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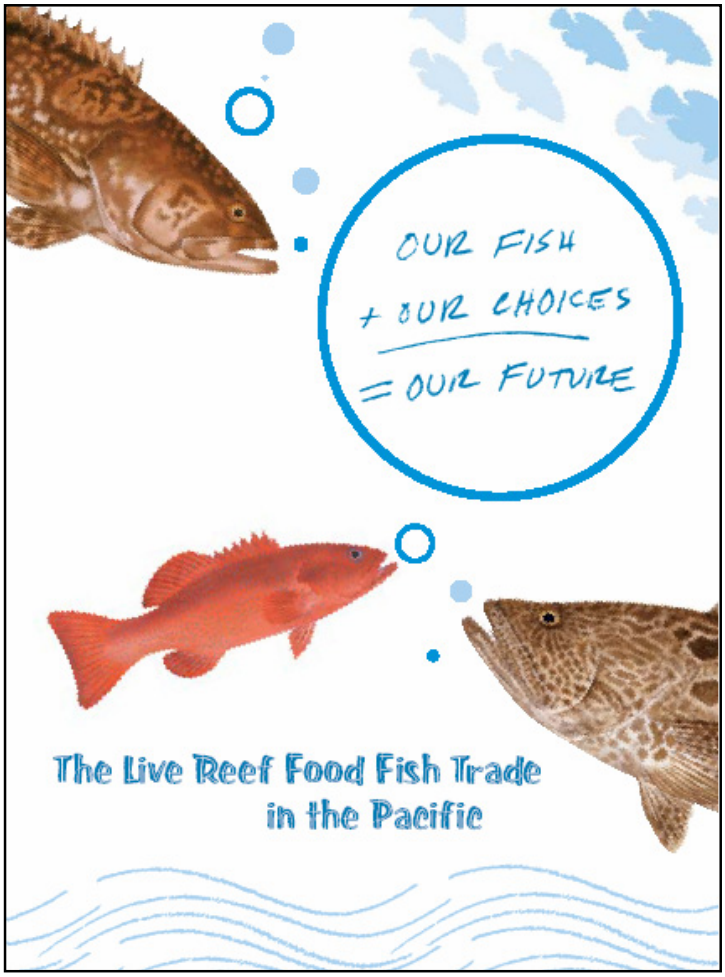
TNC Pacific Island Countries
Report No. 3/04

Pacific Live Reef Food Fish Trade (LRFFT) Project

Project Review



Pacific Island Countries Coastal Marine Program
The Nature Conservancy

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This project review would not have been possible without support from many quarters. First, we would like to acknowledge Tim Adams' contributions and thank the Marine Resources Division of the Secretariat of the Pacific Community for supporting his participation. Tim was both insightful and patient during occasional forays into Conservancy-speak. The Conservation Measures Group and Pacific Islands Countries Coastal Marine Program supported the hard costs of the review (airfare, hotel, etc.) as well as providing extensive staff time for participation in the review by Ian Dutton, Andrew Smith, and Paul Lokani. The Alaska Chapter of the Conservancy supported Randy Hagenstein's salary costs during the review. Shanrang Wenty, in the Conservancy's Palau Field Office, ensured a smooth review by handling logistics and arrangements. Finally, we wish to acknowledge and thank the many partners and staff we interviewed during the course of the review (see Appendix 3) who reached back far in their memory to give us their insights and perspectives.

Memories are never perfect, and perspectives of different players may vary widely and lead to alternative interpretations. The review team takes full responsibility for any misreporting, misrepresentation, or misinterpretation of the actual events that took place.

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Cover: Taken from Pacific Live Reef Food Fish Trade awareness pamphlet cover.

REVIEW SUMMARY

Title	**Review of the Pacific Live Reef Fish Food Trade Project**
TNC Operating Unit/Geographic Area(s)	Pacific Island Countries Operating Unit: Palau, Papua New Guinea, Federated States of Micronesia, Solomon Islands with reference to other Pacific Countries and Indonesia.
Thematic Focus	Abatement of destructive fishing threats from the live reef food fish trade at regional, national and site scales.
Chronology	
- **Initial Request**	Initially proposed during Asia Pacific & California Division meeting in February 2003.
- **Review Period**	April 14-20, 2004
- **Draft Submitted**	April 21, 2004
- **Report Complete**	July 2004
Principal Client(s)	***Internal:*** ♦ Pacific Island Countries Operating Unit program managers and senior management ♦ Marine Initiative managers ♦ Asia-Pacific Region Director ♦ Other Conservancy OU marine programs and multi-site project managers ***External:*** ♦ The Secretariat of the Pacific Community ♦ The David and Lucile Packard Foundation ♦ The Oak Foundation ♦ USAID + East Asia and Pacific Environmental Initiative ♦ Other conservation NGOs through a lessons learned publication
Team & Affiliations	***Leader***: ♦ **Randy Hagenstein** – Conservation Director, TNC Alaska Chapter, Anchorage, AK, USA (rhagenstein@tnc.org) ***Members:*** ♦ **Tim Adams** – Director, Marine Resources Division, Secretariat of the Pacific Community, Noumea, New Caledonia (tima@spc.int) ♦ **Ian Dutton** – Director, TNC Conservation Measures Group, Bethesda, MD, USA (idutton@tnc.org) ♦ **Paul Lokani** – Director, TNC Melanesia Program, Pt. Moresby, Papua New Guinea (lok.tnc@global.net.pg) ♦ **Andrew Smith** – Director, TNC Pacific Island Countries Coastal Marine Programs, Koror, Republic of Palau andrew_smith@tnc.org) [Pacific LRFFT Project Manager]

Principal Method(s)	Review of project documents, in-depth interviews of core team members in Palau, internal and external partner interviews by phone and in person.
Major Findings/Lessons	**5.1 OVERALL FINDINGS** ♦ The multi-scale strategy has been effective in reducing the threat to marine biodiversity posed by the LRFFT by creating the awareness and the regional and national capacity and alliances to address LRFFT operations.[1] ♦ By clearly and correctly defining the scale of the LRFFT issue, the Conservancy and partners were able to craft a strategic response and implement conservation actions at the scale of the problem. ♦ While we can't document and quantify direct impacts on marine biodiversity as a result of the LRFFT project, the collaborative strategy has reduced the pressure on key fish stocks, assisted in improving inshore fisheries management, and reduced related destructive practices in countries where TNC is active (and indirectly in countries where our partners work). ♦ The LRFFT project and associated strategies have positioned TNC as a credible and effective agent in marine conservation in the Pacific by developing enduring partnerships with national and regional agencies. We are much better placed to address regional-scale threats to marine biodiversity today than we were eight years ago. **5.2 Key Lessons** ♦ The MOU between TNC, SPC, IMA, and WRI played a critical role in formalizing relationships, clearly defining roles, and facilitating joint grants and cross-funding. ♦ TNC had the right key staff in place for the project that had the right experience and relationships in both national and regional management venues. Continuity of key staff (both within TNC and our partners) was also critical to the long-term success of the project. ♦ The LRFFT project would have benefited by additional capacity (at least one full time equivalent) to bring single-minded focus to this complex program. ♦ Clearly defined goals and milestones, with clear evaluation points, should have been included in the original strategic framework for the Conservancy's LRFFT project and the MOU. ♦ Annual "status of the LRFFT" meeting and report as a component of the MOU would have improved the ability

[1] While the threat posed by the LRFFT was reduced, it hasn't been eliminated. Changing economic conditions in China could allow this trade to rapidly reemerge as a regional threat to marine biodiversity. The LRFFT project has established a solid foundation and national/regional capacity to address a future surge in LRFFT activity.

of the project to adapt to changes in the LRFFT industry and performance by various parties under the MOU.

5.3 Recommendations

Project staff should develop a near-term follow-up plan as a result of the review to:

- Create a roadmap that articulates the bigger picture of how the LRFFT project has evolved—and continues to evolve—into efforts to conserve spawning aggregations (including linkages to MPA networks) and how leverage at the national and regional levels will occur through selected site level investments.
- Establish a new MOU with SPC (and potentially other partners) to guide collaboration around spawning aggregations, finalize and publish the generic management guidelines, where appropriate assist SPC's expanded involvement with other related fisheries management issues (e.g., spear-fishery of aggregations; other fishery impacts on LRFFT species), and create a contingency plan and triggering mechanisms in the event of expansion of LRFFT or related fisheries.
- Recommend to the Asia-Pacific Region management a review of the overall Asia-Pacific Integrated LRFFT strategy.
- Disseminate the findings of the review both internally (e.g., through an article in TNC@News; through the Conservation Measures Group and the Global Marine Initiative) and externally (e.g., as a case study article for an appropriate environmental journal; SPC LRF Bulletin).

5.4 Observations on the Review Process

- The review, including drafting the report occurred over seven working days. This was sufficient. Not all reviewers needed to be present during the drafting phase.
- The review period and location did not allow interviews of key players prior to drafting the bulk of the review report. Interviews in the middle of the review likely would have identified issues to address in the review, rather than after.
- The mix of internal and external reviewers was appropriate and effective – it enabled a lot of information to be processed in a very efficient manner and ensured that facts could be checked concurrently with the review process.
- Participation by key project staff familiar with all phases of the project was essential to provide perspective, present an overview of the project, and answer questions. This was much more efficient than digging through the universe of project documentation would have been. Having the project manager sort through documentation prior to the review to highlight the most important material was also a huge time-saver.

	♦ Preparation time to organize and prepare background documents, etc., was underestimated. This work has to be done by someone intimate with the project. (Contracting a person to compile a chronology and list of documents was attempted, but failed due to their unfamiliarity of the project and TNC.) ♦ The review team was elated that most of the writing was completed prior to getting on airplanes and being sucked back into the vortex of normal work obligations!
Total Cost	$39,975
- CMG Investment	$10,800
- Leverage & Source(s)	$29,175 (TNC Programs - $20,875; Partners - $8,300)

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ABBREVIATIONS AND ACRONYMS:

ADB	Asian Development Bank
ADB TA	ADB Technical Assistance
CMG	Conservation Measures Group (TNC)
FFA	Forum Fisheries Agency
FSM	Federated States of Micronesia
GEF	Global Environmental Facility
IMA	International Marinelife Alliance
LRFFT	Live Reef Food Fish Trade
MOU	Memorandum of Understanding
MPA	Marine Protected Area
PNG	Papua New Guinea
RMI	Republic of the Marshall Islands
SI	Solomon Islands
SPAG	Spawning Aggregation (esp. of grouper species)
SPC	Secretariat of the Pacific Community
SPREP	South Pacific Regional Environment Programme
TNC	The Nature Conservancy
WRI	World Resources Institute

1.0 INTRODUCTION

In the mid 1990s, The Nature Conservancy (TNC) recognized an emerging fishery—the live reef food fish trade (LRFFT)—that had severely impacted coral reef habitats and fish assemblages in Southeast Asia and was expanding into the island countries of the Pacific. The Conservancy responded by working with partner organizations to collaboratively design and implement a complex and comprehensive program to address this emerging threat to marine habitats and biodiversity. The overall Conservancy program included both "demand-side" strategies, primarily in Hong Kong, and "supply-side" strategies in Southeast Asia and the Pacific. This review focuses on the "supply-side" strategies, actions, and outcomes in the Pacific of the Conservancy program.

The LRFFT project was an eight-year investment in addressing a pervasive, emerging threat at multiple sites and multiple levels. From a conservation management perspective, these strategies represent one of the largest-scale, multi-site initiatives ever undertaken by The Nature Conservancy. Traditionally an organization that is very much place-oriented in its conservation activities, the Conservancy recognized that effective conservation action to address such a significant threat must be nested within a broad response framework operating at multiple levels from reefs to international markets and involving multiple partners. As such, the project provides an outstanding learning opportunity for the Pacific Island Countries program staff, for key partners involved in addressing the LRFFT, and for the Conservancy overall.

The specific purposes of this review are three-fold: First, the review provides a formal opportunity for project staff to better understand and assess what went well and what went awry in the project and better understand causes and effects to improve performance in future large, complex projects. The review may also allow Pacific Island Countries Program staff to communicate to donors, partners, and Conservancy leadership the effectiveness of conservation efforts in the Pacific Island Countries program. The review provides a similar opportunity for key partners, especially the Secretariat of the Pacific Community (SPC), in assessing the effectiveness of some of the fisheries management aspects of the Initiative.

Second, the review provides an opportunity to distill more general lessons of value to staff throughout the Conservancy (and potentially other conservation and natural resource management practitioners). These key findings and recommendations should improve how we conceptualize, plan, and implement projects at a similar scale and of comparable complexity.

Finally, the review is an opportunity to learn from, improve upon, and distill best practices on *how* the Conservancy conducts project reviews. This review is an early experiment in reviewing the effectiveness, efficiency, and sustainability of a conservation endeavor within the Conservancy. We hope future review teams can learn from our process, improve on our efforts, and avoid mistakes we may have made.

2.0 EVALUATION METHODOLOGY

The need for a review of the LRFFT strategy was identified in the FY03 workplan of the Pacific Island Countries Coastal Marine Programs Director in 2003 and was scheduled for early 2004. This timing was predicated by the end of a key phase in this long term (8 year) project and rapidly emerging plans to develop new strategies to address marine biodiversity conservation at the local, country, and regional scales in the Asia-Pacific Region.

The review scope[2] was defined in consultation with the newly-formed Conservation Measures Group and resulted in formation of a project review team[3] comprising:

- Tim Adams – Director, Marine Resources Division, Secretariat of the Pacific Community, Noumea, New Caledonia (tima@spc.int).
- Ian Dutton – Director, TNC's Conservation Measures Group, Bethesda, MD, USA (idutton@tnc.org).
- Randy Hagenstein – Conservation Director, TNC's Alaska Chapter, Anchorage, AK USA (rhagenstein@tnc.org).
- Paul Lokani – Director, TNC's Melanesia Program (and formerly an implementer of the LRFFT project), Pt. Moresby, Papua New Guinea (lok.tnc@global.net.pg).
- Andrew Smith – Director, TNC's Pacific Island Countries Coastal Marine Programs (and LRFFT project manager), Koror, Republic of Palau (andrew_smith@tnc.org).

The review team included a deliberate balance of 'insiders' and 'outsiders'.[4] Given the specialized nature of the subject being reviewed and the long history of program implementation, it was felt that this approach would be both more efficient in terms of processing the large quantity of information and more insightful by allowing in-depth questioning on program development.

To take advantage of this potential, the core approach employed by the team was to obtain an initial familiarization with the vast set of project documents (see Appendix 3 for summary overview) and then undertake an intensive (three day) critical review of key documents and experiences. This was accomplished by cataloguing all key documents and presentations in each phase of the Pacific LRFFT project and then conducting a series of question and answer sessions with the three key program participants – Tim Adams, Paul Lokani, and Andrew Smith. These in-depth analyses were undertaken during a series of meetings in Palau between April 14-22 and involved definition of:

- key findings;
- preliminary conclusions and "lessons learned" ; and
- information gaps and questions that still need to be asked of other project participants.

Based on these interviews, an initial report was drafted and responsibilities for further questions/verification with other project participants defined. Follow-up interviews were undertaken by phone and in person in Honolulu, Indonesia, Washington DC, Fiji, and Noumea between April 22 and May 5, 2004.

The final draft review report was prepared following these interviews. The final report was submitted to the Pacific Island Countries Director in August 2004.

Overall, the team felt that the approach used worked very well, particularly given the long history of the project, the vast amount of documentation (and inevitable gaps), the multiple partners involved, and the lack of comparable project reviews within TNC to provide a framework for inquiry. The

[2] Please see Appendix 1 for the Terms of Reference for the review.
[3] Please see Appendix 2 for biographical data on each of the reviewers.
[4] An additional outside reviewer initially accepted but had to withdraw. Unfortunately, this occurred too late for a replacement to be identified and invited to participate.

methods employed in this project review could be relevant to future reviews of multi-site strategies and long-term projects undertaken by TNC. This assertion will be tested at a planned TNC workshop in San Francisco in September, 2004 to review our conservation audit approach; the experience gained during this review will be presented at that meeting.

