shallow waters such as found along the north coast and western end of Vanua Levu are favourable localities as well as the waters between the Tailevu coast and the main ocean reef extending south from Ovalau. Sand covered patches are frequented by the "fish."

VARIETIES.

Sucu Walu: Teat Fish. This is the most valuable species. It is brown in colour, large. The presence of eight tubercles or podia on either side is responsible for its name, eight-teats. It is found on the sandy bottoms at a depth of from three to eight fathoms.

Dri Loa: Large Black Fish. This also a valuable species. It is jet black in colour even when taken from the sea. Sandy bottoms in water from three to eight fathoms are favourite locations for this fish.

Dri Dina: This fish is found on and under the reef.

Tarasea: A small variety, reddish in colour, ranking slightly below the first two mentioned in value.

Vula: Whitish-yellow in colour when taken from the sea, this fish with only slight pressure emits large quantities of sticky white threads. It is very common on the surface of the reef but also occurs in deeper water. Live fish are fairly large but on curing the size shrinks very considerably and greater than other commercial varieties.

Dairo-Volovoto: This is a small, black fish with prickles or spiny protuberances. Fairly common and occurs in shallow water on top of the reef. It has no value as bêche-de-mer, but Fijians occasionally use it.

Loli: Very plentiful on shore reefs. In colour it is greyish. Little commercial value, although it is sometimes prepared and offered for sale as bêche-de-mer. Local Chinese are said to use the varieties and the Fijians boil the fresh "fish" for food.

In regard to the first historical record concerning the quest for trepang in the Fijis, Captain Aikin on the 13th May, 1805, two or three weeks after his return to Sydney after a voyage to New Caledonia in quest of trepang, addressed a memorial to Governor King of New South Wales asking for permission to depart from Sydney in an American vessel ostensibly in quest of sandalwood and "Beechleymar" among the islands of Fiji. Governor King addressed a despatch on the 30th April to Earl Camden setting out the circumstances of Captain Aikin's voyage in quest of bêche-de-mer. Although they failed in their quest, the presence of sandalwood in the Fiji Islands, a group hitherto not much known, was brought to light.

Between 1805 and 1813 a flourishing trade in sandalwood developed. So great were the profits that Lockerby described the trade as being equal to the coining business. The connection with the coastal natives made through this sandalwood trade enabled an immediate change over to bêche-de-mer collection possible on the breakdown of the former industry. In this connection I quote from *The Journal of William Lockerby*, edited by Im Thurn and Wharton:—

"The year 1813 is memorable for the visit of the East India ship *Hunter*, Captain James Robson having with him Peter Dillon: for this visit lead to an affray with the natives of Wailea, so serious that it finally put an end to the already dwindling chance of successful trade for sandalwood with the Fijians."

This fact lead to the masters of ships engaged in the sandalwood trade to turn their attention to the collection and preparation of bêche-de-mer for the China market. The narrative goes on and after some detail of their adventure appears the following passage:—

"But the Waileans bringing in sandalwood only very slowly: there was little work for the boat hands to do on the ship, and these were therefore taken over and placed at 'a place called Camba,' near the island of Bow to procure bêche-de-mer . . ."

It should be noted that the *Hunter* is the first European ship recorded as having approached and touched at the south-eastern corner of Viti Levu: also that this camp of bêche-de-mer hunters is the first known instance of Europeans, other than the few beach-combers who got to Bau from wrecks in the Lau Islands, remaining, even for a brief period, anywhere on the mainland of Viti Levu.

HISTORICAL.

In the following years the bêche-de-mer trade appears to have largely supplanted sandalwood collection. Passing the interim years to 1829 I quote from the volume *Wrecked Among the Cannibals of the Fijis*, Endicott-Jenkins, Salem, Massachusetts.

"On the 24th (Nov., 1829) . . . the Captain contacted with one of the principal chiefs to build three houses on shore for the purpose of curing bêche-de-mer* at a place called Sub-a-sub (Savu Savu). On the 10th December the First and Third Officers went ashore with ten men and commenced purchasing the bêche-de-mer.

"We employed great numbers of natives, frequently upwards of 80 canoes averaging 10 men each, besides great numbers on shore procuring wood (of which we used great quantities) and assisting us in curing the cargo [purchased by trade articles].

"We also purchased a kettle of Captain Kinsman (ours being too small to make any progress). On 21st December the brig *Quill* sailed for Manilla, having on board 800 piculs of bêche-de-mer. [Picul = 140 lbs.]

Illustrating the difficulties which beset the early bêche-de-mer fishermen, the account continues:—

"We continued curing bêche-de-mer on shore, whilst those on board were putting the ship in order and nothing particular

* *Wrecked Among Cannibals in the Fijis*, Endicott-Jenkins, Marine Research Society, Salem, Massachusetts.

occurred until the 30 January (1830) when the natives on shore maliciously set fire to our houses and destroyed 60 piculs of bêche-de-mer.

"The next morning we discovered that they had broken our kettles for the purpose of getting our wrought iron . . . on the 2nd February we recommenced curing fish, in the houses of the King, the blacksmith having mended the kettles.

"On the 10th February as the bêche-de-mer began to grow scarce on the reefs, it was determined on the advise of the King to go to another bay, about 40 miles distant (Ngaloa) and build new houses and employ the natives in that place . . . We found on April 9th that we had upwards of 1,000 peculs of bêche-de-mer, 350 tortoise shell and some sandalwood so we settled with the natives and burned our houses" [so that they would not be used by other traders].

The life of the early bêche-de-mer fishermen was hard and often fraught with much danger.

After William Endicott had spent the night in the witnessing of the horrors of a cannibal feast he recorded in his diary "about sunrise, I went to the bêche-de-mer house and set myself to work collecting the bêche-de-mer on the battens (*vatas*) in readiness to be put into the bags when the boat came off."

Development of the Trade.

From the book *The Cruise of the "Curacoa"* I quote:—

"The disputes which took place latterly between the fishermen on the coast of Macuata have diminished the yield of bêche-de-mer, nevertheless the price is good being 1,200 dollars per picul of 140 pounds and for inferior, 1,000 dollars."

Statistical records of the trade are wanting, however, until 1875 when the publication of export trade figures in the *Blue Book of Fiji* became available. There follows a table of average annual trade figures for ten-year periods.

Period	Quantity Tons	Value £	
1876-1885	45	2,111	annually
1886-1895	36	1,852	,,
1896-1905	17	1,180	,,
1906-1915	6	480	,,
1916-1925	34	3,952	,,
1926-1935	62	6,368	,,
1936-1942			

During these sixty-seven years boom periods have occurred as follows:—

Period	Quantity Tons	Value £
1875	113	3,411
1920	116	17,545
1930	133	13,886
1931	143	16,045
1932	103	8,801

Since the commencement of the Sino-Japanese war the trade has fallen off to negligible proportions. Apart from the difficulty of trade during war time there is a peculiar and characteristic Chinese reason for this. Previously a considerable proportion of the bêche-de-mer consumed in China was Japanese produce. When Japan attacked China, the latter placed an embargo on trade with Japan and since there was no means by which the Chinese citizen could differentiate the Japanese product from that produced elsewhere, the Chinese refused to consume bêche-de-mer from any source, so that today they do without this luxury as a war effort.

Curing.

Great care must be taken in all stages of curing bêche-de-mer. All foreign matter such as sand and shell has to be cleared, it is then boiled and the " innards " taken out, and then dried over a slow fire. Wire netting or a grille of bamboo is used to hold the bêche-de-mer over the fire. Sun drying is too slow. Expert attention is required, for if selection of quality is careless, or if boiling is too little or too long, it will not dry but remain a pulpy mass whch soon begins to rot and smell, and has to be discarded.

After proper curing, and if kept in a dry place, it will remain in good condition for several years.

Food Value.

As a food, opinion differs amongst the Chinese, but in any case it is not considered to be an aristocrat dish like bird's nest, shark fin, or eel tripe soup.

It is not used by itself, since it has no culinary taste of its own, but is used as one of the ingredients, giving its name to the dish, when making soup or pork or poultry, and it simply helps to bring out or improve the taste of these two meats. The dish is served up hot in bowls on the table, the bêche-de-mer, chicken, pork and all ingredients swimming in the soup. The guests to the dinner help themselves to the liquid, but eat very sparingly of the bêche-de-mer. But the left-overs of all courses of the dinner is carefully retained by the chef, and next day an all-in mixture is prepared again, which is very palatable (compare chop suey, rissoles and hash). The bêche-de-mer by this time has borrowed and absorbed all the flavours of the remains of the other courses, and now is exceedingly tasty.

