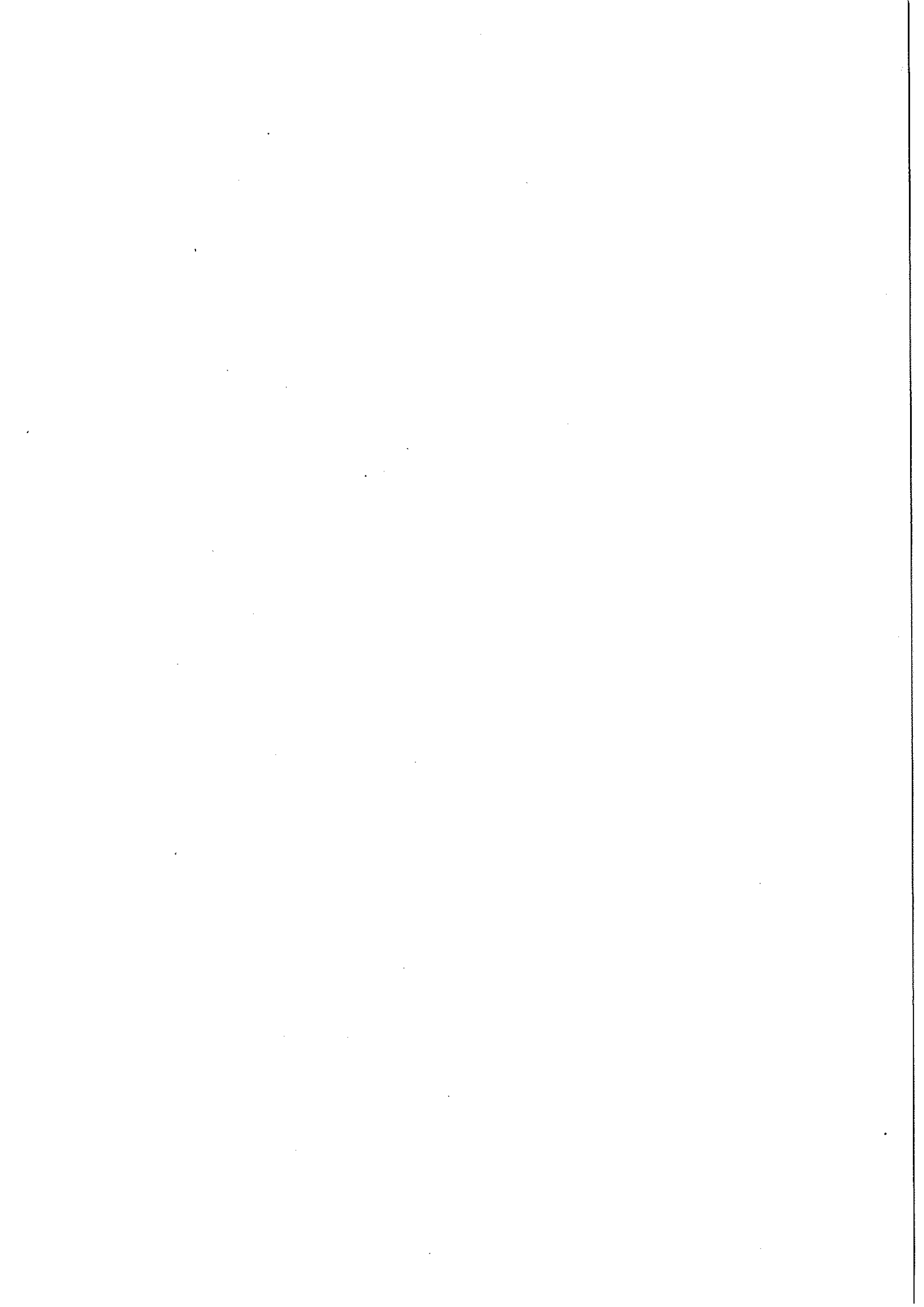


**FIJI'S NON-DETRIMENT FINDING
METHODOLOGY FOR
EXTRACTION OF AND TRADE IN
MARINE AQUARIUM SPECIES**

AN ADAPTIVE MANAGEMENT STRATEGY

**TRAFFIC OCEANIA SOUTH PACIFIC PROGRAMME
AND
DEPARTMENT OF ENVIRONMENT**



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This report presents the background to and key recommendations from the non-detriment finding (NDF) workshop for extraction of and trade in marine aquarium specimens, convened in Suva, July 2004.

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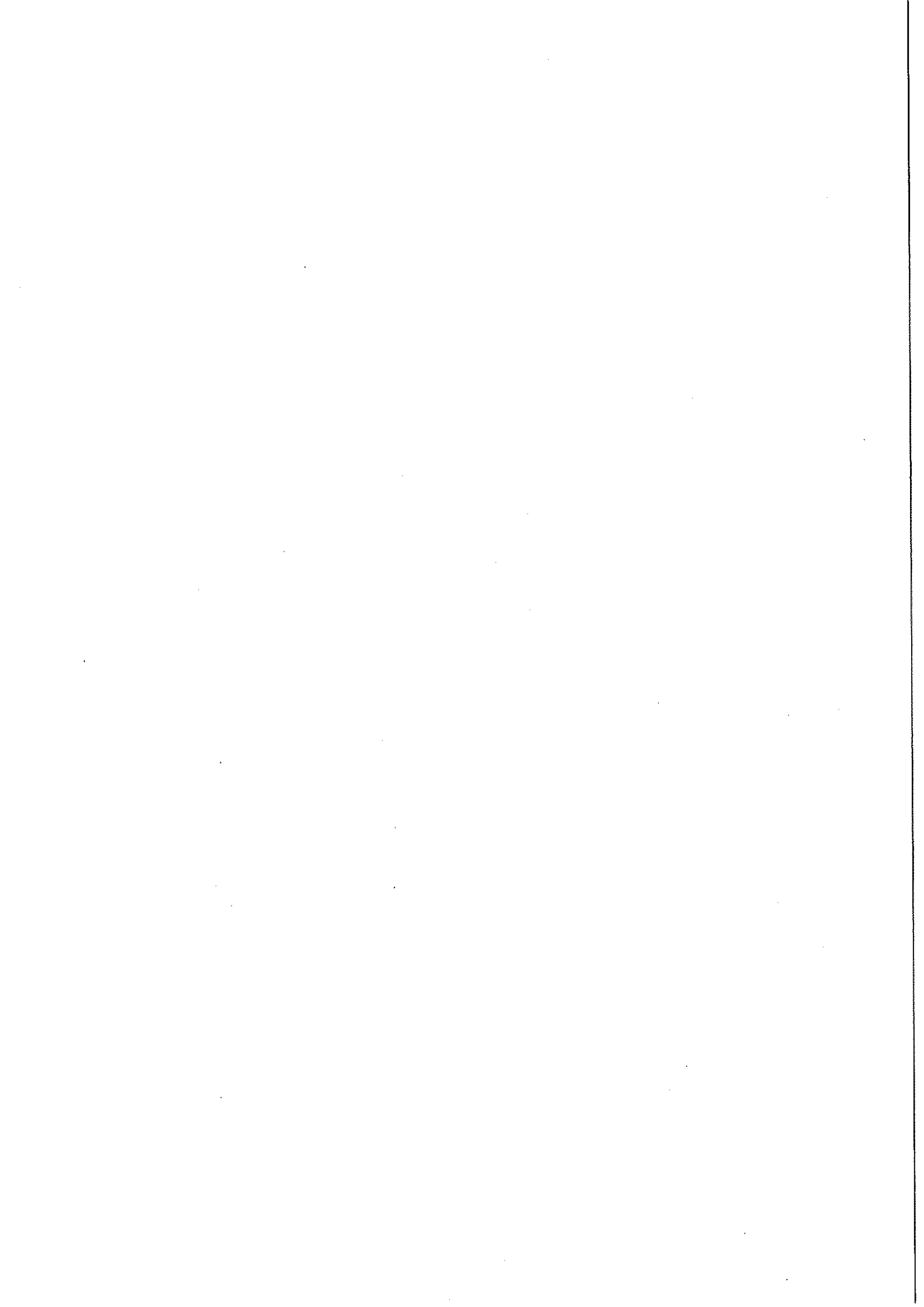
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INTRODUCTION

In 2003, the World Conservation Monitoring Centre of the United Nations Environment Programme (UNEP-WCMC) estimated the global trade in marine aquarium species to be worth between USD200 - 300 million per year. In the same year, the export value of the marine aquarium trade to Fiji was estimated to be in the region of USD8 million, around 3% of the global value. Species traded for display in marine aquaria are comprised mainly of hard and soft corals, live rock, giant clams and other marine invertebrates as well as ornamental fish.

The main exporting nations are in Southeast Asia, but many island nations in the Indian and Pacific Ocean also, and increasingly, are involved in the trade. In the Pacific region, countries involved in the trade in marine aquarium species include: Fiji, Tonga, Vanuatu, Papua New Guinea, the Solomon Islands, the Cook Islands, New Caledonia, Kiribati, the Marshall Islands and the Federated States of Micronesia. Involvement in the trade in marine aquarium species forms a significant component of and sometimes the only alternative cash income for many local communities in Fiji and other Pacific island nations. Main destination markets for these species include the United States of America, the European Union, and Japan.

Marine aquarium species regulated in international trade under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) include all species of hard corals and all species of giant clams. One of the key requirements of CITES is that export of specimens of species listed in its Appendices is allowed only if the off-take and export of such specimens will not be detrimental to the survival of the species in the wild or to the ecosystem. This is known as a non-detriment finding (NDF). Another key requirement is that the country enacts national legislation to implement the Convention. Fiji enacted the *Endangered and Protected Species Act* (EPS Act) in December 2002 and the *Endangered and Protected Species Regulations* in 2003. The EPS Act legislates that export of specimens of species listed in the Convention will be allowed only if such export is not detrimental to the survival of the species in the wild.

Whilst the text of the Convention provides the fundamental elements of a non-detriment finding, in keeping with the spirit of the preamble of the Convention that "*Peoples and States are and should be the best protectors of their own wild fauna and flora*", it remains the responsibility of the national government to develop their non-detriment finding framework. Ensuring that export of a species will not be detrimental to the survival of that species in the wild and maintaining the species throughout its range at a level consistent with its role in the ecosystems in which it occurs are the fundamental and required components to a non-detriment finding. However, they are by no means the only considerations which national governments may wish to consider. Development of the non-detriment finding methodology can incorporate many elements ranging from the environmental to the traditional social structure, to local and national economies. In essence, therefore, the NDF framework for the marine aquarium trade has the same structure and aims, albeit on lesser scales, as a Strategic Environmental Assessment: the sum of the NDF components form an appropriate framework and strategy for government and aid-agencies to mainstream environmental considerations into local and national economic and social development interventions. Furthermore, the regional scale of the trade, and the impacts that national policy of one country can have on other countries in the region, call for the development of sound collaborative management strategies at both the national and regional level.

Development and implementation of the national NDF framework and action plan should not be seen as an additional burden for government, rather it synergizes the many on-going international, regional and national processes. For example:

At the International Level:

- The purpose of the CITES Strategic Vision through 2005, "to ensure that no species of wild fauna or flora becomes or remains subject to unsustainable exploitation because of international trade", is clearly consistent with the World Summit on Sustainable Development (WSSD) 2010 target to achieve a significant reduction in the current rate of biodiversity loss. The WSSD Plan of Implementation notes also that the Convention on Biological Diversity (CBD) is a key instrument in helping meet this 2010 target. Specifically, Goal 4 of the CBD provisional framework includes in its targets the sustainable management of biodiversity-based products and their production areas, the reduction of unsustainable consumption of biological resources and that no species of wild flora or fauna is endangered by international trade (Stolpe and Fischer, 2004).
- The US, Fiji's main market destination for marine aquarium species currently is considering the Coral Reef Conservation and Protection Bill which seeks to, *inter alia*, prohibit the import of coral, live rock, giant clams and reef fish, unless such species were taken in accordance with a qualified scientifically-based management plan;
- The European Union, Fiji's second largest market destination for marine aquarium species, in accordance with the European Wildlife Trade Regulation - Council Regulations (EC) No 338/97, has imposed temporary import suspensions on certain species from Fiji due to the lack of information pertaining to occurrence and/or management of the species in the wild in Fiji.

At the Regional Level

- Pacific Regional Type II initiatives of the WSSD, in particular the Biodiversity, Genetic Resources and Traditional Knowledge, the Capacity Building and the Pacific Ocean initiatives, relate directly to development and implementation of the non-detriment finding framework for coral reef resources;
- The Action Strategy for Nature Conservation in the Pacific Islands Region (2003 - 2007) has 37 targets under the three pillars of Environment, Economy and Society which relate directly to the NDF framework;
- The Pacific Region Environmental Strategy (2005 - 2009) developed in collaboration by the Asian Development Bank in cooperation with the Government of New Zealand. Three of the eight concerns consistently identified as being of the highest priority are directly related to non-detriment findings for coral reef resources: marine and coastal environment degradation; depletion of biological diversity; and weak environmental management capacities and related governance issues.

At the National Level

- Three components of the National Biodiversity Strategic Action Plan established under CBD link directly with the CITES NDF framework: i) Strengthen Fiji's capacity to implement CITES; ii) Encourage Conservation Management-orientated Research on Threatened Species; and iii) Prepare Threatened Species Management Plans to include, where appropriate, linkages with best international expertise; and
- Emerging natural resource management initiatives underway in Fiji, such as the fisheries resource inventories and the fish warden monitoring programme, are mutually complementary;
- Management and development of the marine aquarium trade also could be more closely linked with on-going environmental and educational programmes, including the

Integrated Coastal Management programme overseen by the Institute of Applied Science (IAS) at the University of the South Pacific (USP), and work undertaken by the Organisation for Industrial, Spiritual and Cultural Advancement (OISCA) to promote sustainable development. OISCA has active programmes in natural resource education, management and conservation, including for example, replanting / reseeded of mangroves, coral and other targeted and depleted resources such as giant clams.

- Development of the industry also should be mainstreamed with other livelihood development programmes. For example, designation of collection areas could be closely aligned with livelihood development assistance programmes, such as the sanitation and sewage treatment programmes, currently pursued by village communities in collaboration with government.

The interdependence of wildlife conservation and human needs in the form of sustainable development and poverty alleviation is clearly illustrated in the synergies between the NDF process and the many examples above of on-going national, regional and international processes. This interdependence is summarized succinctly in the opening remarks of Klaus Topfer, UNEP Executive Director at the thirteenth meeting of the Conference of the Parties to CITES (CoP 13), Bangkok, Thailand, 2-14 October 2004: "The World Summit on Sustainable Development confirmed that biodiversity is a fundamental resource for the sustainable development of humanity. Without diversity of species and healthy ecosystems, the MDG goals for alleviating poverty and achieving environmental sustainability cannot be achieved".

This report presents the outcomes and recommendations of workshops convened in Fiji to develop a framework and action plan for development of non-detriment finding methodology for trade in corals, coral rock and live rock as well as ornamental fish. The report is provided for the various stakeholders in Fiji and in the region, many of whom possess the requisite knowledge to develop and implement various components of the NDF framework. For this reason, and because it is beyond the scope of the report to present otherwise, the report does not aim to synthesize all available information regarding management of coral reef resources. Although developed for Fiji, it is anticipated that the NDF framework for trade in coral reef resources from Fiji may provide a useful and practical approach and model for other countries in the Pacific region engaged in the marine aquarium trade.

BACKGROUND

The Convention on International Trade in Endangered Species of Wild Fauna and Flora - CITES - is an international agreement between Governments. The aim of the Convention is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

The international trade in wildlife is estimated to be worth around USD 10 billion dollars per year and includes hundreds of millions of plant and animal specimens. Wildlife trade is diverse, ranging from live animals, such as parrots, and plants (such as orchids) to a vast array of wildlife products derived from them. Such products include food products such as giant clams, exotic leather goods (for example crocodiles), wooden musical instruments including guitars which use Mahogany, aquarium products such as live corals and tourist curios such as dead coral, marine turtle shell and some sea-shells. In addition, trade in wildlife also includes items of great cultural significance such as Tabua (sperm whale teeth).

