

ENVIRONMENT NEWSLETTER

Quarterly Newsletter of the South Pacific Regional Environment Programme

Contents:

NUMBER 6

JULY - SEPTEMBER 1986

	Page
. News In and Around the Region	1
. World Environment News	10
. Feature	12
. Courses in Environmental Subjects	16
. Calendar of Events	17
. Publications	19

The South Pacific Commission's ENVIRONMENT NEWSLETTER commenced publication after having been in 'retirement' since issue No. 4 (March 1982). It will be produced on a quarterly basis commencing with No. 5 (April - June 1986). News articles and comments are welcomed for future issues.

South Pacific Regional Environment Programme

(SPREP)

South Pacific Commission



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Original text: English

NEWS IN AND AROUND THE REGION

CHEMICAL USE AND PESTICIDE RESISTANCE SEEN AS EMERGING ENVIRONMENTAL ISSUES OF WORLDWIDE CONCERN

- WHAT IS THE SITUATION IN THE SOUTH PACIFIC ?

The use of pesticides has markedly increased in the world over the past few years, the annual rate of growth in pesticide use now being about 10 per cent, as compared to 5 per cent between 1972 and 1980. Total world expenditure on pesticides increased from US\$ 5 billion in 1975 to over US\$ 11 billion in 1981 and continues to increase.

As pesticide use increases, so too does resistance to pesticides. Recently the Food and Agriculture Organisation (FAO) reported that 392 species of arthropods (insects, mites and cattle ticks) have become resistant to pesticides. About 50 species of plant pathogens have so far been reported resistant to fungicides and bactericides, and 5 weed species resistant to herbicides. The World Health Organisation (WHO) has also reported an increased resistance of mosquitoes to insecticides.

PESTICIDE USE IN THE SOUTH PACIFIC

Dr David Mowbray of the University of Papua New Guinea has, over the past three years, undertaken extensive research, on behalf of his university and SPREP, into pesticide use in the South Pacific Region.

He has found that many small island countries and territories of the South Pacific have neither effective legislation nor infrastructure necessary to regulate the importation, sale and distribution of pesticides. As a result many hazardous pesticides, (classed as extremely and highly hazardous) are amongst the multitude of those available and used throughout the region, often by people unaware of the hazards. As well many of these are either banned or severely restricted elsewhere in the world.



NUMBER OF PESTICIDES

Mowbray found that a minimum of 620 different pesticides were available in the region and, as some countries do not keep accurate records of imports, some pesticides could be imported without the knowledge of the appropriate authorities. Most countries showed a substantial increase in number of pesticides available in the 1977-1985 period from those in a previous survey between 1975-1980, in some cases an increase of over 400%, while for one country as high as 900%.

BANNED OR RESTRICTED PESTICIDES

Mowbray points to the number of writers in recent years who have drawn our attention to the fact that many pesticides are exported to, and freely available in, third world countries - these pesticides being restricted for use by certified operators only or severely restricted or banned in their country of origin.

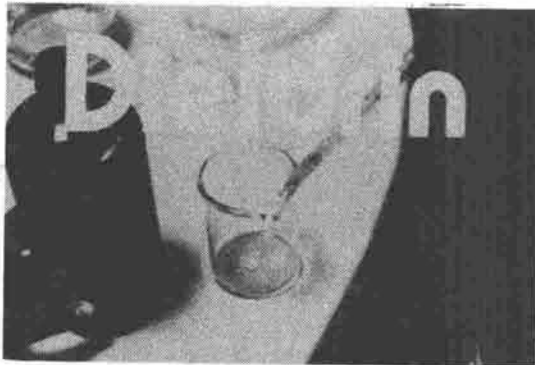
Whilst stating that the situation is not necessarily always as clear cut as it may first appear, with many diverse reasons existing for banning or restriction, he nevertheless alerts us to a significant problem in our region. Much onus is placed on the "importing" nation to weigh the costs and benefits in allowing certain hazardous pesticides within its boundaries. However, the problem in the South Pacific is that there may not necessarily be a "designated national authority" and where there is, this authority (registrar) is all too often grossly overburdened with divergent responsibilities. Mowbray's figures show that within the region there are 71 compounds "banned, withdrawn, not approved somewhere in the world", and 34 compounds with World Health Organisation (WHO) classification of "extremely hazardous".



MONITORING OF PESTICIDE USE AND EFFECTS

Mowbray's study revealed that very little control is exercised over the use of pesticides and their environmental and health effects are barely known. Also indicated was the urgent need to monitor the levels of pesticides in human tissues, agricultural products and environmental samples.