3.0 BACKGROUND

3.1 PROBLEM IDENTIFICATION

In the early 1990s, growing economic prosperity in Asia prompted the rapid expansion of the market for live reef food fish. The target species included *Cheilinus undulatus* (humphead / Napoleon / Maori wrasse), *Cromileptus altivelis* (highfin grouper / barramundi cod) and a variety of *Plectropomus* and *Epinephelus* species (groupers, coral cods and coral trout). This increasing demand for live reef fish has been met by a range of more intensive fishing techniques, notably the use of destructive fishing methods, resulting in widespread devastation of coral reefs within Southeast Asia. The most damaging of these methods is the use of sodium cyanide—an extremely toxic chemical—to stun fish and allow live capture. The use of cyanide resulted in widespread coral reef degradation and an associated localized decline of reef fish and invertebrate populations. The targeting of reef fish spawning aggregation sites by the LRFFT operators has also had serious impacts on coral reef ecosystems throughout the region.

According to fish importers, the live reef fish trade severely depleted target species in much of the Philippines' coral reefs where cyanide fishing was first practiced in the 1970s. As demand grew and reef fisheries became depleted there, alternative sources of supply were exploited.

The Nature Conservancy[5] first helped identify the live reef food fish trade as a major threat to the marine biodiversity in the Asia-Pacific region in 1995 by co-funding (with the Forum Fisheries Agency) marine biologist Dr. Robert Johannes and fisheries economist Michael Riepen's landmark 1995 study, *Environmental, Economic and Social Implications of the Live Reef Fish Trade in Asia and the Western Pacific*. The report was first presented to the Pacific region at the SPC FFA Workshop on Inshore Fisheries Management. The report highlighted the rapid expansion of the food-fish fishery being driven by the increasing demand for live reef fish—especially in Hong Kong, Taiwan and southern China—and the diminishing supply of target fish from Southeast Asian waters due to over-exploitation and habitat degradation.

Conservative estimates of the annual export/import of wild-caught live reef fish in the Asia/Pacific region in the mid-1990s ranged between 20,000 and 25,000 tonnes. Hong Kong was the largest consumer, but southern China, with its rapidly expanding economy, was where demand grew fastest. Johannes and Riepen confirmed the western Pacific as the next frontier for the supply side of the trade. Initial interest in securing live fish from the Pacific was observed in the mid-1980s (e.g., an operation was established in Palau in 1984), but demand did not really begin to escalate until the end of that decade. By 1995, there had already been LRFFT operations in Papua New Guinea, the Solomon Islands, the Federated States of Micronesia, and the Marshall Islands, and Asian LRFFT operators had made approaches to several additional countries.

[5] The Nature Conservancy focuses on biodiversity conservation primarily through habitat protection. Our mission is: "To preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive". We recognized that while the LRFFT was primarily a fisheries issue, it was also a biodiversity conservation issue due to the extent of the coral reef habitat damage and by-catch issues.

3.2 THE NATURE CONSERVANCY'S STRATEGIES

Following the seminal Johannes and Riepen report, The Nature Conservancy, in partnership with a number of other organizations (e.g. International Marinelife Alliance) and individuals (e.g. Dr. Robert Johannes), quickly developed multi-level and multi-site strategies to combat the environmentally-damaging effects of the live reef fish trade in the Asia-Pacific region. These included:

- Raising awareness of the seriousness of the issue, internationally, nationally and at the community level within the Asia-Pacific region.
- Encouraging regional cooperation to address the live reef fish issue.
- Pursuing mariculture of groupers as a substitution strategy to displace wild-caught fish.
- Holding taste tests in China to determine if consumers can distinguish between maricultured and wild-caught fish.
- Encouraging sustainable fisheries at specific sites.
- Identifying realistic alternative livelihood options for local live reef fish fishers.
- Assisting with developing policy and regulatory controls at the broader regional scale as well as at the country level.
- Assisting PNG's National Fisheries Authority with developing management strategies for the live reef fish industry.
- Assisting SPC in production of the SPC Special Interest Group "Live Reef Fish Information Bulletin: The Live Reef Fish Export and Aquarium Trade."
- Assist with the listing of the Humphead Wrasse on CITES, Appendix 2.

At that time, there were a number of regional and international organizations and agencies working on the live reef fish trades (both food fish and aquarium) issues in both Asia and the Pacific. Within the Pacific region, no single agency or organization had the capacity (financial or other) to adequately address all the issues arising from the LRFFT. Collaboration between concerned agencies and organizations was essential for controlling and managing the LRFFT.

3.3 TNC'S PACIFIC STRATEGY

The Live Reef Food Fish Trade has presented Pacific island countries with both potential and problems. As a relatively small-volume, high-value fishery in which income could accrue directly to fishing communities, LRFFT fisheries have the potential to contribute to sustainable economic development in many Pacific island countries. However, the experiences in Southeast Asia, and the initial forays into the Pacific, suggested that the LRFFT was characterized by "boom-and-bust"—one area after another being over-fished for the highest-valued species, social conflict, use of cyanide with resultant extensive damage to the coral reefs, and unsustainable targeting of spawning aggregation sites.

In most of the Pacific countries, there was little awareness at either the national decision-making or the community levels concerning the potential impacts of this fishery. Although there was considerable concern and a will to act, this was a new fishery in the region. Rarely were there any management strategies in place to adequately and effectively manage the fishery, nor did the countries have the necessary resources, financial or otherwise, to assess, monitor, manage, and enforce these fisheries.

While The Nature Conservancy had been addressing the broader live reef food fish trade issues in an integrated manner—with both "supply-" and "demand-side" strategies—the Pacific supply-side work on the LRFFT took a different direction from supply-side strategies in Indonesia due to the changing nature of the LRFFT fisheries (by the time it reached the more distant Pacific) and the differing expression of the biodiversity threats between the two regions.

In the Pacific, the LRFFT project had two primary components: *Regional* assistance strategies; and assistance to *national* governments.

For the purposes of this review, the regional component can be separated into three main phases:

- **Phase 1:** Conceptualization, planning, and partner engagement beginning in 1995 and leading up to the signing of the Memorandum of Understanding (MOU) on The Pacific Regional Live Reef Fish Trade Initiative in December 1999. TNC actions included clearly defining the issue, raising awareness in regional fora, developing a collaborative approach with key partners, securing internal approval, and raising funds.
- **Phase 2:** Implementation and collaboration through the MOU from December 1999 until December 2002. Broadly, the activities undertaken by the parties to the MOU included: coordination; assessment and information; awareness building; management and policy assistance; research; and training and technical assistance. TNC's commitments focused primarily on coordination, awareness raising, and management assistance.
- **Phase 3:** During this period, key tasks initiated under the MOU were completed, the LRFFT program was institutionalized within SPC, and the Conservancy refocused its efforts on management and protection of reef fish spawning aggregations and linkages to the development of networks of interconnected marine protected areas.

Throughout this period, the Conservancy was very active at the national level on LRFFT issues in Papua New Guinea, the Solomon Islands, and to a lesser extent the Republic of Palau and Federated States of Micronesia. The Conservancy's efforts included working with fisheries management agencies to recognize potential issues associated with new LRFFT fisheries and assist the agencies in developing strategies and plans to manage the fisheries.

3.4 ASSUMPTIONS

In developing and implementing the Pacific LRFFT strategy, a number of assumptions were made and agreed to by the collaborating partners. These included:

- The LRFFT is an expanding fishery—in terms of demand and geography—and Pacific island countries will be increasingly targeted by the industry as Southeast Asian stocks are depleted.
- As a relatively small-volume, high-value fishery in which significant income can potentially accrue directly to fishing communities, LRFFT fisheries *may* have the potential to contribute to sustainable economic development in many Pacific island countries.
- Based on the experience with the trade in Southeast Asia—and its initial forays into the Pacific—the trade is prone to the "boom-and-bust" syndrome, with one area after another being over-fished for the highest-valued species.
- Of particular concern for the Pacific is the unsustainable targeting of grouper spawning aggregation sites and the use of cyanide to stun and capture fish, resulting in extensive damage to the coral reefs and the degradation of marine biodiversity.
- Very careful and separate management and strict enforcement are required to manage this fishery in a sustainable manner and alleviate any likely negative impacts.
- This rapidly expanding export fishery and the resultant problems usually develop far more quickly than governments can acquire the knowledge and experience necessary to guide exploitation sustainably. As such, a regionally-coordinated approach to national management and control of the fishery is required.
- No single agency or organization within the Pacific region has the capacity to adequately address all the issues arising from the LRFFT, and so collaboration between concerned organizations is essential for success. Where feasible, the development of regional principles should be based on the collaborating partners' national- and local-level experiences.

- Pacific Island nations have a considerable will to take measures to control fisheries where problems are perceived, particularly externally-driven fisheries. The continuing existence of customary marine tenure systems on many reefs and the history of effective management of the tuna fishery, provide a platform for supporting effective action.
- Since this is an export trade, it is potentially more effectively controllable than domestic fisheries targeting vulnerable species. Even though this is a rapidly-moving and widespread fishery there was the prospect of being able to mobilize practical action that would actually control the trade before the initial fishery management problem became a major conservation problem.
- The Nature Conservancy never intended to become involved in fisheries management in the Pacific over the long term. Rather, the LRFFT strategy needed a built-in "exit strategy" for TNC following a focused effort to raise awareness, build regional and national capacity, and provide tools for improved management. By building leverage and capacity through regional partnerships, the Conservancy would position itself for future multi-scale projects.
- Given the challenges the LRFFT poses to the Pacific, a precautionary approach is required. Due to the ability of the trade to rapidly expand and adjust to new circumstances, adaptive management will be required.

3.5 STRATEGIC OBJECTIVES

TNC's Pacific LRFFT strategy has continually evolved from its inception in 1996, but has principally focused on:

1. Working proactively and collaboratively with government fisheries agencies in the Pacific countries where TNC had a presence (Papua New Guinea, Solomon Islands, Palau, and Federated States of Micronesia) to:
    - Recognize the potential issues associated with an unmanaged LRFFT, and
    - Assist those agencies with developing management strategies and plans to effectively manage the fishery.
2. Working regionally to:
    - Promote effective partnerships with and between organizations and agencies that have related interests and responsibilities to ensure a coordinated approach and to minimize duplication of effort,
    - Extend some of the benefits of improved conservation and management of reef fish to countries that did not have a direct TNC presence, and
    - Increase awareness of the live reef food fish trade and the associated impacts across and within key sectors in Pacific island countries and to provide the necessary policy and management assistance as follow-up. This involved five broad and overlapping components:
        - Assessment and information
        - Awareness raising
        - Management and policy assistance
        - Research, and
        - Training and technical assistance.

3.6 OUTCOMES

TNC assisted both the PNG National Fisheries Authority and the Solomon Islands Department of Fisheries and Marine Resources to develop National LRFFT Management Plans.[6] Advice and technical assistance were provided to both Palau and the Federated States of Micronesia, and they have since actively discouraged any new LRFFT operations based on their experiences in the 1980s and 1990s and new information provided by the Conservancy and others.

At the regional level, TNC worked with the Secretariat of the Pacific Community (SPC), International Marinelife Alliance (IMA) and the World Resources Institute (WRI) to develop and implement a cooperative initiative to provide scientific information, policy and management advice and assistance to Pacific island countries and territories with respect to the live reef fish trade. This collaboration was formalized through a three-year Memorandum of Understanding (Dec. 1999 to Dec. 2002). Under this MOU, the Conservancy committed to:

- Assist SPC with coordination and facilitation of the LRFFT Initiative, with decreasing responsibility as SPC's institutional capacity improved.
- Develop and refine generic national and provincial/state level LRFFT management plans and licensing agreements as guides for use within the region (in collaboration with SPC and WRI).
- Compile and maintain an inventory of LRFFT awareness materials (all media), to be transferred to SPC within two years (with assistance from all Parties).
- Develop relevant generic LRFFT awareness materials for each target audience (regional and national; decision-makers; local communities) and disseminate them in high priority countries (in collaboration with SPC and IMA).
- Develop and implement protection strategies for key spawning aggregation sites (in collaboration with all Parties).
- Complete and implement example site-specific LRFFT response strategies at test sites in Papua New Guinea and the Solomon Islands.
- Assist national and provincial governments with completing, adopting and implementing LRFFT management plans as requested (in collaboration with SPC and WRI).

These goals have largely been met and work on the LRFFT in the Pacific is continuing through programs at SPC[7]. Since then, the Conservancy has refocused its efforts on:

- Reducing unsustainable harvests of aggregating reef fish in selected Pacific island countries;
- Improving spawning aggregation site protection;
- Increasing awareness of the vulnerability of spawning aggregations to over-exploitation; and
- Enhancing in-country and regional capacity to manage fish spawning aggregations and Marine Protected Areas that incorporate spawning aggregation sites.

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[6] According to the head of the Solomon Islands Fisheries Division, Sylvester Diake, the civil unrest in Guadalcanal and Malaita put most new initiatives on hold, but the restoration of law and order in 2004 has created an environment for enacting the plan. There are currently no LRFFT operations in the Solomon Islands, but it is stated that the draft plan has already been of great assistance in developing government strategy.

[7] Since the LRFFT Initiative began, SPC has instituted a major reef fishery survey program, a government-community fisheries management advisory section, and consolidated its LRFT specialist position and in-service LRFT attachment training.

3.7 FUNDING[8]

The TNC Pacific LRFFT project – and the follow-on spawning aggregation project – has been funded by:

- David and Lucile Packard Foundation (various grants, or parts of larger grants).
- East Asia and Pacific Environmental Initiative (EAPEI) grants (through USAID):
  - "Protecting Coral Reefs from Destructive Fishing Practices in the Pacific" Oct. 1999 to Sep. 2003. Global Conservation Program (EAPEI). LAG-A-00-99-00045-00.
  - "Protecting Coral Reefs from Destructive Fishing Practices**:** Protecting and Managing Reef Fish Spawning Aggregations in the Pacific" Oct. 2002 to Sep. 2005. Global Conservation Program (EAPEI). LAG-A-00-99-00045-00.
- Oak Foundation grants in 1999 and 2001.
- Internal TNC funds.
- Donations from private individuals.

[8] See Appendix 4 for details

4.0 REVIEW

4.1 INTRODUCTION

The following detailed review of the LRFFT project is divided into an assessment of the *regional*-level strategies and *national*-level strategies. Both prongs of the overall project were being implemented simultaneously throughout the project. The review begins with regional level strategies.

4.2 REGIONAL STRATEGIES

4.2.1 Phase 1 Findings

Phase 1 was important for defining the scope of the threat, developing strategies, evaluating and aligning partnerships, and securing high-level clearance (both within TNC and in regional governance and advisory bodies). This groundwork was essential for creating the right scope of work in the MOU with the right partners.

The Johannes and Riepen (1995) study defined the scale and significance of the LRFFT threat to marine biodiversity in Asia and the Pacific. Formulation of a response and definition of TNC's role in that response proved challenging because of the scale of the threat and the broad array of potential partners. As a consequence, there was a hiatus between recognition of the issue and development of a formal organizational response. Part of this hiatus was due to the relative newness of the TNC Pacific program and the relatively small staff capacity. During this time, a series of initial proposals for interventions at the site-scale were developed (see section 4.3 National Strategies) and these began to be linked under the umbrella of the Packard-funded Asia-Pacific Coastal Marine Program.

In March 1998, after a long period of consultation (internally, then externally) with key players at a regional level, a formal TNC strategy was defined and presented to TNC's Asia-Pacific Regional managers. The overall strategy proposed involved four broad components:

- awareness raising;
- management assistance;
- research; and
- training/technical assistance.