High levels of exploitation combined with other factors, such as habitat loss, are capable of heavily depleting populations of certain plants and animals. In some cases, trade is the main threat to the species, even bringing some species close to extinction. Many wildlife species in trade are not endangered, but the existence of an agreement to ensure the sustainability of the trade is important in order to safeguard these resources for the future.

Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation. CITES was conceived in the spirit of such international cooperation. The Convention accords varying degrees of protection to more than 30,000 species of animals and plants trade in their various forms.

The signing of CITES

CITES was agreed at a meeting of representatives of 80 countries in Washington DC., United States of America, on 3 March 1973. It entered into force on 1 July 1975. Because it was signed in Washington, it is sometimes referred to as the Washington Convention. It is administered by the CITES Secretariat; under the United Nations Environment Programme, based in Geneva, Switzerland.

Countries that have joined CITES and have thus agreed to be bound by the Convention are known as Parties. Although CITES is legally binding on the Parties - in other words they have to implement the Convention through national legislation - it does not take the place of national laws.

How CITES works

Species which governments feel are of conservation concern due to pressure from international trade and other factors can be proposed for listing in the Appendices of CITES. Deciding which species should be listed in which CITES Appendix is made by governments at the Conferences of the Parties to CITES, held approximately every two to three years. The structure of CITES is provided in *Annex 1* of this document.

The species covered by CITES are listed in three Appendices, according to the degree of protection they need.

- **Appendix I** includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances. An example of a species which occurs in Fiji and which is listed in Appendix I is the hawksbill turtle *Eretmochelys imbricata*. Indeed, all marine turtles are listed in Appendix I.
- **Appendix II** includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival. An example in Fiji is hard corals - all of which are listed in Appendix II.
- **Appendix III** contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade. Fiji has not listed any species in Appendix III of the Convention although species occurring in Fiji have been listed in this Appendix by other countries, for example all *Gonystylus species* (Ramin / Mavota) listed by Indonesia (uplisted to Appendix II at CITES CoP 13).

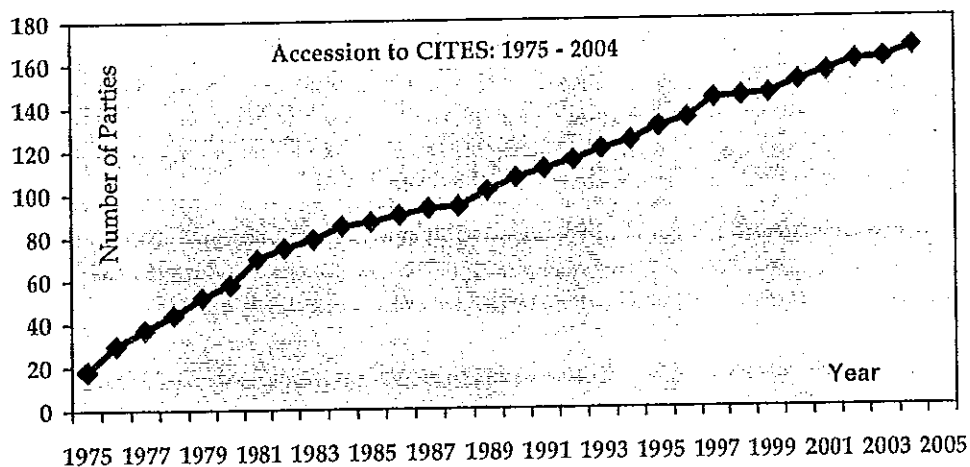
Species listed in the Appendices of CITES are subject to certain controls. All import, export, re-export and introduction from the sea of species listed in the Appendices of the Convention must be authorized through a licensing system. A specimen of a CITES-listed species may be imported into or exported (or re-exported) from a State party to the Convention only if the appropriate document has been obtained and presented for clearance at the port of entry or exit.

Each Party to the Convention must enact national legislation to implement the Convention and must designate one or more Management Authorities in charge of administering the licensing system. One or more Scientific Authorities also is required to advise the Management Authority on the effects of trade on the status of the species.

The procedural mechanisms and the legal framework established to implement CITES within each country essentially provide a means of 'green certification' taking into account environmental, social, trade and other economic considerations. The Convention provides a tool for facilitating trade whilst regulating it to within sustainable levels that can be maintained for the next generations, for monitoring such trade and thereby contributing to the sustainable development of the nation.

CITES Parties

As of August 2004, there are 166 Parties to CITES, the most recent Party being Palau which acceded to the Convention on 16 April 2004. Most countries in the world therefore are Parties to CITES.



CITES Parties and non-Parties in the Oceania Region

<i>CITES Parties in Oceania</i>	<i>Non-CITES Parties in Oceania</i>
American Samoa	Cook Islands
Australia	Federated States of Micronesia
Fiji	Kiribati
French Polynesia	Marshall Islands
Guam	Nauru
New Caledonia	Niue
New Zealand	Solomon Islands
Northern Mariana Islands	Tokelau
Palau	Tonga
Papua New Guinea	Tuvalu
Pitcairn Islands	
Samoa (acceded on 9 Nov '04. Enters into force on 7 Feb '05)	
Vanuatu	
Wallis & Futuna	

Trade between countries which are Party to the Convention must be conducted in accordance with the provisions of the Convention. Trade between a CITES Party and a country which is not a Party to CITES still requires equivalent documentation; non-Parties are required to follow equivalent procedures if trading with a Party. Thus, and by way of example, if Fiji (a CITES Party) imported giant clams (CITES Appendix II) from the Cook Islands (a non-Party), documents would still need to be issued by the Cook Islands authorizing trade and such documents could only be issued once an equivalent scientific authority had advised that such export would not be detrimental to giant clam populations in the Cook Islands.

CITES AND THE FIJI ISLANDS

The Fiji Islands acceded to CITES in 1997. An on-going review of the status of CITES Parties' national legislation to implement the Convention (The National Legislation Project), conducted by the CITES Secretariat, identified Fiji as having inadequate legislation to implement the Convention.

- In November 2000, the Secretariat advised Fiji of the need to adopt CITES-implementing legislation, noting that failure to do so may result in trade suspensions.
- In January 2002, Fiji still had not enacted national legislation to implement the Convention. Due also to concerns over what was believed to be significant and increasing trade in corals from Fiji, based on recommendations of the CITES Standing Committee, the CITES Secretariat issued Notification No. 2002/003 recommending that Parties suspend trade with Fiji in CITES specimens until such time that Fiji had enacted national legislation.
- In March 2002, at its 46th meeting (Geneva, 12-15 March 2002) the Standing Committee agreed to withdraw temporarily the recommendation to suspend trade, in light of the commitment of the Government of Fiji to enact national legislation for the implementation of the Convention before the end of 2002. Simultaneously, Fiji agreed to implement an action plan to address concerns over the unsustainable levels of trade in corals from Fiji that existed before the Standing Committee recommended the suspension of trade. One key point of this action plan was for Fiji to voluntarily reduce its national exports of coral specimens to 50 per cent of the level of trade that occurred in 2001.
- On 6 December 2002, Fiji enacted the *Endangered and Protected Species Act (2002)* - henceforth the EPS Act. The EPS Act was gazetted on 9 May 2003 and entered fully into force upon the convening of the CITES Management Authority in October 2003 and the gazettal of the *Endangered and Protected Species Regulations (2003)* on 7 November 2003.
- On 12 November 2003, Fiji submitted the 2003 coral export quota in accordance with actions agreed upon at the 46th meeting of the Standing Committee and following consultation with the CITES Secretariat in July / August 2003. The quota endorsed by the CITES Secretariat in 2003 and the methodology used to develop this quota are attached as *Annex 2*.
- On 18 November 2003, the CITES Secretariat issued Notification Number 2003/075 definitively withdrawing the recommendation to suspend trade with Fiji.

2004 Coral and Live Rock Export Quota

All hard corals and live rock are regulated in international trade because they are listed in Appendix II of CITES. Except in certain circumstances, such as Fiji's voluntary agreement with the CITES Standing Committee to establish a quota for export of corals in 2003, there is no requirement within the text of the Convention that Parties must establish quotas to limit trade in species listed in the Appendices.

As of November 2003, all outstanding issues of compliance for Fiji had been addressed to the satisfaction of the CITES Standing Committee and therefore, as of 1 January 2004, there was no longer a requirement for Fiji to establish a national export quota for corals and live rock.

However, before any Party may issue a permit to allow export of specimens of species listed in Appendix I or II, the CITES Scientific Authority of the State must advise the CITES Management Authority that the proposed export will not be detrimental to the survival of the species. This is referred to as the 'non-detriment finding'. This requirement of CITES is specified in Article III, paragraph 2(a), and Article IV, paragraphs 2(a) and 3, of the Convention, and in Section 13(3) of the Fiji Islands *Endangered and Protected Species Act (2002)*.

The setting of a precautionary export quota by a Party in effect meets the non-detriment finding requirement by establishing the maximum number of specimens of a species that it will allow over the course of a year that will not have a detrimental effect on the survival of the species.

In the absence of robust biological and socio-economic scientific data, the CITES Scientific Council and Management Authority of Fiji decided to maintain a quota system to regulate export of corals and live rock in 2004 for the following reasons:

- i) as an interim precautionary measure to ensure that extraction and trade was within reasonable limits whilst a quota based on robust scientific data is under development;
- ii) to facilitate CITES permitting and monitoring of trade; and
- iii) as a demonstration to the international community of Fiji's commitment to regulate trade in coral specimens and live rock.

The 2004 export quota was based upon the quota developed in 2003 by the Department of Fisheries, the Department of Environment, Industry, the CITES Secretariat, the Department of the Environment and Heritage (Australia) and TRAFFIC. An introduction to the TRAFFIC Network is provided as *Annex 3*.

Although the implementation of a quota system enabled export of coral specimens from Fiji in 2004 and facilitated monitoring of the export of corals and live rock, the quota established in 2003 and used again in 2004, was based on arbitrary figures. In other words, although believed to be set at precautionary levels, the quota had no basis in either biological or socio-economic data. The quota is managed by the Department of Fisheries using a basic database; management would be greatly improved through an updated database which also would facilitate considerably the production of Annual trade reports, required under CITES.

Current Status Of The Industry In Fiji

The export of marine aquarium specimens from Fiji started in 1984. As of 2004, there are six licensed traders in operation. These companies collectively export live and dead coral, live rock, coral rock, cultured coral and cultured 'live rock', live ornamental fish and invertebrates such as giant clams (Table 1). The Department of Fisheries is allowing no further industry members to engage in the trade until sound management and monitoring procedures are in place and the environmental, social and economic implications of the trade are better understood (Priti Singh, Department of Fisheries, *personal communication*, 8 September 2004). All industry members engaged in trade in live specimens are members of the industry body, the Marine Ornamental Traders Association (MOTA). All members of MOTA, the one trader engaged in trade in dead specimens only, as well as the Department of Fisheries, the Department of Environment and non-governmental organizations (NGOs) are members of the Fiji Marine Aquarium and Coral

Council (FMACC). This consultative liaison group meets quarterly, and serves an important role in raising and addressing the broad spectrum of challenges that arise for the traders and for government in permitting and monitoring the trade.

Table 1. Marine Aquarium Industry Members operating in Fiji

Company	Date of Establishment	Commodity (Re-) Exported	Extraction Sites
Aquarium Fish Fiji	1984	Live fish and live corals and invertebrates	Galoa, Culanuku, Yanuca, Nasorowaca, Sawau, Burenitu
Seaking Trading Co.	1984	Import and Re-export of Scleractinia (dead only)	N/A
WaterLife Exporters	1988	Live fish, live corals and live rock	Bativudi, Suva, Navukavu, Navunisoco
Ocean 2000	1995	Live fish, live corals, live rocks and invertebrates	Moturiki Nabukebuke, Malolo, Momi
Walt Smith Int.	1995	Live fish, live coral and rock, cultured coral and cultured rock & invertebrates	Vuda*, Marou, Naviti, Vatukarasa, Vitogo, Namada, Malevu*, Namalata
REL Fisheries	2000	Live Rock only	Bativudi

Source: Priti Singh, Department of Fisheries, *in litt.*, to TRAFFIC, 8 September 2004

Note: * = Culturing of live rock only; extraction does not occur in these areas (P.Singh, *in litt.*, to TRAFFIC, October 2004).

VALUE OF THE MARINE AQUARIUM TRADE

In 2003, Fiji exported around 94,000 pieces of live coral and over one thousand tonnes of live rock. The 2003 export value of the marine aquarium trade, including ornamental fish and other marine specimens, was an estimated 14 million Fijian Dollars (just under USD 7.5 million) (Department of Fisheries, *in litt.*, to TRAFFIC, July 2004). Estimated export earnings (product export value) in 2004 were FJD 16,610,000 (around USD 9.5 million). This can be compared to estimated export value of FJD 9,785,000 in 2000 (Source: Ed Lovell, *in litt.*, to TRAFFIC, 23 September 2004, based on figures provided by Industry).

Additional revenue also was generated through the implementation of Fiji's national CITES-implementing legislation. In accordance with the *Endangered and Protected Species Act (2002)* and the *EPS Regulations (2003)*, any persons wishing to trade in specimens of species listed in the Appendices of CITES must register to trade and must apply for a CITES permit for each

consignment leaving Fiji. The fee for registration to trade is FJD1,000 per annum; the fee for application for each export permit is FJD30.00. In 2004, implementation of CITES through the EPS Act for registration and permit-application fees generated FJ\$39,105 (approx. USD22,575) in revenue for the Fijian Government (Department of Environment, *in litt.*, to TRAFFIC, January 2005); around 70% of this revenue was generated by the marine aquarium trade, managed by the Department of Fisheries. The 2003 figures for revenue generated by registration to trade in CITES specimens and CITES permit-application fees are not available because the revenue generation system was only introduced with the enactment of the *Endangered and Protected Species Regulations* in November 2003.

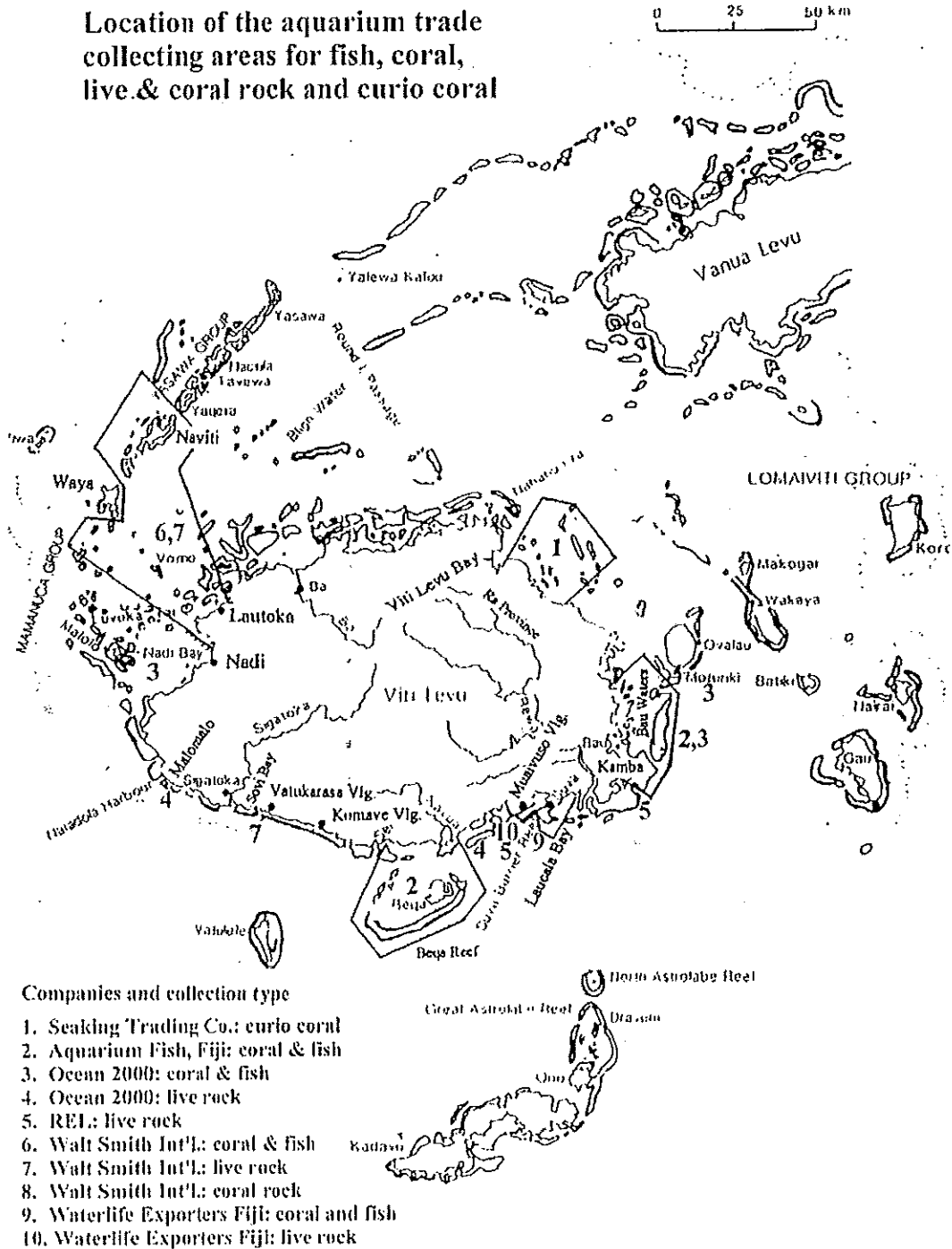
Collection areas for each industry member are illustrated in Figure 1. Around 600 people are employed directly in the industry but collection of specimens takes place within 23 traditional fishing grounds (*I qoliqolis*) comprising an area of just under 1000 km², utilised by an estimated 5000 people. It is predominantly these people who are the beneficiaries of a well managed trade: income from the trade can range from around FJD\$800 - 1750 /month (USD425 to USD925) per collector as compared to an average FJD\$90 /month (USD 50) for non-collectors (WWF SPP - Fiji Country Programme, *in litt.*, to TRAFFIC, January 2005; Lal and Cerelala, *in prep*). Conversely, it is the same 5,000 local villagers and the traditional fishing grounds who will feel the most immediate and damaging effects of a poorly managed trade.