As a means of addressing this need, the University of Papua New Guinea Science Faculty hosted an international workshop from 23 June to 3 July this year on "ANALYSIS OF ORGANOCHLORINES IN MARINE MAMMALS". Funding for the workshop was provided by the South Pacific Regional Environment Programme (SPREP), East Asia Seas/Co-ordinating Body on the Seas of East Asia, and Inter-governmental Oceanographic Commission/Programme for the Western Pacific, with assistance also from the PNG Department of Environment and Conservation. Trainees from 13 countries of South-East Asia and the Pacific attended with participants from within our region representing the Northern Mariana Islands, Guam, Fiji, French Polynesia, Papua New Guinea and Tonga.



**ANALYSIS OF ORGANOCHLORINES
IN MARINE MAMMALS UNDERTAKEN
AT UPNG WORKSHOP**

During the two-week course, participants learnt many of the skills and new techniques used in analysing animal tissues/environmental samples for trace elements of contaminants; specifically analysing organochlorine pesticides (e.g., DDT, dieldrin, lindane) and polychlorinated biphenyls in bivalves (oysters, mussels and clams).

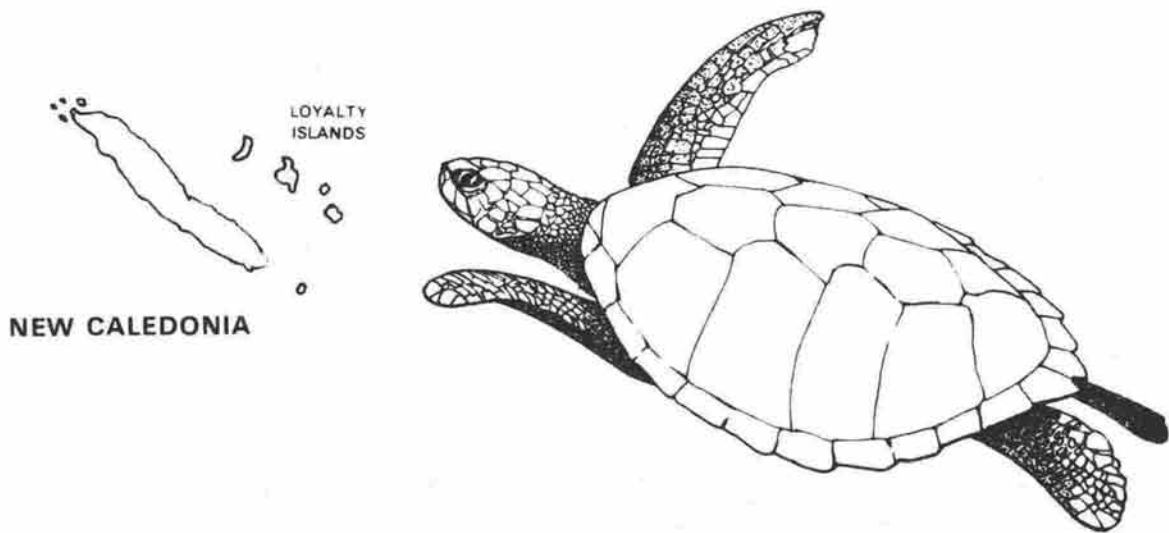
The importance of ensuring that our region becomes aware of the need to monitor the environment for effects of pesticides, cannot be overstated.

(David Mowbray's study will soon be published in SPREP's Topic Review Series).

COOK ISLANDS GOVERNMENT APPROVES ACCESSION TO APIA CONVENTION

The Cook Islands Ministry of Foreign Affairs announced that on 12 August 1986 their government approved the Cook Islands acceding to the Convention on Conservation of Nature in the South Pacific (APIA CONVENTION) 1976 and stated that highest consideration would be given to deposit of the instrument of accession with the Western Samoa Government.