The guests having eaten their dinner the day before, of course, do not partake in this hash dish, but the host often sends a portion of it to his relatives and intimate friends, and it is very much welcome.

Preparation.

The bêche-de-mer is placed in water and brought to a boil. Then a stiff brush is used to clean away the foreign matter clinging thereto. The bêche-de-mer is then cut up into small slices and put in to another change of water and boiled again. This boiling takes several hours and some chefs prefer to do it overnight.

Another change of water is made for the final process, and pieces of pork and poultry, and probably some bamboo shoots, and the usual seasoning are added to it. The whole is then boiled again until everything becomes tender. The whole process from start to finish takes about ten hours. No great skill is required, but some patience is desirable.

Great care is taken in preparing bêche-de-mer for food, and it is well sterilised and cleaned of foreign matter in several changes of boiling water before the final cooking takes place. Being a sea product, there is every reason to think that it possesses health-giving properties, something like kelp, for its phosphorous and iodine content must be substantial. The popularity of sea food amongst the Chinese in the maritime provinces may explain the reason for the small incidence of goitre.

Economic Value.

Some years ago, Fiji bêche-de-mer found good markets in China. It was shipped to Hongkong, but the bulk of it was not consumed in Hongkong or Canton, but actually went to markets in Shanghai and north China.

Japanese fishermen, whether at home or in other places where bêche-de-mer abounds, make a good livelihood fishing for and curing this product, and the Chinese public long had the idea that it was a Japanese product. When the wave of nationalism passed over China some years ago, the public opinion called for a boycott of Japanese goods, Fiji bêche-de-mer was also adversely affected, as the Chinese thought that all bêche-de-mer was a product of Japanese enterprise.

Acknowledgments.

My special thanks are due to Mr. P. R. Whysall of Suva, Mr. L. Dietrich of Levuka and to Mr. G. D. Hill of Suva for notes on the species encountered in Fiji and for the method of preparation for market. To Mr. Cheng for notes on food and economic value and preparation of bêche-de-mer soup. I am indebted to Mr. Honson for the samples of bêche-de-mer demonstrated.

19

THE TURTLE AND THE TORTOISESHELL INDUSTRY

By N. Levy.

(Read 30th November, 1942)

It is perhaps not commonly known that it is *Turtleshell* and *not* Tortoiseshell from which such a great variety of articles is manufactured.

There are two types of turtle in Fijian waters, one being called the Greenback or "Vonudina" and the other the Hawksbill or "Taku." The Greenback being a vegetarian is excellent eating, but the shell is useless commercially as the flakes are only of paper thickness. The Hawksbill is carnivorous and is not such good eating but the shell is of high commercial value. It is, therefore, to this species of turtle that the following remarks will be confined.

The back is covered with large scales or flakes, numbering thirteen, consisting of five crown or centre pieces and eight side pieces. The edge pieces or hoofs, number twenty-three. The thickness and size of the flakes and hoofs vary according to the age of the turtle.

Some of the turtle's habits are interesting. For instance, the female makes her way above high-water mark on a sandy beach, and after scooping out a hole in the sand, she will lay approximately 150 eggs, covering them over and disturbing the growth for some distance surrounding the nest, as a camouflage. She will also make four or five false nests in a similar manner as a further means of protection to the real nest. So well does she carry out her deception that it is only by means of pointed sticks speared into the sand over the disturbed areas, that the native in search of eggs, is able to locate them, as when the nest is struck the yolk adheres to the point of the stick.

The eggs, which have a covering of a leathery nature, are round, similar to a ping pong ball in shape and size, with a dent in one side. They require approximately four or five weeks to hatch. The young turtles wriggle through the sand to the surface, and immediately make their way towards the water. For them it is the commencement of a perilous journey, as they are preyed upon by sea birds. After thus running the gauntlet, they are met the the water's edge by the adult turtle who devours them as they come within reach. The few who manage to get past and are fortunate enough to escape the fish, make for driftwood and leaves, under which they shelter to avoid observation. They are very slow growing, and when full grown measure approxi-

mately three feet in length. The small turtles are an exact replica of their elders, though they have proportionately longer flippers. The shell of the young turtle is transparent, and thickens as it grows.

During their breeding season, the Government of Fiji protects the turtle by having a closed season for four months, from November to February.

The shell of the Hawksbill is exceedingly beautiful, with a variably mottled pattern, in colours ranging from black, through deep red, to honey colour and blonde. This mottled colouring forms a protection, affording a likeness to the coral and rocks when viewed from the surface of the water, while the belly of the turtle is blonde in colour and resembles the light on the surface when seen from below.

The methods of capture are varied. One is with nets made of strong fishing cord, having a twelve-inch square mesh. The nets stretch for hundreds of yards, and the fishermen have to be smart when they get a catch, for their old enemy the shark soon gets busy, and the net is ruined.

Another method is that of spearing.

The author has also heard of a Fijian coming across a turtle asleep on the surface of the water, and by quietly swimming up and turning the turtle on its back he is able to keep it in this position until a canoe comes alongside and takes it aboard.

A rather interesting method of capture is practised in the Torres Straits and in the West Indies. The sucking-fish, or Remora, is in this case pressed into the service of the fishermen. Taking advantage of the fishs' natural habit of swimming towards, and adhering fast to, any larger floating object, fishermen go out with specimens kept alive in small wells in the bottoms of their boats. When in pursuit of turtle, a long light line is attached to the fish's tail; and coming within sight of the turtle, the fish, with an abundance of slack or pay-out line, is thrown in the direction of the turtle. The Remora immediately swims towards and adheres firmly to, the under surface of the shell of the turtle, when it will suffer its body to be torn asunder rather than let go its hold. Both the fish and the turtle are dragged with the line back to the boat.

The natives detach the flakes from the back of the turtle by means of steaming, with a sack dipped in boiling water. Beautiful shell may be ruined by lazy methods of placing the shell near a fire to get the heat. In this way it becomes badly scorched and useless.

Apart from exporting turtleshell in large quantities to other parts of the world, we have quite an industry here in Fiji, manufacturing articles such as toilet sets, cigarette cases, jewel boxes, watch bands, and other goods too numerous to detail, right down to the humble saltspoon. In England, very expensive toilet sets

are manufactured, being richly inlaid with platinum or gold, the prices running into hundreds of guineas. The author had an instrument case to repair which was made in England over 100 years ago, and it had withstood wear particularly well. When repaired and polished it looked almost as good as new.

In concluding, little insight into the manufacture of turtle-shell goods may be given. The shell, with treatment, will take a beautiful and lasting lustre. The application of heat renders it ductile, thus enabling it to be worked into all manner of shapes. The making of a cigarette case may be described.

First, a piece of shell of suitable colouring is selected, for no two pieces of shell will be found to have the same marking and colouring. As the thickness of the shell varies, the first step in the manufacture is to bring it to an *even* thickness. If an extra large case is being made, it necessitates the joining of the shell by a secret method. The piece of shell is then placed in a double mould, one half is convex and the other concave. The shell and the moulds are next subjected to heat which makes it ductile. Pressure is then exerted on one half of the mould, causing the shell to take shape. Both the mould and the shell are then cooled off. After removing the shell from the mould it retains its shape. The same process is repeated to form the other half. The two halves are then scraped, sand papered to a fine degree, and roughly polished. The edges are trued up to receive the hinges and catch, the fitting of which requires an expert tradesman. The case is now given its final polish. This completes the manufacture and is followed by a thorough inspection of all parts before being offered for sale.


Par avion
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59c
Hinds University
Hawaii 96744
Hawaii
USA.
George Bolazs
@UMFS..
Air Mail
Par avion

DLNR-DIVISION OF
AQUATIC RESOURCES
70 S. High St., Rm. 291
Wailuku, HI 96793

Dear George:

The attached news article below was brought in by one of my Aquarium commercial fisherman (Robert Bruck) who happen to be in Fiji and at that place when they brought up that turtle. So he thought that we might be interested in this story or at least contact you folks about it. If you need any further information, just give me a call.

10-6-92

FIJI TIMES - 10/03/92

THE tagged turtle outside Labasa Market yesterday. Jonacani Misikini, 17, (left) and Isei Tilly, 17, take a closer look. Picture: SAMSON PARETI

Giant Hawaii turtle caught off Labasa

HAWAII may be far away from Labasa, but not to a turtle.

This giant turtle was caught by Labasa fisherman Peni Waqabulacalavu in waters off the Labasa coast on Monday night.

A tag on its flippers proved its origin - Hawaii.

Inscription on the tag reads: "Write - Himb University, Hawaii, 96744".

"When I shone the torch on the turtle, the reflection from the alumunium tag caught my eye.