It was envisioned that TNC would focus on the specific areas within these broader components where TNC had the necessary core competencies and would partner with other organizations and agencies that had complementary competencies and mandates. Program staff clearly recognized that no single agency/organization has the capacity (financial or other) to adequately address all the issues arising from the LRFFT, and so collaboration between concerned agencies/organizations was recognized as essential for success.

The aim for TNC was to be proactive wherever possible, but also to continue to respond to requests from countries and states already dealing with or being approached by LRFFT operators.

These strategies and assumptions seem eminently reasonable given the context of the issue and TNC's mission and structure, although three concerns are flagged. First, the defined goals were general in nature, and not S.M.A.R.T.[9]; the lack of measurable goals limited our ability to assess progress in implementing strategies. While aspects of each strategy were further defined in subsequent annual operational plans and budgets, and there was considerable scope for partners to engage and give feedback, there was a lack of clear definition of criteria for assessing how effective those strategies were.

[9] **S**pecific; **M**easurable; **A**ttainable; **R**esource-based; **T**ime-bound.

Second, it was evident from the beginning that this would not be an issue that would be solved in the initial three-year planning period. While it is very difficult to garner resources for long-term program commitments, the lack of a full cycle, longer-term plan for addressing the evolution of the LRFFT strategies was a clear deficiency. This concern is offset to a large extent by the way in which TNC subsequently engaged with the SPC and national governments to address LRFFT strategies in the Pacific. By working with the overarching fisheries advisory bodies (SPC and government fisheries management agencies) in the region, considerable leverage was established—leverage that ultimately enabled a coordinated response at the highest levels of national and regional governance.

Finally, as proved to be the case in the subsequent implementation of the strategies, differences in orientation between the Asia (e.g., single-site; remedial; reactive) and Pacific (e.g., multiple sites; pre-emptive) components of the LRFFT project, and the limited ability of a NGO to influence policy at this scale required TNC to very carefully define its role and strategies applied in each region. These differences also reflect the inherent variations in governance and fisheries management approach within the vast region.

These differences required strategies to be tailored to each region as appropriate. While this review did not address this issue in detail, some of the current lack of integration of coastal and marine programs (e.g. in relation to SPAGS survey methods) within the Asia-Pacific programs of TNC stems from this initial difference in focus between the Asia and Pacific components of the program.[10]

It is interesting in hindsight to observe that 1997-98 marked the peak of LRFFT in terms of volume of fish imported to Chinese markets, due in part to the Asian economic crisis.[11] The conservation and fisheries community were thus relatively slow to respond. Similar lag effects are often noted by observers of environmental management programs. However, in this case, this did not represent the end of the crisis nor a significant diminution in threat to marine biodiversity in the region. Rather, the LRFFT evolved to different types of operations and to different areas of operation. The slow down in harvesting rates enabled the LRFFT program partners to consolidate their approach. Although the LRFFT did not grow at the scale and at the rate envisioned in 1996, the threat remained and the need for proactive solutions was still relevant.

The LRFFT program clearly adapted to these changes. From an initial and ongoing emphasis on awareness raising to more direct action at the national and site scales, it is clear that program staff and their advisors kept a close eye on the trends in the industry. Additionally, while there were obvious differences in perspectives between organizations involved in working on this issue at a regional level, there was also a commonality of purpose and a strong level of international donor and media interest that greatly facilitated government recognition of the need to act. This dialogue and interaction created a favorable environment for defining how best to address the LRFFT; the mechanisms for addressing the LRFFT issue were subsequently articulated in the MOU.

4.2.2 Phase 1 Lessons Learned

Six key lessons emerge from analysis of the regional component of the program in this phase:

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[10] During the life of this project TNC underwent a number of programmatic, operational, and organizational structure changes, which influenced project management and focus to some extent. During the first phase the original TNC Asia-Pacific Region was integrated with the Latin America and Caribbean Region to form an International Program. Within the Asia-Pacific Region, the A-P Coastal Marine Program work was subsumed into the Indonesia and Pacific programs for nearly two years, before being reestablished as an Asia-Pacific-wide program again. The LRFFT project manager was reassigned to the A-P Coastal Marine program for a year before being reassigned back to the Pacific Island Countries Operating Unit when that was formed. Also during the life of this project, TNC's strategic organization direction was fully realigned behind Conservation By Design, entailing a shift to an ecoregion-based approach.

[11] Graham, T. 2001. A Collaborative Strategy to Address the Live Reef Food Fish Trade. Asia Pacific Coastal Marine Program, Report #0101, The Nature Conservancy, Honolulu, HI, USA.
Sadovy, Y.J., T.J. Donaldson, T.R. Graham, F. McGilvray, G.J. Muldoon, M.J. Phillips, M.A. Rimmer, A. Smith, and B. Yeeting. 2003. While Stocks Last: The Live Reef Food Fish Trade. Pacific Studies Series, Asian Development Bank, Manila. 147 pp.

- The Johannes and Riepen study established a solid context and independent authority for this work that greatly facilitated partner buy-in and attracted government and donor interest. Due in part to Bob Johannes' force of personality, this report also received considerable international press which elevated the profile of the LRFFT issue.
- TNC was well placed to work on this issue at a regional scale because of both its regional structure and because of recruitment of key staff who had a strong background and professional networks in marine resources management in the Pacific (through both in-country experience and regional organization experience).
- While strategies were well defined, measurable goals and milestones for the project as a whole were lacking. Annual goals and milestones were contained in TNC's annual plans and employee objectives as well as in various grant proposals. Still, the overall project would have benefited from goals and interim measures clearly articulated at the outset of the project.
- In developing a program of this type, there is a need to define overall funding and match opportunities flexibly so as to be able to take advantage of new opportunities (e.g. EAPEI funding) and allocate discretionary resources to best effect. There is also a need to carefully coordinate with donors and partners (e.g. joint presentations to ADB by IMA, TNC, WRI, and SPC member countries) to present a clear set of coordinated strategies and priorities.
- Project conceptualization is a more complex and time-consuming process than is usually recognized, particularly when multiple partners and countries are involved, and where the 'threat' is rapidly changing. There is clear value in allocating adequate resources for project management and for lead staff, in working adaptively, in negotiating effectively, and in framing activities that are achievable in the near-term so as to build trust and confidence in the overall strategy. This is especially true of the response to the LRFFT in the mid- to late-1990s as the industry was changing quickly in terms of changes in demand, in the players in the industry, and in the supply locations.
- In a multi-site and multi-level strategy like this, effective partnerships are critical to success. Despite challenges, this program was put on a very firm footing by paying special attention to defining the most appropriate partners during strategy conceptualization and by working hard to build effective alliances within each area of operation at an early stage.

4.2.3 Phase 2 Findings

This phase of the project was synchronous with the period covered by the MOU between the Conservancy, SPC, IMA, and WRI[12] (Appendix 6). The strategies implemented during this phase were inherently collaborative in nature, and the responsibilities and commitments detailed in the MOU for each party represent a comprehensive approach to addressing the LRFFT issue. Hence, this review covers the effectiveness and efficiency of the overall program, including activities undertaken under the auspices of the MOU by all parties, but with a focus on TNC activities and responsibilities.

Under the terms of the MOU, TNC's focus was primarily on:

- Assisting SPC with coordination and facilitation of the initiative, with decreasing responsibility as SPC's institutional capacity in this area improved;
- Developing awareness materials that could be provided by SPC to their partner countries; and
- Developing generic management guidelines that could be used by government fisheries agencies to establish a coherent management framework for LRFFT activities in their countries.

The collaborative strategy encompassed by the MOU had six components: coordination; assessment and information dissemination; awareness; management and policy guidance; research; and training

[12] Although WRI was a signatory to the MOU, their involvement in the project was limited to essentially one person closely linked with IMA.

and technical assistance. The general roles of each organization envisioned in the MOU is shown in the following table:

Component:	**TNC**	**SPC**	**IMA**
Coordination	X	X	
Assessment & Information		X	X
Awareness	X	x	x
Management & Policy	X	X	
Research		x	X
Training & Tech. Assistance		X	X

(X = substantial role; x = supporting role)

Coordination

The MOU between the parties served as the formal mechanism to guide a coordinated approach to the LRFFT issue. The process of drafting the MOU was an effective way to bring parties together, resolve (sometimes) conflicting perspectives, and identify strengths and appropriate roles of the parties.

The MOU was effective for a variety of reasons. The MOU:

- Was specific in nature, rather than a very general "agree to work together" agreement. The responsibilities and roles of each party were very clear.
- Provided a unified voice to external partners and funders and ensured a common position on key sensitive issues. For example, the MOU identified the LRFFT as a potential opportunity for economic development – not just a threat to biodiversity (see *Mutuality of Interest* and *Statement of Purpose* sections of the MOU).
- Provided the high-level clearance for the Conservancy to build SPC's capacity by providing seed-funding for a key staff position in SPC to focus on the LRFFT project.
- Ensured efficient use of limited resources by avoiding redundancy and duplication of effort.

The MOU could have been improved by requiring annual face-to-face progress meetings[13] to identify changes in the LRFFT fishery, make necessary adjustments in strategy, detect slipping milestones and deliverables, and enable changes in the ability of MOU parties to perform according to the terms of the MOU.[14] Finally, the MOU should have required a summary report on activities under the MOU as a deliverable (this review may be used to largely serve that function).

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[13] Whenever possible, to save on costs, meetings of the parties were convened as side-sessions at meetings where two or more of the parties were present.

[14] There were particular issues with IMA's performance under the terms of the MOU. IMA had a strong focus on the live reef fish trade and was a catalytic player in the Philippines. They had developed programs in monitoring, training, cyanide testing, and other areas, and were growing rapidly in geographic scope in the late 1990s. IMA was significantly affected by a variety of economic factors including the post 9/11 economic downturn that reduced their capacity to lead key components of the program envisioned under the MOU. Both TNC and SPC expressed frustration with IMA's performance in a number of areas, including shifting policy positions, differing views on content and audience for awareness materials, difficulty getting assessment reports submitted, etc. TNC and SPC also deferred to IMA in key program areas. For example, TNC did not pursue deeper relationships with the Republic of the Marshall Islands, because IMA indicated that they were going to establish an office and program based there. The intent here is not to assign blame or tease out causal factors, but to recognize that the LRFFT collaborative strategy had its share of frustrations and that some shortfalls in program delivery were the result of culture and changes in capacity within a key MOU party.

Assessment and Information Dissemination

Conducting basic assessments of reef fish abundance (especially targeted species in the LRFFT) was a key component of the overall LRFFT project. These assessments were intended to address a threshold question for a country considering entry into the LRFFT: "Is the resource available to support a managed fishery?" Responsibility for this aspect of the project lay with SPC and IMA (largely funded via an ADB Technical Assistance grant to SPC).

Stock assessments provide the basic data to influence policy at the national level. In situations where assessments were completed, they proved effective at defining the generally limited nature of the resource, which had a direct result on management at the national/site level (e.g., in PNG and Fiji). The assessment work that was completed, including the assessment methods, have broad applicability and provide valuable guidelines that can be quickly applied in new situations (e.g., rough estimates of how much annual production various habitat types can support).

Resources available (through the ADB Technical Assistance grant) should have been enough to meet the assessment goals and needs, but there were shortfalls, in part due to performance issues by IMA under the ADB Technical Assistance grant. There were also some types of assessments that were not completed due to reduced LRFFT activity (e.g., register of vessels and operators, pricing information). Finally, there was a divergence of opinion between SPC and IMA on the depth of the assessments required (assessing all fish at a site vs. assessing LRFFT target species only). The assessment efforts could have been improved and streamlined by agreeing on a standard assessment methodology at the outset.

Awareness

One of TNC's primary roles under the MOU was to develop awareness materials on the LRFFT that could be provided by SPC to its member countries. The Conservancy hosted a workshop in May 2001 in PNG with MOU partners and others to determine the needs, audience, messages, and delivery media.

Final print products included a "rapid-response package" targeted at government fisheries managers and officers, and decision-makers that included:

- An overview and chronology of the LRFFT in the Pacific, including an overview of the chain of custody between suppliers in the Pacific and restaurants in Asia;
- Fact sheets on resource assessments, benefits of management, information needs for effective management, and community development aspects;
- An overview video titled *The Live Reef Food Fish Trade: Avoiding the Boom and Bust Syndrome*;
- An information bulletin by SPC on the LRFFT; and
- Fish identification cards (with identification, life history, and conservation status information) for species targeted in the LRFFT (to help standardize the use of names in reporting).

The design and content of the awareness package is quite good and SPC has used the material to respond to requests from various Pacific governments. These materials now reside with SPC and with their member country fisheries agencies and are available for rapid response to future requests. SPC will be evaluating their awareness materials broadly in the near future and will include the LRFFT material in their evaluation.

So the final product was good, despite labor pains in delivery. TNC indicated that development of the awareness materials was the most time-consuming and frustrating part of the project. There were divided—rather than centralized—responsibilities among the MOU parties and "too many cooks in the kitchen," especially in terms of defining content, developing text, and finalizing design. Eventually, this situation was resolved by TNC assuming overall responsibility for all components of the awareness material and making unilateral final decisions.

Much of the pain of developing the awareness materials could have been avoided by contracting with someone who had the appropriate expertise and mandate to oversee the process from conceptualization through writing, editing, design, and production.

Management and Policy Guidance

The Conservancy's role in management and policy assistance was to develop a set of generic management guidelines for LRFFT fisheries that could be delivered through SPC to Pacific Island governments. Although the materials were not completed within the MOU period, there now exists a comprehensive, turnkey management framework that can be adopted (or customized) and used by governments to regulate the LRFFT fisheries within their borders. This material was eventually produced by a contractor (once project staff realized that they were stretched too thin to complete the generic guidelines) and delivered to SPC, where they are currently being reviewed. Although drafting of the generic guidelines took longer that originally hoped, the delay allowed the sum of accumulated knowledge about managing LRFFT fisheries to be included.[15]

Research

The research goals in the MOU were modest. Substantial research on biological and ecological information on target populations is underway (by SPC and their research partners). And IMA did some work on ecological effects of cyanide. Very early in the project TNC sought (but did not secure) funding to study the short- and long-term effects of cyanide on coral reefs. Much of the applied research envisioned under the MOU is underway under different auspices. Some of the research originally planned is less urgent due to reduced LRFFT activities.

Training and Technical Assistance

Training and technical assistance, originally envisioned as a major component of the MOU, was to include training and assistance on: monitoring, inspection, and sampling of live reef fish shipments; cyanide testing and establishment of testing labs; cyanide-free capture techniques; and post-capture handling to increase fish survival. IMA was largely responsible for implementation of the training and technical assistance aspects of the program. Relatively little of this work actually happened, in part related to declining capacity within IMA but also because of reduced activity in the LRFFT (i.e., there is no point in training on monitoring and fish handling if there are limited operations and few fish being captured for the LRFFT).

Although the training needs are diminished, SPC has an established "master fisherman" program that could be used to deliver this type of training and technical assistance should the LRFFT expand in the future.

4.2.4 Phase 2 Lessons Learned

The key lessons from Phase 2 of regional components of the LRFFT project are listed below:

- The MOU provided an appropriate structure for coordination between the major players in the LRFFT project. Complex multi-organization efforts like this should always have a similar guiding document to establish clear roles, reduce duplication of effort, and ensure clear communication with external audiences. The MOU could have been improved by establishing clear goals and milestones and having a mechanism for periodically assessing progress and performance.
- Creating awareness materials via committee is time consuming. Sufficient time and money should be programmed into development of these materials. Overall control for the awareness materials

[15] SPC's next step with the generic guidelines is to develop an executive summary to provide to fisheries heads at the Head of Fisheries-4 meeting in September 2004.

should be centralized in one organization or person with enough force of personality to get agreement on content, design, etc.