NEW CALEDONIA STRENGTHENS TURTLE PROTECTION LAW



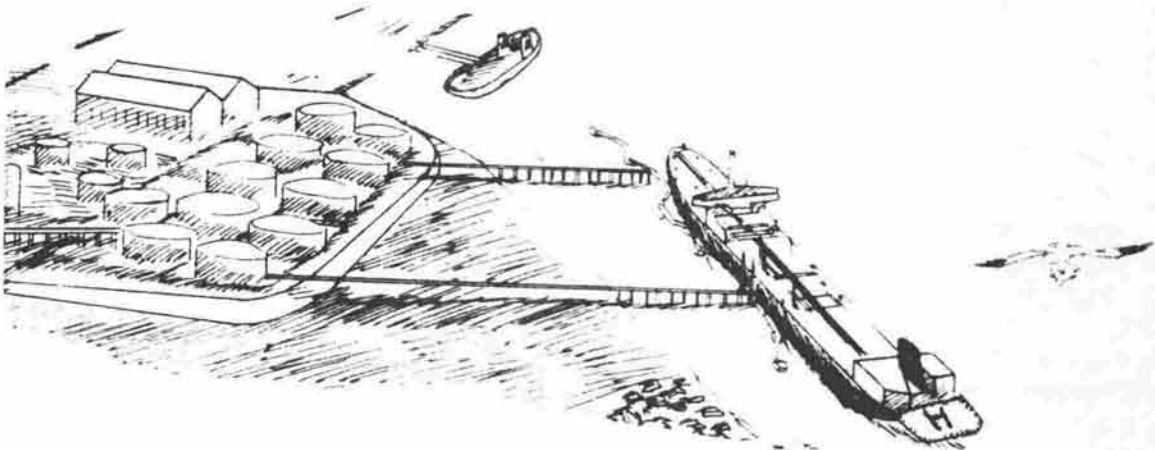
Through an ordinance dated 16 July 1985, New Caledonia has reinforced measures to protect marine turtles. Replacing the previous turtle ordinance of 1977, the new law forbids the capture of any species of marine turtles between 1 November and 31 March throughout the territory of New Caledonia and its Dependencies and in surrounding water. It is also illegal to destroy nests of marine turtles at any time or to take, keep, or sell their eggs. The new law also forbids the importing, offering for sale, selling, buying or exporting of marine turtles (alive or dead) or of any marine turtle parts or sub-products obtained from them. Exceptions to the restrictions on capture may be granted by the appropriate authorities for customary celebrations or for scientific purposes if the demand is justified.

(Source: Marine Turtle Newsletter, Number 38, September 1986)

HAZARDOUS WASTE DISPOSAL AND OIL LEAKS
IN NORTHERN MARIANAS

Alleged improper disposal at the northern end of Saipan, of a large quantity of pesticides including DDT, 2,4,5-T and 2,4-D is currently the subject of investigation by the Division of Environmental Quality (DEQ) of the Department of Public Health and Environmental Services of the Commonwealth of the Northern Marianas. First reported in February this year, the investigation is still continuing with the DEQ hoping to carry out field reconnaissance work during the last quarter of the year.

Oil Spills from Baker Dock into the Tanapag Lagoon have been the subject of investigation by the Division of Environmental Quality on two occasions this year. First reported in January, the spill was believed to be associated with transfer of oil from an ocean-going tanker to land-based tanks. A later oil spill pollution report and investigation in June found the cause to be several leaks in a pipeline. In June approximately 10,000 gallons of oil were removed, the pipeline replaced and critical portions of contaminated soil removed and backfilled with clay to below the tidal groundwater level. This effectively has established a dam, behind which a remedial oil removal effort is continuing.



(Source: Third Quaterly Report for FY-1986, Division of Environmental Quality, Department of Public Health and Environmental Services, Commonwealth of the Northern Mariana Islands.)

NZ NATIONAL PARKS AND PROTECTED AREAS OPERATIONAL TRAINING COURSE
FOR OVERSEAS PARK OFFICERS, 19 August - 4 December 1987.



As part of the New Zealand National Parks Centennial 1987, this 16-week course, designed for existing or potential parks officers from the South Pacific, Asia and South America, offers the opportunity to observe a wide range of protected area management techniques, operational activities and management skills. Based at Turangi near New Zealand's largest lake, Taupo, this Training Course is located close to the north island's three national parks, countless reserves, two maritime parks and state forest parks.

Course fees are US\$ 3,000, the course qualifying for Official Development Assistance (ODA) funding from the New Zealand government. The application must be made by the recipient country as part of their overall development assistance application. Those wishing to apply for funding should contact the appropriate government authority in their country which has responsibility for overseas study and training. The course is limited to 20 participants and applications must be received by 31 March 1987. For further details contact:

The Director,
National Parks and Reserves,
Department of Lands and Survey,
Private Bag,
WELLINGTON,
New Zealand.

TRAINING NEEDS FOR PARKS MANAGEMENT IDENTIFIED

A survey of training needs for protected area management was recently undertaken by SPREP. This survey arose from the Action Strategy for Protected Areas in the South Pacific which was developed and adopted at the Third South Pacific National Parks and Reserves Conference held in Western Samoa in 1985. The survey aimed to assess four broad areas relating to protected area management, namely: (i) existing number of staff and lack of skill; (ii) country perceptions of the priority of different types of training courses; (iii) country attitudes to options for undertaking training; and (iv) levels of assistance required to enable island participants to attend training courses.

Survey Findings

- (i) Very few island countries currently have protected areas but most indicated that the number of such areas is likely to increase, thus requiring people with protected area management skills.
- (ii) Most countries have very limited staff resources for protected area management, existing staff having few skills in this area.