Aquarium Harvest Policy Guidelines have been drafted by the Department of Fisheries as a 'best practice' approach to the collection of and trade in marine aquarium specimens covering aspects of the trade including, for example, procedures for operating in the collection areas, collection practices, record keeping, legislative requirements as well as monitoring and enforcement.

The Aquarium Harvest Guidelines under development by the Department of Fisheries complement the requirements of the Marine Aquarium Council (MAC) for independent third-party certification, including the development and implementation of a Collection Area Management Plan. MAC is a non-governmental organization whose mission is "*to conserve coral reefs and other marine ecosystems by creating standards and certification for those engaged in the collection and care of ornamental marine life from reef to aquarium.*" MAC has developed a set of Core Standards covering the "Reef to Retail" chain of custody, among which are included standards on: Ecosystem and Fishery Management (EFM), Collection, Fishing and Holding (CFH) and the Handling, Husbandary and Transport (HHT).

Government has noted their intention to incorporate selected MAC requirements for certification into the Department of Fisheries' Aquarium Harvest Guidelines so they may become government policy. It was agreed by participants at the workshop that the draft Aquarium Harvest Guidelines remain an outstanding issue of high priority and should be finalized and gazetted in the immediate future.

Figure 1 Marine Aquarium Trade Collection Areas, August 2004



CITES AND NON-DETRIMENT FINDINGS

Determining when international trade (of an individual shipment or on an annual basis) is likely to prove non-detrimental to the survival of species is essential to achieving the aims of the CITES. If species become threatened with extinction as a result of use that is incompatible with their survival, Parties to CITES face the prospect of including more species in Appendix I. Indeed, every transfer of a species from Appendix II to Appendix I as a result of a lack of appropriate regulation of trade, particularly from a scientific perspective, can be considered as a failure of the Parties to fulfil their obligations under the Convention.

An operational definition of non-detriment

The elements of an operational definition for non-detriment findings for species listed in Appendix II of the Convention can be identified by examining the relevant paragraphs of Article IV of the Convention.

CITES Article IV, paragraph 2

The export of any specimen of a species included in Appendix II shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met:

Article IV, paragraph 2.a)

A Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species.

Article IV, paragraph 3

A Scientific Authority in each Party shall monitor both the export permits granted by that State for specimens of species included in Appendix II and the actual exports of such specimens. Whenever a Scientific Authority determines that the export of specimens of any such species should be limited in order to maintain that species throughout its range at a level consistent with its role in the ecosystems in which it occurs and well above the level at which that species might become eligible for inclusion in Appendix I, the Scientific Authority shall advise the appropriate Management Authority of suitable measures to be taken to limit the grant of export permits for specimens of that species.

These paragraphs of Article IV require the Scientific Authority to determine that proposed exports will not be detrimental to the survival of species. Furthermore, once exports are underway, the Scientific Authority must monitor the actual levels of export to ensure that the species is maintained throughout its range at a level consistent with its role in the ecosystem and well above the level at which the species might become eligible for inclusion in Appendix I.

In practice, the Scientific Authority must consider total national harvest levels for both new and on-going exports to make a non-detriment finding. Although the Convention is concerned only with international trade, all parameters should be considered when determining what levels of off-take will be sustainable, including domestic use of the resource and illegal trade. Export for international trade is not detrimental when it is part of an off-take, the sum of which is sustainable, in that it does not result in unplanned range reduction, or long-term population

decline, or otherwise change the population in a way that might be expected to lead to the species being eligible for inclusion in Appendix I.

As noted above, in the absence of data to determine whether extraction / trade will have a detrimental impact, a precautionary approach can be adopted whereby a quota is established at levels which, to the best knowledge available, are believed to be below the level where a detrimental impact would occur.

An adaptive management approach

Whilst the establishment of a quota is a practical approach to facilitate trade at precautionary levels, in the absence of robust scientific data it should be seen as an interim measure to be supported and developed over time through the collection of requisite data. The quota can then be modified as data become available. This approach, known as adaptive management, must be based on adequate monitoring and appropriate feedback to ensure sustainability of the extraction of the natural resource.

DEVELOPMENT OF NON-DETRIMENT FINDING METHODOLOGY FOR FIJI

"Peoples and States are and should be the best protectors of their own wild fauna and flora" (CITES Preamble).

Whilst non-detriment findings are required under CITES, and Article IV of the Convention provides the broad overall requirements of a non-detriment finding for trade in species listed in Appendix II of the Convention, determining what information is required, what methodology will be applied and what monitoring procedures are appropriate to maintain a stable and functioning environment as well as a viable industry are the responsibility of the Fiji Government. Fiji's national considerations therefore can, and indeed should be factored into the methodology for determining levels of extraction that will not have a detrimental impact on the species and/or the ecosystem. Parameters other than environmental parameters therefore can be taken into account, such as the traditional use of the resource, national customs and the socio-economic impacts of the trade. Thus, whilst CITES establishes the broad over-arching themes for non-detriment findings, Fiji can determine and broaden the scope of NDFs as appropriate for Fiji.

The non-detriment finding framework also serves to integrate and synergize existing measures, linking with other Multi-lateral Environmental Agreements (MEAs), for example maintaining the integrity of high conservation value reefs and threatened species as stipulated in Fiji's National Biodiversity Strategic Action Plan established under the Convention on Biological Diversity (CBD / NBSAP). The NDF framework complements and links also with Fiji's emerging management approaches, such as management of community based marine reserves (Fiji Locally Managed Marine Areas - FLMMA), marine resource inventories conducted by the Department of Fisheries, and monitoring of coastal fisheries by the Fish Wardens.

The NDF framework serves as a useful model for management of Fiji's marine and terrestrial wildlife, providing the framework for monitoring extractive use and also for regulating trade in species which, although not listed in the CITES Appendices, may be of conservation concern in

Fiji or may require attention and monitoring to determine whether greater attention should be paid to the species.

Non-detriment finding workshops for corals and live rock in Fiji

Recognizing the need to develop non-detriment finding methodology for the extraction and trade in corals and live rock, a one-day workshop was convened by TRAFFIC in May 2004, bringing together key stakeholders including Government, Industry, the University of the South Pacific (USP) and non-governmental organizations (NGOs), to develop a framework and approach.

A second workshop was held in July 2004 with funding provided by the British Government, facilitated by the CITES Secretariat, bringing together local stakeholders including Government, Industry, USP, NGOs as well as international experts to further refine the scientific and socio-economic requirements for non-detriment findings in Fiji. A list of participants who attended the July workshop is provided in *Annex 4* of this document.

Outcomes of the May 2004 workshop

The flow-chart on the following page presents the NDF framework developed at the May workshop.

The final goal of this framework for corals and live rock is to develop the current arbitrary quota to a quota based on scientifically robust biological and socio-economic data. Broad blocks of activities include determining key focal species (for corals) for further research, for example selection of indicator species; review and collation of data from published and unpublished information, including historical records of harvest, trade and resource surveys to determine what is known and to prioritize further research requirements. On-going reviews and collation of data, and results of research requiring external funding would be incorporated into the quota review and harvest / trade management strategies as information became available.

This framework was presented to and endorsed by the Fiji Islands CITES Scientific Authority (Council) in June 2004. The framework also formed the basis for the workshop held in July 2004.

Current
(June 2004)

5-Jul-04

1-Sep-04

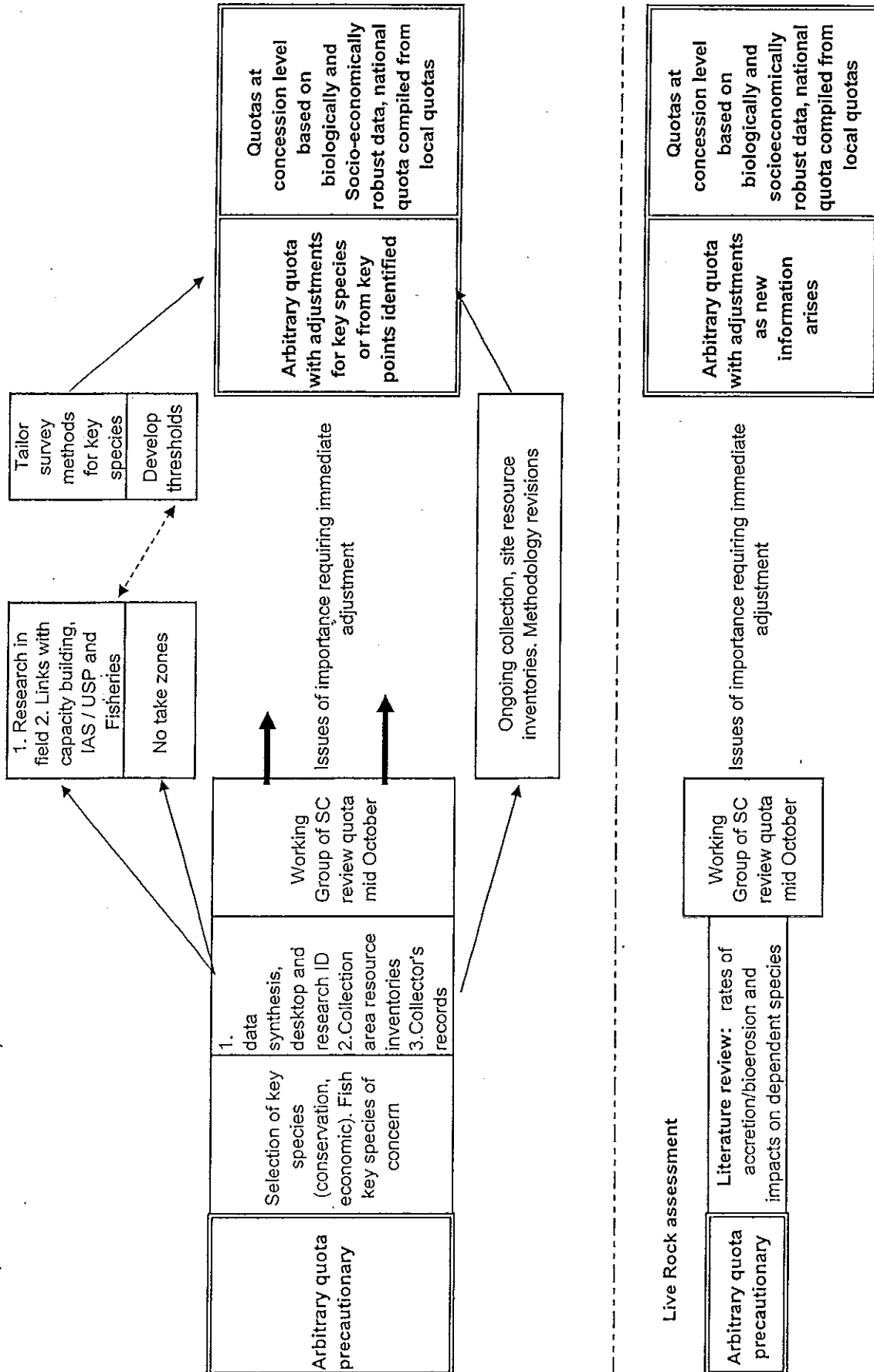
Mid Oct

Proposal Development
15 Nov 2004

Ongoing review
by Working
Group every 3
months

After 2-3 years with
ongoing feedback

Hard coral (and live ornamental fish)



Objectives of July Workshop

The key objective of the July workshop was to build on the framework developed in May and to determine both the minimal level and the ideal level of information required to make NDFs for coral and live rock with confidence.

A holistic approach taking into account environmental considerations as well as those social, economic and traditional resource use considerations which are particular to Fiji was endorsed. Noting the absence of immediately available scientific data, a precautionary approach was agreed upon, including the use of a quota to facilitate and to regulate trade in corals and live rock.

Noting the paucity of resources, the simultaneous inclusion of ornamental fish in the NDF framework for corals and live rock was acknowledged as being logical, cost-effective as well as complementing the overall environmental resource management requirements for Fiji.

Four key areas for discussion amongst working groups emerged: Live rock, Coral, Ornamental Fish and Socio-economics aspects of the trade. These four areas are discussed in more detail following the next section.

General points of discussion and recommendations common to all four focal areas:

- There is no government agency, academic institution or conservation organisation which has the resources available to undertake all requisite activities to coordinate and determine non-detriment findings for harvest of and trade in corals, live rock and fish, etc.
- The requisite expertise in fisheries management, coral biology and survey methodology and socio-economics, etc., exists in Fiji, for example within the Department of Fisheries, University of the South Pacific (USP), the Marine Aquarium Council (MAC) and other NGOs, etc., but currently there is no established procedure for prioritizing and coordinating activities.
- A collaborative approach with established channels of coordination and communication is critical to develop and implement Fiji's non-detriment finding action plan for the marine aquarium trade.
- The Department of Fisheries will take on the overall coordinating role but will need the pro-active support of all stakeholders to fulfill this onerous task.
- WWF South Pacific Programme (WWF SPP) will coordinate the review of the coral and live rock quota, in collaboration with the Department of Fisheries.
- A salaried coordinator was identified as a requirement to assist the Department of Fisheries to coordinate activities, to develop funding proposals and to ensure that priority actions are addressed and duplication of effort avoided.
- Coordination will need also to ensure synergy with other environment conservation-related projects. For example the project under development by WWF SPP and the Wildlife Conservation Society (WCS): *Science for Ecosystem-Based Management of Fiji's Coastal Marine Biodiversity, Natural Resources & Ecosystem Services* and the MAC/FSPi (Foundation for the Peoples of the South Pacific International) study funded by the South Pacific Regional Environment Programme (SPREP): *Socio-economic and financial viability of the trade in corals in the Solomon Islands and Fiji* have clear areas of overlap with the development of a non-detriment finding action plan for Fiji's aquarium trade.
- Four groupings of recommendations regarding priority activities were identified:

- i) Recommendations and action points for the Ministry of Fisheries and Forests regarding institutional changes and budget allocations;
- ii) Recommendations and action points, such as *in-situ* research and salaried coordinator/s, requiring external funding, to be conducted as and when funds become available;
- iii) Recommendations and action points not requiring funding and to be conducted by stakeholders such as Industry (provision of records), Ed Lovell (initial revision of quota ranking system for review), with overall coordination provided by the Department of Fisheries.
- iv) Recommendations for monitoring implementation, impacts, etc., and feedback to incorporate information into the NDF process as it becomes available.