- The program had generally enough resources to accomplish most of the work envisioned. However, in hindsight, having another dedicated staff and/or some additional funds for contracting would have been a good investment. There were underestimates of the time and effort required for key components (especially development of awareness materials and creating model management guidelines). In the case of developing management guidelines, the TNC project manager (Andrew Smith) was simply stretched too thin with other responsibilities (both LRFFT related and other program priorities) to devote sufficient time; the draft guidelines were completed only after contracting with a consultant who could provide sufficient focus.
- Partners should be chosen carefully, because collaborative partnerships don't always work smoothly. In the case of the LRFFT project, one of the key partners had a significant decline in capacity during the project. This led to under-performance on several MOU tasks and a gap between expectations and ability to deliver. To a degree, this expectation gap could have been identified by having clear goals and milestones in the MOU and periodic (annual) meetings between all the MOU parties to assess the effectiveness of the MOU and make adjustments as necessary.[16]

4.2.5 Phase 3 Findings

During Phase 3, final tasks anticipated in the MOU were completed and the regional components of the LRFFT project evolved in two directions. First, the Conservancy refocused its efforts on management and protection of reef fish spawning aggregations and linkages to development of networks of marine protected areas. At the same time, SPC integrated the LRFFT work as one component of their broader coastal fisheries management program.

SPC continues to play a key regional coordination role and continues to have an officer dedicated to LRFFT issues. Awareness materials continue to be provided to member countries and generic management guidelines are being finalized. LRFFT management and policy advice is being provided throughout the region. SPC continues to assist member countries with resource assessments for LRFFT as part of their larger resource assessment program. Training and technical assistance needs, as envisaged during the MOU, are not currently needed but can be picked up through the SPC master fishermen program when and if needed. Member countries have—and continue to—request assistance and information from SPC when approached by operators interested in LRFFT.

There is every expectation that the efforts to address LRFFT issues in the Pacific will be sustained. SPC's LRFFT work is funded for the next three years with a $300,000 grant from the MacArthur Foundation and professional staff are in place.

Pacific Island nations also value the work completed to date. At the third SPC Heads of Fisheries (HoF) Meeting[17] in August 2003, delegates "noted with approval the progress made by the regional Live Reef Fish Trade initiative since it was launched by Heads of Fisheries in 1999, and acknowledged the contributions made by several agencies, NGOs and organizations towards the joint goals of the initiative. HoF3 looked forward to the implementation of promising new avenues for achieving or maintaining sustainable management of, and maximum local benefit from, these fisheries, particularly … industry "best practices" for the food-fish trade."

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[16] Entering into an MOU with a range of partners over multiple years requires a degree of faith that each partner organization will manage itself effectively. It isn't one partner's role to interfere in another's internal matters. There is an inherent risk with any multiple-partner, multiple-year MOU that relies on substantial performance by all parties. A 'risk analysis' of the partners and the issue should precede entering into such an MOU.

[17] SPC's Heads of Fisheries meeting is a regional meeting of Pacific Island countries and territories that covers the entire range of interests under the purview of national and territorial fisheries services. As such it plays a unique role in promoting dialogue and experience-sharing between island nations and territories, as well as guiding the work of the SPC's fisheries programs.

The Conservancy has essentially closed out its workplan under the MOU. The work on improving management of reef fisheries through the LRFFT project has transitioned into an initiative to protect spawning aggregations with linkages to the broader efforts to establish networks of resilient marine protected areas. This is a logical transition given TNC's focus on habitat protection as a primary tool for conservation.

With the progress made through the LRFFT project, TNC has also developed the relationships and track record of collaboration that will allow future efforts to be scaled to national and regional levels. How this will happen is unclear, however. The mechanisms by which the site-level spawning aggregation work gets "scaled up" to national and regional influence through SPC should be articulated by Andrew Smith.[18] The 4th SPC Heads of Fisheries meeting in August 2004 presents and ideal opportunity to develop the next stage of collaboration at the regional level. Additionally, the links between the Pacific Island Countries Program spawning aggregation conservation efforts and the *Transforming Coral Reef Conservation* program through TNC's Global Marine Initiative should be clearly articulated.

Finally, all parties involved in this conservation strategy need to be wary about claiming "success". With the booming Chinese economy and changing patterns of demand, a wide range of reef fisheries could be revived or expanded in a relatively short period. All involved parties should consider (a) development of an 'early warning' monitoring program, particularly in coastal mainland cities such as Guangzhou and (b) development of a contingency plan to address at regional, national and local scales how to abate the threats posed by rapid escalation in fisheries exploitation by whatever mechanism. Maintaining SPC's commitment to the LRFT (in part this will be through continued endorsement by the SPC HoF4 meeting in August this year), and continued development of 'contingency' plans, should be a priority.

4.2.6 Phase 3 Lessons Learned

- As with other phases, this is a huge program with huge potential results that could have benefited from a more singular focus. Additional staff—not many, maybe just one more FTE—to focus on LRFFT would have made a significant difference in focus and timely results.
- The Pacific had a different situation, different pressures, and different history of involvement in LRFFT—this led to different strategies in the Pacific compared to Asia. It would be useful in the context of the future development of the Asia Pacific marine program to look at the broader collaborative strategy (Pacific supply; Asia supply and demand side) and perhaps to conduct an overall review of TNC's integrated LRFFT initiative.

4.2.7 Regional Strategies Overarching Lessons

- Continuity of key staff (both within TNC and with key partners and contractors) has been an important aspect to the success of the LRFFT project.
- The two tracks (regional and national) informed each other well and created a whole greater than the sum of the parts. For example, the Conservancy's management and policy work in PNG and the Solomon Islands informed the regional management efforts, and the regional efforts informed national efforts within the broader SPC member countries (e.g. Fiji, Kiribati, Tonga).
- Engagement at multiple levels (site/country/regional) positioned TNC as a key partner with governments and regional agencies. This positions the Conservancy well in the future to protect biodiversity by influencing management of inshore fisheries (e.g., prohibiting destructive fishing on spawning aggregations, and inshore fisheries management) at national and regional levels and building capacity in national and regional levels to leverage our work. One of our starting

[18] Discussions are currently underway between TNC and SPC staff on a new MOU to address conservation of spawning aggregations at a regional level.

points—that we want to focus on proper management of live reef fisheries rather than prohibition of all reef export fisheries—allowed us in the door with governments and regional organizations.

- The LRFFT project is a prime example of multi-scale threat abatement effort; this is exactly the kind of thinking and action at scale that we are seeking broadly throughout TNC. From the outset, project staff identified an emerging threat at a scale above the site or ecoregion level and developed a suite of strategies at a variety of scales. The Conservancy's current conservation tools (e.g., ecoregional assessments, conservation area planning) are currently inadequate to identify and develop strategies for dealing with a multi-level, multi-site threat that spans multiple ecoregions and is expressed differently in different areas.

4.3 NATIONAL STRATEGIES - FINDINGS

The Conservancy recognized the importance of working on the LRFFT issue at the national level with Pacific Island governments as well as the regional level (discussed previously), in part to develop the experience, tools, and credibility to address the issue regionally and in part to establish the long term relationships with government management agencies as groundwork for future engagement.

The national-level work focused on Papua New Guinea and the Solomon Islands which had active LRFFT operations in the countries since 1991 and 1994 respectively and, to a lesser degree, on Palau and Federated States of Micronesia, which had LRFFT operations beginning in 1984 and 1991 respectively. Approaching the governments to highlight the potentially destructive nature of the LRFFT in a manner that was not seen to be confrontational was important. The approach taken included:

- Convening a seminar for government agencies responsible for fisheries, environmental management, and development and stakeholders to present the state-of-knowledge on the LRFFT. This resulted in a formal agreement with the PNG National Fisheries Authority on how to proceed in PNG.
- Briefing government executives in the PNG National Fisheries Authority and Solomon Islands Department of Fisheries and Marine Resources to highlight the destructive nature of the LRFFT.
- Securing formal agreement committing the governments to address the LRFFT as a distinct fishery from other finfish fisheries and take a precautionary approach in development and management of the LRFFT fishery.
- Encouraging the governments to impose a moratorium to stop the LRFFT fisheries until a management framework was developed and implemented. Moratoria were placed on new LRFFT operations in 1998 in PNG and 1999 in the Solomon Islands.
- National Fisheries Authority and Department of Fisheries and Marine Resources appointed officers who were dedicated and focused on the LRFFT fishery and related activities including development of LRFFT policies and management.

In PNG, the Conservancy deepened its work with the National Fisheries Authority, conducting several stock assessments (two assessments in PNG showed not enough fish; one fishery was stopped and the other fishery moved on due to insufficient stocks) and developing draft management plans for the LRFFT fishery. In 2002, PNG passed a National LRFFT Management Plan. The completion of a management plan for the Solomon Islands was delayed due to civil unrest and other factors. However, a draft management plan (currently under review) has been competed through a joint effort by TNC and the Solomon Islands Department of Fisheries and Marine Resources.

Although the investment in working at the national level in Palau, FSM, and the Marshall Islands was significantly lower (briefings and advisory input on fisheries proposals on request), these low investment strategies were both effective and efficient to affect management. The regional-level strategies through SPC also influenced actions in other non-TNC focus countries (e.g. Fiji, Kiribati).

Overall, the national strategies were highly effective both in terms of affecting policy at the national level and at informing the regional-level work. TNC's efforts were effective for several reasons. First, TNC was not seen as promoting its own agenda. Rather, we understood the fisheries management mandates of the agencies and recognized the LRFFT may present economic opportunities if managed sustainably. Second, TNC delivered on commitments made, was careful not to over-commit, and referred requests to other groups as appropriate (e.g., FSM and Marshall Islands agencies to IMA for cyanide testing). Third, TNC staff maintained frequent contact with fisheries agency staff and worked to build internal capacity in the agencies through one-on-one training and mentoring between TNC staff (or contractors) and key people in management agencies. Finally, by targeting briefings to the executive level in fisheries management agencies in PNG and the Solomon Islands, policy decisions were made quickly. It would have taken much longer had the briefing and awareness focused only on the lower-level officers rather than executives. It is often common for executives in government agencies in the Pacific to take advice from outside the agency (especially if the source is viewed as reputable) rather than from with the agency itself.

Another success factor was that the agencies committed manpower, funding and in-kind contributions to the LRFFT issue. For example, the target species assessment in Kavieng (in PNG) was funded by PNG's National Fisheries Authority (NFA) based on training and methods used previously at Manus (which was funded by TNC with NFA participation). The increasing investment in assessments by PNG NFA staff laid important groundwork for greater interest in inshore fisheries management and ultimately adoption of the national LRFFT management plan.

The project has provided an opportunity for PNG's National Fisheries Authority to work with an NGO, which was unique. The relationship was also a unique opportunity for the Conservancy to engage with a national fisheries management agency.

As with the regional strategies, there was an issue with over-commitment of project staff, which led to delays in hitting project milestones. For example, in-country awareness materials in PNG are just being finalized (about two years behind schedule) and are being incorporated into the on-going spawning aggregation work. Paul Lokani's promotion to Melanesia Program Director and the difficulty back-filling his position has significantly contributed to these delays.

Despite the slow-downs described above, the transition from a national focus on the LRFFT to a site level focus is proceeding smoothly. The marine program and strategies are being effectively integrated into the TNC country program priorities (especially Micronesia and Melanesia). The spawning aggregation work has provided a better mechanism for the Conservancy to connect with communities, local NGOs, and provincial fisheries agencies on issues of mutual importance. In addition, other NGOs are looking to TNC for advice on LRFFT operations (e.g., Conservation International in Milne Bay, PNG). Finally, funding is reasonably secure to continue these activities within the contexts of the Melanesia and Micronesia programs.

4.4 NATIONAL STRATEGIES – LESSONS LEARNED

- It is important to understand the mandate, perspectives, and culture of the government partners. Programs must be implemented at the pace of the agency and in a manner that recognizes that the Conservancy cannot make decisions for the agency. Rather, TNC should provide sound information and advice and let the agencies reach their own conclusions and decisions.
- There is great value in securing a formal agreement (e.g., MOU) that is *developed with* and *signed by* a high-level person (and that identifies lower, project level staff commitments). Having a dedicated agency staff contact is important for continued coordination and communication and for demonstrating on-going agency commitment to the project.

- As with other aspects of the project, there was too much on the plate of key staff. Deadlines were missed and contractors needed better follow-up. Again, the addition of even one additional FTE for the project overall would have made significant difference.[19]

[19] TNC's experience has shown, however, that committing to an additional hire is easier than actually finding the right person, especially with a commitment to hiring locally. The issue of local capacity, both for TNC or partners to hire, has been a significant issue throughout the life of this project.

5.0 SUMMARY OF KEY FINDINGS AND RECOMMENDATIONS

5.1 OVERALL FINDINGS

- The multi-scale strategy has been effective in reducing the threat to marine biodiversity posed by the LRFFT by creating the awareness and the regional and national capacity and alliances to address LRFFT operations.[20]
- By clearly and correctly defining the scale of the LRFFT issue, the Conservancy and partners were able to craft a strategic response and implement conservation actions at the scale of the problem.
- While we can't document and quantify direct impacts on marine biodiversity as a result of the LRFFT project, the collaborative strategy has reduced the pressure on key fish stocks, assisted in improving inshore fisheries management, and reduced related destructive practices in countries where TNC is active (and indirectly in countries where our partners work).
- The LRFFT project and associated strategies have positioned TNC as a credible and effective agent in marine conservation in the Pacific by developing enduring partnerships with national and regional agencies. We are much better placed to address regional-scale threats to marine biodiversity today than we were eight years ago.

5.2 KEY LESSONS

- The MOU between TNC, SPC, IMA, and WRI played a critical role in formalizing relationships, clearly defining roles, and facilitating joint grants and cross-funding.
- TNC had the right key staff in place for the project that had the right experience and relationships in both national and regional management venues. Continuity of key staff (both within TNC and our partners) was also critical to the long-term success of the project.
- The LRFFT project would have benefited by additional capacity (at least one full time equivalent) to bring single-minded focus to this complex program.
- Clearly defined goals and milestones, with clear evaluation points, should have been included in the original strategic framework for the Conservancy's LRFFT project and the MOU.
- Annual "status of the LRFFT" meeting and report as a component of the MOU would have improved the ability of the project to adapt to changes in the LRFFT industry and performance by various parties under the MOU.

5.3 RECOMMENDATIONS

Project staff should develop a near-term follow-up plan as a result of the review to:

- Create a roadmap that articulates the bigger picture of how the LRFFT project has evolved—and continues to evolve—into efforts to conserve spawning aggregations (including linkages to MPA networks) and how leverage at the national and regional levels will occur through selected site level investments.
- Establish a new MOU with SPC (and potentially other partners) to guide collaboration around spawning aggregations, finalize and publish the generic management guidelines, where appropriate assist SPC's expanded involvement with other related fisheries management issues

[20] While the threat posed by the LRFFT was reduced, it hasn't been eliminated. Changing economic conditions in China could allow this trade to rapidly reemerge as a regional threat to marine biodiversity. The LRFFT project has established a solid foundation and national/regional capacity to address a future surge in LRFFT activity.

(e.g., spear-fishery of aggregations; other fishery impacts on LRFFT species), and create a contingency plan and triggering mechanisms in the event of expansion of LRFFT or related fisheries.

- Recommend to the Asia-Pacific Region management a review of the overall Asia-Pacific Integrated LRFFT strategy.
- Disseminate the findings of the review both internally (e.g., through an article in TNC@News; through the Conservation Measures Group and the Global Marine Initiative) and externally (e.g., as a case study article for an appropriate environmental journal; SPC LRF Bulletin).

