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South Pacific Biodiversity Conservation Programme

COMMUNITY MARINE CONSERVATION AREA THE ARNAVON ISLANDS, SOLOMON ISLANDS

PROJECT PREPARATION DOCUMENT

South Pacific Biodiversity Conservation Programme

Executed by the South Pacific Regional Environment Programme (SPREP) with financial assistance from the Global Environment Facility (GEF) through UNDP

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Principle Project Partners

- The Nature Conservancy, Solomon Island Field Office
- The Ministry of Forest Environment and Conservation, Solomon Island Government
- Arnavon Community Marine Conservation Area Management Committee
  Representing the communities of Kia, Waghena, and Posarae

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EXECUTIVE SUMMARY

In 1981, the Isabel provincial government first recognized the importance of the Arnavon Islands as a nesting ground for Hawksbill turtles, and designated the islands as a Wildlife Sanctuary. At that time, however, the government did not adequately recognize the local communities' rights and the project failed. In 1989, the South Pacific Regional Environment Programme (SPREP) collaborated with the Solomon Islands government and the Ministry of Natural Resources (now the Ministry of Forestry, Environment and Conservation or MFEC) to survey the Hawksbill turtle nesting beaches and populations in the northern Solomon Islands including the Arnavons. The surveys documented the severe depletion of the Hawksbill turtle population due to the turtle shell (*bekko*) export trade which has flourished in recent years. As a result of the surveys interest was renewed for conservation in the area and local communities were approached for their support in establishing a conservation area. Through its close association with SPREP and MFEC, The Nature Conservancy (TNC) was invited by the government to take a leading role in developing and implementing a marine conservation area project to protect turtle nesting beaches and other important marine and island species on the Arnavon Islands.

The Arnavon Islands lie in the Manning Straits of the Solomon Islands, midway between the islands of Santa Isabel and Choiseul at approximately 7-27'S and 158-E. They support a great diversity of marine resources, including key species of commercial and subsistence value for local communities, and contain significant areas of unspoiled reef. The Arnavon Islands are also the most important rookery in the western Pacific for the endangered Hawksbill turtle (*Eretmochelys imbricata*) (Vaughan, 1981; Leary, 1990) and home to one of the world's largest nesting populations of the species (Marquez, 1990). The Arnavon Islands support a high diversity of terrestrial fauna for a small island group, with 41 species of bird, six species of bat, and at least seven species of terrestrial reptile. Eight bird species are endemic to the area. The Arnavons are also an important nesting ground for the rare Sanford's Sea Eagle, Brahmany Kites, ospreys, megapodes, two species of pigeon, and many seabird species.

Although the islands of the proposed Arnavon CMCA are uninhabited, there are a number of communities from Isabel and Choiseul provinces who claim traditional ownership to the islands, and are users of the resources for both subsistence and commercial purposes. From the outset of the project, TNC and MFEC have emphasized the involvement of traditional resource owners and users in the planning, establishment, and management of the CMCA. Although the islands are officially owned by the government, identifying and recognizing traditional ownership and use rights to the resources of the Arnavon Islands was essential to the project's long-term success. It was learned that the main groups with traditional ownership rights are the Sinagi and Volaikana tribes, located in the villages of Kia (northwest Isabel) and Posarae (southwest Choiseul) respectively. While these tribes have traditional ownership rights, the Gilbertese people of Waghena, one-and-a half hours by canoe to the north of the Arnavon Islands, are the main users of the marine resources. The Gilbertese were relocated from Kiribati to Waghena by the British in the early 1960's. As non-Solomon Islanders, the Gilbertese have rights only to limited land area on Waghena Island and have no traditional marine tenure. This situation is a potential source of tension between the communities and one of the major risks to project success. Open dialogue between the communities, and a project framework that supports this, is therefore essential and being built into the project design.