"My initial thought was that this turtle has been identified by the fisheries department as part of its fish migration study."

He estimated the turtle's weight to be over 150kg.

He sold it to the Hotel Takia for $130.

Sheraton Fiji Resort

Mr. and Mrs. A.C. Finlay,
52 Lucinda Street,
Taringa. Q. 4068.
Australia.

The Dean,
Faculty of Marine Biology / Research,
Himb. University.
Hawaii. U.S.A.

To Whom It May Concern,

My husband and I are currently holidaying in Fiji and recently came across an article that we thought might interest you. The article concerns a giant Hawaiian turtle, which your institution had tagged, that was recently caught off the coast of Lambasa, Vanua Levu. Perhaps, your researchers have been notified that the turtle has been destroyed! However, it sickens me to tell you, that the creature was sold for its carcass to a local hotel supposedly for human consumption.
Does this concur with recognised, international practises for the protection of endangered and / or tagged wild life?

The tone of the article attached certainly leads me to believe that the attitude and efficiency of local fishery authorities, at the very least, needs to be questioned. I hope and trust that your office swiftly takes any necessary action.

Yours sincerely,

Robin Finlay.

ROBIN FINLAY.

1 Oct '92.

THE tagged turtle outside Labasa Market yesterday. Jonacani Misikini, 17, (left) and Isei Tilly, 17, take a closer look. Picture: SAMISONI PARETI.

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THE Fiji Times
THE FIRST NEWSPAPER PUBLISHED IN THE WORLD TODAY
RSDAY, OCTOBER 1, 1992 44 PAGES PLUS 12-PAGE INSERT 42¢ inc VAT 123rd YEAR No.234

Sheraton Fiji
RESORT

P.O. BOX 9761 NADI AIRPORT, DENARAU BEACH, FIJI

URGENT
AIR MAIL.

100692 PM. *****

~~The Dean,~~ Dr Phil Helfrich
Faculty of marine Biology Research
Himb University,
Hawaii. United States of America.

Mr. + Mrs. A. & V. Finlay,
52 Lucinda Street,
Taringa. Q. 4068.
AUSTRALIA.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Science Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396
(808)943-1221 • Fax: (808)943-1290

April 27, 1993 F/SWC2:GHB:JLB
TUR-11L.GHB

Mr. George Turaga
Box 36
Korovou, Tailevu
Fiji Islands

Dear Mr. Turaga:

Thank you very much for taking the time to report turtle X993 that was accidentally killed near your shore. We greatly appreciate receiving this valuable information.

The turtle you found was a young hawksbill that had been tagged and released from captivity by the Fiji Fisheries Division on April 23, 1992. It was released at Dalice Bay on Mokogai Island. Two tags were attached to the turtle, X992 and X993.

We would be very interested to learn exactly how the turtle was accidentally killed. Also, if the upper shell was saved, could you please tell me its length, measured over the curve right along the midline? Did the turtle appear to be in good physical condition? Do you often see other turtles near your shore? Have you ever seen other turtles with metal tags?

As a small reward for reporting this tagged turtle to us, I have enclosed a shirt with a sea turtle logo. You will also be receiving a "thank you" letter and another shirt from the Regional Marine Turtle Conservation Programme of the South Pacific Regional Environmental Programme. I look forward to hearing from you again at your earliest convenience.

Sincerely,

George H. Balazs
Zoologist

cc: Fiji Fisheries Division
A. Farago, SPREP
S. Geermans

OCEAN

PROPOSAL TO IMPLEMENT **OCEAN'S** TURTLE PROTECTION PROGRAM.

COUNTRY : Fiji Islands

TITLE: :Turtle Protection Program for Fiji

DATE OF SUBMISSION: June 1993

REGISTER: **O**ceania **C**onservation & **E**nvironmental **A**wareness **N**etwork(**OCEAN**)

PROJECT DURATION: 1 year

STARTING DATE: July 1993

FUNDS NEEDED: Fijian $48,810

PERSON TO CONTACT: Taraivina Costello
OCEAN Coordinator
PO Box 14641, Suva, Fiji.
Tel:(679)302270 Fax: (679)302646

AIMS

1) To promote public awareness and action to conserve Fiji's sea turtles.

2) To instigate action programmes through projects such as:
   a) 'Adopt a turtle' project
   b) Turtle 'buy back' program
   c) Tagging programme through the Fiji Dive Operators Association (FDOA).
   d) Save **O**ur **S**eas (**S.O.S**) school education program initiated.

3) To produce and broadcast '**S**ave **O**ur **S**eas' environmental 15 minute video.

4) To produce interpretation and dissemination of information.

5) To initialize and maintain a computerized database on Turtles.

6) To research new environmental related projects that need addressing.

7) To produce a bi-monthly newsletter which focuses on Marine Issues pertinent to the OCEAN Cause

8) Research and produce a funding proposal for turtle nesting and marine parks in conjuction with the National Trust of Fiji. (see appendix C-9 & B-4 Proposed Marine Parks, C-8 Protected Areas Report)

OBJECTIVES

1) **PUBLIC AWARENESS** will take the form of:

a) Media coverage which will include television advertising, newspaper articles and radio programmes.

b) School presentations on the marine environment. This program will be called "Save Our Seas"(S.O.S). OCEAN with the National Trust's support, will initially visit 12 high schools to conduct educational seminars comprised of slide presentations, S.O.S videos and interactive talks. With positive feed back, we will put forward a Environmental (S.O.S) education package to the Ministry of Education for approval. The Coordinator has created two such programmes together with the help of the National Trust of Fiji and feild tested them in 3 high schools. (see Appendix C-1,6) The OCEAN logo and stylized turtle has been registered with the Registrar Of Titles (see Appendix B-3)

c-d) The S.O.S. video will document the capture of turtles, the selling of turtles in the market place and the buy back and release of turtles. The documentary will rely heavily on interviews with fisherman, consumers and government officials. We plan a series of videos. The first video will document the turtle Program.

2. **DIRECT ACTION** programmes will include :

a) **Adopt a turtle project :**

- Together with all of OCEAN's supporters we will implement the above program. The objective of the program is to encourage public funding and support.

- Encourage the individual, local companies, schools, International Corporations and the Hotel and Dive industry **Adopt a turtle.**

- Adopted turtles to be tagged and any information on sitings to be forwarded to the sponsors

- Compile statistics for publication.

- Through this scheme OCEAN intends to adopt 50 turtles in 12 months.

- After the initial costs are met,(Posters, advertising and certification costs) it is envisaged that OCEAN will make Adopt a turtle a self funding project.

b) Turtle buy back programme:

- Buy turtles from major markets and educate the individual fishermen for tagging and release.

- Undersized turtles to be confiscated from market with the help of Fisheries Division. Fisheries Wardens licences will be issued to OCEAN staff. OCEAN volunteers go to Suva market daily to measure under sized turtles. Six undersized turtles have been tagged and released to date.

- Donation boxes to be distributed to every Dive Operator. This will help fund the cost of the buy- back programme. Donation boxes have already been made using perspex. OCEAN has two donation boxes out at the moment and 8 more are in the process of being built. A percentage of the income will be used to make more boxes.

- Educate the fisher folks on the reasons we are buying the turtles for release, and that the turtles bought by OCEAN should not be recaptured for consumption. Rewards will be posted for information on tagged turtles.

- Media coverage through the newspapers to keep the public informed on the statistics involved.

c)**Tagging project:**

Do workshops with the Fiji Dive Operators Association and Hoteliers in tagging and information gather ing. This will include:

1) Training for the divemasters and boatmen in correct procedures for tagging turtles and filling out data sheets.(see Appendix C - 3,4)

2) Marine and reef resource management.

3) Environmentally safe practises. This will include conscious boating practises e.g Anchoring and associ ated problems.

4) Coral Reef study on all dive sites and isand Resorts reefs.(see Appendix C-5)

- **F**iji **D**ive **O**perators **A**ssociation will help implement this programme through manpower. (see Appendix - support letters).

- Work with the Department of Fisheries in implementing their tagging programme. OCEAN will handle the research and data processing.

- Publicize statistics over the 12 month period..

- Participate in the 'Yamaha Expo' and promote OCEAN and it's projects. Corporate sponsorship will be sort.(See Appendix A-8)

By the end of the 12 month project OCEAN will accomplish the following:

- visit at least 12 schools for 'Save Our Seas' presentations and write a proposal for the Ministry of Education in supporting the S.O.S education program. The first 12 months is basically field testing programs before Ministerial backing.