OUTCOMES OF THE WORKING GROUPS

Live Rock

The trade in live rock¹ from Fiji is facilitated and regulated through an export quota (see Annex 2). Extraction of live rock, essentially, is a mining operation of a natural resource; replacement of the hard consolidated material generally measurable more in geological time-frames than in human life times due to the insignificant rate of accretion (replacement). Nonetheless, it was noted that live rock may be collected from one site for a number of years on a rotational basis, for example, extraction of live rock was on-going in Malo Malo on the south coast of Viti Levu from 1994 to 2003: after coralline algae deposits have accrued on the coral rock left after extraction, a further layer of live rock may be extracted. It should also be noted that cyclones and storms may bring up rocks that, if not picked up become part of the consolidated material (Michelle Lam, *in litt.*, to TRAFFIC, October 2004).

Live rock extraction was considered mainly in the context of the potential impact on its role in the ecosystem, its role as fish nursery and octopus/food fish habitat, etc., and the physical impacts that its removal may have, such as altering the matrix of hard reef substratum which may weaken the reef framework that buffers the coastline from incoming oceanic waves and protects shoreline from coastline erosion.

Conflict with the tourism industry - Fiji's main domestic industry - also was noted, particularly the use of crow bars to extract live rock, and attention given to the need to balance public perceptions of the trade with scientific information and sound management plans. Extraction of live rock for domestic use (sewerage treatment) also was noted as being a factor necessary to consider in the development of management plans. Attention was drawn also to current deliberations within Government about entirely phasing out the extraction of natural live rock. Cultured 'live rock', where concrete reef-like shapes are deposited in the sea until they have

¹ *Coral rock (also live rock and substrate)* – hard consolidated material, >3 cm in diameter, formed of fragments of dead coral and which may also contain cemented sand, coralline algae and other sedimentary rocks. *Live rock* is the term given to pieces of coral rock to which are attached live specimens of invertebrate species and coralline algae not included in the CITES Appendices and which are transported moist, but not in water, in crates. *Substrate* is the term given to pieces of coral rock to which are attached invertebrates (of species not included in the CITES Appendices) and which are transported in water like live corals. Coral rock is not identifiable to the level of genus but is recognizable to the level of order. The definition excludes specimens defined as dead coral.

Source: CITES Resolution Conf 11.10 (Rev CoP.12) - *Trade in Stony Corals*, Annex 1

accrued sufficient coralline algae, was raised as a potential alternative to the extraction of natural live rock.

The live rock working group focused on three areas:

Extraction of live rock

Cultured 'live rock'

Natural versus cultured 'live rock'

A framework was devised examining what is known and what biological and socio-economic information is required in order to develop sound policies to ensure that the direction Fiji takes, for example phasing out the extraction of natural live rock, does not have a negative impact on the ecosystem or on local communities and the national economy. The potential impact on other countries in the region due to policy decisions made by Fiji, also was considered and put forward for further deliberation in Fiji and within regional fora, such as the South Pacific Regional Environment Programme (SPREP) and the Secretariat of the Pacific Community (SPC).

The complete frame work of required activities according to the three focal areas, above, of the live rock working group are presented in *Annex 5*. Key priority recommendations and actions particular to Live Rock extraction and trade are summarized below; generic recommendations applicable also to the other focal areas are provided at the end of the document.

Key recommendations from the Live Rock Working Groups

Priority recommendations directed to the Ministry of Fisheries and Forests for all current and potential live rock and cultured 'live rock' activities are included in the summary recommendations at the end of the document.

Live Rock Extraction

Priority recommendations for Live Rock extraction which do not require funds

1. A precautionary approach should be adopted on the extraction of live rock until scientific studies have determined:
 - a. the amount of live rock that can be extracted per location with minimal impact (including the rate of coralline algae recovery) to the successional changes of the benthic assemblage and to the shoreline from erosion (*see below under studies requiring funds*).
2. Industry should be engaged to determine quantities of live rock extracted versus quantities of live rock exported, and the information fed into the process for review of the live rock export quota.
3. A site-based quota for extraction (not just export) with an adaptive management plan should be established on a precautionary basis as soon as possible, including:
 - a. Best practice guidelines for extraction and disposal of rejected live rock;
 - b. Examination of possible methods of extracting live rock in the future if the use of crow bars is to be phased out.

Priority recommendations for Live Rock extraction requiring funds

1. Scientific studies to determine the amount of live rock that can be extracted per location with minimal impact (including the rate of coralline algae recovery) to the successional changes of the benthic assemblage and to the shoreline from erosion.

The following recommendation remains of priority although should be addressed in the on-going SPREP-funded study by FSPI on *Socio-economic and financial viability of the trade in corals in ... Fiji*:

2. The potential socio-economic impacts of phasing out the extraction of live rock on communities currently involved in live rock extraction and on communities who may become involved in culturing of live rock should be explored before any decision is made to phase out the extraction of live rock.

Should funding be obtained for remote sensing of representative areas of coral habitat, etc., (see recommendations of next section) the following recommendation applies:

3. Incorporate remote sensing of live rock habitat into coral habitat remote sensing as far as possible.

Cultured 'Live Rock'

Priority recommendations for cultured 'live rock' requiring funds

The following priority recommendations become more urgent if Government decides to phase out the extraction of natural live rock in favour of culturing 'live rock', but should be considered after the FSPI study, noted above, has been concluded.

1. A study of the impacts of extraction of raw material to manufacture 'live rock' should be undertaken taking into account the projected growth in the international market for this product.
2. A study of the impact of culturing 'live rock' on the reef ecosystem should be undertaken, with attention to the impact of continuous introduction and removal of artificial habitat and its ecological impact.

Natural versus Cultured 'Live Rock' (e.g: if extraction of natural live rock is phased out)

Phasing out the extraction of natural live rock in favour of cultured live rock should only be undertaken when the potential socio-economic impacts, noted above, have been examined.

Further recommendations include:

1. The potential challenges in regulating an industry based solely on 'live rock' culturing should be explored and management procedures in place before extraction of natural live rock is phased out. Regulatory issues concerning aspects such as collection of raw materials, placement areas for culturing 'live rock', quality control, impacts on the international market and associated socio-economic impacts should be examined.

Corals

Current status

As noted earlier, exports of coral from Fiji currently are regulated and monitored through an arbitrary quota established as a voluntary national measure. This quota and the approach was endorsed by the Fiji Islands CITES Scientific Authority (Council) on the provision that progress is demonstrated towards modifying the quota based on scientifically robust data.

A precautionary quota system provides a means to facilitate, regulate and monitor trade in the absence of adequate scientific data; progressing towards a scientifically based quota provides a framework within which to define priority activities to ensure the sustainable harvest of corals.

Key requirements for a quota

The flow chart developed during the May 2004 workshop provides an overview of the steps required to determine non-detriment findings for collection of and trade in corals from Fiji.

From the current arbitrary quota, the final goal is the establishment of a quota based on scientifically robust biological and socio-economic data. Adjustments to the quota will be made on a periodic basis as scientific information becomes available, coordinated by the Quota Review Group (WWF SPP) in collaboration with the Department of Fisheries.

Key steps required towards this goal include:

1. Selection of key species

as indicators - representative life histories, habitat requirements, etc
of conservation concern
of economic importance

2. Defining and prioritizing research activities, based on

Literature review of published and unpublished information

3. Development of ranking system methodology

Coral production systems also were discussed by the coral working group (see *Annex 6*) due to their potential to alleviate pressure on wild specimens and because corals from such production systems would not fall within the current quota. Further studies however would be required, for example Risk Analysis; Cost-benefit analysis of culturing corals, noting village-based culturing systems and the likelihood that only *Acropora spp.* would be appropriate for culturing; and demand and projected demand for cultured corals and species-specific trends in the international market. While these would make interesting studies, they were not thought to be of high priority or likely to replace wild harvest in the foreseeable future.

Selection of key species

It is unrealistic and impractical to study the distribution, abundance and life histories, etc., of all species of coral that occur in Fiji in order to determine what level of off-take may or may not be sustainable. Certain species could be chosen for further study based on selected criteria, including:

- Indicator forms, genera and species can serve as representatives for wider taxonomic groups that share life history characteristics, etc;
- Species that are naturally rare or which are known to have a restricted habitat such as single polyp species *Cynarina lacrymalis* and *Blastomussa wellsii*.
- Species with special habitat requirements, such as *Plerogyra spp* favouring steep reef escarpments;
- Species identified by the European Council Scientific Review Group as being of conservation concern (see below).
- Species of economic importance in the marine aquarium trade, such as *Acropora* and *Pocillopora*.

The European Council and Import Restrictions

Certain species currently have "zero quota" for trade. This step was taken either because

- 1) the species was known to be rare in Fiji or it was believed to be rare but sufficient information was not available to determine whether any trade should be allowed;
- 2) a 'negative opinion' (which equates to a temporary import suspension) had been imposed by the Scientific Review Group of the European Commission (EC SRG) due either because:
 - a. it was believed to be rare and no information had been provided by Fiji in response to the EC SRG on its distribution, abundance or management in Fiji; or
 - b. it was not recognized by the EC SRG as occurring in Fiji. The EC SRG adheres to a policy that a species only occurs in a country if there is a documented record of occurrence in a peer reviewed journal.

Recommendations requiring external funds

1. Publish papers in peer reviewed journals regarding distribution, abundance, etc., of coral species not documented as occurring within Fiji waters but which are known to occur in Fiji.
2. Develop a list of species for further study, categorised according to the above criteria;
3. Develop species-specific survey methodology, as appropriate, for surveying distribution and abundance of species if current survey methodology is not adequate.

Defining and prioritizing research activities

Management of the coral trade currently is conducted on a site-specific basis, for example, by industry operators seeking compliance with the Marine Aquarium Council Standard for Ecosystem and Fishery Management, which includes undertaking a resource assessment using standardized methods, and developing a Collection Area Management Plan. This work is undertaken in collaboration with the Department of Fisheries. This site-specific management focus needs to be expanded to the national level to determine representative habitat sites, and to ensure that collection of coral species is not occurring in areas of unique biological significance. Control - impact studies also need to be conducted, comparing impact of collection in the collection sites with control sites in representative habitat.

Certain steps to develop this national overview were identified as priority actions, including remote sensing and ground-truthing to map areas representative of coral habitat, distribution and abundance, and to identify and map high conservation value reefs & seascapes which would be established as no-take zones.

Localised site-specific considerations stressed the importance of utilizing resources already available, including survey methodology (MAQTRAC) developed by MAC for use in achieving compliance with the MAC Standard for Ecosystem and Fishery Management. Certain actions also were identified as requirements for incorporation into the current methodology.

Specific scientific research questions were identified as being suitable for potential MSc students, for example:

- Habitat - species relationships
- Growth rate / size-age information
- Reproduction and natural mortality in age classes

Close coordination should be maintained with marine programmes at the University of the South Pacific (USP).

Review of available published and unpublished literature will facilitate determining further priority areas of research at both the macro and micro level.

Recommendations requiring funds

1. Remote sensing and ground truthing to map representative areas of coral habitat, distribution and abundance, and to identify and map high conservation value reefs & seascapes which would be established as no-take zones;
2. Control - impact studies to determine and compare impact of collection in the collection sites with control sites in representative habitat;
3. Distribution and abundance surveys of selected species, according to the criteria noted above;
4. Scientific studies, potentially conducted by USP MSc students, on specifically identified areas and focal species identified according to the above criteria, for example:
 - a. Habitat - species relationships
 - b. Growth rate / size-age information
 - c. Reproduction and natural mortality in age classes.

Development of ranking system methodology to estimate what quantity of the resource may be taken for the trade without having a detrimental impact

The Fiji Islands CITES Scientific Council and Management Authority have decided to maintain a quota system as a voluntary national measure to facilitate monitoring and regulation of the aquarium trade. Turning the information gathered through literature reviews, remote sensing and ground-truthing surveys, species-specific studies, etc., into a number-based quota remains a relatively unexplored area and one for which there are no known precedents. A draft ranking system developed by Ed Lovell was approved as a starting point by the coral working group.

In addition to knowledge on levels of abundance based on field assessment, biological characteristics reflecting suitability for collection would be included in the ranking system. Based on their biological characteristics, a quota could be developed by ranking the species (*see Annex 7*) to provide a relative measure of species' vulnerability to over-collection. The sum of this ranking provides a clear and understandable measure of the species suitability to collection and the numerical ranking provides an indication of the appropriate percentage of harvest to be allowed of the estimated standing stock.

Recommendation not requiring external funds

The ranking system developed by Ed Lovell provides a suitable adaptive framework for developing quotas as information becomes available. This system should be weighted according to selected parameters to ensure precautionary thresholds and reviewed by other coral biology and management experts. The primary recommendation therefore is to:

1. Review and adapt the current draft ranking system.

Time dedicated to continued adaptation and implementation of the quota system will be required, and thus:

Recommendation requiring external funds

1. Continued review and implementation of the quota ranking system.

Ornamental Fish

In accordance with CITES and with Fiji's national legislation, the Fiji Government is required to develop non-detriment finding methodology for CITES Appendix-listed species in trade. Although no species of ornamental fish currently are listed in the CITES Appendices, the Fish Working Group considered that issues relating to fish should be considered in the development of a non-detriment finding (NDF) methodology for corals and live rock for the following reasons:

1. It is logical and cost-effective to develop the NDF process simultaneous with coral and live rock;
2. No studies have been conducted in Fiji to determine the impact of the ornamental fish trade on populations of ornamental fish;
3. Removal of ornamental fish for the trade may have detrimental impacts on food fish populations thereby having negative ramifications for local communities' food security;
4. Fish can be used as indicator species in research studies; and
5. Fiji's main industry - Tourism - relies on a healthy marine environment where tourists can view fish and healthy reefs.

Including ornamental fish in the NDF framework addresses action points identified in Fiji's National Biodiversity Strategic Action Plan (NBSAP), established under the Convention on Biological Diversity (CBD), and also provides the Fiji Government with requisite information to determine whether further management measures are required. For example, information gathered may indicate that listing certain species in the CITES Appendices would facilitate and complement management of the trade.

As with the NDF approach to corals and live rock, it was recognized that the expertise in fisheries management, fish biology and survey methodology, and socio-economics, etc., exists in Fiji or is available from other countries. Prioritizing research activities through reviews of published and unpublished literature remains a priority requirement but should be closely coordinated with those institutions or organisations working in the same or related fields to maximise the work already carried out and to avoid duplication of effort. For example, *in-situ* studies on the effects of coral / live rock extraction should incorporate also fish components into the survey methodology.

Review of traders records since exports from Fiji started in 1984 will provide a starting point for determining focal species for further targeted research. The most pressing requirement is to select species of realized or potential conservation concern and to determine rates of natural turn-over compared with population trends due to targeted collection. Methodology already has been devised and implemented for surveying fish populations, such as MAQTRAC methodology used by the industry in achieving compliance with the MAC Standard for Ecosystem and Fishery Management, and should be adapted for use in Fiji, with reference to, but not limited to, the following criteria:

- Available methods have species-lists for surveys but different companies exert different pressures on different species;
- Not all species on those lists already developed will occur in Fiji; where applicable, in the Fijian context apply methodology used to develop those species lists.
- Local expertise and knowledge should be utilized to select species of relevance to collection / survey areas, for example which species are harvested and which species would serve as indicator species in that area.

Links with USP were again stressed as being of critical importance, for example MSc students studying life histories of species heavily targeted in Fiji (such as Damselfish and Chaetodonts), species of conservation concern or of economic importance, and endemic species.

Recommendations requiring funds

1. Analysis of industry collection and export records to determine species of realized or of potential concern for further study. Factors such as trends in market demand and import policies as well as collection areas should be taken into account when analyzing trade records;
2. Adaptation of existing species lists and survey methodology to suit Fiji according to, but not limited to, the criteria noted above;
3. Scientific studies on distribution and abundance, in tandem with live rock and coral surveys where possible;
4. Scientific studies on life history, etc., of selected species.

The full list of recommendations from the Fish Working Group is attached as *Annex 8*. The need for a coordinator to ensure links with other projects also was emphasized by the Fish Working Group and is included in the overall recommendations at the end of the document.