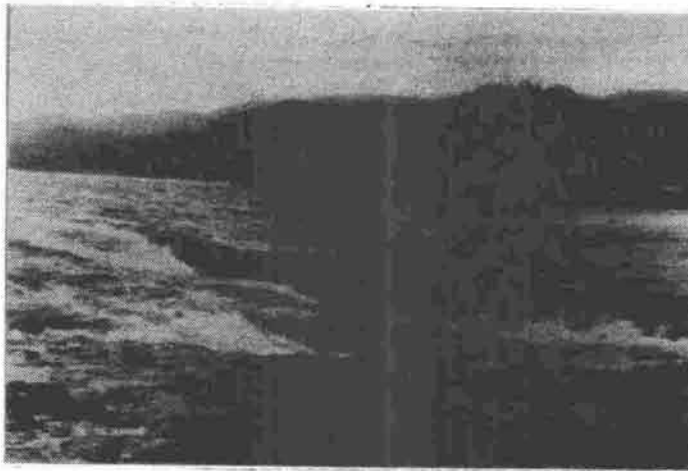
- (iii) Staff are often called upon to undertake a wide range of functions, necessitating training in development of practical all round-skills.
- (iv) Country preference for training courses indicated top priority to techniques and approaches to developing community information and public relations programmes. Second priority was assistance in preparation of planning procedures (e.g. management plans, etc.).

In answer to options for undertaking training, the most popular one was for either secondment of staff from island countries to Australia/ New Zealand and for secondment of staff from Australia/New Zealand to island countries.

If courses were to be held within the region, top priority was given to regionally based courses, next were courses held in-island at local level and finally sub-regional courses.

The major implications from the survey show that there is no "best" answer but rather that a "package" approach should be undertaken.

MARINE SANCTUARY IN AMERICAN SAMOA



Fagatele Bay, a 163-acre (68-ha) bay, formed when a volcanic crater collapsed in American Samoa, has become the seventh US National Marine Sanctuary. It is located on Tutuila Island, and contains a spectacular coral terrace system and is the home to green and hawksbill turtles. Traditional subsistence fishing and recreation will continue in the sanctuary but dredging and discharge of pollutants will be prohibited.

(Source: CNPPA Members' Newsletter, 31)

World Environment Day

5 June 1986

A tree for peace

WHAT HAPPENED IN OUR REGION?



TONGA

Whilst many countries in the world celebrate World Environment Day, the Kingdom of Tonga sets aside a whole WEEK in June for Environment Awareness activities following a proclamation by the Honourable Prime Minister, HRH Prince Tu'ipelehake for nationwide observance of this event.

This year Tonga's Environment Awareness Week commenced with church services on the theme of "Environment and Peace", one of which was broadcast on the radio. The following day 6 000 seedlings were freely given to the general public as a tree planting activity. Day 3 was clean-up day involving Government Ministries/Departments, schools, private companies, quasi-government agencies and the general public. Day 4 brought with it a singing competition for primary schools and several demonstrations highlighting environmental problems. Major activities centred around World Environment Day (WED) (5 June) commencing with the WED message by the Honourable Prime Minister, HRH Prince Tu'ipelehake broadcast on the air both day and night.

This was followed by a one-day seminar on Environmental Management opened by HRH Princess Pilolevu Tuita; an essay competition for Secondary schools on the theme "Environment and Peace", first prize going to 'Amelia Karalus of St. Mary's High School; and the formal opening of the 74 acre Vamapa Nature Reserve containing one of the few remaining tropical rainforests in Tonga.

Day 6 had an on-air panel discussion on "Environment and Peace", with the 7th, and final, day having a replanting activity in Nuku'alofa Harbour of one species of grant clam (*Tridacua derasa*), the planting area of which will be later surveyed for gazettal as a new marine park. The formal closing message for Tonga's Environment Awareness Week was broadcast by the Deputy Prime Minister and Honourable Minister of Lands, Survey and Natural Resources, Baron Tuita.

June 6, 1986.

Environment Week In Pictures



Tuita delivering the opening address at a seminar on environment management sponsored by the Ministry of Lands, Survey, and Natural Resources at the International Dateline Hotel on Thursday.



Guests at the opening of Vaomapa Park, the Kingdom's first forest reserve for preservation of cultural trees.



Tuesday was National Clean-up Day for the Kingdom
Pictured above are school children of the Nuku'alofa Primary School



Their Royal Highnesses Fusipala Vaha'i, Pilolevu Tuita, Nanasipau'u Tuku'aho, and Taone Ma'afu planting trees at the headquarters compound of the Kona'i Club at Peleliake. The club was opened on Wednesday.