- Adopt 50 turtles. After the initial costs, this will be a self-funding project. Adoptive parents will buy the turtle's freedom. Certifications of adoption and up-dates on sitings of this turtle will be will be reported in the newsletter. Ten percent of adoption costs will go towards material costs which will include postage, printing, releasing and the data base. The remaining funds will be put into a Trust account and used only to buy turtles.

- The buy back programme is tied in with adopt a turtle. OCEAN volunteers will visit major markets, buy back live turtles and confiscate undersized turtles. Turtles will be tagged and measured before release. Donation boxes income and t-shirt sales will help support OCEAN's running costs.

- Trained the Mamanuca Hotel Association and the FDOA on the use of tagging applicators and complete siting forms. Marine conservation and management concepts will also be included in the workshops. Once the initial costs are met, (tags, tagging applications, travel, printing, fuel) it will only cost OCEAN time to process the information and postage to send the statistics to SPREP (South Pacific Regional Environment Programme) to include in the regional data base.The resorts will provide the manpower to implement this project. OCEAN will hold 30 workshops.

  - Issue Press statements on turtle statistics.

  - Produced 6 OCEAN Newsletters.

  - Increased membership and clothing sales to be able to help in new equipment costs.

INTRODUCTION

Oceania **C**onservation & **E**nvironmental **A**wareness **N**etwork (**OCEAN**) was registered under the Charitable Trusts Ordinance in October 1992.
A constitution was drawn up and a committee formed, consisting of a Chairperson, Secretary, Treasurer and committee members.(see Appendix B-1,OCEAN Constitution)

The concept of OCEAN first began in Nadi, November 1992. The founder and now OCEAN Coordinator worked as a Divemaster for 7 years diving Fiji and the Pacific extensively. Seeing first hand the deterioration of our massive reef systems, Reefs stripped,mangroves destroyed and endangered species come closer to extinction. OCEAN was founded to help protect our cultural heritage and support sustainable development. OCEAN was created so that the people could make a difference and survive the 21st century.

OCEAN received $4000 Fijian in October 1992 from The Pacific Development and Conservation Trust of New Zealand to register as a charitable trust and start an endangered species awareness programme.

Coca Cola Bottlers sponsored the production of a 30 second video spot about turtle protection which is being broadcast by Fiji One Television.

OCEAN's main objective for 1993/94 is turtle conservation. All seven species of sea turtle are on the endangered species list. Fiji is a major consumer of turtle meat and it's by-products. The Fiji Government has good laws on marine and turtle protection but due to lack of manpower have not been able to enforce these laws. OCEAN will help Government implement these laws through the Fisheries Department by providing more manpower. (see Appendix A-1)

ORGANIZATIONAL FRAMEWORK

OCEAN has one full time volunteer, a Coordinator who is a Fisheries Warden. The Coordinator works on tabled events designed by the Executive Committee. The Treasurer and two others are signatories to the OCEAN account, these are all honorary positions. Two signatories are needed on the cheque account.
The committee runs as a collective and decisions are made by consensus. Membership is divided into six categories (see appendix C-2, OCEAN brochure).

SUMMARY

All turtles need protective measures now to ensure their survival. Over the last decade there has been a rapid decline in the turtle populations worldwide due to commercialism. By the end of this century there will be no more turtles unless protective measures are enforced.

The benefits of statistics are two fold : Firstly to determine the exact rate of decline in the populations and then to assess the effectiveness of the proposed protective measures.

Fijians traditionally had great conservation methods for marine resource management.Only certain Chiefs were allowed to eat turtle meat and only special fishermen could catch turtles. With the advert of Christianity the old taboos were lost. Turtles are now harvested mainly for economic reasons which is the major factor for the decline in turtle populations. OCEAN would like see turtles used only for cultural purposes and stop the sale of turtle meat and it's by-products.

There is no other organization active in marine protection in Fiji so there are no statistics, OCEAN has therefore made the Turtle Protection project it's top priority.

BUDGET

PERSONNEL	ONE YEAR
Coordinator	Fijian $10,800
Research Officer	9,720
PUBLIC AWARENESS:	
Advertising	2000
Video Production	6500
Slides	500
Audio	200
Newsletter printing and compiling of information (6 editions)	1,800
Transport	1,500
Research	1,000
DIRECT ACTION	
Workshops (training)	6,000
Printing	1,200
Compiling data base	1,200
GENERAL	
Rent	1,500
Fax/phone	1,490
Electricity	700
Petty Cash	2,700
TOTAL	**48810**

JUSTIFICATION OF BUDGET

PERSONNEL:

Coordinator : (Full -time position)
The Coordinator is responsible for the office administration as well as the implementation of the projects in the assigned time.She will develop new projects during her period of employ.
The salary component of FJ$200 per week allocated for this position does not justify the current rate payable to Professionals at her level in the Tourism industry.
(Her previous position was earning her US$300+ per week)
The Coordinator has been working as a full time volunteer since OCEAN's inaguration.

Research Officer : (Full-time position)
The person is also responsible for the office administration as well as exploring new projects. His work will also involve computerising the database on turtles.
His Educational background includes a Bachelor of Science (Biology/Chemistry) from University of the South Pacific. Subjects studied include Marine Biology, Fisheries and Oceanology.
Work experience includes:
Education (currently a senior Science teacher in Fiji); Computers and Fisheries.
The local Salary component for University graduates is FJ$ 12000 -)

PUBLIC AWARENESS:

Advertising - This is important because publicity is needed to maximize public impact. Advertising will take the form of Newspaper & Radio ads and posters. OCEAN is looking for Coperate sponsorship for National Television. Slides - Slides are needed for the S.O.S educational presentations as well as for documentation of OCEAN's happenings. The budget covers development costs for film.

Video - 15 minutes turtle documentary is needed for school education programmes (S.O.S) and basic public education. The people of Fiji need to know what is happening around them and video is a great medium.

Audio - This will cover studio costs to put a radio jingle together. Professional time will be volunteered.

Nesletter printing & compiling information - The bi-monthly newsletter is necessary so we can publicize our statistics and findings and get public partisipation and support. $300 per newsletter has been allocated and this will include printing and compiling information costs.

Transport - This is for OCEAN staff to be able to network the country to implement this project.Travel costs include visits to schools, turtle nesting beaches,markets and research areas. Also boat fuel for releasing of turtles.

Research - Is for the development of new areas for OCEAN to become involved in. For example managroves,marine parks.

DIRECT ACTION

Workshops: OCEAN will conduct 30 workshops within the time frame and has allocated FJ$200 per workshop. This will include boat fuel, printed matter costs, tags, applicators, travel and living allowance.

Printing : These costs include turtle certifications, posters and membership forms. $100 per month has been allocated.

Compiling Data base: $100 per month has been allocated and this will include discs and computer use & repairs.

GENERAL

Rent - Office space situated 10 minutes for downtown Suva has been offered to OCEAN for a token $100 per month, this is a quater of the going rate for office space. $300 has been added to the budget to cover repair and maintainance costs.

Fax/phone - $120 per month has been allocated which is currently OCEAN's costs. OCEAN uses the National Trust fax at the moment and pays accordingly.
$50 has been added for the telephone deposit.

Electricity - $50 per month is included and another $100 to cover repairs and maintainance.

Petty Cash - $50 per week and this will include postage,office materials and stationary. Petty cash is needed at all times in cases when turtles need to be bought immediately. Petty cash is used and then reinbursed by the Trust Account.

Appendix

Appendix A 1-9 Support letters

1) Ministry for Primary Industries.

2) National Trust For Fiji.

3) FDOA Northern Spokesperson.

4) Mamanuca Hotel Association.

5) Islands in the Sun Ltd.

6) FDOA Eastern

7) FDOA Western

8) Asco Motors 'Yamaha Expo'

9) Nabavatu Plantation

Appendix B 1-3 Legalities

1) Constitution of Oceania Conservation and Environmental Awareness Network.

2)Certificate of Incorporation

3)Registration of Trade Mark.

4)Register of Customary Fishing rights (Yanuca Island)

Appendix C 1-9 Information

1) Mangrove Slide presentation.

2) OCEAN brochure

3) Turtle research (tagging & nesting forms)

4) Turtle identification chart

5) Coral reef data sheet

6) Report on schools

7) Sample design for OCEAN advertising

8) Protected areas report

9) Proposed marine park for Beachcomber and Treasure Island.

MINISTRY OF PRIMARY INDUSTRIES
Fisheries Division
PO BOX 358, Suva, Fiji

Tel:361122 362448 362449
Tlx:2290
Fax:361184
Date:January 25, 1993
File:

The Co-ordinator
OCEAN
P O Box 14641
SUVA

ATTENTION: Ms Taraivina Costello

Dear Madam

This letter is to confirm that the Fiji Fisheries Department will assist your organisation with its turtle and other conservation/management programmes.