Governance and Socio-economic aspects of the trade

In developing a non-detriment finding methodology for species traded by the aquarium industry, socio-economic issues need to be considered in relation to management of the industry as a whole as well as to individual operations and the impact, positive or negative, on local communities and the national economy.

The socio-economic parameters of the trade were emphasised heavily throughout the workshop and were considered not only by the Socio-economic working group, but also by the other three working groups. The socio-economic working group focused particularly on the current government management of the industry and potential areas for further review or development (see *Annex 9*).

Policy considerations recommended by the group included the development of a Strategic Environmental Assessment plan for the aquarium trade for consideration by the Fiji Islands CITES Scientific Council and a recommendation that extraction activities should undergo an Environmental Impact Assessment (EIA), reflecting the intent of the draft Environmental Management Bill.

Strategic Environmental Assessment

A Strategic Environmental Assessment is a tool for integrating environmental considerations into decision making by ensuring that significant environmental effects of a plan or policy, etc., are taken into account. The European Union defines its purpose as being 'to provide for a high level of protection of the environment and contribute to the integration of environmental considerations into the preparation and adoption of plans ... with a view to promoting sustainable development' (Article 1 of Directive 2001/42/EC in Levett and McNally, 2003). In essence therefore, the non-detriment finding process has the same objectives as the Strategic Environmental Assessment, albeit on a smaller scale, and requires the same level of integration and mainstreaming of environmental considerations to ensure a sustainable industry and sustainable development of the nation.

Key issues considered by the working groups included:

Occupational health and safety

- Best practice guidelines are required to prevent injury to those involved in the trade.
- Legal support in the form of employment contracts or licenses are required to enable persons engaged in the live rock extraction to seek recompense if injured whilst engaged in activities associated with the trade.

Capacity of community / government to implement 'best practice'

- Development of best practice guidelines for OHS, collection practices, etc., should involve the provincial and local leaders as well as the national government.
- Adequate understanding and capacity for good governance is required both at the traditional level (i.e., the Iqoliqolis) and at all levels of the national Government (i.e., from the Tikina to the Ministries). The feasibility of co-management options between resource owners and government should be explored.
- Avenues for communication and intervention in the traditional and government infrastructure should be clearly delineated.

Benefit sharing

- Information on the relative values of marine aquarium products (export and retail value weighted against operational costs) is required to determine fair prices for resources extracted and exported from Fiji and to ensure the equitable sharing of benefits both from the exporter to the community and within the local communities.

Effects of shifts in employment and impacts on the traditional social structure

- The physically demanding nature of the marine aquarium trade places a heavy reliance on men from the villages which, in turn, disrupts the traditional structure and hierarchy in the local communities. An analysis of the costs and benefits of the industry was recommended to determine whether the overall impact of the trade was beneficial to Fijian society as a whole, even if extraction of the natural resources was conducted at sustainable levels and a long-term economically viable industry was in place.

RECOMMENDATIONS

Funding

Three groupings of priority activities were identified:

1. Recommendations and action points for the Ministry of Fisheries and Forests regarding institutional changes and budget allocations;
2. Recommendations and action points, such as *in-situ* research and salaried coordinator/s, requiring external funding, to be conducted as and when funds become available;
3. Recommendations and action points not requiring funding and to be conducted by stakeholders such as Industry (provision of records), Ed Lovell (initial revision of quota ranking system), etc., with overall coordination provided by the Department of Fisheries.

Over-arching Recommendations

1. Priority Recommendations for the Ministry of Fisheries and Forests (*developed by the Ministry of Fisheries and Forests following the outcome of the workshop*)

- Two salaried field assistants, one based in Lami and one based in Sigatoka, are required to conduct on-site monitoring of aquarium specimen collection, under the supervision of the overall project coordinator (Aquarium Project, Department of Fisheries);
- Travel funds for the above three fisheries officers to monitor collection areas and to assist in training Customs to inspect export consignments;
- The Department of Fisheries Aquarium Harvest Policy Guidelines to be finalized and gazetted as a matter of immediate priority. The Ministry of Fisheries and Forests must provide institutional support to the development of these guidelines, making mandatory for all industry members within agreed time-frames the undertaking and completion of Collection Area Management Plans (CAMP), developed by the Marine Aquarium Council but to be amended and adopted as government policy. Failure to abide by the timeframes for the CAMP process should, for example, include penalties such as non-issuance of export permits. Zoning of collection areas and monitoring of collection and trade practices also should be agreed upon and incorporated into the guidelines;
- Ministry of Fisheries and Forests to liaise with Fiji Islands Customs and Revenue regarding placement of a designated officer to check consignments of marine aquarium specimens leaving Fiji and an operational budget;
- Salaried officers for issuance of CITES documents and for maintaining the trade database (although this work is on-going, there is no budget allocation to cover time and costs).

2. Over-arching Priority Recommendations requiring external funding

- Salaried scientific coordinator required to develop funding proposals and to coordinate implementation of scientific components of the NDF programme;
- Salaried socio-economic coordinator required or FSPI / USP to serve as advisors (*to be determined*);
- Continued refinement and implementation of the quota review and ranking system (following adaptation and review of the current draft system);
- Updated database for monitoring and reporting on trade within the Department of Fisheries and within the Department of Environment;
- Monitoring of collection sites through control / impact studies.

3. Over-arching Priority Recommendations for priority action points not requiring external funds.

- Initial refinement and development of adaptive quota ranking system;
- Monitoring of exports, quota allocations, trade records, etc., (*see monitoring flowchart*);
- Establishment of the Quota Review Group and processes for reviewing the quota (*see monitoring flow-chart and below*).

Quota Review Group

The Quota Review Group would be chaired by the NGO representative to the CITES Scientific Council (David Olson), with Ed Lovell serving as technical advisor. A local resident national should be invited to attend all meetings of the Quota Review Group as a capacity building process, ultimately to take on chairing of the working group.

WWF to work with Ed Lovell to revise ranking system and to determine focal species and representative genera, etc. for review under the revised quota system.

WWF, through FLMMA Network, to approach relevant bodies who may have requisite information, for example IAS, FSPI and MAC. Outputs from these discussions would include:

1. Membership of the Quota Review Group established
2. Channels of communication for the Quota Review Group;
3. Coordination of information gathering for submission to person synthesizing data (to be identified); and
4. Established time frames for submission of information to the person responsible for synthesizing information.

Monitoring

A suggested monitoring process is included on the following page.

Implementation of the non-detriment finding process for the aquarium trade in Fiji

OVERALL COORDINATION-DEPARTMENT OF FISHERIES
 o Report to CITES Scientific Council and Management Authority

Monitoring of trade

COLLECTION SITE

What is required: Monitoring to assess impacts at collection sites

Ongoing monitoring of impacts of coral, live rock and fish collection (by salaried fisheries officers and in accordance with research proposal (to be developed) and working group outputs.

Who and How: Monitoring of collection practice and standards

1. Department of Fisheries to monitor collection is according to policy guidelines/best practice (to be developed)
2. MAC certification process-ongoing monitoring of CAMPS with Fisheries.

Coordination of implementation

Quota Review Group

WWF to work with Ed Lovell to revise ranking system and to determine focal species and representative genera, etc. for review under the revised quota system.

WWF, through FLMMA Network, to approach relevant bodies who may have requisite information, for example IAS, FSPI and MAC.

Outputs from these discussions would include:

1. Membership of the Quota Review Group established
2. Channels of communication for the Quota Review Group;
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4. Established time frames for submission of information to the person responsible for synthesizing data.

APPLICATION FOR PERMITS

Monitoring through review of trade applications

EXPORT

Monitoring of actual trade

1. Department of Fisheries
 - o Maintain records of permitted and actual trade;
 - o Fiji's annual report monitors trends in % quota utilized;
 - o Compare with annual reports of importing countries (database maintained by UNEP-WCMC)
2. Customs
 - o Can check export consignments and advise MA/Dept of Fisheries as appropriate;
 - o Maintain trade records and provide to Fisheries on periodic basis

Monitoring implementation of scientific programmes (pending funding)

Scientific Coordinator

- o Development of research proposals
- o Oversee implementation of scientific aspects/research
- o Visit field sites to verify methodologies (not actually conduct research)
- o Provide technical guidance to Quota Review Group re synthesis of information
- o Report back to coordinating body (Fisheries), and to

Socioeconomic coordinator/advisor?

FSPI?

1. The potential challenges in regulating an industry based solely on 'live rock' culturing should be explored and management procedures in place before extraction of natural live rock is phased out. Regulatory issues concerning aspects such as collection of raw materials, placement areas for culturing 'live rock', quality control, impacts on the international market and associated socio-economic impacts should be examined.

Corals

Recommendation not requiring external funds

The ranking system developed by Ed Lovell provides a suitable adaptive framework for developing quotas as information becomes available. This system should be weighted according to selected parameters to ensure precautionary thresholds and reviewed by other coral biology and management experts. The primary recommendations therefore are to:

1. Develop a list of species for further study, categorised according to the criteria noted earlier;
2. Develop species-specific survey methodology, as appropriate, for surveying distribution and abundance of species if current survey methodology is not adequate.
3. Review and adapt the current draft ranking system.

Recommendations requiring external funds

1. Publish papers in peer reviewed journals regarding distribution, abundance, etc., of coral species not documented as occurring within Fiji waters but which are known to occur in Fiji.
2. Continued review and implementation of the quota ranking system.
3. Remote sensing and ground-truthing to map representative areas of coral habitat, distribution and abundance, and to identify and map high conservation value reefs & seascapes which would be established as no-take zones;
4. Control - impact studies to determine and compare impact of collection in the collection sites with control sites in representative habitat;
5. Distribution and abundance surveys of selected species, according to the criteria noted above;
6. Scientific studies, potentially conducted by USP MSc students, on specifically identified areas and focal species identified according to the above criteria, for example:
 - d. Habitat - species relationships
 - e. Growth rate / size-age information
 - f. Reproduction and natural mortality in age classes.

Ornamental Fish

Recommendations requiring funds

1. Analysis of industry collection and export records to determine species of realized or of potential concern for further study. Factors such as trends in market demand and import policies as well as collection areas should be taken into account when analyzing trade records;
2. Adaptation of existing species lists and survey methodology to suit Fiji according to, but not limited to, the criteria noted above;
3. Scientific studies on distribution and abundance, in tandem with live rock and coral surveys where possible;
4. Scientific studies on life history, etc., of selected species.

SUMMARY OF RECOMMENDATIONS PROVIDED BY THE FOUR WORKING GROUPS

Live Rock

Live Rock Extraction

Priority recommendations for Live Rock extraction which do not require funds

1. A precautionary approach should be adopted on the extraction of live rock until scientific studies have determined:
 - a. the amount of live rock that can be extracted per location with minimal impact (including the rate of coralline algae recovery) to the successional changes of the benthic assemblage and to the shoreline from erosion (*see below under studies requiring funds*).
2. Industry should be engaged to determine quantities of live rock extracted versus quantities of live rock exported, and the information fed into the process for review of the live rock export quota.
3. A site-based quota for extraction (not just export) with an adaptive management plan should be established on a precautionary basis as soon as possible, including:
 - a. Best practice guidelines for extraction and disposal of rejected live rock;
 - b. Examination of possible methods of extracting live rock in the future if the use of crow bars is to be phased out.

Priority recommendations for Live Rock extraction requiring funds

1. Scientific studies to determine the amount of live rock that can be extracted per location with minimal impact (including the rate of coralline algae recovery) to the successional changes of the benthic assemblage and to the shoreline from erosion.

The following recommendation remains of priority although should be addressed in the on-going MAC / FSPI study on *Socio-economic and financial viability of the trade in corals in the Solomon Islands and Fiji*:

2. The potential socio-economic impacts of phasing out the extraction of live rock on communities currently involved in live rock extraction and on communities who may become involved in culturing of live rock should be explored before any decision is made to phase out the extraction of live rock.

Should funding be obtained for remote sensing of representative areas of coral habitat, etc., (see recommendations of next section) the following recommendation applies:

3. Incorporate remote sensing of live rock habitat into coral habitat remote sensing as far as possible.

Cultured 'Live Rock'

Priority recommendations for cultured 'live rock' requiring funds

The following priority recommendations become more urgent if Government decides to phase out the extraction of natural live rock in favour of culturing 'live rock', but should be considered after the MAC/FSPI study funded by SPREP has been concluded.

1. A study of the impacts of extraction of raw material to manufacture 'live rock' should be undertaken taking into account the projected growth in the international market for this product.
2. A study of the impact of culturing 'live rock' on the reef ecosystem should be undertaken, with attention to the impact of continuous introduction and removal of artificial habitat and its ecological impact.

Natural versus Cultured 'Live Rock' (if extraction of natural live rock is phased out)

Phasing out the extraction of natural live rock in favour of cultured live rock should only be undertaken when the potential socio-economic impacts, noted above, have been examined. Further recommendations include:

COORDINATION BY THE DEPARTMENT OF FISHERIES

Actions Required, Terms of Reference and Issues to Consider

Actions Required

Terms of Reference for Fisheries Coordination Team

- Report to CITES Scientific Council and Management Authority
- Coordination and liaison with the Quota Review Group and the Scientific Coordinator
- Communication of information to stakeholders (communities, collectors, traders)
- Channels of communication to the international community

Issues to consider

- Ensure that use of unpublished data does not infringe on Intellectual Property Rights;
- Ensure that results of research conducted by visiting scientists in Fiji is returned to Fiji.

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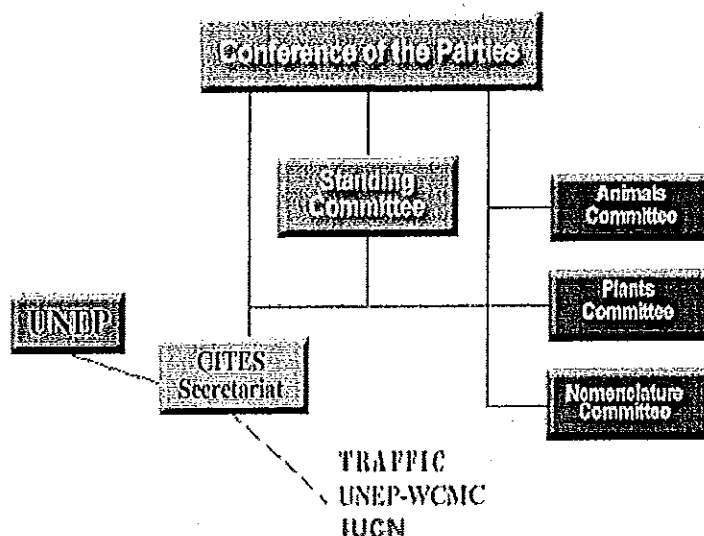
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ANNEX 1: THE STRUCTURE OF CITES



The Conference of the Parties (CoP)

The Parties to CITES meet every two to three years to review the implementation of the Convention. These meetings last for about two weeks and are usually hosted by one of the Parties. They provide the occasion for the Parties to:

- review progress in the conservation of species included in the Appendices;
- consider (and where appropriate adopt) proposals to amend the lists of species in Appendices I and II;
- consider discussion documents and reports from the Secretariat, Parties, permanent committees or other working groups;
- recommend measures to improve the effectiveness of the Convention; and
- make provisions (including the adoption of a budget) necessary to allow the Secretariat to function effectively.

The Standing Committee

The Standing Committee provides policy guidance to the Secretariat concerning the implementation of the Convention and oversees the management of the Secretariat's budget. It also coordinates and oversees the work of other committees and working groups. Major issues recently addressed by the Standing Committee have included issues of non-compliance of some Parties with the Convention.

The members of the Standing Committee are countries. The voting members are Parties representing each of the six major geographical regions (Africa, Asia, Europe, North America, Central and South America and the Caribbean, and Oceania). Australia is currently the regional representative for Oceania to the CITES Standing Committee.

Additionally, the Standing Committee includes a representative from:

- the Depositary Government (Switzerland);
- the Party that hosted the previous meeting of the Conference of the Parties; and
- the Party that will host the next meeting of the Conference of the Parties.

Usually the Standing Committee meets only once a year, although it does also meet just before each meeting of the Conference of the Parties. The membership of the Standing Committee is reviewed at every regular meeting of the Conference of the Parties.