WORLD ENVIRONMENT NEWS

SOVIETS TO SUPPORT NUCLEAR SAFETY PLAN

The Soviet Union wants the United Nations Environment Programme (UNEP) involved in plans to prevent future nuclear power plant accidents and it is now prepared to render all possible assistance to develop international co-operation within the United Nations and other organisations to establish an early warning system in case of accidents and breakdowns at nuclear power plants.

Addressing Permanent UNEP Representatives in Nairobi on 21 May 1986, the Deputy Representative Victor Dolmatov referred to Soviet leader Mikhail Gorbachev's proposal to establish an international code for the safe development of nuclear power and an early warning system for accidents.

The proposal, he said, calls for international co-operation both within UNEP and other international organisations, like the International Atomic Energy Agency, the World Health Organisation and the World Meteorological Organisations.

Acknowledging UNEP's Chief Mostafa Tolba's support for Gorbachev's proposal, Mr Dolmatov said "We hope that UNEP will take practical steps to translate these proposals into action. And, in the wake of the Chernobyl nuclear plant accident, the Soviet Union wants UNEP to study the possible ecological consequences of nuclear war".

(Source: UNEP/ROAP/INFORMATION/68.)

COLOMBIA, CHILE, ECUADOR AND PERU DECLARE OPPOSITION TO FRENCH NUCLEAR TESTS

The following statement was communicated to the South Pacific Commission on 7 May, 1986.

"The COMISION PERMANENTE DEL PACIFICO SUR (CPPS) - Permanent South Pacific Commission - conformed by Colombia, Chile, Ecuador and Peru issued on May 7, 1986, a new declaration before the French Government protesting for the nuclear explosion at Muroroa Atoll last April 26th, which seriously threatens the marine environment, its natural resources as well as the interest of the Member States.

The CPPS at adopting this new Declaration, requested the French Government the immediate cease of said explosions." (ACTUAL QUOTATION)

PLANTS PLOT POLLUTION

Growing global concern over the effects of acid rain on forests and of radioactive fallout on food crops highlights the importance of plants as environmental monitors. "Plants are increasingly used to determine the levels and effects of metal pollutants like lead and zinc, organic contaminants like PCBs, oil, DDT and other pesticides, gaseous pollutants like sulphur dioxide and fluoride, and radioactive nuclides", says Professor Peter Peterson, Director of the Monitoring and Assessment Research Centre (MARC) in London.



All sorts of plants are used: mosses, mushrooms, grass, seaweed and tobacco weed, ferns, foliage and food crops. They are monitored on land, in lakes, rivers and coastal waters. More detail on this monitoring is found in a new book called Biological Monitoring, by Agneta Burton and commissioned by UNEP's Global Environment Monitoring System (GEMS). The book is not intended purely for academics but was written for environmentalists of all kinds, those in government ministries, on regulatory commissions, in non-governmental groups.

Coincidentally, the 250-page book appears in the aftermath of the Chernobyl nuclear accident. A 35-page section of the book deals with radioactive isotopes, concerned with detecting their release from atomic testing, power stations, nuclear fuel reprocessing, and accidents.

"One of the virtues of plants as pollution monitors is that not only do they allow you to determine levels but they suffer visible damage. We can all see the brown patches on green leaves and discoloured tips... In a sense, much less dramatically of course, plants are a warning system for man's environments just as the miner's canary once tested the air underground."

Plants are much cheaper, simpler and quicker to use for measuring atmospheric concentrations than are static monitoring instruments. Dr Burton says it is easier to analyse seaweed for radionuclides and metal pollution than it would be to analyze the water itself. She continues that plants near pollution sources have a lot to tell us about the food chain. Cows eat grass and we consume cow's milk. In arctic areas, where radioactivity has been studied in lichens, reindeer eat lichen and man eats reindeer.

Another book, to appear in 1987, will look at animals as monitors of environmental pollutants from earthworms and field mice to bats, pigs and deer, as well as tuna, seals and whales.

It appears we can learn much about pollution from looking more closely at our surrounding environment - our plants and animals have much to tell us.

(Source: Paul Evans Ress, A UNEP-GEMS Feature.)