In 1993, TNC and MFEC conducted a Rapid Ecological Survey of the Arnavons, and Household Surveys in each of the above three communities. The REA provided valuable data on the state of the islands' resources, anecdotal information on resource use, and recommendations for

resource management. The REA concluded that: 1) the coral reef system of the Arnavon Islands was in excellent condition with an impressive diversity of corals, fish, and marine invertebrates; and, 2) populations of important commercial macro-invertebrates (e.g., Trochus, beche-de-mer, giant clams, and black and gold lip pearl oysters) were depleted, 3) the islands were an important habitat for an impressive variety of terrestrial fauna. In the three communities, the household surveys identified resource use patterns, socio-economic needs, the subsistence, cultural, and economic importance of marine resources to these communities and considered the impact of specific management prescriptions on them. These surveys sought to identify the socio-economic pressures which have led to the over-exploitation of the resources. In these early discussions, all three communities revealed a good understanding of the depleted state of the commercial resources of the islands and were enthusiastic to support a project to test the benefits of resource management in the Arnavon Islands.

In planning the project strategy, a framework is being used that views the region as consisting of a core conservation area at the Arnavon Islands where intensive resource management will be pursued, and a broader economic area that encompasses the sea and reef from Posarae community in Choiseul Province to Kia community in Isabel province where the focus will be on sustainable enterprise development and environmental awareness activities. Within the conservation area, the project will work through the community controlled Management Committee, which has drafted a management plan and regulations for the area. This plan will be implemented by community hired Conservation Officers who will reside at the Arnavon CMCA and who are responsible to the Management Committee. Activities in the broader area will concentrate on building community environmental awareness focusing on the importance of sustainable levels of harvest, discouraging destructive methods of extraction, and transferring resource management methods learned in the CMCA to the broader area for the protection of resources on a regional level. Marine enterprise development options, which incorporate these sound environmental and resource management ideas, will be explored and implemented in order to establish a foundation for sustainable economic development within the stakeholders' communities.

Using this strategy, the project will achieve objectives in four areas; Conservation Area Management, Protection of Biodiversity, Socio-economic and Sustainable Enterprise Development, and Capacity Building. Objectives in these four areas enhance and support the project's central objective, to establish the first community-managed Marine Conservation Area in the Solomon Islands to protect and sustainably manage marine resources in and around the Arnavon Islands, and to ensure the viability of one of the world's largest nesting grounds for endangered Hawksbill turtles.

The focus of project activities in 1994 have been on the establishment of the CMCA. This has included establishing a Management Committee which holds primary responsibility for the management of the CMCA. At the committee's three meetings during 1994, they drafted and finalized a CMCA Management Plan, decided on a framework for community selection of CO's and hired six outstanding young men for the positions, and planned and coordinated the construction of CMCA infrastructure to support the work of the CO's. Also accomplished during this period was securing the legal status of the CMCA under Isabel Province bylaws, initiating the biological monitoring program, the first phase of CO training, and community consultations to strengthen community support, involvement and build conservation awareness.

During 1995, the CMCA will officially open around mid year upon completion of the island infrastructure, initial monitoring, and CO training. 1995 will also mark the beginning of

significant project activity in the broader project area. It will include in depth environmental awareness work in the communities associated with the assessment of options for sustainable enterprise development.

A project of this scope can be expected to have significant impacts both environmental and socio-economic. These may include; the significant improvement in the biological resources both with the CMCA and hopefully in the surrounding areas, resource management techniques spreading to other area under community control, the negative impacts of CMCA infrastructural development offset by an improvement of coastal vegetation and shoreline stability through regulation of previously unrestricted activities, an increase in the communities understanding of their environment and capacity for undertaking sustainable resource management, the long term sustainability of resource harvesting and the continued availability of subsistence and commercial marine resources for future generations, building of communication links between these three communities which have never before existed, increased income to individuals and the communities through enterprise development activities and project employment, and possible medium term loss of income for individuals who have been regularly fishing and harvesting the waters and reefs of the Arnavons.

Project risks include; the lack of perceived benefits to the communities, inequitable distribution of the benefits between and within the communities, rivalries and dissension between committee members and between communities, and the lack of resources or commitment within Government and the communities to maintain the project into the future.