5.4 OBSERVATIONS ON THE REVIEW PROCESS

- The review, including drafting the report occurred over seven working days. This was sufficient. Not all reviewers needed to be present during the drafting phase.
- The review period and location did not allow interviews of key players prior to drafting the bulk of the review report. Interviews in the middle of the review likely would have identified issues to address in the review, rather than after.
- The mix of internal and external reviewers was appropriate and effective—it enabled a lot of information to be processed in a very efficient manner and ensured that facts could be checked concurrently with the review process.
- Participation by key project staff familiar with all phases of the project was essential to provide perspective, present an overview of the project, and answer questions. This was much more efficient than digging through the universe of project documentation would have been. Having the project manager sort through documentation prior to the review to highlight the most important material was also a huge time-saver.
- Preparation time to organize and prepare background documents, etc., was underestimated. This work has to be done by someone intimate with the project. (Contracting a person to compile a chronology and list of documents was attempted, but failed due to their unfamiliarity of the project and TNC.)
- The review team was elated that most of the writing was completed prior to getting on airplanes and getting sucked back into the vortex of normal work obligations!

APPENDICES

APPENDIX 1: Terms of Reference

Pacific Island Countries Coastal Marine Program

PACIFIC LIVE REEF FOOD FISH TRADE PROJECT REVIEW

Terms of Reference

Background

The Nature Conservancy first helped identify the live reef food fish trade (LRFFT) as a major threat to the marine biodiversity in the Asia-Pacific region in 1995 by sponsoring marine biologist Dr. Robert Johannes and fisheries economist Michael Riepen's landmark 1995 study, "Environmental, Economic and Social Implications of the Live Reef Fish Trade in Asia and the Western Pacific." The report highlighted the rapid expansion of the food-fish fishery being driven by the increasing demand for live reef fish—especially in Hong Kong, Taiwan and southern China—and the diminishing supply of target fish from Southeast Asian waters due to over-exploitation and habitat degradation. The western Pacific was identified as the next frontier for the trade, and by 1995 there had already been some LRFF operations in Papua New Guinea and the Federated States of Micronesia.

Of particular concern to the Conservancy[21] was the LRFFT's rampant use of sodium cyanide to stun the target fish, and the targeting of reef fish spawning aggregations. The use of cyanide resulted in widespread coral reef degradation and an associated localized decline of reef fish and invertebrate populations. The targeting of spawning aggregation sites for reef fish has also had serious impacts on coral reef ecosystems throughout the region.

The Live Reef Food Fish Trade has presented Pacific island countries with both potential and problems. As relatively small-volume, high-value fisheries in which income could accrue directly to fishing communities, LRFF fisheries have the potential to contribute to sustainable economic development in many Pacific island countries. However, the experiences in Southeast Asia, and the initial forays into the Pacific, were ones of "boom-and-bust"—one area after another being overfished for the highest-valued species; social conflicts developing or exacerbated; the use of cyanide causing extensive damage on the reefs; and the unsustainable targeting of spawning aggregation sites.

In most of the Pacific countries there was little awareness at either the decision-making or the community levels concerning the potential impacts of this fishery. Rarely were there any management strategies in place to adequately and effectively manage the fishery, nor did they have the necessary resources, financial or otherwise, to raise awareness and to strictly enforce and manage these fisheries.

At that time, there were a number of regional and international organizations and agencies working on the live reef fish trades (both food fish and aquarium trades) related issues in both Asia and the Pacific. Within the Pacific region no one agency or organization had the capacity (financial or other) to adequately address all the issues arising from the live reef food fish trade, and so collaboration

[21] The Nature Conservancy focuses on biodiversity conservation primarily through habitat protection. Our mission is: "To preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive". We recognized that while the LRFFT was a fisheries issue, it was also a biodiversity conservation issue due to the extent of the coral reef habitat damage and by-catch.

between concerned agencies and organizations was seen as essential for controlling and managing the LRFFT.

TNC's Pacific Strategy

While The Nature Conservancy has been involved with addressing live reef food fish trade issues in an integrated manner—with both "supply-" and "demand-side" strategies—this review will primarily focus on the Pacific "supply-side" strategy and activities. The Pacific supply-side work on the LRFFT began to take a different direction to the Indonesia supply-side activities in 1996, due to the need for different approaches for the differing threats and circumstances developing in the Pacific.

TNC's Pacific LRFFT strategy has continually evolved from its inception in 1996, but has principally focused on:

1. Working proactively with government fisheries agencies in the Pacific countries where TNC had a presence (Papua New Guinea, Solomon Islands, Palau, and Federated States of Micronesia) to:
    - Recognize the potential issues associated with an unmanaged LRFFT, and
    - Assist those agencies with developing management strategies and plans to effectively manage the fishery.

2. Working regionally to:
    - Develop effective partnerships between organizations and agencies that have related interests and responsibilities to ensure a coordinated approach and to minimize duplication of effort, and
    - Increase awareness of the live reef food fish trade and the associated impacts within key sectors in Pacific island countries and to provide the necessary policy and management assistance as follow-up. This involved five broad and overlapping components:
        - Assessment and information
        - Awareness raising
        - Management and policy assistance
        - Research, and
        - Training and technical assistance.

TNC assisted both the PNG National Fisheries Authority and the Solomon Islands Department of Fisheries and Marine Resources to develop National LRFFT Management Plans (although the Solomon Islands have yet to adopt and implement theirs). Advice and technical assistance were provided to both Palau and the Federated States of Micronesia, and they actively discouraged any new LRFFT operations based on their experiences in the 1980s and 90s.

TNC worked with the Secretariat of the Pacific Community (SPC), International Marinelife Alliance (IMA) and the World Resources Institute (WRI) to develop and implement a cooperative initiative to provide scientific, information, policy and management advice and assistance to Pacific island countries and territories with respect to the live reef fish trade. This collaboration was formalized through a three-year Memorandum of Understanding (Dec. 1999 to Dec. 2002). Under this MOU, the Conservancy committed to:

- Assist SPC with coordination and facilitation of the Initiative, with decreasing responsibility as SPC's institutional capacity improves.
- Develop and refine generic national and provincial/state level LRFT management plans and licensing agreements as guides for use within the region (in collaboration with SPC and WRI).
- Compile and maintain an inventory of LRFT awareness materials (all media), to be transferred to SPC within two years (with assistance from all Parties).

- Develop relevant generic LRFT awareness materials for each target audience (regional and national; decision-makers; local communities) and disseminate them in high priority countries (in collaboration with SPC and IMA).
- Develop and implement protection strategies for key spawning aggregation sites (in collaboration with all Parties).
- Complete and implement example site-specific LRFT response strategies at test sites in Papua New Guinea and the Solomon Islands.
- Assist national and provincial governments with completing, adopting and implementing LRFT management plans as requested (in collaboration with SPC and WRI).

Work on the LRFFT in the Pacific is continuing through programs at SPC.

The Conservancy has refocused its efforts towards reducing the depletion of aggregating reef fish in selected Pacific island countries, through improved resource management and spawning aggregation site protection, increased awareness of these resources' vulnerability to over-exploitation, and enhanced in-country and regional capacity to manage fish spawning aggregations and MPAs that incorporate spawning aggregation sites.

The Pacific LRFFT project—and the follow-on spawning aggregation project—has been funded by:

- David and Lucile Packard Foundation (various grants, or parts of larger grants).
- East Asia and Pacific Environmental Initiative (EAPEI) grants (through USAID)
  - "Protecting Coral Reefs from Destructive Fishing Practices in the Pacific" Oct. 1999 to Sep. 2003. Global Conservation Program (EAPEI). LAG-A-00-99-00045-00.
  - "Protecting Coral Reefs from Destructive Fishing Practices**:** Protecting and Managing Reef Fish Spawning Aggregations in the Pacific" Oct. 2002 to Sep. 2005. Global Conservation Program (EAPEI). LAG-A-00-99-00045-00.
- Oak Foundation grants (two).
- Internal TNC funds.
- Donations from private individuals.

Purpose of the Review

The purpose of this review of the Pacific Live Reef Food Fish Trade project is to:

1. Assess the ***effectiveness*** of the project's strategies in terms of the goals;
2. Evaluate the ***efficiency*** of this multi-site, collaborative conservation strategy;
3. Assess the ***sustainability*** of the activities and outcomes of the project; and
4. Identify ***specific lessons*** that can be learnt from this project.

These four areas represent the focus of the review. The following is a preliminary list of indicative questions under each area. These questions should be adjusted and/or supplemented by the review team prior to, and during the first days of the review. Some tips on process are provided in Attachment 3.

1. Assess the *effectiveness* of the project's strategies in terms of the goals

- What were the goals of the project?
- Did the goals change over time, if so how and why?
- Were the goals and objectives of the project appropriate?
- Did the activities lead to the outcomes that were predicted?
- How did the actual outcomes (results) compare with those predicted (objectives)?
- What was the level of satisfaction of key stakeholders with the outcomes?
- Was the management of the partnerships and collaboration affective? (See Attachment 4 for '20 success factors for collaboration' as a guide).

2. Evaluate the *efficiency* of this multi-site, collaborative conservation strategy

    - Did the project do what it proposed with the available resources?
    - How did the inputs needed compare to what was needed to produce the specific outputs?
    - How did the actual costs of each activity compare against the allocated budget?

3. Assess the *sustainability* of the activities and outcomes of the project

    - What follow-on activities, projects or programs have resulted?
    - Are they enough to maintain the momentum of the outcomes?
    - Have the collaborative efforts and partnerships been effective?

4. Identify *specific lessons* that can be learnt from this project.

    - Did the project have any unintended impacts?
    - What worked well and we would do again?
    - What would we do differently?

Target Audiences for the Review

The primary audience for this review will be internal TNC managers, including:

- Pacific Island Countries Operating Unit project managers and senior management;
- Marine Initiative managers;
- Asia Pacific and California Division Director;
- Conservation Measures Group Director; and
- Other Conservancy marine program or project managers.

A secondary audience could be the key partners and donors, including:

- The Secretariat of the Pacific Community;
- The David and Lucile Packard Foundation;
- The Oak Foundation;
- USAID / East Asia and Pacific Environmental Initiative; and
- Other conservation NGOs through a lessons learnt publication.

Review Team

The review team members include:

- Ian Dutton – Director, TNC's Conservation Measures Group, Bethesda, MD, USA (idutton@tnc.org).
- Randy Hagenstein – Conservation Director, TNC's Alaska Chapter, Anchorage, USA (rhagenstein@tnc.org).
- Tim Adams – Director, Marine Resources Division, Secretariat of the Pacific Community, Noumea, New Caledonia (TimA@spc.int).
- Paul Lokani – Director, TNC's Melanesia Program (and formerly an implementer of the LRFFT project), Pt. Moresby, Papua New Guinea (lok.tnc@global.net.pg).
- Andrew Smith – Director, TNC's Pacific Island Countries Coastal Marine Program (and LRFFT project manager), Koror, Republic of Palau (andrew_smith@tnc.org).

Review Schedule

January to March, 2004:
- Team confirmed, logistics completed
- Background documents prepared (AS)

April 1-9:
- Terms of Reference finalized
- Team leader identified
- Background interview list agreed and phone interviews completed

April 13-21:
- Team gathers in Palau to complete bulk of review (see suggested agenda)

June:
- Draft Report finalized and circulated for review

July:
- Final report available.

Attachment 1: Tentative Review Report Format

I. EXECUTIVE SUMMARY

II. PURPOSE of EVALUATION

III. METHODOLOGY of EVALUATION

IV. BACKGROUND of PROJECT

V. By each Project Objective / Strategy Component:
EFFECTIVENESS – Findings and Conclusions
EFFICIENCY – Findings and Conclusions
SUSTAINABLITY – Findings and Conclusions
SPECIFIC LESSONS – Findings and Conclusions

VI. SUMMARY of FUTURE ACTIONS

VII. APPENDICES
Terms of Reference
Biodata of Review Team
List of Informants
Project Summary Report (objectives, results, milestones, indicators)
Other supporting documents (Annotated list of project document outputs)

Attachment 2: Palau Review Meeting Agenda

Location: Penthouse Hotel Meeting Room

Draft Agenda:

Wed. April 14

- Introductions
- Agree on timeframe, methods, tasks and responsibilities, resources needed and available, logistics
- Review project background and chronology

Thu. April 15

- Review project objectives, milestones, main activities, results
- Review documents and information available to answer questions – highlight gaps, review responses to interviews, any further tasks to obtain additional information

Fri. April 16

- Further review of documents and information

Sat. April 17

- Discussion of review findings on:
    - Effectiveness
    - Efficiency
    - Sustainability

Sun. April 18

- Diving (possibly at the spawning aggregation at Ngerumekoal, although it is early in the season) or kayaking (TBD)

Mon. April 19

- Further discussion of review findings on:
    - Effectiveness
    - Efficiency
    - Sustainability
- Compile lessons learnt
- Agree on conclusions

Tue. April 20

- Prepare draft of report, presentations

Wed. April 21

- Prepare draft of report, presentations

Wed/Thu April 21/22

- Team departs

Attachment 3: Tips on Process (from Kath Shurcliff, Evaluation Guidelines)

- Use summary tables as much as possible, e.g. objectives, outcomes, indicators, finding
- 2 or 3 people interview each person, group – agree on findings after interview
- List findings separate from conclusions among Team and in report
- Triangulate whenever possible – i.e., 3 pieces of evidence/findings to support conclusion
- Specify your criteria for making judgments, conclusions – it is helpful if Team members make their biases known to each other
- Write down findings and conclusions as you go – check in with other Team members regularly
- Keep lists of informants, other sources
- Use a guided interview – no formal questionnaire but a checklist of questions used as a flexible guide
- Use existing information as much as possible
- Also use direct observation
- Use key indicators
- Use a multi-disciplinary team
- Take multiple approaches
- Practice "optimal ignorance" – know what is not worth knowing
- Usually orders of magnitude are all that is needed in data collection
- Your methods need to inspire confidence that the information presented is reliable and valid and your conclusions are convincing
- Listen and learn!

Attachment 4: Collaboration: What Makes It Work – Twenty Success Factors

Environment Factors

- History of collaboration or cooperation in the community
- Collaborative group seen as a legitimate leader in the community
- Favorable political and social climate

Membership Characteristics

- Mutual respect, understanding and trust
- Appropriate cross section of members
- Members see collaboration as in their self-interest
- Ability to compromise

Process and Structure

- Members share a stake in both process and outcome
- Multiple layers of participation
- Flexibility
- Development of clear roles and policy guidelines
- Adaptability
- Appropriate pace of development

Communication

- Open and frequent communication
- Established informal relationships and communication links

Purpose

- Concrete, attainable goals and objectives
- Shared vision
- Unique purpose

Resources

- Sufficient funds, staff, materials and time
- Skilled leadership

"The bottom line is: to ensure the effectiveness of your collaborative effort, pay attention to all the factors listed." From PW Mattessich, M. Murray-Close, B. R. Monsey, Wilder Research Center 2001.

APPENDIX 2: Review team biographical data

Tim Adams is a forestry botanist and population biologist turned fisheries manager and regional intergovernmental agency bureaucrat. Tim is British by birth, educated at St. Andrews and Exeter Universities, and went to Fiji in 1982. He rose through the ranks of the Fiji Fisheries Division from Fisheries Officer to Director before joining the Secretariat of the Pacific Community (SPC) in 1992 and rising again through the ranks from Fisheries Resource Adviser to Director of the SPC Marine Resources Division. Tim is not a live reef fishery specialist, but has been responsible for several LRFFT-specific management initiatives over the years, both at the country and the regional level. His Division at SPC will continue to provide assistance and advice to Pacific Island governments on LRFFT issues as part of its overall coastal fishery regional support service.