We are indeed grateful to your organisation for its complementary function to our work. We fully support and would be happy to be involved with the implementation of your programmes.

Yours sincerely

[P Kunatuba]
DIRECTOR OF FISHERIES

National Trust for Fiji

3/2/93
Ms T Costello
OCEANS
P O Box 14641
SUVA

Dear Ms Costello

RE : OCEANS - Programmes and Projects

We are pleased to state that the National Trust for Fiji Council was delighted that your organisation has been formed to undertake educational and marine environment programmes at the NGO level.

We would be very supportive of all your proposals in the fields that you have indicated and would recommend that if possible the Trust could be considered as a co-partner in the implementation stage.

Looking forward to working with your organisation in preserving **FIJI's Heritage**.

Yours faithfully

Birendra B Singh
DIRECTOR

IUCN
CHAIRMAN PATRON DIRECTOR
3 MAAFU STREET, SUVA. P.O. BOX 2089, GOVT BUILDINGS, SUVA, FIJI. TEL: 301807 FAX: 305092

A-2

F I J I D I V E O P E R A T O R S A S S O C I A T I O N.

To: Tara Costello,
OCEAN

Date: 3\6\93

From: David Dickinson,
FDOA Northern Spokesperson.

Fax: 880 288
Phone: 880 286

Dear Tara,

Thankyou for your call and information regarding the OCEAN organisation. The Dive Operators in the northern region are very concerned with the issue of conservation of the environment and in particular the aquatic realm. We are presently in the process of having the world renowned Rainbow Reef declared a Marine Park which will benefit all those who live in the Cakaudrove area.

Your proposed turtle tagging programme is a great start to national environment awareness and has the full support of the FDOA members in the northern division. We will be very happy to assist in the tag programme and realise the importance of the need for a data base of this type. We have seen over the years the decimation of the turtle population due to traditional fishing and now accidental net killings from commercial operations and would welcome efforts to have them return to normal population levels.

I wish your trip to Western Samoa success and hope we can be of assistance in your most worthy cause.

Yours Sincerely,

Dave Dickinson.
Spokesperson FDOA Northern.

MAMANUCA REGION

OF THE FIJI HOTEL ASSOCIATION

PRIVATE MAIL BAG, NADI AIRPORT, NADI FIJI ISLANDS

TELEPHONE 723999

FACSIMILE 790197

CHAIRMAN M.Macdonald

SECRETARY M.Pettitt

TREASURER A.Reed

Ms Taravina Costello
OCEAN Co-ordinator
Fax # 305092

Dear Tara,

As requested this is a letter of support on behalf of the members of the Mamanuca Region of the Fiji Hotel Association.

We would offer you 100% support on your tagging programme and assist in anyway possible to ensure the preservation of turtles in our waters.

It might be an idea for you and your organisation to come out and address the villagers in the area as they are the great gathers of turtles, in all seasons.

The question of accommodation & meals at each resort will have to be dealt with by you on an individual property basis, also the availability of boats for use.

There are thirteen resorts in the area, including Magic Island, Navini, Beachcomber & Treasure Island.

All the best & every success Tara.

Yours sincerely,

Max Macdonald
Chairman Mamanuca FHA.

A-4

Management & Marketing
of Fiji Island Resorts &
Cruises:
- Beachcomber Island
- Treasure Island
- Tui Tai Cruises

Islands in the Sun, Fiji.

Walu St. & Vitogo Pde.
(P.O. Box 364)
Lautoka, Fiji
Telex: FJ5189
Fax: 64496
Member PATA, FHA & SOFTA

4 June, 1993

Ms Tara Costello
OCEAN
P.O. Box 14641
SUVA FIJI ISLANDS

'Bula' Tara,

This letter serves to confirm our interest in Turtle Conservation and hatching/nursery.

All of our Mamanutha Resorts support "OCEAN'S" objectives and will definitely stand behind it and would be pleased to assist your endeavours in whatever way we can.

Yours sincerely,

P.B. Costello
EXECUTIVE CHAIRMAN

A-5

FDOA

FIJI DIVE OPERATORS ASSOCIATION

P.O.BOX 3066 LAMI, FIJI ISLANDS - Phone(679)300599 Fax(679)302639

TO WHOM IT MAY CONCERN

RE : OCEAN (Oceania Conservation & Environmental Awareness Network)

FIJI DIVE OPERATORS ASSOCIATION CENTRAL DIVISION HAS PLEDGED SUPPORT TO THE CO - ORDINATOR OF OCEAN, TARAIVINA COSTELLO.

OUR MEMBERSHIP IS IN EXCESS OF TEN DEDICATED DIVE OPERATORS THROUGHOUT THE SOUTHERN/CENTRAL REGION OF FIJI, WHICH INCLUDES THE CORAL COAST, PACIFIC HARBOUR, SUVA, BEQA ISLAND, KADAVU ISLAND, WAKAYA ISLAND.

THE ASSOCIATION HAS A COMMON AIM WITH OCEAN AND THAT IS TO ENCOURAGE LOCAL AWARENESS AND WORK TOWARD ESTABLISHING MARINE AND COASTAL SANCTUARIES.

YOURS FAITHFULLY

.....

C. R. ST. JULIAN
Secretary

A-6

FIJI DIVE OPERATORS ASSOCIATION.

PO BOX 10215 WESTERN REGION PHONE: 780 413
NADI AIRPORT FAX : 780 412

TO: OCEAN CO-ORDINATOR
ATT: TARAIVINA COSTELLO
FROM: VALU TAMANIVALU
FAX: 305 092
DATE: 03. 06. 1993.

DEAR TARA,

THE FIJI DIVE OPERATORS ASSOCIATION (WESTERN REGION) IS IN FULL SUPPORT TO THE TAGGING PROGRAMME THAT THE SPREP IS GOING TO IMPLEMENT IN THE FIJI WATERS. IN THE WESTERN REGION WE HAVE A MEMBER OF 12 OPERATORS, BUT THERE ARE 3 OTHER OPERATORS IN OUR REGION WHO HAD SHOW INTEREST OF JOINING AS WELL.

WE THE FDOA WESTERN REGION ARE SO GLAD THAT SUCH PROGRAMME ARE BEEN LOOKED INTO, BECAUSE THIS WILL PROVIDE US INFORMATION AND KNOWLEDGE OF WAYS TO PROTECT OUR MARINE LIFE.

WE ARE LOOKING FORWARD TO SEE YOU IN THE WEST.

YOUR'S SINCERELY,

VALU TAMANIVALU
PRESIDENT
FDOA (WESTERN REGION.

Asco Motors

BPT (SOUTH SEA) COMPANY LIMITED

FOSTER ROAD, WALU BAY
P.O. BOX 355, SUVA FIJI
TELEPHONE (679) 312666
FACSIMILE (679) 301426

19 May 1993

Ocean
P O Box 14641
SUVA

ATTN: TARAIVINA COSTELLO

Many thank for your letter of May 16th requesting participation in our 'Yamaha Expo' on June 25/26.

We are pleased to include your exhibit in the show and assume you of our support in any way possible. Please contact the undersigned concerning details of display requirements and positioning, as well as work programme.

We may be of some assistance to your cause.

Regards.

Barry Lee
MARINE & EQUIPMENT MANAGER

NABAVATU PLANTATION

FAX TO: TARA COSTELLO
Fax No: 305092

FROM: CAROL & COLIN DUNLOP
Fax No: 361256

DATE: MONDAY 7TH JUNE 1993

Dear Tara,

We would like you to know that we and all the partners of Nabavatu Plantation Company - Vanubalavu, Lau fully support your "Oceans" turtle programme.

We would like to become involved. Our remote property has a fine protected beach and 800 acres of native trees, copra, etc.

We would like to start a hatchery there and could certainly provide accomodation and all the necessary infrastructure to support a warden etc.

Duff reef a sand key just half an hour away from us is the location where the Green Turtles lay their eggs-we would like to help protect them from the "locals" who we have seen taking the eggs during the breeding season. Maybe it would be worth transporting the eggs to our beach but we would leave that up to the experts to advise. Do let us know how we can help.

Regards,

Colin & Carol Dunlop

P.O. Box 2313, Suva, Fiji
Tel/Fax (679) 361 256

A-9

F I J I

CHARITABLE TRUSTS ACT (CAP. 67)

CERTIFICATE OF INCORPORATION

I HEREBY CERTIFY that OCEAN (OCEANIA CONSERVATION AND ENVIRONMENTAL AWARENESS NETWORK) is duly incorporated under the provisions of the Charitable Trusts Act subject to the conditions and directions endorsed hereon.