FEATURE

TRADITIONAL FISHING KNOWLEDGE ALIVE IN TOKELAU AND
OF CONSIDERABLE INTEREST TO FISHERIES SCIENTISTS

In the belief that traditional fishermen may be in possession of information of considerable interest to fisheries scientists, in 1985 Bob Gillett, then a scientist with the South Pacific Commission's Tuna and Billfish Assessment Programme undertook a project, in association with SPREP, to record traditional tuna fishing knowledge. This in-depth study formed part of a larger project in which anthropologists are recording a wider range of traditional Tokelauan knowledge and practices. Excerpts from Bob Gillett's report, Traditional Tuna Fishing in Tokelau, SPREP Topic Review No. 27, follow (full report available from the SPREP Office):



"Tokelau, a New Zealand dependency since 1924, is made up of three low-lying atolls, Fakaofu, Nukunonu, and Atafu, which lie respectively 267, 276, and 318 nautical miles to the north of Western Samoa. Other neighbouring island groups include Tuvalu to the west, the Phoenix Islands to the north, and the Cook Islands to the east. The Tokelau atolls are all of the closed type; there are no passes through the reef between the lagoon and the ocean. Small blasted channels and even smaller natural depressions permit small craft to travel over the reef in relatively calm conditions. There are no safe anchorages for ships in Tokelau and only rarely do vessels attempt to anchor outside the reef. The atolls are roughly polygonal in shape, the corners forming points ("utua") which are of great importance for tuna fishing."

"Fakaofu, the principal site of the study, consists of about 60 small islets. A total of about 4 square km of land together with the reef encircles 59 square km of lagoon. It is populated by about 750 Polynesian people, the vast majority living at Fale (the original village) or at Fenuafala (inhabited since 1958). Small craft are able to cross the reef en route from the ocean to the lagoon at about 15 natural depressions in addition to two blasted channels; however the trip over the reef is hazardous with even a moderate swell or wind chop. There are no offshore seamounds, and all fishing activity occurs within three or four miles of land."

"The people of Fakaofu have always been highly dependent on the marine environment for food. With coconut and pandanus the only local food plants at the time of first European contact (Hooper, 1984), it is easily understood why Tokelauans have historically been good fishermen. Tokelau's remote position in the Pacific, reinforced by the absence of suitable anchorages for ships, has limited contact with the outside world until fairly recently; this isolation resulting in the preservation of traditional fishing techniques to a greater extent than in most neighbouring island groups."

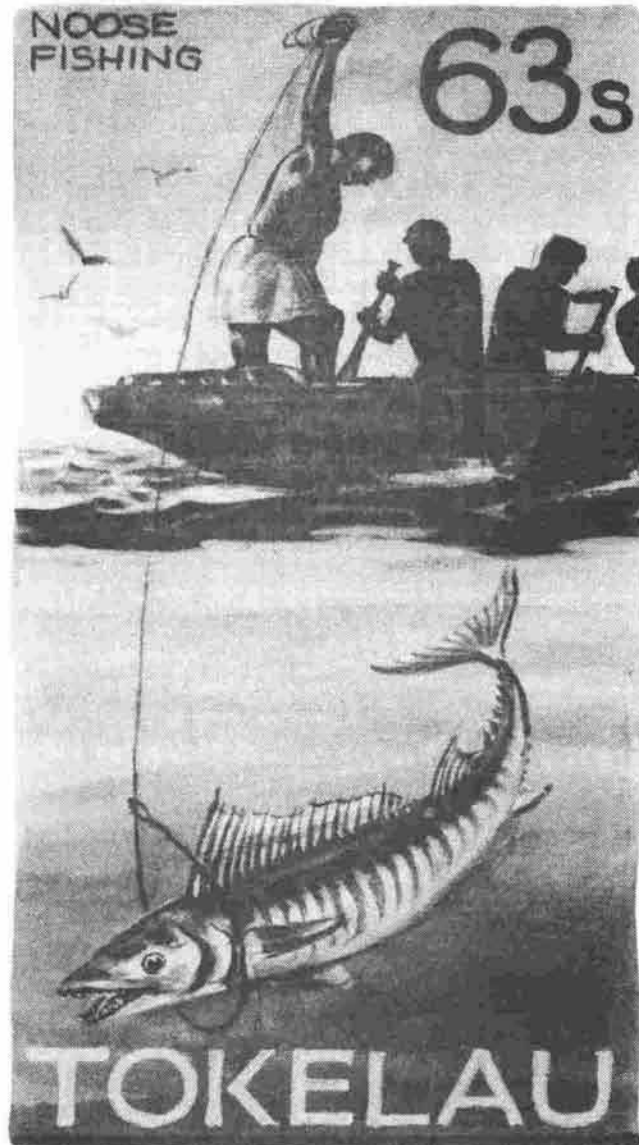
"An important repository of traditional fishing knowledge are the men known as "tautai". The title "tautai", known in many areas of Polynesia, is very important in a discussion of fishing in Tokelau. It could be thought of as a combination of the terms "masterfisherman" in English and the Japanese concept of a "fishingmaster"; that is, a fisherman who has a considerable amount of expertise in the entire spectrum of fish-catching methods and also the leadership skills and experience necessary for directing and managing fishing expeditions. Although tuna fishing is an important part of the training of a "tautai", all forms of capturing wild animals are included, such as the catching of crab and even tree climbing for birds."