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Ian Dutton is Director of the Conservation Measures Group of The Nature Conservancy and tasked with leading the development of a performance monitoring and evaluation system for the entire organization. He was formerly the Indonesia Country Program Director where he led the development of new programs in East Kalimantan and West Papua and consolidated existing marine and terrestrial programs in Sulawesi, Komodo and Bali. He has also assisted with developing partnerships with conservation and development organizations across South and East Asia. Ian has 25 years experience in environmental planning and management and has worked for government, academic and private sector organizations. He holds a Bachelor of Science degree (geography/ecology) from the University of Canberra, a Master of Science (environmental planning) from Griffith University and a PhD (environmental monitoring) from the University of Queensland. He is author/co-author of 150 publications on environmental impact assessment and planning, coastal management, GIS applications, recreation and tourism planning, protected area management and monitoring and environmental education/interpretation.

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Randy Hagenstein has an extensive background in natural resource issues with 25 years of experience in conservation, research, analysis, management, and use of natural resources, especially in northern ecosystems. Currently he is the Director of Conservation for The Nature Conservancy's Alaska Program, responsible for implementing the Conservancy's science-based, non-confrontational approach to conservation of plants and animals and their habitats in Alaska. Previously, he was co-founder and Alaska Program Director with Pacific GIS, a Portland, Oregon based non-profit created to enhance public access to geographic data and technology. His GIS experience also includes development of a GIS database for the Prince William Sound-Copper River ecosystem in south-central Alaska in conjunction with Conservation International and Ecotrust and management of the North Slope Borough's GIS office. Randy has also been involved in research on subsistence resource use patterns in Alaska and was a commercial salmon fisherman for several years. His educational background includes a B.A. from Middlebury College in Northern Studies and a Master's degree from Yale University in forest ecology and silviculture. Contact information: Randall H. Hagenstein, The Nature Conservancy

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Paul Lokani is The Nature Conservancy's Melanesia Program Director. Paul joined the Conservancy's Pacific team in 1999 as the South Pacific Coastal Marine Projects Manager. He worked on developing national policy, management plans, and licensing models to address the live reef food fish trade in Papua New Guinea, as well as spawning aggregation assessments in PNG and the Solomon Islands. In 2002, Paul became the Director of the newly formed Melanesia Program, which includes the Conservancy's Papua New Guinea and Solomon Islands Country Programs. In this capacity, he is leading the Conservancy's work to expand our site-based projects in Kimbe Bay, the Arnavon Islands, Adlebert Range and to export our experience throughout Melanesia. Prior to joining the Conservancy, Paul was an Executive Manager with the Division of Surveillance, Enforcement and Licensing, PNG National Fisheries Authority (NFA), where he held a number of technical and management positions, led several major fisheries research projects, and was responsible for putting in place many of the Fisheries Management Plans now being implemented by the NFA. He holds a BSc in Fisheries Biology from the PNG University of Technology and an MSc in Marine Biology from James Cook University in Australia.

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Andrew Smith is the Director of The Nature Conservancy's Pacific Island Countries Coastal Marine Programs. He joined the Conservancy in 1996 from the South Pacific Regional Environment Programme where he provided coastal management advice and assistance to 22 island nations and territories. Andrew is a marine biologist with 21 years of experience in tropical marine resource management, specializing in areas where customary use rights and marine tenure issues predominate. He obtained his Ph.D. from James Cook University in Queensland, Australia where his research focused on the use and management of marine resources by Aboriginal communities.

Andrew's responsibilities for the Conservancy include providing strategic direction, technical and management assistance to coastal and marine programs in the Pacific, including Palau, the Federated States of Micronesia, Papua New Guinea, and the Solomon Islands. He works closely with local communities, state and national governments, regional agencies, and universities to develop and implement inshore marine resource and coastal management projects, including networks of Marine Protected Areas.

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APPENDIX 3: List of Key Project Documents

Arritt, S. (2001) Live Reef Fish Trade – Pacific Awareness Project. Summary of Workshop (7-11 May 2001) at Mahonia Na Dari Conservation and Research Center, Kimbe Bay, Papua New Guinea. 11 pp.

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SI Fisheries Division & TNC. (1999) Workshop Report on Consultative Workshop on the Development and Management of the Live Reef Fish Food Trade in the Solomon Islands. Honiara, May 17 – 20, 1999. 40 pp.

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October 1, 1999 – July 31, 2000 (15-Aug-00) Extract 5 pp.
August 1, 2000 – January 15, 2001 (23-Jan-01) Extract 6 pp.
January 2001 – March 2001 (7-Nov-01) Extract 7 pp.
April 1, 2001 – September 30, 2001 (Oct-01) Extract 7 pp.
October 2001 – March 2002 (16-Aug-02) Extract 7 pp.
April, 2002 – September, 2002 (Oct-02) Extract 7 pp
October 2002 – September 2003 (Oct-03) Extract 24 pp.

TNC. (2001) First Annual Report to the Oak Foundation. 7 pp.

TNC. (2001) Protecting Spawning Aggregations from Destructive Fishing and the Live Reef Food Fish Trade. Proposal to the Oak Foundation. 29 pp.

TNC. (2003) Annual Report to the Oak Foundation. 5 pp.

TNC. (2000) The Nature Conservancy and The Live Reef Fish Trade. TNC's Integrated Strategy to Address the Live Reef Fish Trade's Threats to Marine Biodiversity in the Asia Pacific Region (Draft). TNC, Palau. 24 pp.

TNC, SPC, IMA. (2002) Live Reef Food Fish Trade Regional Awareness Materials Package.

Yeeting, B. (2001) SPC Pacific Regional Live Reef Fish Trade Initiative. SPC LRF Bulletin #9. pp 19-20.

Yeeting, B. (2002) SPC Pacific Regional Live Reef Fish Trade Initiative Update. SPC LRF Bulletin #10. pp 27-29.

Yeeting, B. (2003) Pacific Regional Live Reef Fish Trade Management Workshop. SPC LRF Bulletin #11. pp 39-43.

APPENDIX 4: List of Key Financial Contributors

Source	Grant Title	Year	Duration	Amount for LRFFT Activities (US$)			Comments
				(Total)	(Direct)	(Indirect)	
David & Lucile Packard Foundation	(Initial grant to AP Coastal Marine Program)	1995	2 years	?			Total grant of ~$2,000,000 over 2 years. 1:1 match requirement. Amount spent specifically on Pacific LRFT activities unknown
David & Lucile Packard Foundation	Coastal & Marine Conservation: A Strategy for Addressing Regional Threats & Protecting Key Sites (Grant #97-5555)	1997	2 years	~190,000			Total grant $2,000,000 over 2 years. 1:1 match requirement. Estimated ~$190,000 went toward Pacific LRF activities
David & Lucile Packard Foundation	Coastal Marine Conservation in the Asia Pacific Region: Building Local Leadership and Strategic Alliances (Grant #2000-1265)	2000	2 years	~120,900			Total grant of $2,111,199 over 2 years. 1:1 match requirement. Pacific LRFT support mostly for salaries
David & Lucile Packard Foundation	Protecting Reef Fish Spawning Aggregation Sites (Grant #2001-19075)	2003	1 year	44,010	37,010	7,000	
USAID / EAPEI Global Conservation Program	Protecting Coral Reefs from Destructive Fishing Practices in the Pacific (LAG-A-00-99-00045-00)	1999	4 years	$340,000	264471	75,529	Match of $85,000 required
USAID / EAPEI Global Conservation Program	Protecting Coral Reefs from Destructive Fishing Practices: Protecting and Managing Reef Fish Spawning Aggregations in the Pacific (LAG-A-00-99-00045-00)	2002	3 years	$500,000	409,836	90,164	Match of $125,000 required
Oak Foundation	Controlling the Expansion of the Live Reef Fish Trade: TNC's Coastal & Marine Program in the Asia-Pacific Region	2000	2 years	$150,000	125,000	25,000	
Oak Foundation	Protecting Spawning Aggregations from Destructive Fishing & the Live Reef Fish Trade	2003	2 years	$80,000	69,600	10,400	
Henry Foundation	Donation	1998	1 year	$12,500			

		(Calendar)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
		(TNC FY)	FY96 FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05 FY06	
Source	**Amount (US$)**	(US FY)	US FY96 US FY97	US FY98	US FY99	US FY00	US FY01	US FY02	US FY03	US FY04	US FY05	
Packard Fdn - 1st AP CMP	?											
Packard Fdn - Grant #97-5555	(~$190,000)											
Packard Fdn - Grant #2000-1265	(~$120,900)											
Packard Foundation SPAGS	$44,010											
USAID / EAPEI LWA LRFT	$340,000											
USAID / EAPEI LWA SPAGS	$500,000											
Oak Foundation LRFT	$150,000											
Oak Foundation SPAGS	$80,000											
Henry Foundation	$12,500											

APPENDIX 5: List of Informants

Interviewed:	By:	Notes:
Leban Gisawa Fisheries Manager - Inshore National Fisheries Authority (NFA) P.O. Box 2016 Port Moresby, N.C.D. Papua New Guinea Phone: +675 3212643 Fax: +675 3202061 E-mail: lgisawa@fisheries.gov.pg	Tim Adams	Responsible for managing PNG's LRFFT
Edwin Oreihaka Ministry of Fisheries and Marine Resources P.O. Box G13 Honiara Solomon Islands Phone: +677 38730 Fax: +677 38106 E-mail: sbfish@ffa.int	Tim Adams	Responsible for managing LRFFT in Solomon Islands
Vaughn Pratt President International Marinelife Alliance Honolulu, Hawaii USA E-mail: vpratt@marine.org	Randy Hagenstein	One of the MOU partners.
Charles "Chip" Barber Formerly WRI and IMA Currently: Biodiversity Policy Consultant IUCN US Multilateral Office 1630 Connecticut Ave. NW Suite 300 Washington DC 20009 USA cbarber@iucnus.org	Ian Dutton	One of the key MOU partners and has a long history of engagement with the LRFFT issue.
Charles "Chuck" Cook Director Coastal and Marine Program TNC - California E-mail: ccook@tnc.org	Ian Dutton	Initiated TNC's involvement with the LRFT
Michelle Lam Marine Aquarium Council Suva, Fiji E-mail: lamkile@yahoo.com	Paul Lokani	Formerly Solomon Islands Fisheries Officer responsible for LRFT management

Interviewed:	By:	Notes:
Thomas Graham NMFS Honolulu, HI 96809 USA Phone: +1 808 625 8755 E-mail: thomasgraham@aol.com	Randy Hagenstein	Formerly consultant to TNC on LRF and spawning aggregation projects
Being Yeeting Senior Fisheries Scientist SPC Noumea Tel: +687 26.20.00 E-mail: BeingY@spc.int	Tim Adams	SPC Officer responsible for Pacific LRF work
Dr Jos Pet Deputy Director, South East Asia Center for MPAs The Nature Conservancy Indonesia Program, Bali. jpet@tnc.org	Ian Dutton	Actively engaged in spags studies and mariculture in Komodo NP and eastern Indonesia since mid-1990s
Dr Peter Mous Senior Scientist South East Asia Center for MPAs The Nature Conservancy Indonesia Program, Bali. pmous@tnc.org	Ian Dutton	Actively engaged in coral /fish monitoring and threat abatement programs in eastern Indonesia

APPENDIX 6: Chronology of Key Events and Milestones

Chronology of Activities

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
REGIONAL:				
Phase 1: Conceptualization, Planning and Engagement (1996 to December 1999)				
1995-July	SPC-FFA Workshop on the Management of Inshore Fisheries and presentation on LRF trade by Bob Johannes	In workshop report, SPC countries task agency with producing regular LRF bulletin, and flagged the need for research on grouper fishery sustainability and a regional register of export operators.	Pacific Island countries agree to a more collective approach to the LRFFT issue and several subsequent regional and local initiatives sparked	The report of this meeting was published only on the web (www.spc.int/coastfish/Reports/ICFMAP/IFMW2.pdf).
1995-Oct	Publication of Johannes and Riepen LRFT report	*Environmental, Economic & Social Implications of the LRFT in Asia & the Western Pacific* – TNC & Forum Fisheries Agency (R.E.Johannes & M.Riepen, 1995)	Report received international attention (CNN & Time magazine) highlighting the threat to the Asia Pacific reefs	Report identified the priority issues and areas that formed the basis for TNC's Asia Pacific LRFT work
1996-Mar	TNC provided financial support for editor of SPC LRF Information Bulletin	SPC Special Interest Group *Information Bulletin on the Live Reef-fish (export and aquarium) Trade*. No.1 published		TNC covered the costs of Dr. Robert Johannes to edit the SPC Live Reef Fish Information Bulletin, which has become a major avenue for disseminating live reef fish related information. From 1996 to early 2004, 11 bulletins have been published.
1996-Aug	Report analyzing laws relating to the LRFT in Asia Pacific	*Analysis of Laws Addressing Destructive Fishing Practices in the Asia/Pacific Region (Sodium Cyanide/Live Reef Fish Trade)* (TNC internal report)		

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
1996-Aug	TNC raised the issue with SPC and member country fisheries representatives during the 26th Regional Technical Meeting on Fisheries (Noumea, 5-9 August, 1996)	Information Paper: *The Live Reef Fish Trade and the Implications for the Western Pacific*		The purpose was to provide a summary of the current state of the LRFFT in Asia and Pacific, highlight the key environmental, economic and social issues, and their implications for the western Pacific.
1996-late	The issue of potential environmental impacts was raised with SPREP during the early stages (late 1996) of the 1997 Pacific Year of the Coral Reef campaign planning	SPREP circulated to their members an information sheet on the potential environmental impacts of the LRFT. Prepared by TNC in early 1997.	SPREP member countries made aware of potential issues	SPREP members are the same as SPC member countries and territories, but different government agencies are the contact points.
1997-May	LRFFT was the flagship issue for the SPC Marine Resources presentation at the SPC 50th anniversary Ministerial Conference at the Australian Ministry of Foreign Affairs in Canberra			No interest whatsoever from Ministers, who were much more interested in the SPC name change than the possibility of Pacific reefs being plundered.
1997-Jun	TNC was the NGO representative on the Pacific Regional Task Force to assist SPREP with the preparation of Global Environment Facility (GEF), Strategic Action Programme (SAP) for International Waters of Pacific Islands.	Strategic Action Programme (SAP) for International Waters of Pacific Islands	LRFT issues incorporated into the SAP	This SAP for International Waters of the Pacific Islands Region was initiated and developed by the thirteen Pacific Island States eligible for GEF support. The SAP covers live reef fish related issues under the Integrated Coastal and Watershed Management theme.
1997-Jul	Production of LRFT Information Sheet for the Pacific	Live Reef Fish Trade. Information Sheet (TNC) 3pp		
1997-Sep	TNC worked with the SPREP Secretariat on a briefing paper to be submitted to the Forum Officials meeting for consideration.	Paper outlining the potential environmental impacts for the region from the LRFT.	Due to the controversy over Australia's climate change position, this item was dropped, along with a number of other environmental issues, from the Forum Officials agenda. It was, however, discussed informally and it was agreed that individual countries should address the issue first.	