The CITES Secretariat

The CITES Secretariat is located at Geneva, Switzerland, and administered by the United Nations Environment Programme. The key roles of the Secretariat include:

- playing a coordinating, advisory and servicing role in the working of the Convention;
- acting as the repository for the reports, sample permits and other information submitted by the Parties;
- distributing information relevant to several or all Parties, for example, proposals to amend the Appendices, sample permits, information about enforcement problems, national legislation, reference material or news of a new Party;
- providing technical assistance, for instance in preparing national legislation to implement the Convention, and organizing training seminars;
- assisting with communication and monitoring the implementation of the Convention to ensure that the provisions are respected;
- issuing new editions of Appendices I, II and III, whenever there is a change, and information to assist identification of species listed in the Appendices;
- undertaking, under agreed programmes, occasional scientific and technical studies into issues affecting the implementation of the Convention;
- preparing annual to the Parties on its own work and on the implementation of the Convention;
- arranging meetings of the Conference of the Parties and of the permanent Committees at regular intervals and to service those meetings; and
- making recommendations regarding the implementation of the Convention.

The Animals and Plants Committees

These committees of experts were established to fill gaps in biological and other specialized knowledge regarding species of animals and plants that are (or might become) subject to CITES trade controls. Their role is to provide technical support to decision-making about these species. These two Committees have similar terms of reference:

- undertaking periodic reviews of species, in order to ensure appropriate categorization in the CITES Appendices;
- advising when certain species are subject to unsustainable trade and recommending remedial action (through what is known as the "Review of Significant Trade");
- drafting resolutions on animal and plant matters for consideration by the Parties; and
- performing other functions entrusted to them by the Parties or the Standing Committee.

The Animals and Plants Committees generally meet once a year. They report to the Conference of the Parties at its meetings and, if so requested, provide advice to the Standing Committee between such meetings.

The members of the Animals and Plants Committees are individuals from Africa, Asia, Europe, North America, South and Central America and the Caribbean, and Oceania.

One of the tasks of the Animals Committee and the Plants Committee [contained in Annex 2 to Resolution Conf. 11.1 (Rev. CoP12)] is the preparation of regional directories for each of the six CITES regions. These directories list, for each Party the botanists and zoologists who are experts in CITES-listed species, as well as other details of the Management and Scientific Authorities.

The Nomenclature Committee

The Nomenclature Committee was established in recognition of the need to standardize the taxonomic nomenclature used in the Appendices and in other CITES documents. The Committee recommends standard names for animal or plants species, to the level of subspecies or botanical variety. The Appendices are reviewed routinely to ensure correct use of zoological and botanical nomenclature.

Membership of the Nomenclature Committee is voluntary. It comprises one zoologist and one botanist appointed by the Conference of the Parties, who work with other experts to fulfil the Committee's role. The Nomenclature Committee informs the Animals and Plants Committees of its progress at each of their meetings and reports at each meeting of the Conference of the Parties.

ANNEX 2: DEVELOPMENT AND METHODOLOGY FOR FIJI'S CORAL AND LIVE ROCK EXPORT QUOTA

The development of Fiji's coral and live rock export quota was based on the voluntary agreement of the Fiji Government with the CITES Standing Committee to adopt a quota system in 2003, consultations between stakeholders in Fiji and the Deputy Secretary General of the CITES Secretariat during a visit to Fiji in July / August 2003 and guided by the following Resolutions adopted by the Parties to CITES as well as one Notification issued by the CITES Secretariat in April 2003. Resolutions provide guidance to the Parties, but are not legally binding.

Resolution Conf. 11.10 (Rev CoP.12) *Trade in Stony Corals*, Annex I, provides the definitions for the various forms in which coral is traded, including as live rock.

Resolution Conf. 12.3 - Permits and Certificates, paragraph X: *Regarding permits and certificates for coral specimens*, RECOMMENDS that:

- a) ...
- b) ...
- c) Parties that authorize export of coral rock should:
 - i) establish an annual quota for exports and communicate this quota to the Secretariat for distribution to the Parties; and
 - ii) through their Scientific Authorities, make an assessment (which would be available to the Secretariat on request), based on a monitoring programme, that such export will not affect the role that coral rock has in ecosystems affected by the extraction of such specimens;

CITES Notification 2003/020 issued on 4 April 2003: *Trade in hard corals. List of coral taxa that can be recognized at species and at genus levels*, provides a list of 71 taxa of hard coral that are considered to be identifiable to species level, and 49 taxa where identification to genus level is acceptable but which should be identified to species level where feasible.

The full text of the Resolutions and of Notification 2003/020 are not included in this report, but may be found on the CITES website: www.cites.org

Methodology developed by the CITES Secretariat in consultation with stakeholders in Fiji is included on the following page.

The export quota for Live Rock was developed simply by reducing by 50% the previously allocated quota. The quota developed and applied from 1 August to 31 December 2003 is included on the page following the methodology.

In the absence of data to develop a robust scientific quota, this same quota developed initially for a period of 5 months was applied for successive 6-month periods from 1 January 2004 until the present.

Methodology for establishing the 2003 Coral Export Quota, 1 August to 31 December 2003.

(Based on 1 August 2003 consultation between the Deputy Secretary General of the CITES Secretariat, Department of Fisheries, Department of Environment, Environment Australia, TRAFFIC Oceania South Pacific Programme, Ed Lovell and Industry).

1. Actual exports for 2001 (live plus curio coral) provide the basic quota framework for 2003.
2. Zero quotas were established for the following species of concern, aided also by the decisions of the European Commission Scientific Review Group: *Blastomussa wellsi*; *Catalaphyllia jardinei*; *Heliopora coerulea*; *Hydnophora microconos*; *Leptastrea spp*; *Leptoseris spp*; *Leptoria phrygia*; *Scolymia vitiensis*; *Symphyllia spp*.
3. Where 2003 exports already exceeded actual exports in 2001, the remaining quota for 2003 is determined as follows: $(1.5 \times 2003 \text{ exports})$ minus 2003 exports, and then rounding down for most cases. Species / genera where this formula has been applied: *Polyphyllia talpina* (163); *Trachyphyllia geoffroyi* (1000); *Montastrea spp.* (5); *Montipora spp.* (700).
4. A total remaining quota for 2003 of 100 specimens for the species *Pachyseris rugosa* and *P. speciosa* (to be divided between the two species) was allocated.
5. The total 2003 quota for *Acropora spp.* was calculated by adding the curio quota (19,978) to the figure for 2003 exports to date (28,202). Number of specimens that can be traded for the remainder of 2003 : 19,978 pc (live or curio).
6. The total 2003 quota for *Pocillopora spp.* is 52,381 specimens. The earlier quota (2003) was 37,687 specimens. To date, only 3,202 specimens have been exported. The quota will be reduced to demonstrate to the international community Fiji's commitment to a precautionary approach, and to reflect a figure closer to estimated trade volumes for 2003.

Fiji's Coral and Live Rock Six-Month Export Quota

ANTHOZOA		
<i>Acropora</i> spp.	48 180	pieces, live or dead
<i>Acrhelia horrescens</i>	14	pieces, live or dead
<i>Blastomussa wellsi</i>	-	pieces, live or dead
<i>Catalaphyllia jardinei</i>	-	pieces, live or dead
<i>Caulastraea</i> spp.	2 150	pieces, live or dead
<i>Cynarina lacrymalis</i>	-	pieces, live or dead
<i>Dendrophyllia</i> spp.	-	pieces, live or dead
<i>Distichopora</i> spp.	73	pieces, live or dead
<i>Echinopora</i> spp.	30	pieces, live or dead
<i>Euphyllia ancora</i>	200	pieces, live or dead
<i>Euphyllia cristata</i>	78	pieces, live or dead
<i>Euphyllia glabrescens</i>	3 000	pieces, live or dead
<i>Euphyllia yaeyamaensis</i>	200	pieces, live or dead
<i>Favia</i> spp.	1 063	pieces, live or dead
<i>Favites</i> spp.	2 538	pieces, live or dead
<i>Fungia</i> spp.	6 233	pieces, live or dead
<i>Galaxea astreata</i>	303	pieces, live or dead
<i>Galaxea fascicularis</i>	800	pieces, live or dead
<i>Goniastrea</i> spp.	1 801	pieces, live or dead
<i>Goniopora</i> spp.	1 430	pieces, live or dead
<i>Heliopora coerulea</i>		pieces, live or dead
<i>Hydnophora exesa</i>	331	pieces, live or dead
<i>Hydnophora microconos</i>		pieces, live or dead
<i>Hydnophora rigida</i>	3 000	pieces, live or dead
<i>Leptastrea</i> spp.	-	pieces, live or dead
<i>Leptoria phrygia</i>	-	pieces, live or dead
<i>Leptoseris</i> spp.	-	pieces, live or dead
<i>Lobophyllia</i> spp.	4 889	pieces, live or dead
<i>Merulina ampliata</i>	1 500	pieces, live or dead
<i>Merulina scabricula</i>	317	pieces, live or dead
<i>Millepora</i> spp.	3 217	pieces, live or dead
<i>Montastraea</i> spp.	15	pieces, live or dead
<i>Montipora</i> spp.	2 152	pieces, live or dead
<i>Mycedium elephantotus</i>	724	pieces, live or dead
<i>Oxypora</i> spp.	-	pieces, live or dead
<i>Pachyseris rugosa</i>	170	pieces, live or dead
<i>Pachyseris speciosa</i>	173	pieces, live or dead

FIJI'S NON-DETRIMENT FINDING METHODOLOGY FOR EXTRACTION OF AND TRADE IN MARINE AQUARIUM SPECIES

<i>Pavona</i> spp.	3 469	pieces, live or dead
<i>Pectinia</i> spp.	605	pieces, live or dead
<i>Platygyra</i> spp.	2 758	pieces, live or dead
<i>Plerogyra simplex</i>	1 200	pieces, live or dead
<i>Plerogyra sinuosa</i>	205	pieces, live or dead
<i>Pocillopora</i> spp.	33 202	pieces, live or dead
<i>Polyphyllia talpina</i>	489	pieces, live or dead
<i>Porites</i> spp.	2 617	pieces, live or dead
<i>Scolymia vitiensis</i>	-	pieces, live or dead
<i>Seriatopora hystrix</i>	2 822	pieces, live or dead
<i>Seriatopora caliendrum</i>	-	pieces, live or dead
<i>Stylaster</i> spp.	480	pieces, live or dead
<i>Stylophora</i> spp.	6 281	pieces, live or dead
<i>Symphyllia</i> spp.	-	pieces, live or dead
<i>Trachyphyllia geoffroyi</i>	3 167	pieces, live or dead
<i>Tubastraea</i> spp.	771	pieces, live or dead
<i>Tubipora musica</i>	5 436	pieces, live or dead
<i>Turbinaria</i> spp.	7 398	pieces, live or dead
Live rock	716 040	Kilogrammes

ANNEX 3: TRAFFIC – THE WILDLIFE TRADE MONITORING NETWORK

TRAFFIC is the world's largest wildlife trade monitoring network and is a joint programme of WWF and IUCN -The World Conservation Union. TRAFFIC's mission is to ensure that trade in wild plants and animals is not a threat to the conservation of nature. TRAFFIC believes that sustainable trade in wildlife and their derivatives and products that is conducted legally and based upon the best available science can benefit local communities and national economies. TRAFFIC has 22 offices including seven regional offices around the world and programmes currently under development in South Asia and West/Central Africa. TRAFFIC was established by the IUCN Species Survival Commission in 1976 primarily to assist in the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which came into force in 1975. This still remains a key focus for TRAFFIC - and one that is enhanced through TRAFFIC's Memorandum of Understanding (1999) on CITES capacity building with the CITES Secretariat, Geneva, Switzerland. TRAFFIC also works in diverse fields from addressing trade and sustainable development issues at the local level to working on issues of governance through collaboration with key stakeholders in the major resource sectors, for example fisheries and timber. Through its pioneering work in the medicinal resource sector in some countries, TRAFFIC has established effective channels of communication with the traditional medicine industry from the grass roots level up to the policy and decision makers at the national, regional and international levels. The head office of the TRAFFIC network is in Cambridge, UK.

TRAFFIC Oceania

The TRAFFIC Oceania regional programme, based in Sydney, covers 24 countries and territories in the South Pacific region. TRAFFIC Oceania, established as a national programme in 1984, became a regional programme in 1987. TRAFFIC Oceania has a diverse programme addressing a wide variety of wildlife trade issues but with a particularly active marine and fisheries programme. Prior to the establishment of the TRAFFIC Oceania South Pacific Programme, TRAFFIC Oceania has carried out a number of projects in the South Pacific including a study on marine invertebrates in trade (1995) and also a study on the trade in Agarwood / gaharu *Aquilaria sp.* and *Gyrinops sp.* (2001). This study, conducted with WWF in Papua New Guinea broadened not only the understanding of the unregulated nature of much of the harvest and trade affecting this valuable non-timber forest product, but also the potential it offers as a long-term resource if it can be sustainably managed. Information collected thus far has also shown unequivocally that most of the benefits are not being retained by local resource owners and more recent information points towards a decline in the quality and quantity of agarwood from PNG.

TRAFFIC Oceania South Pacific Programme

TRAFFIC Oceania established the South Pacific Programme in February 2003, located within the offices of the WWF South Pacific Programme in Suva, Fiji. The main focus of the TRAFFIC Oceania South Pacific Programme is to work with government and other stakeholders to build capacity to implement CITES within the region, with a particular focus on Fiji. In this context, key areas of collaboration between TRAFFIC and government include development and implementation of CITES implementing legislation, facilitating the development of non-detriment / adaptive management frameworks to ensure that harvest and export of coral, etc., is conducted legally and within sustainable levels, and addressing permitting and reporting requirements. TRAFFIC Oceania SPP and the TRAFFIC network also are well placed to provide guidance and assistance on regulations at the international level which may influence trade into and from the Pacific region - such as the wildlife trade regulations of the European Union, and to facilitate liaison between the government, the CITES Secretariat, academic and scientific bodies, etc.

Biodiversity hotspots identified by WWF, referred to as Ecoregions, also are a focus for TRAFFIC's work in the Pacific. External threats to biodiversity in these ecoregions - (including in the Fiji Islands Marine Ecoregion) can have serious negative impacts on species and, in some cases, are the key factor threatening the resource. With offices located in key trade centres around the world, and with the establishment and co-location of TRAFFIC with the WWF South Pacific Programme, TRAFFIC is well placed to work with WWF and other partners to identify and address emerging issues of conservation concern that can otherwise be difficult to identify until the effects of unsustainable rates of exploitation become all too apparent.

TRAFFIC Oceania South Pacific Programme is funded by the Foreign and Commonwealth Office of the British Government.

For further information on TRAFFIC Oceania South Pacific Programme contact :

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Representative, TRAFFIC Oceania South Pacific Programme
c/o WWF South Pacific Programme, Fiji Country Programme Office
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General Tel: (67 9) 331 5533
Fax: (67 9) 331 5410
Email: robpjones@wwfpacific.org.fj

Further information about TRAFFIC is available at : www.traffic.org

ANNEX 4: PARTICIPANTS WHO ATTENDED THE WORKSHOP

Government Department / Organisation, etc	Name
Minister of Fisheries and Forests	Konusi Yabaki
Acting Director of Fisheries and Chair of the workshop	Saimoni Tuilacala
Principal Environment Officer, DoE	Manasa Sovaki
CITES Officer, DoE	Sharelle Hart
Environment Officer, International Waters Programme	Sandeep Singh
Ministry of Tourism	Manoa Malani
Fijian Affairs Board	Alivereti Bogiva
Department of Fisheries	Aisake Batibasaga
Department of Fisheries	Priti Singh
Peace Corp, Dept. Fisheries / USP - FLMMA	Prof. Jim Reynolds
Institute of Applied Science, USP	Bill Aalbersberg
MSP / USP	Monifa Fiu
MSP / USP	Dilpreet Kaur
IAS / MSP	Alifereti Qauqau
IAS / MSP - FLMMA	Make Liku Movono
IAS / MSP	Alifereti Tawake
IAS / MSP	Semisi Meo
IAS / MSP	Akuila Cakacaka
IAS / MSP	Ron Vave
FSPI	Hugh Govan
FSPI	Ellie Delaney
SPREP	Miriam Philip
TRAFFIC Oceania South Pacific Programme	Rob Parry-Jones
South Pacific Community (SPC)	Being Yeeting
Wildlife Conservation Society (WCS) & CITES Scientific Council NGO rep	David Olson
Industry representative	David Oliver
Industry representative	Tim McLeod
WWF SPP	Etika Rupeni
WWF SPP	Daniel Afzal
WWF SPP	Aliti Susau
Marine Aquarium Council (MAC)	Paul Holthus
Marine Aquarium Council (MAC)	Cherie Whippy-Morris
Marine Aquarium Council (MAC)	Michelle Lam
Marine Aquarium Council (MAC)	Ron Lilley
Chair, Coral Trade Working Group of CITES Animals Committee	Vin Fleming
Reef Check	Gregor Hodgson
Consultant (fish)	Helen Sykes
Consultant (corals)	Ed Lovell
USP	Tim Pickering

ANNEX 5: LIVE ROCK WORKING GROUP OUTPUT

Chair: Monifa Fiu (USP)

Members: Aisake Batibasaga (Department of Fisheries), Akuila Cakacaka (USP), Vin Fleming (CITES Coral Working Group), Dilpreet Kaur (USP), Make Movono (USP), Aliti Susau (WWF), Paul Holthus (MAC).