DATED at Suva this 16th day of October, 1992.

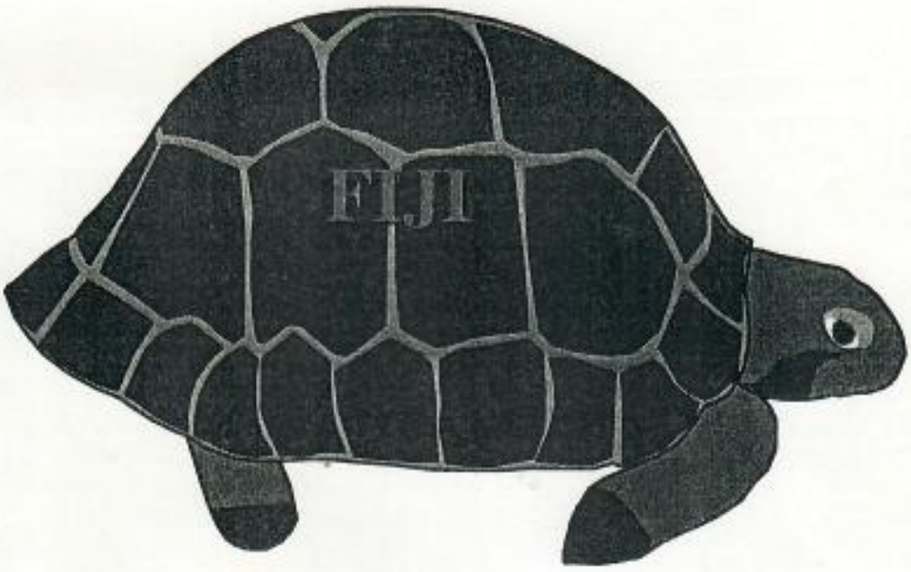
REGISTRAR OF TITLES

CONDITIONS AND DIRECTIONS

N I L

B-1, 2

SEA TURTLE RESEARCH PROPOSAL



RECEIVING AGENCY
SOUTH PACIFIC REGIONAL ENVIRONMENT PROGRAMME
(SPREP)

SUBMISSION MADE BY THE FISHERIES DEPARTMENT
MAFF

RESEARCH DESCRIPTION

Introduction:

The islands in the Fiji Group lies between Latitude 12° to 21° South and between Longitude 177° East and 178° West. The Fiji island groups are one of the best foraging grounds for sea turtles in their juvenile and semi-adult stages. Because of the South Equitorial current, a great percentage of juvenile turtles (especially Green turtle) end up in fiji waters, and commence their pre-reproductive years from there. Recruitments comes from as far as French Polynesia and PNG. Over 95% of Green Turtles in Fiji in any given time, are hatched-out from other shores in the Pacific.

There are 7 known species of sea turtles,(scientist are still divided on the question of the 8th species saying *Chelonia agassizi* is a subspecies of *C. mydas*) of which 6 are in the Pacific region, and all are currently listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which prohibits commercial trade in sea turtle products. This has been largely ignored. The four species of sea turtles that are found in Fiji, in order of abundance, are:

i) Green Turtle *(Chelonia mydas)*
ii) Hawksbill Turtle *(Eretmochelys imbricata)*
iii) Loggerhead Turtle *(Carretta carretta)*
iv) Leatherback Turtle *(Dermochelys coriacea)*

Three species with the exception of the Loggerhead Turtles, are known to nest in Fiji. The last remaining nesting sites for Green turtles are isolated islands and sand isles north of Taveuni. These sites are found within the Hemskercq and the Ringgold Reef Systems (positions: 16°43'15"S - 16°18'00"S and 179°26'30"W - 179°24'30"W)

The nesting of Hawksbill turtles are more widespread in Fiji, but in very small standing populations. Nestings is more common on the Eastern and Southern parts of the Fiji Groups. One of the last major nesting site for hawksbills is Namena Lala island (17.25°S, 179.1°E) which use to have up to 200 nests per season from the early 1980's. Namenalala should be made a national marine park.

There is only occasional nesting of the Leatherback turtle within Fiji, which is only restricted to the Natewa Peninsular (Vanua Levu), and the last nesting encountered was in Nawi village, on 17 January 1994. Leatherbacks and Loggerheads should be completely protected in Fiji. Existing Fisheries Laws on sea turtles should be reviewed and if need be, amended.

Fiji badly needs to update information on existing dynamics and structures of sea turtle populations. There is a priority to carry out research or field work on:

1) existing nesting sites and nesting populations (especially for the 2 main species, Greens and Hawksbills)

2) determine a method or regime whereby current harvest level can be effectively monitored or estimated. Also collect, collate and analyse harvest data for the last 10 years (1985-1995) may be necessary to take it up to the last 20 years.

3) Carry out an ecological survey of major feeding grounds, and seagrass habitats favoured by Greens and Hawksbills. The preferred seagrass species are

   i) *Syringodium isoetifolium*
   ii) *Halodule uninerva*
   iii) *H.pinifolia*
   iv) Halophila ovalus

There is also a list of preferred macroalgae such as *Caulerpa* and *Gracillaria* species.

4) assess the Tagging, Capture and Recapture Programme being carried out within Fiji - particularly from Makogai Mariculture Centre, as pertaining to positive impacts towards conservation of sea turtles. Scientists from the US and Mexico still have doubts on head-start or breeding programmes on sea turtles saying that reproductive capacity and homing instincts may be impaired in the process.

5) population structure distribution, recruitment and migration patterns of the 2 rare species in Fiji, the Loggerhead and the Leatherback turtles.

6) identification of protected areas, reserves or marine parks to include in the first instance, nesting and mating sites. Major nesting and foraging sites should be mapped-out and a measure of protection imposed, if a national park status is not given. There is currently no marine park in Fiji. Namenalala and the Islands north of Taveuni must be given priority.

Research/Field Work:

Survey on Ecology and Population Structures of the Sea Turtles of Fiji:

Survey will be carried out by field visits, diving trips to establish individual residential populations, nesting, beach monitoring, sightings, taggings and analysis of past statistics.

Objectives:

The objectives of the field work is to:

1) Establish current nesting population for Hawksbills and Greens in main nesting sites in the selected areas.

2) Establish major mating grounds, and estimate breeding populations (for Hawksbills and Greens).

3) Identify major seagrass pastures, and hence main feeding grounds for Greens and Hawksbills.

This will include the Loggerhead turtle which is now largely restricted to the Eastern Bligh Water (around Yadua and Great Sea Reef). Loggerheads are also carnivorous, feeding mainly on mollusks and crustaceans.

4) Estimate local population of loggerhead turtles (which is estimated to be less than 100 from 1994), and if possible, also assess the trans-oceanic Leatherbacks, which is estimated to be less than 20 in any given time, in Fiji.

5) Identify strategic sites to be protected as reserves or marine parks. Protections could be area-based or species-based (or both).

6) Review of existing legislations, and where necessary, suggest amendments.

7) Continue Turtle Tagging Programme and assess feedbacks on local turtle populations.

These findings could help us to draw up a complete report on the 'Current Status of Sea Turtles in Fiji'.

Location of Project:

Location will be in Fiji (see map). The major areas to be surveyed will be the (a) Lomaiviti Group (b) Kadavu islands and (c) islands North of Taveuni (or the Hemskercq, Ringgold and Duff Reefs).

Over the last 2 decades, a few biologists have carried out some studies on Sea turtles in Fiji of which two are notable, Bustard (1970) and Guinea (1980's). As previously outlined, research findings from these early studies are inadequate, and data and knowledge needs to be updated, and off course, some questions to be answered further. Protection measures could only be effective if background knowledge on biology, life histories, reproductive sub-populations, recruitment and migration patterns are clear and complete. To date, sea turtle knowledge in Fiji, is at best, fragmentary. Research into sea turtle populations in Fiji and in the region is a priority, for we must collectively managed our sea turtles. It is important that we must now established what is happening to our sea turtle populations. The killing of sea turtles has continued unchecked in Fiji for the last 150 years. All age classes are being killed for their shells and meat. The killing of so many juveniles (less than 18 inches) and breeding adults is made worse by organised or intentional collection of eggs on nesting beaches and remote islands. As a result, natural capacity for replenishment diminishes greatly.

There is now an awakening of interest to save sea turtles from over-exploitation. 1995 has been declared by regional governments and SPREP as "**The Year of the Sea Turtle**" in an effort to raise awareness into the plight of sea turtles in the region. It is now imperative to carry out further research on Sea Turtles to be able to establish exactly what is the status of sea turtles in each country.