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
1997-Sep/Oct	TNC, with support from FSM, Marshall Islands and PNG governments and NGO representatives, raised the issue of the LRFT and its impacts at the 6th South Pacific Conference on Nature Conservation and Protected Areas, sponsored by SPREP, and held in Pohnpei, FSM, 23 September to 3 October, 1997.	Resolution 5: Control and management of the live reef fish trade in the Pacific Islands region.	Conference adopted a resolution on the live reef fish trade.	At the conference, discussions were held with the SPREP Director about the LRFT issues and advised he would talk to the SPC Director General about it. They decided SPC should take the lead on LRF issues as it was more of a fisheries issue.
1997-Oct	TNC began working more closely with SPC Marine Resources Division Director.		The Director informally discussed live reef fish trade concerns with SPC member government representatives at the SPC Council meeting in Canberra late 1997, and received informal approval to continue with addressing the trade as an SPC fisheries matter	
1997-Dec	Preparation and publication of management suggestions for the LRFFT in the Pacific	Management suggestions for the sustainable development of live reef fish food fisheries in the Pacific Islands region. SPC Live Reef Fish Information Bulletin #3 – December 1997 (pp 47-51) Smith, A.		
1998-Mar	Presentation of draft Pacific LRFT strategy to TNC Asia Pacific Team Meeting in Honolulu	Preliminary draft regional LRFT strategy and presentation	Draft strategy reviewed, revised, and approved. Ready for distribution to partners for comment.	Proposed: Purpose; Strategy (4 components: awareness raising; management assistance; research facilitation; training/technical assistance); assumptions; partnerships; timeframe; funding; delivery; next steps.
1998-Apr	Red tide devastates Hong Kong Live Reef Fish Trade			Destroyed 80% of fish in Mariculture facilities in HK. Sent lead companies out of business.
1998-May	Consultations with IMA in Manila on possible collaboration in Asia and Pacific		Agreement to work more closely and collaborate on a joint strategy for the Pacific	

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
1998-Apr-Jul	Revision of draft TNC regional LRFT strategy with partners	*Draft Live Reef Fish Pacific Regional Strategy: A Collaborative Approach*	Broad strategy components agreed to by SPC, IMA and WRI	
1998-Aug	Meeting with ADB on LRFT issues (IMA, WRI, TNC)	Joint presentation to ADB staff	Agreement from ADB to proceed with identifying possible Pacific needs and to get Pacific country endorsement.	Obvious that ADB staff had no knowledge of the LRFT
1998-Oct	Proposed Regional LRFT Initiative presented by SPC and TNC at the 2nd Pacific Community Fisheries Management Workshop held in Noumea, New Caledonia	*Live Reef Fish Pacific Regional Strategy: A Collaborative Approach.* (SPC & TNC) Formal endorsement of the strategy in the meeting report.	The meeting endorsed the "Live Reef Fish Pacific Regional Strategy" as a new initiative with high priority, and urged SPC to secure partners and seek the new resources necessary to implement.	This was the first time that the SPC Marine Resources Division was directed by its members to work with NGOs.
1999-Apr	Proposal submitted for East Asia and Pacific Environmental Initiative (EAPEI) funding (US Govt) for 'Protecting Coral Reefs from Destructive Fishing Practices' (focusing on the LRFFT) approved	Funding approved $200,000	Funding not made available until late 1999.	Funding covered period from October 1999 until September 2003.
1999-Jun	Meeting with ADB in Manila on the design of a Pacific LRFT RETA (IMA, WRI, SPC, TNC)	Presentations and discussions	Direction form ADB staff on how to proceed	
1999-Jun-Dec	Development of ADB proposal for Technical Assistance for Development of Capacity to Sustainably Manage the Trade in Live Reef Fish in the Member Countries of the Secretariat of the Pacific Commission	ADB RETA proposal and workplan	TA Grant eventually awarded in 2000	Joint IMA, WRI, SPC, TNC initiative.

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
1999-Aug	Presented revised Pacific Regional LRFT Initiative and strategy to SPC 1st Heads of Fisheries meeting in Noumea	TNC observer statement, and joint IMA/WRI/TNC LRFT presentation	The meeting reaffirmed last years' decision and noted the need to build effective local capacity to cope with the management of the expanding LRFT, and to strengthen the information base for management. It directed SPC to seek the means for implementing its part in the Regional Live Reef Fishery Strategy, and supported the proposal for a regional LRF Initiative in collaboration with IMA, TNC and WRI.	
1999-Aug-Dec	Development of MOU with SPC, IMA and WRI	Memorandum of Understanding – The Pacific Regional Live Reef Fish Trade Initiative (signed 15-Dec-99) (TNC SPC IMA WRI 7pp)	Established both a regional strategy, a collaborative arrangement, and an agreed set of work priorities for the Pacific region	This marked the completion of Phase 1.
Phase 2: Implementation and Collaboration Through the MOU (December 1999 to December 2002)				
2000-May to 2001-Mar	Financial support of SPC LRF Officer through contract.	2 progress reports	Enabled SPC to fully implement their MOU obligations. Built SPC's coordination capacity.	Key to the success of the MOU. Filled in the gap until other funding could be obtained for the position.
2000-Jul	Draft TNC integrated LRFT strategy prepared.	*TNC's Integrated Strategy to Address the Live Reef Fish Trade's Threats to Marine Biodiversity in the Asia Pacific Region*. 24pp	Placed the Pacific LRFT project activities within the broader strategy	Not finalized as it was superseded by a mutli-agency integrated strategy.
2001-Feb	Workshop held to address threats to marine biodiversity from the LRFT and to develop a collaborative strategy (22-24 February 2001, Honolulu, Hawaii)	Graham, T. 2001. *A Collaborative Strategy to Address the Live Reef Food Fish Trade*. Asia Pacific Coastal Marine Program, Report # 0101, The Nature Conservancy, Honolulu, HI, USA. 54 pp	Agreement by TNC, SPC, IMA, WRI, on future activities within Asia Pacific to address the LRFT.	Had support of both Packard and MacArthur Foundations.

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
2001-May	Pacific LRFFT awareness project workshop held in PNG.	Arritt, S. *Live Reef Fish Trade – Pacific Awareness Project. Summary of Workshop*. 7 – 11 May 2001. Mahonia Na Dari Conservation and Research Center, Kimbe Bay, WNB, Papua New Guinea.	Identified and agreed on key target audiences, messages, priority materials and production process.	While the steps were clearly articulated, many challenges resulted in preparing these materials. Became a very long drawn-out process.
2001-Jul	MOU partners reported on the Pacific LRFT Initiative activities to the SPC 2nd Heads of Fisheries meeting in Noumea.	Statement of support in the meeting report.	SPC member countries commended SPC and partners on the progress of the Pacific Regional LRFT Initiative	
2001-Jul to 2002-Mar	SPC contracted to prepare short LRFT video for decision makers	A six-minute video for decision makers that outlines the main issues associated with the LRF food trade. Included Pacific fishery heads talking about their experiences with the LRFFT.	Distributed by SPC throughout the Pacific as one component of the awareness materials package	
2001-Nov	Proposal to the East Asia and Pacific Environmental Initiative (EAPEI) for Protecting Coral Reefs from Destructive Fishing Practices: Protecting and Managing Reef Fish Spawning Aggregations in the Pacific	Awarded and funds available from October 2002. $500,000	Project will improve resource management and spawning aggregation site protection, increase awareness of these resources' vulnerability to over-exploitation, and enhance capacity to manage fish spawning aggregations and MPAs that incorporate these sites.	
2002-Feb	Consultancy to develop both the Asia Pacific and Pacific Division components of a TNC-wide spawning aggregation conservation strategy.	*Pacific Division Implementation Plan for the Asia Pacific Regional Conservation Strategy for Reef Fish Spawning Aggregations*. Coastal Marine Program, The Nature Conservancy. Graham, T. (Feb. 2001) 100 pp. *Asia Pacific Regional Conservation Strategy for Reef Fish Spawning Aggregations*. Coastal Marine Program, The Nature Conservancy. Graham, T. (Feb. 2001) 58 pp.	Provided recommendations on how TNC should address spawning aggregation conservation in the region.	

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
2002-Apr	Inventory of LRFFT-related awareness materials completed	Electronic inventory and copies of all materials sent to SPC Fisheries Information Section	Allowed the project to use and build on existing awareness materials and not duplicate effort.	
2002-Sep	Pacific Regional Live Reef Fish Trade Management Workshop held in Suva, Fiji, for SPC and MOU partners to provide fisheries policymakers and managers in the region with information on activities and outputs under the project, elicit the views of participants, and identify priorities for action on policy and technical levels.	Pacific Regional Live Reef Fish Trade Management Workshop Report. SPC LRF Bulletin #11. pp 39-43	A series of key findings and recommendations related to the LRFT, and countries specific needs and concerns.	Provided an opportunity to present the results of the Pacific Regional LRFT Initiative, and assess what the next steps should be.
2002-Dec	Regional LRFFT awareness materials package completed.	Materials shipped to SPC for distribution. The awareness package included: 1. A presentation folder (containing an 8-page overview of the LRFT; four 2-page fact sheets; a poster with target species and a diagram of the "chain of custody" from the fishers to restaurants, and a map of LRF food trade history in the Pacific. 2. A six-minute video for decision makers. 3. Plastic fish identification cards for the top 16 LRF food trade species. 4. The latest SPC Information Bulletin on Live Reef Fish	Distributed to all Pacific island countries fisheries agencies and relevant NGOs.	
2002-Nov to 2003-Sep	Development of draft regional guidelines for managing the LRFFT in the Pacific.	*Draft Guidelines for Managing Live Reef Food Fish Fisheries in the Pacific Islands Region*. (Sep 2003) 120 pp	Draft provided to SPC for finalization and publication.	

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
Phase 3: Evolution and Re-Focusing of TNC's Efforts Post-MOU (2003 to present)				
2003-Jul-Sep	Consultancy to compile TNC Pacific LRFFT project chronology of components, activities and outputs.	Draft report and tables.	Of limited value.	Too difficult for a contractor to compile the chronology for such a long and complex project when not familiar with the project.
2004-Apr	Review meeting for the TNC Pacific LRFFT Project held in Palau.	Review report in preparation.	Identify lessons learnt to guide future TNC work.	
2002-Oct to (on-going)	Focus on spawning aggregation protection and management			
NATIONAL:				
1994-Apr to 1996-Aug	**Palau:** Study of 3 spawning aggregations in Palau	Johannes, R.E., L. Squire, T. Graham, Y. Sadovy, and H. Renguul. 1999. *Spawning aggregations of Groupers (Serranidae) in Palau*. Marine Conservation Research Series Publ .#1, The Nature Conservancy. 144pp.	First long-term study of grouper spawning aggregations in the Asia Pacific	Guided TNC's spawning aggregation monitoring and assessment work. Funding for this project was provided by the South Pacific Forum Fisheries Agency, the Pew Foundation, TNC, the Palau Division of Marine Resources and the University of Hong Kong Research Grants Council.

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
1996-Mar	**PNG:** Meeting with local NGOs, fishing industry and dive industry representatives, and government departments (NFA, DEC and AGO) to discuss LRFT issues	Meeting notes and report	The National Fisheries Authority (NFA) requested TNC's assistance to prepare an Information Paper to be presented to the National Fisheries Council meeting (April 3-5, 1996). The Information Paper recommended to the NFC that a resolution be agreed to by that meeting for a Reef Fishing Management Plan for PNG to be prepared by NFA as soon as possible. NFA, with assistance from TNC, to prepare a preliminary draft Reef Fisheries Management Plan/Guidelines.	
1996-May	**PNG:** Provided NFA with information papers on the LRFF and aquarium trades	Information Paper: The Live Reef Fish Trade and the Implications for Papua New Guinea Briefing Paper on Marine Aquarium Fish Management	Used by NFA in briefing the National Fisheries Board.	
1996-Nov	**PNG:** TNC provided NFA with a draft LRF national management plan	Draft National Live Reef Fish Fisheries Management Plan. 19 pp	Used by NFA as the basis for their final management plan	
1997-Jun	**RMI:** Documented the LRFFT situation in the Marshall Islands and provided briefings to key leaders	Confidential internal report. *Live Reef Fisheries Activities in the Republic of the Marshall Islands.* SPC LRF Bulletin #3 Dec. 97. Smith, A. pp 14-15	Referred RMI EPA to IMA for testing fish samples for cyanide. Increased awareness within key agencies on LRFFT issues.	
1997-Aug	**FSM:** Provided review comments on LRFFT application for Pohnpei.	Review submission with comments and suggestions for management of the LRFFT in FSM	Application by the LRFFT operator was rejected.	
1998-Aug(?)	**PNG:** National Fisheries Board (NFB) imposed a moratorium on any new LRF licenses	Moratorium	All LRFFT operations stopped, and no new licenses issued.	NFA adopts precautionary principle because of the presentation by TNC to the Board Chair

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
1998-Aug	**PNG:** Meeting with National Surveillance Coordination Centre on possible LRFT vessel monitoring	Briefing on LRFT	Agreement to work with NSCC to investigate the establishment of a "coastwatch" network	
1998-Aug	**SI:** Meeting in Brisbane to coordinate inter-group LRFFT activities in the Solomon Islands. Attended by RE Johannes for TNC.	Report by Johannes on coordination	Coordination agreement.	Involved: SI Fisheries, ACIAR project, TNC, IMA, WRI.
1999-Feb	**SI:** Moratorium on LRFT licenses imposed	Moratorium		No formal notice served on the moratorium. Concerns for the destructive nature of the LRFFT by government officers
1999-May	**SI:** TNC funds and facilitates Consultative Workshop on the Development and Management of the Live Reef Fish Food Trade in the Solomon Islands (Honiara, May 17 – 20, 1999)	Workshop Report on Consultative Workshop on the Development and Management of the Live Reef Fish Food Trade in the Solomon Islands. Honiara, May 17 – 20, 1999.	Agreement by all sectors (government, community, industry) on the broad strategy for managing the LRFFT in the Solomon Islands	
1999-Jul to 2001-Dec	**SI:** Sustainable Management of the Live Reef Fish Trade-Based Fishery in Solomon Islands. ACIAR Project ANRE1/1998/094	Various reports. Management workshop Nov. 2001	Added to the understanding of the SI LRFFT, but did not result in the completion of a National LRFFT Management Plan.	ACIAR funded this project to investigate the socioeconomic aspects of the LRFT in SI, with the aim to complete the LRFT National Management Plan. With this project in place, TNC considerably reduced its involvement in LRFFT matters in SI, until completion of the project.
1999-Nov	**PNG:** National Fisheries Board submission requesting NFA to work with TNC on LRFFT management strategies.	NF Board directs NFA to liaise with TNC to develop National LRF Management Plan for PNG		Note: During the time TNC worked with NFA on the management plan (1996 to 2002), NFA changed Managing Director 3 times; and at least 5 changes of Board.
1999-Nov	Proposal to the Oak Foundation for 'Controlling the Expansion of the Live Reef Fish Trade'	Awarded in February 2000. $150,000 for two years	Provided funding for national and community-based work on Melanesia.	

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
2000-Mar-Nov	**Palau:** Review of all LRFT activities in Palau.	Graham, T. 2001. *The Live Reef Fisheries of Palau: History and Prospects for Management, December, 2001*. Asia Pacific Coastal Marine Program Report # 0103, The Nature Conservancy, Honolulu, Hawaii, U.S.A: 85 pp.	Provided the Palau Division of Marine Resources with management recommendations for future LRFT operations.	
2000-Sep	**PNG:** NFA and TNC sign MOU	Signed MOU	MOU specifies formal working relationship. Requires NFA to assign at least one staff person to the LRFFT.	
2000-Sep	**PNG:** Preparation of draft site management plans for trail fisheries in M'Buke and Tingwon.	NFA. Fisheries Management Act 1998. Site Management Plan for M'Buke Live Reef Food Fish Fishery. (draft) NFA. Fisheries Management Act 1998. Site Management Plan for Tongwon Live Reef Food Fish Fishery. (draft)	These plans were not used.	
2000-Nov	Proposal to the Oak Foundation for 'Protecting Spawning Aggregations from Destructive Fishing and the Live Reef Food Fish Trade'	Awarded in February 2002. $80,000 over two years.	Provided funding for national and community-based work on Melanesia.	
2001-Mar	**PNG:** LRF target species assessment survey and training in M'Buke, Manus, for trial fishery	*A Survey of Spawning Aggregation Sites, Monitoring and Management Guidelines for the Live Reef Fish Trade at M'Buke Island, Manus Province*. A report prepared for The Nature Conservancy. Lyle Squire. June 2001. 32 pp.	Due to lack of target species the trial fishery was cancelled by NFA with the agreement of the concerned communities.	