Issues for consideration

- Potential phasing out of live rock mining to shift towards cultured live rock
- Ensuring sustainable livelihoods for communities
- Capacity building processes
- Communication processes and networks

Research questions which need to be asked in terms of non-detriment findings for live rock

1. Assessment of the live rock resource which is available for harvest
2. What is the impact of mining wild live-rock vs cultured live rock?
 - Priorities-impacts on food fish and shore line erosion
 - Impacts on ecosystems
 - Socio-economic impacts
3. How much information is already available on potential ecological impacts of wild and cultured live rock production
 - Monitoring?
 - How can we monitor?
 - Do we have methods (existing methods/users)
 - Who will undertake monitoring?
4. Management of collection and best practice for collection

Harvest of wild live rock

Issue	Current available information	Further research or information required
1) Assessment of resource available for harvest Methods	<ul style="list-style-type: none"> • Export records • History of extraction 	<ul style="list-style-type: none"> • Imagery+ground truthing→habitat based resource assessment at a site
2) Impacts Assessment, monitoring & methods	<ul style="list-style-type: none"> • Impact of harvest regimes on-going (Methods: IAS/WWF) • Impact on fish groups (Methods: IAS/WWF) 	<ul style="list-style-type: none"> • Amount of live rock that can be extracted per location with minimal impact (includes knowing recovery rate of coralline algae covered rock) • Successional changes of benthic assemblage • Wider ecosystem impacts/coastal dynamics/socio-economic?
3) Site management	<ul style="list-style-type: none"> • Arbitrary quota (extraction vs export?) • Community controls - No take areas, management plans (ICM, FLMMA, Tourism) 	<ul style="list-style-type: none"> • Site-based quota: management plans for all iqoliqolis and the total of all the site-based quotas = national quota
4) Collection practices	<ul style="list-style-type: none"> • Rotation of collection sites • Assessment of collection techniques (eg consider phasing out the use of crowbars) 	<ul style="list-style-type: none"> • Live/coral rock rejection rate (byproduct) • Return byproduct to reef? • Define industry responsibility for best collection practices: eg training, licensing of collectors • Weighing rock at collection sites (including byproduct) • Industry to purchase all rocks extracted • Differentiate between 'live rock' and 'coral rock' • What method of extraction to use if use of crow bars phased out?

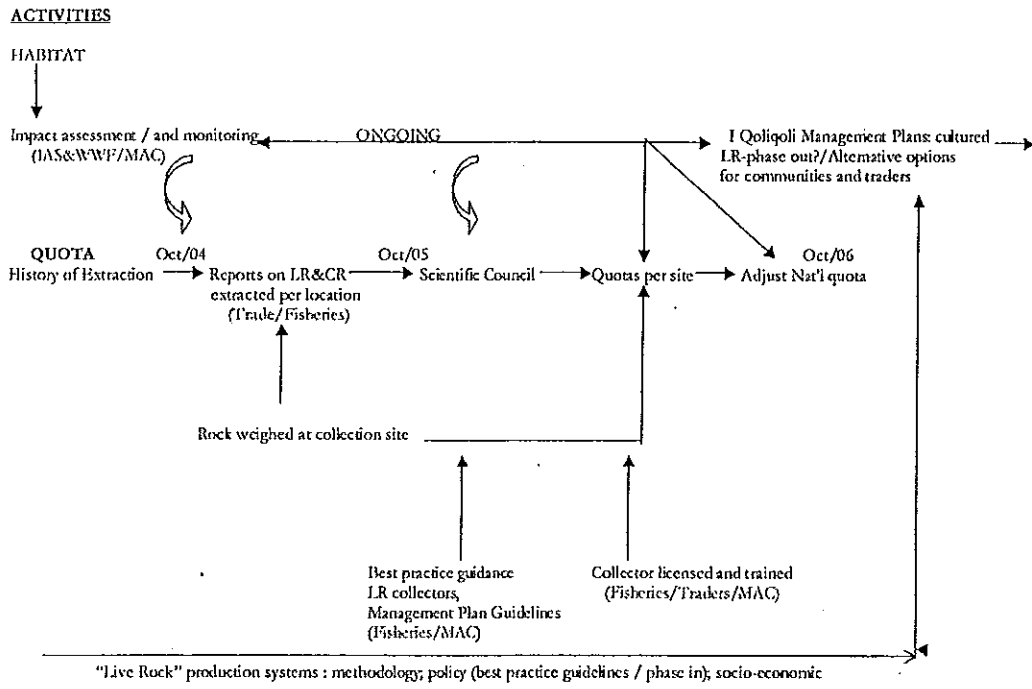
Cultured live rock

Issue	Current available information	Further research or information required
1) Assessment of sites to establish cultured rock production	<ul style="list-style-type: none"> Some production sites already (15 farms WSI) 	<ul style="list-style-type: none"> Availability of sites/habitat suitable for culturing Availability of raw materials Impact of harvesting raw materials for production
2) Impacts of cultured rock production	<ul style="list-style-type: none"> Generic impacts of beach removal known 	<ul style="list-style-type: none"> Projected impacts of raw material extraction: eg EIA for sand extraction Impacts (+ve and -ve) on reef ecosystem of rock culturing Socio-economic impacts (employment/income)
3) Site management	<ul style="list-style-type: none"> Methods for culturing known 	<ul style="list-style-type: none"> Site management plans / zonation for placement for culturing live rock
4) Best practice	<ul style="list-style-type: none"> Some production sites already (WSI) 	<ul style="list-style-type: none"> Techniques for other operations eg at a smaller scale or village level Potential improvements to current culturing systems and techniques

Wild vs cultured rock (eg potential phase out of wild rock)

Pros	Cons	Mechanisms to address potential negative impacts
<ul style="list-style-type: none"> Ecosystem impact of wild harvest minimized 	<ul style="list-style-type: none"> Loss of employment 	<ul style="list-style-type: none"> Alternatives – ecotourism (coral farm visit/cultured corals) Maintain max number of jobs with culturing Address in Integrated Coastal Management (ICM)
<ul style="list-style-type: none"> Support from operator currently culturing live rock 	<ul style="list-style-type: none"> Potential opposition from other members of industry Ecological impacts of raw material extraction 	<ul style="list-style-type: none"> Educate consumers EIA/ICM for resource extraction
	<ul style="list-style-type: none"> Loss of community control 	<ul style="list-style-type: none"> Fisheries to raise awareness in local communities so community makes informed decision regarding their involvement in culturing rock
	<ul style="list-style-type: none"> Loss of regulatory control over production 	<ul style="list-style-type: none"> Licensing arrangement for culturing of rock.
	<ul style="list-style-type: none"> Community capital investment required but risk of collapse if all involved 	<ul style="list-style-type: none"> Fisheries support for community involvement in cultured rock
	<ul style="list-style-type: none"> Creation of monopolies within industry 	<ul style="list-style-type: none"> Regulation or policies by Department of Fisheries
	<ul style="list-style-type: none"> Variable customer / market demand for quantity of cultured rock. 	<ul style="list-style-type: none"> Marketing/awareness raising
	<ul style="list-style-type: none"> Shift of wild harvest to other countries 	<ul style="list-style-type: none"> Raise in regional fora

FIJI'S NON-DETRIMENT FINDING METHODOLOGY FOR EXTRACTION OF AND TRADE IN MARINE AQUARIUM SPECIES



ANNEX 6: CORAL AND CORAL PRODUCTION SYSTEMS WORKING GROUP OUTPUT

Initial Discussion

- Importance of NDF process
- Many initiatives already in progress
- Scientific Council wants to see progress in development of non-detriment finding methodology and a scientific basis to the quotas used in permitting the aquarium trade.
- Quotas are a means of assessing and facilitating trade and therefore are useful as a tool/overall goal. Quotas need to be validated or trade will stop.
- TRAFFIC report - Ed wrote a ranking system and points system based on area, abundance, life history/ecology/reproduction. This could be a useful basis for the quota review group to transform information into quotas. The method needs review and improvements made to the weighted ranking system.
- Indonesia workshop report and recommendations such as best practices for industry is a useful resource that can be utilized by Fiji
- Need 2-3 years need to come up with answers

Research questions to be considered

- Stock assessment of CITES categories for NDF
- MAC: baseline and monitoring
- Key research questions (potential MSc) – population dynamics of a proxy set, colony size, growth rates, sustainable harvest, comparison of control and collection areas
- Priority spp list – negative opinion list of species for research focus
- Fixing coral distribution list for Fiji (must be published in literature for European Community), publish in local journals @ USP is a quick way
- Need to review literature and synthesise existing information. This requires funds, TOR, coordinating body. Most information is contained in unpublished sources such as EIA reports, research by Ed Lovell etc. TRAFFIC report has extensive reference list and is a good start.

What do we know now?

- TRAFFIC report and reference list
- Industry monitoring/stats extensive – should be heavily involved and can provide support. Monitoring should take advantage of industry info, customs info, US import info

Further research or work required (what do we need to know?)

- Institutional framework? Enforcement of legislation/guidelines needs improvement – regulatory group with fines, Fiji bylaws
- Regulatory framework – limits to # of collectors, companies, expansion?
- Best practices for collectors (at the field level) – for example if MAC establishes a limit of 1% waste -
- Better training and review of collection practices and punitive measures need to be in place
- Density of organisms at a national level, national distribution map (national marine habitat map) - look at limited distribution species?
- Control Impact density studies
- Growth rate info focused on key list of species – top 10-15 corals concerned about
- Size-age information
- Habitat-species relationships
- Information on natural mortality in age classes – resurrect forestry models
- Info will help determine what level of harvest is sustainable?
- Socioeconomic parameters – benefits, people involved governance capacity at multiple scales – traditional and Government systems, Industry role? Exploration of co-management options with Fishers
- Need short term, medium term, long term questions
- Info of what's being exported at species level – need to find this from pack list

- Exporters should be keeping subcategory (e.g. Acropora lifeforms) list of what is exported, annual review
- Quota development with existing data/information

Methods that can be utilized

- MAQTRAC – answers Control/Impact
- Need to modify size-freq component – Ed and GH
- Socio-economic methods, many out there and already in use (SOCMON), Fiji LMMA experience, USP socio-economic expertise
- Cost-benefit analysis, income levels, etc. - imminent SPREP study (MAC/FSPI/SPREP study in collection areas)
- Need to go thru species list and identify species that are NOT picked up by MAQTRAC, i.e. species in seagrass, inverts - what methods can be used to assess these species
- YPR and/or density estimates

Implementation/ who will do it?

- Need for rigorous taxonomic training, regular biannual tax training – testing and certification for courses (may take over 1 year of follow up revision and training)
- Need for statistical / analytical training – stock assessment
- Approx 10+ people with various levels of training available in Fiji
- Greater Socio-economic training for biologists and specialists
- Training within framework of existing projects to ensure that training is used
- Need for management committee or taskforce? Or lead organization?
- Part of MAC mandate, WWF small component of mandate – danger in source of funding – transparency is important
- Government role – few human and financial resources! MoF can lead with delegation to various partners (MAC, USP, WWF, TRAFFIC)
- Break up of tasks and who can do each component - what is the capacity of each org?
- How many people available with the range of skills to be able to complete body of work

Coral aquaculture

- NGO, research institutes need to promote/require aquaculture of coral culturing products
- Community based low-tech coral culturing with industry involvement/support
- Explore tourism aspects of coral farming
- Within framework of LMMA and alternative livelihoods
- Look into regulations concerning collection of corals for septic systems
- Capture and culture of larval coral - research priority

Other recommendations

- Best practices – for example, collection should be set at a 15m depth limit

Funding

- Piggy back on existing studies, i.e. fisheries 400+ studies, WWF/WCS/Wetlands other NGO surveys
- Potential donors: SPREP, SPC, UNDP/IWP

FIJI'S NON-DETRIMENT FINDING METHODOLOGY FOR EXTRACTION OF AND TRADE IN MARINE AQUARIUM SPECIES

Note: Government departments and organizations noted in the table below were suggestions put forward by participants and do not represent a commitment to undertake such activities.

	Immediate	1 year	2-3 yrs
Coordinating team for NDF process establishment including quota review	Immediate (MOF&F/NGOs)		
Info / existing or historical data synthesis relevant to NDF re: ranking system	EL / USP		
Review of coral lists – species of special concern, negative opinion species, additional CITES categories	Immediate GH and EL		
Breakdown of corals into finer CITES categories / subcategories (e.g. Acropora)	Immediate GH and EL		
Develop Total Allowable Catch (TAC) for coral spp at collection sites using fisheries models		MAQTRAC/Reef Check	
Framework for quota development – review of ranking system (report to TRAFFIC Europe 2003), or other approach	Coordinating team		
Review of best practices for collectors – incorporated into Government guidelines		Fisheries / MAC	
Reviewing coral distribution and species list for Fiji – peer review paper		EL/USP	
Detailed export info review from Industry data (annual by numbers for all CITES categories) – MAC and non certified collectors	Fisheries + MAC		
- Taxonomic training - Socioeconomic training - Data analysis / interpretation training With Annual revision workshops (piggy back with existing training important)	ongoing		
- Collection area habitat maps - National marine habitat maps (GIS maps of collecting areas / habitats)	Collection area maps are immediate priority – MAC	National marine habitat map - WWF, WCS, WI, USP, SOPAC	
Control Impact density studies – at collection areas		Collection area management plan – MAC and potential MSc	
Habitat-species relationships			Potential MSc
Growth rate / size-age information			Potential MSc
Reproduction / natural mortality in age classes			Potential MSc
Socio-economic - Governance at multiple levels - Cost benefit analysis - Exploration of co-management options			Potential MSc
Look into regulations concerning collection of corals for septic systems	Sandeep		
Aquarium Fish Fiji data analysis (19 year data set)			Potential MSc

ANNEX 7: DRAFT RANKING SYSTEM DEVELOPED BY ED LOVELL, BIOLOGICAL CONSULTANTS LTD, FIJI

Ranking system:		Scale for the assessment of allowable numbers to be extracted from a particular collecting area, based on a field assessment which determines the size of the area and the numbers of species present	
	0%		0
	0.5%		8
	1%		15
	1.5%		25
	2%		50
	2.5%		100
	3%		150
Collecting Area Size:		Vulnerability to,	
	Very small - 1	Bleaching	0 to -3
	Small - 10	*Predators	0 to -1
	Medium - 25	Flooding	0 to -1
	Large- 50	Siltation	0 to -1
	Very large- 75		
State of luxuriance:		Relative Community Abundance:	
	Low - 1	Rare:	1
	Medium - 25	Uncommon:	2
	High- 50	Common:	3
		Abundant:	4
Colony form:		Reproductive:	
	Massive 5	Spawning mode:	
	Branching 10	Brooder	1
	Foliose 3	Fragmenter	2
	Solitary Fungi 1	Broadcast	3
	Collyria 1		
		Growth rate:	
		>15cm	6
		>10cm	5
		>5cm	4
		>2cm	3
		>1cm	2
		>0.5cm	1
* Predators, e.g. COT Crown of Thorns			

Examples:

- a) *Favia matthai*
1. Massive: 5
 2. Growth rate less than 2cm per year: 2
 3. Spawning mode: 3
 4. Community Dominance: 2
 5. Life span: long 5
 6. Vulnerability: Bleaching -3

7. Collecting area assessment:
- a. size - 10
 - b. state of luxuriance - 10

Total: 40 = 1.5 - 2% collection allowed of the standing crop as determined by a field assessment.