Support personnel required for the project consist of a full time Project Officer (CASO) employed and supported by MFEC, the half time efforts of TNC's Solomon Island Field Representative, and the assistance of MFEC and Fisheries Division staff as needed for monitoring, surveys, and project coordination. The involvement of the TNC Field Representative will be gradually phased out during the course of the project. Direct responsibility for managing the conservation area will be with management committee and CO's. The time commitment of the 10 members of the management committee is attendance at the twice yearly committee meetings and for community meetings and consultations. They also coordinate project activities at the community level The six conservation officers are responsible for the daily management of the CMCA in two teams of three men each working half time. During 1995 the project will need the services of overseas consultants in enterprise development, management training, community extension, and socio-economic monitoring. Consultants will be used periodically during the remainder of the project in sustainable resource management, training, business development, and other areas.

Total financial requirements for 1995 are estimated at $289,689 USD. The project is requesting $67,820 USD or $234,184 SBD from The South Pacific Biodiversity Conservation Program. Financial requirements for 1996-1998 are estimated at $138,938 USD or $479,760 SBD for 1996, $122,055 USD or $421,460 SBD for 1997, $151,912 USD or $524,560 SBD for 1998.

PART 1 - INTRODUCTION

1.1 Background of the Project

The sustainable harvest of marine invertebrate species for commercial and subsistence uses plays a critical role in the national economic development plans of most Pacific Island nations, including the Solomon Islands. These marine species provide both a source of food and a renewable natural resource that is relatively non-perishable, easy to harvest, and can be exported at considerable unit value. In the Solomon Islands alone, the exports of beche-de-mer in 1991 were worth SI $7.5 million (US $2.9 million) and Trochus shell and button blank exports SI $4 million (nearly US $1.5 million). With a current population estimated at more than 325,000 and an average population growth rate of 3.5%, continued, sustainable harvesting of marine resources will be vital to the future well-being of Solomon Islanders.

Surveying Important Pacific Hawksbill Turtle Population

The Hawksbill turtle nesting ground in the Arnavon Islands is thought to be the largest rookery in the Pacific. In 1981, the Isabel provincial government first recognized the importance of the Arnavon Islands as a nesting ground for Hawksbill turtles, and designated the islands as a Wildlife Sanctuary. At that time, however, the government did not adequately recognize the local communities' rights. Although the islands are government-owned by virtue of their alienation under the British colonial administration, the Volaikana and Sinagi tribes of North Isabel and South Choiseul traditionally use and claim rights to the resources of the area. The sanctuary was never effectively established because it was declared without consulting the tribes and conservation measures were never implemented to ensure protection for the marine resources of the Arnavon Islands.

In 1989, the South Pacific Regional Environment Programme (SPREP) collaborated with the Solomon Islands government and the Ministry of Natural Resources (now the Ministry of Forestry, Environment and Conservation or MFEC) to survey the Hawksbill turtle nesting beaches and populations in the northern Solomon Islands. This and subsequent turtle survey work in the Arnavon Islands was undertaken by the Environment and Conservation Division MFEC. During the course of these surveys, the survey team maintained a constant presence and established credibility in the local communities for the project.

Recognizing the Need for Conservation Status

The surveys documented the severe depletion of the Hawksbill turtle population due to the turtle shell (*bekko*) export trade which has flourished in recent years. This work supported the observations of traditional owners, local communities, and government officials who expressed concern over the depletion of the turtle and other commercially important species, such as beche-de-mer, Trochus, and gold and black lip pearl shell.

These marine invertebrates have high commercial value, are easily collected, and are a vital source of income to the rural semi-subsistence economy of the Solomon Islands. These resources are even more important to the Gilbertese community living in nearby Waghena who rely heavily on cash income for their survival. These groups saw an urgent need to re-establish some kind of conservation status over the islands to protect the turtles and other important economic and subsistence resources.