DATE	ACTIVITY	OUTPUT	OUTCOME	COMMENTS
2001-May	**PNG:** LRF target species assessment survey Kavieng, for trial fishery.	*Spawning Aggregation Survey at New Ireland*. Lokani, P. June 2001.	Based on the survey, NFA proposed to close down the trail LRF operation. But as very little fishery data was collected during the first phase of the trail fishing and because the company had already accumulated at least 4 tonnes of fish, NFA decided to allow the company to fish for another 6 tonnes for export.	
2001-Jul	**PNG:** TNC assists NFA to prepare a LRFFT Trial Fishing Policy and guidelines	*Draft Trial Fishing Policy*. July 2001 *Management Guidelines for Live Reef Food Fish Fishing Trials* (NFA) Final Draft July 2001		
2002-Feb	**PNG:** NFA completes and approves a National LRFFT Management Plan	NFA. *Fisheries Management Act 1998. The National Live Reef Food Fish Fishery Management Plan*. Feb. 2002. 11 pp.	PNG has the management mechanisms in place to effectively manage the LRFFT.	
2003-May-Aug	**SI:** Consultancy to complete the national LRFT management plan for the Solomon Islands.	*Solomon Islands National Management and Development Plan for the Live Reef Food Fish Fishery*. Sep. 2003. 56 pp. + Associated documents	Completes the preparation phase of the SI LRFFT management plan. Currently being reviewed for adoption and implementation.	
2002-Oct to (on-going)	**PNG / SI / Palau / FSM:** Focus on spawning aggregation protection and management			

APPENDIX 7: Memorandum Of Understanding between TNC, SPC, IMA & WRI

Secretariat of the Pacific Community

International Marinelife Alliance

The Nature Conservancy

World Resources Institute

MEMORANDUM OF UNDERSTANDING
The Pacific Regional Live Reef Fish Trade Initiative

This **MEMORANDUM OF UNDERSTANDING** is entered into by and between:

> *The **SECRETARIAT OF THE PACIFIC COMMUNITY ("SPC")**, an inter-governmental organization with headquarters in Noumea, New Caledonia;*
>
> *The **INTERNATIONAL MARINELIFE ALLIANCE ("IMA")**, a non-profit corporation organized in the Philippines, Indonesia, Hong Kong and the United States with headquarters in Manila, Philippines;*
>
> ***THE NATURE CONSERVANCY ("TNC")**, a non-profit corporation organized in the United States with headquarters in Arlington, Virginia; and*
>
> *The **WORLD RESOURCES INSTITUTE ("WRI")**, a non-profit corporation organized in the United States with headquarters in Washington, D.C.;*

on the basis of the following facts and circumstances:

STATEMENT OF PURPOSE

The overriding purpose and goal of this MOU is to implement a cooperative initiative to provide scientific, information, policy and management advice and assistance to Pacific island countries and territories with respect to the live reef fish trade. This shall be done by developing effective partnerships between organizations that have related interests and responsibilities to ensure a coordinated approach and to eliminate duplication of effort. This initiative is herein referred to as "Pacific Regional Live Reef Fish Trade Initiative," or simply "the Initiative."

MANDATE OF SPC MEMBER COUNTRIES AND TERRITORIES

The Initiative responds to the specific mandate of SPC member countries and territories, which was articulated in the official record of two recent SPC fisheries meetings:

At the 2nd Pacific Community Fisheries Management Workshop (Noumea, New Caledonia, 12-16 October 1998), SPC, IMA, TNC and WRI put before the member countries and territories a provisional "Live Reef Fish Pacific Regional Strategy" for their consideration and endorsement. In their official record of the meeting, member countries and territories stated the following:

> *"The meeting endorsed the "Live Reef Fish Trade Pacific Regional Strategy" as a new initiative with high priority, and urged the Secretariat of the Pacific Community to secure partners and seek new resources necessary to implement SPC's role in the strategy, provided this did not compromise the existing capability for providing assistance and advice to members on general reef fishery assessment and management. It was recognized that the live reef fishery whilst being a potential source of both benefits and problems and demanding a high degree of awareness and preparedness, was of more significance to some member countries and territories than others. However, translating the currently high level of concern into action on this issue was likely to benefit reef fishery management activities in general across the region;"*

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In the official record of the First SPC Heads of Fisheries Meeting, held in Noumea, New Caledonia August 9-13, 1999, the Heads of Fisheries Departments of the SPC member countries and territories stated the following:

> *"SPC member countries and territories, pointing out the need to build effective local capacity to cope with the management of the expanding live reef fish trade, and to strengthen the information base for management, directed the Secretariat to continue to seek the means for implementing its part in the Regional Live Reef Fishery Strategy endorsed by the 1998 SPC fisheries meeting, and supported the proposal for a regional Live Reef Fish Initiative being prepared by the Secretariat in collaboration with the International Marinelife Alliance (IMA), The Nature Conservancy (TNC) and the World Resources Institute (WRI)."*

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MUTUALITY OF INTEREST

SPC, IMA, TNC and WRI ("the Parties") share a concern that the Live Reef Fish Trade (LRFT), in both food and aquarium fish, presents Pacific island countries with both potential and problems. As relatively small-volume, high-value fisheries in which significant income can accrue directly to fishing communities, LRF fisheries have the potential to make a significant contribution to sustainable economic development in many Pacific island countries. However, experience with the trade in Southeast Asia–and its initial forays into the Pacific–have shown the trade to be prone to a "boom-and-bust" syndrome, with one area after another being overfished for the highest-valued species. Of particular concern in the Pacific is the unsustainable targeting of grouper spawning aggregation sites by LRF operators for the live reef food fish trade. In addition, the use of cyanide to stun and capture fish in the trade has wreaked extensive damage on the reefs of Indonesia and the Philippines, and several operators have been caught using the poison in Pacific island countries.

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While each organization has been acting on these concerns to assist Pacific island countries and communities, it is obvious that no one agency or organization has the capacity to adequately address all the issues arising from the LRFT, and so a collaboration between concerned organizations is essential for success.

COMPETENCE AND QUALIFICATIONS OF THE PARTIES

The **Secretariat of the Pacific Community (SPC)** is an inter-governmental technical advisory and networking organization founded in 1947. The mission of the Coastal Fisheries Programme, within the Marine Resources Division, is to provide a regional support service that assists Pacific islanders in identifying the status, and optimizing the long-term social and economic value, of small-scale fisheries and aquatic resources in the Pacific island waters. SPC has 26 member governments and administrations (22 Pacific island countries and territories).

As noted above, SPC member countries and territories have given a clear mandate to the SPC Coastal Fisheries Programme to take on a catalytic and coordinating role in assisting member countries and territories to address issues associated with the live reef fish trade, and to initiate cooperation with international organizations possessing relevant expertise for that purpose.

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The **International Marinelife Alliance (IMA)** is a non-profit, non-government organization (NGO) founded in 1985 to help conserve marine biological diversity, protect marine environments and promote sustainable and equitable use of marine resources. Headquartered and registered in the Philippines, it is also registered in Indonesia, Hong Kong, and the USA.

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In partnership with the Philippines' Bureau of Fisheries and Aquatic Resources, IMA has since 1992 managed the Philippines Destructive Fishing Reform Program, the only existing comprehensive national program in the Asia-Pacific which focuses on managing and regulating the live reef fish trade and combating the use of cyanide and other destructive fishing practices in that trade. IMA's Hong Kong Office carries out systematic monitoring of live reef fish imports in collaboration with the Agricultural and Fisheries Department and the Hong Kong Chamber of Seafood Importers. IMA is a Board member of the Marine Aquarium Council, a U.S.-based organization bringing together aquarium fish importers and exporters, scientific experts and marine conservation organizations to promote the environmental sustainability of the marine aquarium fish trade.

The Nature Conservancy (TNC) is an international NGO, founded in 1951, whose mission is to preserve plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. TNC operates field programs throughout the Asia-Pacific region, North America, Latin America and the Caribbean, including terrestrial and marine protection programs. In the Pacific, TNC currently has site-based projects in Palau, the Federated States of Micronesia, the Solomon Islands and Papua New Guinea.

Since the mid-1990s, TNC has been involved with raising international awareness concerning the impacts associated with the LRFT in the Asia-Pacific region. Activities have focused on management and policy at the national level, awareness, mariculture and alternative livelihood options, consumer issues and capacity-building. Initiatives have been focused on country, site and community-based LRFT actions, with an emphasis on the Federated States of Micronesia, Indonesia, Palau , Papua New Guinea and the Solomon Islands. TNC is also a Board member of the Marine Aquarium Council.

The **World Resources Institute (WRI)** is an independent center for policy research and technical assistance on global environment and development issues, founded in 1982 and based in Washington, D.C.. WRI provides – and helps other institutions provide – objective information and practical proposals for policy and institutional change that will foster environmentally sound, socially equitable development. WRI tries to build bridges between ideas and action, meshing the insights of scientific research, economic and institutional analyses and practical experience with the need for open and participatory decision-making.

Since 1996, WRI has worked closely with IMA and other partners to document the Philippines' experience in combating cyanide fishing and regulating the live reef fish trade and to adapt and promote this experience for the benefit of other countries in the Indo-Pacific region, where the live reef fish trade is expanding.

OBJECTIVES

SPC, IMA, TNC and WRI desire to work cooperatively and collaboratively to:

- Collect, assess and disseminate information on LRF fisheries and trade in the Pacific region;
- Assist Pacific island nations to develop and implement regional, national and local mechanisms, policies, and management strategies that promote or foster sustainable practices in the LRF fisheries;
- Provide training and capacity-building to Pacific island nations for sustainable LRF fishing and fishery practices;
- Strengthen the capacity of SPC's Marine Resources Division to respond to requests for technical assistance related to LRF fisheries from SPC member countries and territories;

- Raise Pacific decision-makers' and communities' awareness and understanding of the LRFT; and

- Explore and develop appropriate opportunities for coordination and collaboration between the "supply" communities and "demand" markets to promote a sustainable industry which benefits local Pacific island nation communities.

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UNDERTAKINGS OF THE PARTIES

SPC, IMA, TNC and WRI will work together to achieve specific goals in furtherance of the Pacific Regional Live Reef Fish Trade Initiative as agreed upon from time to time.

Subject to the availability of funding and appropriate human resources, the Parties agree to undertake the following activities under this MOU:

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- Serve as the official liaison between the Initiative and SPC member countries and territories, including regular provision of information about the Initiative and assistance to other Parties in obtaining official support for field activities from relevant agencies of SPC member countries and territories.

- Implement bureau services to respond to requests and inquiries and provide linkages to sources of additional assistance available from the cooperating Parties and others.

- Identify highest priority problem sites/countries and research priorities (in collaboration with other Parties).

- Institute and maintain a regional register of LRF operators (with assistance from IMA and SPC members).

- Promote regional and national dialogue through means appropriate to each area, including dedicated workshops and other fora (in collaboration with other Parties).

- Actively collect and provide access to relevant information through direct publicity, Initiative website, newsletter and responses to requests (in collaboration with all other Parties).

- Formally develop agreed regional standards for managing LRFT fisheries through regional meetings of SPC member representatives (with assistance from all other Parties).

- Building on the ongoing work of the SPC Coastal Fisheries Program, continue to provide Pacific island fisheries managers with information about the status, exploitation levels and future prospects of nearshore resources under their control, and to recommend and assist in the development and application of appropriate fishery or ecosystem management measures.

- Report Initiative activities and progress to scheduled SPC and other inter-governmental meetings.

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International Marinelife Alliance (IMA)

- Conduct field assessments of existing LRFT operations (assisted by SPC).

- Train government fisheries agents in the monitoring, inspection and sampling of LRF shipments, and in the collection of statistical data on exports (assisted by SPC).

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- Provide assistance to target countries that wish to set up Cyanide Detection Testing (CDT) laboratories, and also provide testing services to countries that do not have or need a CDT laboratory.
- Assist with developing information, education and awareness campaigns (in collaboration with TNC and SPC).
- Train fishermen in cyanide-free LRF capture techniques and post-harvest handling procedures (in collaboration with SPC).
- Initiate marketing and community enterprise development, "certification" programs, and alternative livelihood options (in collaboration with SPC, TNC and others).
- Conduct applied scientific research on groupers (in collaboration with SPC).

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The Nature Conservancy (TNC)

- Assist SPC with coordination and facilitation of the Initiative, with decreasing responsibility as SPC's institutional capacity improves.
- Develop and refine generic national and provincial/state level LRFT management plans and licensing agreements as guides for use within the region (in collaboration with SPC and WRI).
- Compile and maintain an inventory of LRFT awareness materials (all media), to be transferred to SPC within two years (with assistance from all Parties).
- Develop relevant generic LRFT awareness materials for each target audience (regional and national; decision-makers; local communities) and disseminate them in high priority countries (in collaboration with SPC and IMA).
- Develop and implement protection strategies for key spawning aggregation sites (in collaboration with all Parties).
- Complete and implement example site-specific LRFT response strategies at test sites in Papua New Guinea and the Solomon Islands.
- Assist national and provincial governments with completing, adopting and implementing LRFT management plans as requested (in collaboration with SPC and WRI).

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- Formally develop agreed regional standards for managing LRFT fisheries (in collaboration with all Parties).
- Conduct government policy, legal framework, and institutional capacity assessments (assisted by SPC and TNC).
- Development of national LRFT policies (in collaboration with SPC member countries and territories, and other Parties).
- Documentation and publicity (in collaboration with all Parties).

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FINANCIAL AND FUND-RAISING MATTERS

This MOU does not create or imply any commitment of financial resources by any of the Parties. All Parties agree to cooperate to seek financial resources to support activities undertaken under the Initiative, and to jointly plan for long-term financial stability of the Initiative.

Arrangements regarding allocation and management of funds raised jointly pursuant to implementation of the Initiative shall be made by means of separate agreements entered into among the Parties, bearing in mind the principles and objectives set out in this MOU.

PROCEDURAL MATTERS

The Parties will communicate on and agree about Initiative goals and strategies, progress against goals, and policy review at least quarterly.

Each Party will perform its functions under its own respective identity, working in partnership and collaboration with each other.

So long as this MOU is in effect, each Party may represent its cooperative activity with the other Parties on this Initiative to outside persons and entities.

The copyright and ownership of any and all materials shall remain with the Party producing such materials unless the Parties reach an agreement specifying a different arrangement.

Use of the logo of any Party by any other Party shall only be permitted by prior written consent, on a case-by-case basis.

RISKS AND RESPONSIBILITIES

Each Party agrees that it will be responsible for its own acts and the results thereof, and shall not be responsible for the acts of the other Parties or the results thereof. Each Party, therefore, agrees that to the extent it may legally do so, it shall assume all risk and liability to itself, its officers, employees or agents, under this MOU, for any claims, damages, losses, judgments, expenses or other costs including litigation costs and attorney's fees, arising out of, in connection with, or resulting at any time from any and all causes due to any act or acts, negligence, or failure to exercise proper precautions, of or by itself, or its own officers, employees or agent, in the performance of this MOU.

EFFECTIVITY AND AMENDMENT

This MOU shall become effective upon signature by all four Parties and shall remain in effect for a period of three (3) years from that date.

The MOU may be renewed at the end of this period by mutual agreement among and signature by all of the Parties.

The MOU may be amended at any time by mutual agreement among and signature by all Parties.

Any Party may withdraw from further participation in this MOU at any time and for any reason by giving thirty (30) days prior written notice to all of the other Parties.

IN WITNESS WHEREOF, each of the Parties to this MOU have caused this MOU to be executed by its proper officers thereunto duly authorized, and have set forth its address and designated representative below.

SIGNATORIES

Secretariat of the Pacific Community

Secretariat of the Pacific Community

Robert Dun
Secretary General

Date 3. Nov. 99

Designated Representative

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International Marinelife Alliance

International Marinelife Alliance

Vaughan R. Pratt
President

Date 10/25/99

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The Nature Conservancy

The Nature Conservancy

John Sawhill
President

Date 15 December 1997

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World Resources Institute

World Resources Institute

Jonathan Lash
President

Date 3 December 1999

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