- b) *Acropora valida*
1. Branching: 10

FIJI'S NON-DETRIMENT FINDING METHODOLOGY FOR EXTRACTION OF AND TRADE IN MARINE AQUARIUM SPECIES

2. Growth rate more than 5cm per year: 4
3. Spawning mode: 3
4. Community Dominance: 4
5. Life span: long 3
6. Vulnerability: Bleaching (-3)
7. Collecting area assessment:
 - a. size: 75
 - b. state of luxuriance : 10

Total: 106 = 2.5% collection allowed of the standing crop as determined by a field assessment

ANNEX 8: FISH WORKING GROUP OUTPUT

Background

Although ornamental fish are not currently listed in the Appendices of CITES, the Fish Working Group considered that issues relating to fish should be considered in the development of a non-detriment finding (NDF) methodology as:

6. It is an opportunity to develop a method for management of the aquarium fish trade alongside other aspects of the aquarium trade;
7. The main concern of local communities regarding the aquarium trade is the potential effects on fish populations as a food source;
8. Fish can be used as indicator species in research studies;
9. The focus on fish research has been on food fish species and therefore there is little information known or available on ornamental fish species in Fijian waters; and
10. The Tourism industry wants tourists to be able to see ornamental fish and a healthy marine environment on their visit.

Under CITES the Fiji government is required to develop a non-detriment finding for the CITES species that are traded from Fiji. However the Fiji government can also choose to use NDF as a tool to manage other Fijian species that are traded such as ornamental fish. Information gained from research on ornamental fish will be useful for the Fijian government in its role of managing biodiversity and potentially in regulation of the trade.

Ornamental fish are defined as those collected specifically for the aquarium trade whereas food fish were considered to be those fish targeted by local subsistence fishing which may be affected due to collection of ornamental fish.

Development of a NDF for fish

Research questions that need to be considered

1. What are the impacts to fish populations caused by the collection of ornamental fish?
2. What are the impacts to fish populations caused by collection of live rock?
3. What are the impacts to fish populations caused by collection of corals?
4. What information do we know and need to know about the life histories and cycles of key fish groups and species of special concern?

Assessments of live rock (Question 2) and coral collection (Question 3) should include basic fish assessments, according to the listing criteria that will be developed. The research required to assess the ecological disturbance caused by live rock and coral collection on fish populations will be very similar however different criteria may be required in selecting species for survey and assessment. For example criteria for fish affected by live rock collection would include basic food fish groups and species of sedentary habitat. Criteria for fish affected by coral collection would include fish dependant on certain coral types for food and habitat. These surveys would be relatively simple and could be carried out by less skilled personnel than surveys for collectable ornamentals (Question 1).

General issues for consideration

1. Collectors at different sites target different species of ornamental fish depending on the site habitat, market demand, number of fish and fish species present, skill of collectors etc. Therefore survey lists need to be site specific and the collection history of a site should be investigated.
2. How will information from research be translated for communities? Who is responsible for presenting information to the communities?
3. There is currently work underway regarding MAQTRAC methods and training in such methods with MAC, USP, and NGO staff.
4. Regular annual monitoring of sites is a fundamental component of NDF. Collection industry should have built in requirement to support monitoring (in kind support such as accommodation, dive costs etc).
5. Selection of sites due to habitat variability in in-shore surveys requires large areas.
6. Improvements are required to local capacity and training for Department of Fisheries officers. In the past the resources have not been available within the Department to conduct surveys and maintain skills. There may be potential for the Department of Fisheries Officers to train alongside Coral Cay? As part of research team aquarium collectors (with guidance) can provide excellent input to survey teams.
7. First task is to collate the available and existing information from published and unpublished sources so that it is possible to have an accurate understanding as to what further research is required. How to access unpublished information and research that has been conducted? Trace research permits?

FIJI'S NON-DETRIMENT FINDING METHODOLOGY FOR EXTRACTION OF AND TRADE IN MARINE AQUARIUM SPECIES

8. Data needs and issues of data confidentiality or ownership.
9. Potential sources of information include:
 - o SPC-compiling a regional database on information (store of research papers) on food fish. SPC are trying to build a database of export/imports/survey data within the Pacific Region to try to develop an interactive database so that countries can enter and access data.
 - o Ruben: database?
 - o PIMRIS is a formal marine information networking system (of regional institutions and Pacific Island countries) devoted to the collection, storage, retrieval and dissemination of information on fisheries and other living and non-living marine resources in the tropical Pacific.
10. Potentially a community questionnaire could be used to obtain information about fish catches pre and post harvest.

Development of non-detriment finding methodology for fish

Research question	What we know now (studies that have been implemented)	What do we need to know or what needs to be done?	Methods
What are the impacts to fish populations caused by the collection of ornamental fish?	<ul style="list-style-type: none"> Philippines: recovery rates from collected areas once designated reserves Hawaii: Impacts of collection Palau: Have assessed their fishery Christmas Island: Difference in age classes of targeted species between collection and non-collection areas Vanuatu: Will be published to assess impacts of aquarium trade. In addition baseline survey of collection regions (for MAC certification). Fiji: Sept-Nov 2002 (Helen and students) Comparison of collection/non-collection areas, demonstrated scale of survey need to get information (cf anecdotal perceptions). Fiji: A number of food fish studies potentially useful in terms of measuring other disturbances (including Dept of Fisheries). Info from PLMMA and USP? Fiji: Coral Cay and Greenforce-baseline fish surveys, other surveys done for EIA or other purposes (eg Helen has other survey data, others???) Fiji: WWF/visiting researchers baseline surveys in non-collection areas eg Kadavu, Vanua Levu potentially could be traced through research permits. How else can we access or collate this information? Fiji: Information from traders on exports/collection data (FMACC) 	<ul style="list-style-type: none"> Priority action is to develop selection criteria for fish species to be surveyed. How do we select the species we want to look at? Species survey lists need to be site specific as collectors exert different collection pressures at different sites. Must use historical and catch data. As a part of this will need to be some assessments of life histories of key families. Criteria will be tiered according to those which are applicable at the global, regional and national level. Centralised database of baseline fish studies (process established with Fisheries, Iqoligoli monitoring committee for documenting research as part of permit requirements, reporting back). Information from Fijian and overseas studies to be collated. What is the temporal and spatial scale of fish communities (time series data to address impact of collection). Resettlement and normal turnover rates, if aim towards rotational harvest, how long does an area take to recover from collection, if rest an area what is the minimum size to achieve recovery. (Note: coral reef symposium connectivity research). 	<ul style="list-style-type: none"> Utilise MACTRAQ method and build on with local input: MACTRAQ has a list of 77 species, but these aren't all found or collected in Fiji. Work through why species selected and look at criteria and find a local equivalent to fulfill the criteria. Must consider species targeted within aquarium trade.
What are the impacts to fish populations caused by collection of live rock?	<ul style="list-style-type: none"> Fiji: Muivuso 2 surveys (one in 2000, one in 2003-Samasoni Sauni). Sig difference in fish species diversity in non-collected area (food fish). Fiji: Make Chetodons and Blennies, small pilot study (to be repeated at a larger scale) Ongoing: Reefcheck Food Fish but also Chetodon and Blennie, Make project. Newcastle group: Nick Dulvy fish populations in fishing grounds and non-fishing grounds (food fish) in collection areas. Anecdotal-perceptions in local communities as to impacts (careful use only but potentially useful in developing questions for a site), also a role in understanding historical use. Coral mining studies: 	<ul style="list-style-type: none"> Priority: To determine the effect of live rock extraction on habitat (fish transects, comparisons of food fish data in collection/non-collection areas noting some zoning is occurring). Look at coral mining in terms of methodologies and also need to integrate with studies of live rock working group. Short Term: Develop simple criteria for indicator species (highly dependant on formation/shape of habitat, locally important fisheries), species that are easy to see/identify etc (Note: not many aquarium species on live rock reef flat). Actual fish monitoring is 	<ul style="list-style-type: none"> Add list of appropriate fish to existing transects being carried out for assessment of Live Rock collection. Methods are available to conduct assessments.

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	<p>eg Sri Lanka, Maldives, Tanzania (reef flats and taken out as chunks)-need to consider as comparable (also useful for live rock to look at when looking at methodologies).</p> <ul style="list-style-type: none"> • Others? 	<p>occurring in areas of disturbance and non-disturbance. Coral Cay could be asked to assess fish and live rock disturbance on Coral Coast (belt transects beach out to edge method, cross-section of reef, using Reefcheck based method, can add species to their list). Not looking specifically at aquarium fish but a lot of the species on their list relate to butterfly fish, damsels etc by default and willing to add any other species for criteria.</p> <ul style="list-style-type: none"> • Link into research of postgraduate students (IAS, overseas Universities conducting studies in Fiji etc). Funding required. 	
<p>What are the impacts to fish populations caused by collection of corals?</p>	<ul style="list-style-type: none"> • Not aware of any studies assessing changes in aquarium fish and coral collection. 	<ul style="list-style-type: none"> • In Fiji need to look at coral and fish on the same sites, running fish collection sites, control sites and coral collection sites (where fish are not collected). Follow same transects for fish and coral. • Once again spatial scale and temporal variability will need to be assessed. • Also need to integrate with studies of coral working group. • Essentially same points as for Live Rock collection, but would involve different criteria and require SCUBA assessment rather than snorkel work as done for Live Rock. 	<ul style="list-style-type: none"> • Add list of appropriate fish to existing transects being carried out for assessment of coral collection. • Methods are available to conduct assessments.
<p>What information do we know and need to know about the life histories and cycles of key fish groups and species of special concern?</p>	<ul style="list-style-type: none"> • Fishbase could be used as a guide • Encourage some student focus on assessment of life histories targeting ornamental especially key family groups (pelagic breeders vs benthic). Damselfish (targeted heavily in Fiji), Chaetodonts, Gobies, Blennies, Endemics. Information is available from overseas literature however need to concentrate new research on species of special concern. 	<ul style="list-style-type: none"> • Longer term studies to improve overall understanding of ornamental fish biology, which will be able to provide more robust information/understanding to inform quota development eg otolith studies to determine fish age/growth parameters, re population spread. However not priority research in the first instance. Such studies are useful as discrete University student projects. 	

ANNEX 9: SOCIOECONOMIC WORKING GROUP OUTPUT

Approach utilized by the Working Group

In developing a non-detriment finding methodology for species traded by the aquarium industry, socioeconomic issues need to be considered in relation to management of the industry as a whole as well as individual operations. The working group considered the current government management of the industry and potential areas for further review or development.

The working group has proposed processes to ensure that the permit approval process is robust and assists in achieving a sustainable industry.

Policy Considerations

1. National policy options for the aquarium trade should undergo the Strategic Environmental Assessment process for consideration by the Fiji Islands Scientific Council
2. Site based work should undergo Environmental Impact Assessment reflecting the intent of the Draft Environmental Management Bill

Socioeconomic issues to be considered in the development of a non-detriment finding

1. Occupational health and safety of collectors and those working in the industry
2. Alternative values for the resource being utilized by the aquarium trade (species)
3. Alternative values for the habitat from which the resource is extracted (site)
4. Alternative values for the cultured/grow out site
5. Employment option impacts eg traditional obligations
6. Capacity for operators and community and government to implement management practices
7. Flow of economic benefits from operators to community:
 - a. Royalties
 - b. Employment
 - c. Fair price for the resources
 - d. Intergenerational sharing of these benefits.
8. Cost to government to implement management practices
9. Transaction costs analysis

Role of Government

Current fee structure for government services

- Collector/resource owner pay 6 FJD per year for license to collect resource (Fisheries)
- Exporter:
 - o Royalties to community through negotiations with Chief
 - o CITES registration fee 1000 FJD per year under the *Endangered and Protected Species Act 2002* (ESP Act)
 - o Consignment permit for export 30 FJD per consignment (ESP Act)

Permitting processes

Fiji Trade and Industry Board (FTIB) evaluate any proposals by investors or exporters that want to establish a business interest in Fiji. If the proposal is relevant to living aquatic resources, it is referred to the Department of Fisheries. However there are currently no guidelines for the review of aquarium trade proposals by the Department of Fisheries.

A Fisheries export permit is required for the export of all living aquatic resources from Fiji. If a species is listed on the CITES Appendices, a CITES permit is also required.

Conditions of Fisheries permits for extraction/export

1. Trader to get consent from resource owner
2. Consent then sought by resource owner from Province, which informs the Commissioner
3. Once consent granted by the Commissioner, the Department of Fisheries is able to consider export permit applications

There are currently no designated resources for inspection of consignments at exit point, although officers from the Department of Fisheries currently endeavour to inspect consignments.

Issues for consideration

1. The Fiji Islands Government needs to be responsive to changes within the aquarium trade industry.
2. There is currently no plan for strategic management of the trade or the aquarium trade industry in Fiji. Provincial and local leaders should approve management guidelines that are developed by the Fiji Government.
3. Outcomes of Strategic Environmental Assessment and Environmental Impact Assessment should inform the development of plan for strategic management of the industry.
4. Permits are not currently required for ornamental fish collection and officers from the Department of Fisheries are unsure how to manage these activities.
5. Details and information is required on:
 - o Export value of ornamental fish
 - o Export value of coral
 - o Stock assessment
6. The following management issues require further development:
 - o Management at the primary level
 - o Management at the export level
 - o Management to be flexible to changes within the industry

Review relationships and communication mechanisms between communities and industry – currently no facilitation process

Recommendations

1. Before any deal entered into with traders Roko should be involved in discussions and negotiations.
2. Terms of Reference for Environmental Impact Assessment should satisfy Marine Aquarium Council Collection Area Management Plan requirements.
3. Registration with the CITES MA is required prior to any activities being carried out. The MA can only register operators that meet the prescribed conditions. Such conditions could include MAC certification and compliance with national management plan for development of the industry.

Improving process for approving permits for extraction

Issue	Current steps	Proposed steps
Approval to operate in Fiji	FTIB – approval for a business to operate Fisheries has input into FTIB approval processes	FTIB
Deal is made between trader and community	Individual or CHIEP-royalties, where and quantity (this is who applies for the permit for extraction from fisheries) – decisions made here with no advice	Fisheries/Environment/independent 1. Initial consultation with community with TAB 75% of Qoli Qoli owners must give consent. 3. Stock assessment 4. Management plan (collection site description) 5. EIA (includes CITES considerations)
Consent Sought	Chief seeks consent from Provincial Office/Commissioner	Fisheries/trader
	Commissioner	Provincial office
	Fisheries	Qoli qoli Owners (Tikina, Village) Consultation Consent for go ahead
	Collection	Provincial consent
	Taken for Export	Commissioner consent
	Export/CITES permits given from Dept of Fisheries Fisheries for each consignment	Individual collection permits approved by Fisheries.

Actions required for inclusion of socioeconomic factors in NDF

Actions required	Responsible Party	Timing
<p>Socio Economics Analysis of industry Objective: Feasibility and socio-economic costs/benefits of culturing corals and live rock as an alternative to wild harvest.</p>	<p>FSPI in partnership with MAC.</p>	<p>To be finished by end of December 2004 (funding secured from SPREP).</p>
<p>Policy review of government processes For example-permit processes, linkages with Environmental Impact Assessment requirements, CITES requirements, options explored for development of Strategic Environmental Assessment and national strategic plan for management of the industry.</p>	<p>Departments of Fisheries and Environment. To some extent will be achieved as part of the Aquarium trade policy review and the review of the Fisheries Act.</p>	<p>To be finished in 2005.</p>
<p>Consideration of socioeconomic issues in NDF projects and processes Development of non-detriment finding methodology using outcomes of socio-economic and policy review and resource assessment activities proposed by the other Working Groups.</p>	<p>All</p>	<p>Yet to be determined.</p>