Principal person responsible for the Research:

Esaroma Ledua
Principal Fisheries Officer
(Development/Assessment)

Aisake Batibasaga
Research Officer

Principal research workers to supervise and be engaged on project:

Aisake Batibasaga (Chief Technical Person) * **This team have already carried out**
Apisai Sesewa (Assistance to Batibasaga) **a Turtle Nesting Survey from the**
Aisake Vana (Fisheries Officer) **Lomaiviti Group from the 1994**
Saiyasi Yabakivou (may not be available) **season. Funds were supplied by**
Filipe Koroi (Fisheries Assistant) **the South Pacific Regional**
Environment Programme (SPREP)

i) As the field work here will entail boat visits to study sites of periods of up to 2-3 weeks, and continuous monitoring of nesting beaches (nesting seasons in Fiji are from November, December, January, February and even, into March) we will need to recruit up to 8 field assistance, who will be paid at an official hourly rate of FJ$2.56 plus field allowance of $10 per day. For Research workers (officers) a field allowance of $17.00 will be levied. This is the current official rate. Allowance is given only during field visits or continuous monitoring. The department will contribute by providing salaries for all technical staff above, vessels infrastructures and other equipments.

ii) if larger seagoing vessels are used (from the department) than seagoing allowance will have to be paid to the boat personels.

iii) Food or rations will have to be met by the project when trips are made or when research people are deployed on an island for continuous monitoring of up to 2 weeks.

iv) Fuel costs for each trip will have to be met by the project (use of Diesoline and premix plus accessories)

v) Gears (diving and camping) could also be met by the project (or otherwise if available supplied by the department).

vi) The Fisheries Department have limited vehicles, and would request for funding assistance on vehicle rent.

Duration of the project:

The duration of the project can take up to 7 months but research on mating grounds, foraging areas and sightings, mapping of nesting beaches and data collection can be carried out throughout the year in conjunction with other routine duties for the department. We would like to proceed with the project from no later than 1 June 1995. Proceedings for this programme are already ongoing within the department. We have a good background too on tag recoveries.

Amount of Financial Aid sought:

$80,000FJD

A draft budget breakdown is attached.

Budget for optic equipments:

	No.	Unit Price FJ($)	Total
1. Zoom Pentax Camera	1	1,200	1,200
2. Under Water Camera (with head lights)	1	1,500	1,500
3. Distance/Range finder	1	1,400	1,400
4. Video Camera	1	4,500	4,500
5. Binoculars	4	200	800
6. Walkie Talkie	4	300	1,200
7. Portable depth gauge	4	250	1,000
8. Accessories			800
			FJD$12,400

Why this gear?

items need justification - back to proposal

1) Limited funding for 95 left - CORA $5-10,000 US PNMA.
Need costing for prioritised work eg
do N. Taveuni (nesting sites N. Lau N. Lalai) - Vanua Levu - eastern lagoon area (check tag recovers?) for foraging site / Timing of survey - peak? Genetic work?
2) Can't support salary costs
3) Support logistic costs, supply tags
(4) Action Plan FTWG meeting Oct 31 - develop 96 → survey & research etc based on this 3 yr? strategy → fund
5) Check GJ / George

nb
Check New Caledonia budget - need to support both from remaining CORA $
(3 this new Cal. ...)

This is a tentative Budget background for your perusal.

BUDGET BREAKDOWN

Contractual Services

Salary for 7 field assistance *(16 weeks)*	*(per week) ($ 112.64)*	$12,600.00
Salary for 1 Technical staff contract *($200 per week)*		$ 2,400.00
Allowance for assistance/Trainees *($10 per field day)*		$ 3,500.00
Allowance for Fisheries Research Staff *($17 per field day)*		$ 8,000.00
Sea going allowance for boat personnel *($7 per day for 7 personnel projected for 50 days since there will be up to 10 Trips).*		$ 2,500.00
Rations for sea going trips		$ 7,500.00
		$36,500.00

Fuel Budget

Diesolene	*(35 x 44 gallon) x $95)*	$ 3,325.00
Premix	*(20 drums for refill x $150)*	$ 3,000.00
Supper	*(10 drums x $145)*	$ 1,500.00
Accessories such as Oil, Grease, Engine plug		$ 1,000.00
		$ 8,825.00

Equipments	Quantity	Cost/Unit	Total Cost
Sleeping bags	16	$ 95.00	$ 1,500.00
High Powered Torch	12	$ 65.00	$ 800.00
Benzene Light	10	$ 135.00	$ 1,300.00
Camp out Tent	6	$ 850.00	$ 5,100.00
Cane knifes	12	$ 12.00	$ 150.00
2 burner metal stove	5	$ 120.00	$ 600.00
Gas cylinder	5	$ 50.00	$ 250.00
Heavy duty rain coat	24	$ 45.00	$ 1,000.00
Jungle boots	24	$ 55.00	$ 1,350.00
Wet suits (diving)	12	$ 160.00	$ 2,000.00
Dive masks	6	$ 95.00	$ 600.00
			$14,650.00

We would be grateful if we could include a budget for vehicle rents. The Fisheries Department, does not have enough vehicles at the moment . There is only 2 operational, plus a Training section mini - bus . Hence, the inclussion of this cost. The location of the Fiji Group covers a wide area, hence the need to have travelling vehicle at our disposal. Budget cost $9,000.

Funding requested: $67,150.00 + $12,400.00 = **$81375.00**

Prepared by: **Aisake Batibasaga**

MINISTRY OF AGRICULTURE, FISHERIES, FORESTRY & ALTA
Fisheries Division
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362449
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Date : 18/05/95
File:

Dear Sue Miller,

Following our meeting on the 21st August concerning the Fiji Fisheries Department Sea Turtle Research Proposal , I am sending you a more detailed description on the **research methodology** to be applied in the study.Also included is a description of the likely implications of the proposed study.

Unfortunately, the Fiji Fisheries Department's funds are not sufficient to allow the study without the financial support from SPREP.

When considering the proposal, I would like to impress on you the urgency of the matter with the 1995/1996 sea turtle nesting season coming up in two months time.If the study is not initiated in time for this nesting season it will be delayed until next year's nesting season.

I am looking forward to your reply with anticipation.

Yours sincerely.

Aisake Batibasaga(Fisheries Officer)

for **Director of Fisheries.**

h:\use\super\letter\

Introduction

The research proposal is for a study covering this year's sea turtle nesting season alone but continuing the study over the coming sea turtle nesting seasons is desirable. It is the intention of the Fisheries Department to do so providing sufficient funds are available in years to come.

To fulfil research objectives 1-7 of the proposed study ("objectives 1-7" refers to original research proposal) three substudies will be carried out. The substudies are presented in detail in the methodology section.

Firstly, the single most important measure is beach monitoring during the nesting season from November to February. This substudy will contribute to the fulfilment of objectives 1,2,5,6 and 7.

Secondly, a substudy identifying major sea turtle feeding areas will be executed. This will be done by means of remote sensing in combination with groundtruthing by divers to fulfil objectives 3 and 5.

Thirdly, research carried out in conjunction with Fisheries Department routine work will contribute to objectives 4 and 7 being fulfilled.

In the last section of this amendment a short description of the implications of the proposed study is presented.

Methodology

Monitoring of Nesting Beaches

The beaches to be monitored are situated on islands and islets in three distinct areas (map 1). These areas are the known nesting areas in Fiji for the hawksbill (*Eretmochelys imbricata*) and green (*Chelonia mydas*) turtles (Guinea, 1993; Batibasaga, 1994).