Iona, Teata, Uili, and Teao.
The translator and principal informants

Gillett gives interesting details about design and use of Tokelauan canoes, fishing gear such as the pearl-shell and several tuna fishing techniques, including that of noose-fishing where the fisherman literally lassos the fish. Once widely practiced in Tokelau and Tuvalu, only one "tautai" on Fakaofu regularly uses this method at present. A summary of the technique used by this fisherman follows.

"The general area for noose-fishing is 100-200 metres offshore along the reef. In choosing the specific fishing area for a particular day, consideration is given to cloud patterns, state of the moon, and current. A whole, scaled flying fish with a line through the eye-sockets is towed behind a canoe. Upon arrival at locations known to be especially good for this type of fishing, the canoe is slowed allowing the flying fish bait to sink almost vertically to a depth of 20 to 30 metres. The crew member in the bow chews coconut meat and separates the solid portion from the oil in his mouth. The oil alone is blown out of the mouth ("puhipuhi") to produce a mist which covers a sizeable area on the ocean surface to starboard of the canoe. The change in surface tension caused by the oil enables the crew to view the bait below. Jiggging the bait line and repeated casting of the line are used to attract wahoo, yellowfin, shark, or billfish to the area. If successful, the "tautai" will make special noises (like sh-sh-sh-sh-) to help entice the fish closer and alert the crew.



By casting the bait line and throwing egg-size pieces of bait to different areas, the fish is manipulated to about two metres off the starboard quarter. At this point the crewmember in the bow slowly paddles the canoe forward while the "tautai" in the stern stands and with the aid of the stick ("Kauhele") will quickly sink the noose (about three metres in circumference) vertically into the water, the forward motion of the canoe assuring that the noose opens. All is quiet in the climactic moment as the final piece of bait is placed in the centre of the loop and the stick is removed allowing it to drift astern.

If the "tautai" has been clever in anticipating the motion of his adversary, the fish darts for the bait and passes through the centre of the loop. A precisely timed jerk on the noose line tightens the loop on the fish's caudal peduncle. The captured fish, usually a wahoo, puts up a fair but futile struggle. If a billfish has been captured the crew is in for what was referred to as a "Nantucket sleigh ride" in the days of whaling."

Bob Gillett states that tuna fishing in Tokelau in the previous half-century appears quite similar to that of Tuvalu as described by Kennedy (1930) with respect to both gear and fishing techniques. The tuna fishing grounds at Fakaofu are very small. The size of the area fished by a "tautai" during his entire life, about 40 square nautical miles, is about ten per cent of that which a modern purse tuna seiner could cover in one hour. Fishing knowledge of this small area has most likely been accumulating for hundreds of years and passed down for generations through the traditional "tautai" education system. The small canoes used for tuna fishing in Tokelau permit close observation of fish not possible on commercial craft in use in most of the Pacific Islands types, skipjack which are chased by billfish, and observations on what might be spawning behaviour. The canoes being very quiet, even more so than traditional sailing vessels used for fishing in other island groups, enable fishermen to associate different noises with the attraction and the repelling of tuna. Expertise on the fishing ground is strongly encouraged by both the status of a highly productive "tautai" and by the need for food on an island where the number of edible plants has historically been very limited. All of the above factors result in Tokelau fishermen knowing their tuna fishing ground to a degree which is unsurpassed in other tuna fisheries of the Pacific.

"The extent to which Tokelau "tautai" know their fishing grounds permits them to detect, observe, and monitor phenomena which are much less known, or even unnoticed, in other documented tuna fisheries. The fishermen are quite aware of tuna movement, its relationship to spawning behaviour, lunar and seasonal changes in tuna abundance, and the relationship of food items to tuna behaviour. The degree to which "tautai" know their area also permits some prediction of fishing success. They are also able to predict when a school will leave the area by the use of gonad stages and school types."

Gillett concludes that the results of his study, show that the traditional knowledge concerning tuna is still very much alive. "The knowledge of "tautai" concerning the interrelationship of gonad stages, school type, tuna movement, and spawning behaviour is of considerable scientific interest and the subject should be pursued."

(Source: R. Gillett, Traditional Tuna Fishing in Tokelau, SPREP Topic Review No. 27, produced in association with the SPC Tuna and Billfish Assessment Programme)

COURSES IN ENVIRONMENTAL SUBJECTS

ASSOCIATE DIPLOMA IN PARK MANAGEMENT

Correspondence course through Riverina College of Advanced Education, NSW, Australia. The aim of this 4 year (eight semester) part-time correspondence course is to provide vocationally oriented management studies suitable for those working, or wishing to work, in protected areas. Students may choose one of three strands: (a) National Park and Wildlife Management, (b) Outdoor Recreation Management, and (c) Cultural Resource Management. For further information contact:

The Course Co-ordinator,
Associate Diploma in Park Management,
Riverina College of Advanced Education,
Albury Wodonga Campus,
P.O. Box 789,
ALBURY NSW 2640
Australia.
Telephone (060) 230800.

UNDERSTANDING CLIMATE

13 July - 19 September 1987

The Climate Research Unit in the University of East Anglia, Norwich (United Kingdom) in collaboration with the Department of Meteorology, University of Reading offers a short, full-time training course on "Understanding Climate" to assist people using climate data in planning processes and decision making, including people engaged in forestry and agriculture services. Although a university degree is not essential for admission to the course, a background in physical or biological science is strongly recommended. For further details contact:

Climatic Research Unit,
School of Environmental Sciences,
University of East Anglia,
NORWICH NR4 7TJ
United Kingdom.

CALENDAR OF EVENTS

WESTPAC International Marine Science
Symposium. The Indo-Pacific Convergence,
 Townsville, Australia.

1 - 6 December 1986

Contact: Mr N.R. Harriss,
 Department of Science,
 P.O. Box 65,
BELCONNEN ACT 2616,
 Australia.
 Telex: AUS CI 62484
 Telegrams: AUS CITEC
 Telephone: (062) 64 4249.

Training course: Ecological
Agriculture in Developing Countries,
"Agriculture, Man and Ecology",
 Pondicherry, South India.

19 January - 15 February 1987

Contact: Erik van der Werf,
 E.T.C. Foundation,
 AME Programme,
 P.O. Box 64,
3830 AB LEUSDEN,
 The Netherlands.
 Telephone: 033-943086
 Telex : 79380 etcnl.

Coastal Resource Management and
Protected Area Planning Course,
 Vanuatu.
 SPREP/ESCAP sponsored.

April 1987
 (Venue and date still to be
 confirmed)

"Coastal Zone 87"
The Fifth Symposium on Coastal
and Ocean Management,
 The Westin Hotel, Seattle, Washington

26 - 29 May 1987

Theme : "Spotlight on Solutions"

Contact: Delores Clark,
 National Oceanic and Atmosphere
 Administration (NOAA),
 External Affairs,
ROCKVILLE, M.D. 20852,
 U. S. A.

Wetland Ecology and Conservation Symposium,
 Edmonton, Canada.

August 1987

Contact: Wetlands '87 Coordinator,
 Environment Canada,
OTTAWA,
 Canada.

29th Working Session Commission on National
Parks and Protected Areas (CNPPA),
 Taupo, New Zealand.
 Further details to be announced.

17 - 21 August 1987

Symposium: "The Forest: Structure, Ecology,
Silviculture, Agroforestry" at Montpellier
 Botanical Institute.

September 1988

Further details from:

Colloque sur la forêt,
 c/- Institut de Botanique,
 163 rue August Broussonet,
34000 MONTPELLIER,
 France.

PUBLICATIONS

Following is a list of recently produced SPREP publications as well as documents published by other organisations and individuals which have come to our notice as being of potential interest to you.

SPREP

- Proceedings of the Third South Pacific National Parks and Reserves Conference, Apia, Western Samoa, June/July 1986. Volume 1 Summary Record of Proceedings of Ministerial and Technical Sessions, Volume 2 Collected Key Issue and Case Study Papers, Volume 3 Country Reviews.
- Action Strategy for Protected Areas in the South Pacific emanating from the above Conference.
- Topic Review No. 27 Traditional Tuna Fishing in Tokelau, by Robert Gillett (Produced in association with the SPC's Tuna and Billfish Assessment Programme).

OTHER

- A Review of Information on the Subsistence Use of Green and Hawksbill Sea Turtles on Islands Under United States Jurisdiction in the Western Pacific Ocean, by R.E. Johannes (Administrative Report SWR-86-2 National Marine Fisheries Service, Southwest Region, 300 S. Ferry Street, Terminal Island, CA 90731, USA).
- Guidelines to Environmental Impact Assessment in Developing Countries by Yusuf J. Ahmad and George K. Sammy (Sponsored by the United Nations Environment Programme and available through SPREP).
- Environmental Decision-Making, Volume One, Ed. Yusuf J. Ahmad (Sponsored by the United Nations Environment Programme and available through SPREP).
- Environmental Decision-Making, Volume Two, Ed. Yusuf J. Ahmad, Partha Dasgupta and Karl-Göran Mäler (Sponsored by the United Nations Environment Programme and available through SPREP).



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Sydney, Australia.