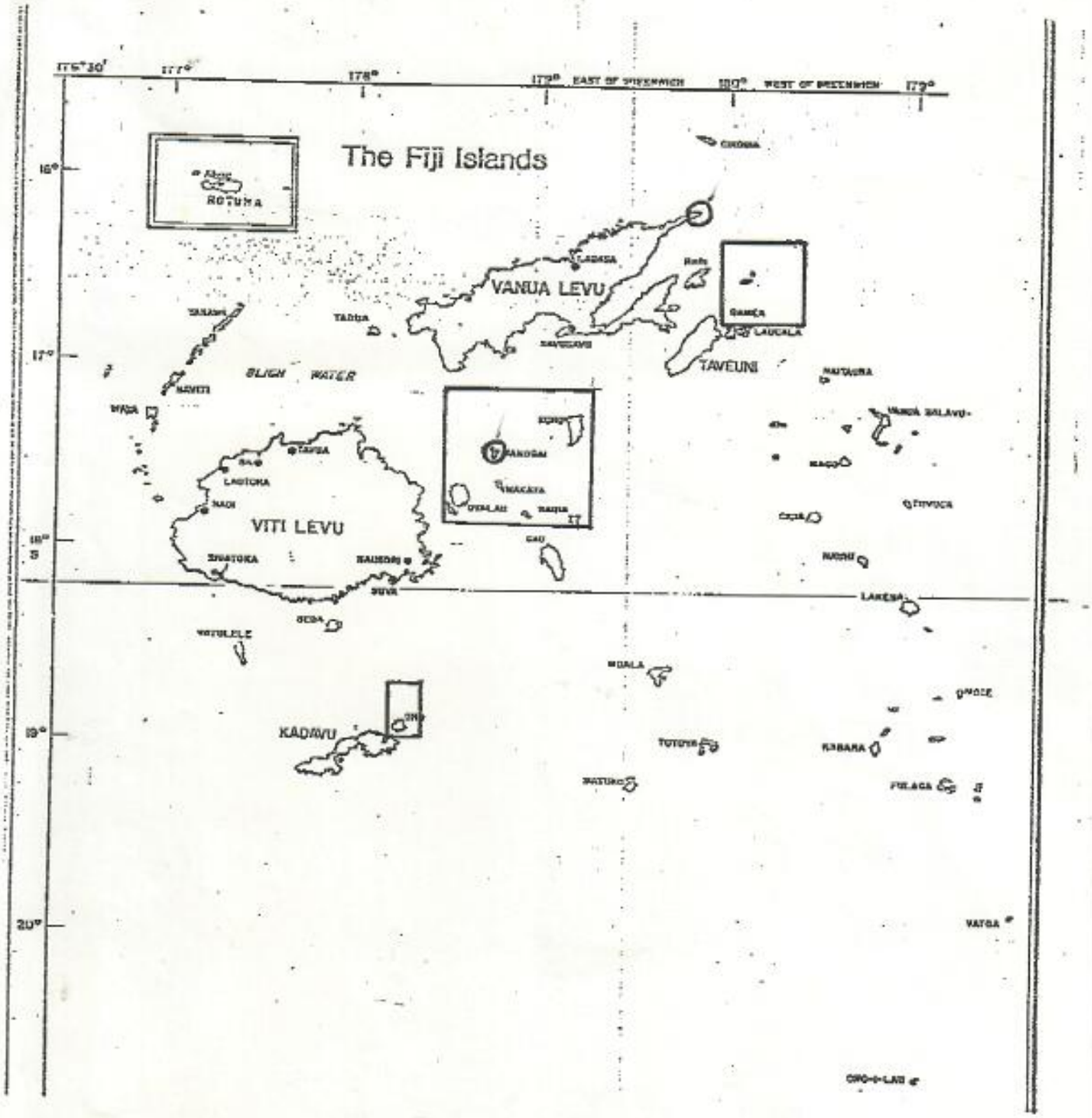
The islands and islets to be surveyed are shown in table 1.

Easily accessible beaches are to be monitored by Fisheries Department staff and field assistants twice daily (6.00am and 10.00pm) throughout the nesting season (Nov-Feb) The nesting data for these beaches will be used to make an accurate estimate of the number of nesting sea turtles.

Remote beaches are to be monitored once weekly. As the sea turtle nesting season is partly overlapped by the cyclone season permanent placement of staff on remote beaches and isolated islets is unfeasible. Low nesting densities contribute to making daily monitoring of these beaches unnecessary. From the data collected at these beaches the relative importance of the remote beaches as sea turtle nesting areas can be estimated.

Area	Island	Monitoring	Other Information
Kadavu	Buliya	Twice daily	One village on island
Kadavu	Dravuni	Once weekly	Inhabited island
Kadavu	Namara	Once weekly	Uninhabited island
Kadavu	Vanuakula	Once weekly	Uninhabited island
Kadavu	Vurolevu	Once weekly	Uninhabited island
Kadavu	Yaukuvelailai	Once weekly	Uninhabited island
Kadavu	Yaukuvelevu	Twice daily	Inhabited island
Lomaiviti	Cagalai	Twice daily	Village style resort on island
Lomaiviti	Koro	Twice daily	Beaches on SW part mainly
Lomaiviti	Leleuvia	Once weekly	Resort island
Lomaiviti	Makodroga	Once weekly	Only one beach on island
Lomaiviti	Makogai	Twice daily	Research station on island
Lomaiviti	Moturiki	Once weekly	Inhabited island
Lomaiviti	Namenalala	Twice daily	Main hawksbill nesting site
Taveuni	Duff Reef	Once weekly	Remote sand cay
Taveuni	Qelelevu	Once weekly	One village on island
Taveuni	Naqelelailai	Once weekly	Remote sand cay
Taveuni	Naqelelevu	Once weekly	Remote sand cay
Taveuni	Nukubalati	Once weekly	Small sand isle
Taveuni	Nukubasaga	Once weekly	Small sand isle
Taveuni	Nukusemanu	Once weekly	Small sand isle
Taveuni	Nukusemanu Reef	Once weekly	4 sand cays
Taveuni	Welagilala	Once weekly	Good nesting beaches for both species
Taveuni	Yanutha	Once weekly	Inhabited island
Taveuni	Yavu	Once weekly	Coconut estate

Table 1. Islands and islets to be surveyed.



Map 1. Fiji Islands. Nesting study areas indicated with squares. Known feeding areas indicated with circles.

Implications of Study

The proposed study will provide a useful estimate of the current status of sea turtle populations in Fiji.
Apart from being of purely scientific interest the result of the study will have important implications in terms of conservation and legislation.
A moratorium on killing sea turtles and collecting turtle eggs is already in place for 1995 and is likely to be extended for at least another year. The study will provide data that can be used to highlight the very real threat of extinction the sea turtles of Fiji are experiencing today. The study will therefore be helpful when seeking to extend the moratorium.

2nd Quantity

The study aims to identify major nesting areas and important feeding grounds. Turtles from all over the South Pacific are known to migrate to Fiji to feed (Balazs *et al.*, 1993). Identifying the main feeding areas within Fiji is therefore of importance to sea turtle populations throughout the Pacific. These areas should be the prime target for protective legislation of marine park type. Hence the study has implications for both conservation and legislation beyond the extension of the moratorium..
The study, especially if repeated over coming nesting seasons, will provide feedback on how efficient existing legislation is in protecting and in increasing recruitment to the sea turtle populations of Fiji. This is of major importance as protective measures have to be efficient if the sea turtle populations of Fiji are to survive.
Finally, when trying to get local support for protective legislation and when educating the public data from the proposed study will be used to emphasis the seriousness of the situation sea turtles in Fiji are facing today.

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This amendment to the Fiji MAFF Sea Turtle Research Proposal was prepared by Fisheries Officer Aisake Batibasaga with the assistance of AHI Marine Biologist Sebastian Troëng

PROPOSED AGENDA
FIJI SEA TURTLE STRATEGY MEETING
31st October 1995

9:00am	Welcome and introduction the meeting, the participants, the agenda 30 minutes
9:30am	An action plan for conservation of turtles in Fiji general discussion and agreement on the proposed outline and process 30 minutes
10:00am	Proposed strategies preliminary definition of a comprehensive and integrated set of strategies or programs for the Action Plan 30 minutes
10:30am	Break for coffee
11:00am	Proposed actions planning the actions required under each strategy 1hour & 30 minutes
12:30pm	Break for lunch
1:30pm	Continuation of proposed actions required for each strategy 1 hour
2:30pm	Break for coffee
2:45pm	Review of draft action plan 1hour
3:45pm	Break for coffee
4:00pm	Continuation of review of draft action plan, list research and management priorities 45 minutes
4:45pm	Goodbyes, list of contacts for future work, clear understanding of next steps 15 minutes

Sea Turtles in Fiji
CONSERVATION ACTION PLAN, 1996 - 1998

1. Purpose of the Action Plan

the overall objective to be reached by implementing the Action Plan and that will outlive the Action Plan.
how can achievement of this Purpose be measured ?
how are these measurements obtained ?

2. Proposed Strategies

a set of 5-8 strategies or programs that, in combination, we believe will contribute effectively to the overall objective

each Strategy should target one of the major issues facing the survival and health of marine turtles in Fiji

3. Action Plan for each Strategy

Objective

what is to be achieved by the individual Strategy ?

who are the potential players or stakeholders ?

what current or planned projects or programs could contribute to this strategy and should be built in and accommodated ?

Planned Results

what are the Results we want to produce through the Action Plan that will help to achieve the Objective ?

what are the types of results or products we want; what quantities, over what period, what area ?

how can achievement of each Result be measured ?

Activities

what are the Activities required to produce each Result ?

where and when would they be undertaken ? how & by whom ? what would be the costs (money, time) ?