Through its close association with SPREP and MFEC, TNC was invited by the government to take a leading role in developing and implementing the project. TNC together with MFEC facilitated discussions with the Volaikana and Sinagi tribes based in Kia and Posarae villages, the Gilbertese based in Waghena, other local communities, and the national and provincial government authorities which resulted in all parties agreeing in principle to re-establish a conservation area over the Arnavon Islands providing that:

- traditional resource use rights are clearly recognized in any legislation;
- management rules and sanctions recognize the need for subsistence and cultural harvesting of marine resources with special provisions for the protection of turtles; and,
- traditional owners, local communities, and government authorities are involved and consulted in all aspects of project implementation and management.

The Choiseul and Isabel provincial governments were also fully supportive of the project, which is located within the boundaries of Isabel Province. Isabel Province listed the project as one of its top ten priorities in the Solomon Islands National Environmental Management Strategy (NEMS) of 1992.

In 1994, TNC, MFEC, and the Arnavon Marine Conservation Area (AMCA) Management Committee, composed of representatives from the three communities and the Fisheries Division of Isabel and Choiseul Provinces, were awarded a planning grant by BCN to support the establishment of a marine conservation area in the Arnavon Islands. A summary of activities already accomplished during the planning phases of this project appear in sections 3.2.1 and 3.2.2.

1.2 Project Preparation Document

The purpose of this Project Preparation Document (PPD) is to provide a framework for the development and implementation of the Arnavon Community Marine Conservation Area project. This document should not be viewed as a static or fixed concept paper, but as an evolving set of guidelines for the project. The PPD is not only a means to inform SPBCP and other project partners about this project, but should serve as an avenue for constructive feedback that can strengthen and enhance the project's effectiveness. The PPD also serves as a proposal for technical and financial support from SPBCP and its extensive network.

PART 2 - THE EXISTING SITUATION

2.1.1 Physical Information

The Arnavon Islands lie in the Manning Straits of the Solomon Islands midway between the islands of Santa Isabel and Choiseul at approximately 7_27'S and 158_E (Figure 1: Location of the Solomon Islands). They are composed of two main islands, Kerehikapa, Sikopo, and several smaller islands (Figure 2: Location of the Arnavon Islands). The total land area of the Arnavon Islands is about 5 sq. km. The proposed Arnavon Islands Community Marine Conservation Area (CMCA) which includes the surrounding reefs and waters is about 83 sq. km, with a Core Conservation Area (CCA) of about 31 sq. km (Figure 3: Proposed Community Marine Conservation Area Boundaries). The islands are uninhabited, although they are visited regularly by local fisherman and turtle hunters.

2.1.2 Ecological Significance of the Area

The Arnavon Islands support a great diversity of marine resources, including key species of commercial and subsistence value for local communities. The Arnavon Islands are also the most important rookery in the western Pacific for the endangered Hawksbill turtle (*Eretmochelys imbricata*) (Vaughan, 1981; Leary, 1990) and home to one of the world's largest nesting populations of the species (Marquez, 1990). A decline in the Hawksbill turtle population has been reported both world wide and locally, and the continued exploitation of turtles could result in the loss of this globally significant resource.

The marine environment of the Arnavon Islands also supports commercially valuable marine species, such as beche-de-mer (various aspidochirotid holothurian genera), Trochus (*Trochus niloticus*), black and gold lip pearl oysters (*Pinctada margaritifera, P.maxima*), green snail (*Turbo marmoratus*) and giant clams (*Tridacna spp.*). These and other marine organisms are important subsistence and economic resources to the people of the surrounding areas.

With the exception of Papua New Guinea, the Solomon Islands have the greatest diversity of terrestrial vertebrate species of all Pacific Island nations. For example, the Solomon Islands are home to 173 species of land birds and about 50 species of sea, shore, and migratory birds. The level of endemism is extremely high and many endemic species are restricted to only one island in the archipelago. The Solomon Islands are therefore extremely important for conservation of biodiversity in the Pacific.

The Arnavon Islands support a high diversity of terrestrial fauna for a small island group, with 41 species of bird, six species of bat, and at least seven species of terrestrial reptile. Eight bird species are endemic to the area. The Arnavons are also an important nesting ground for the rare Sanford's Sea Eagle, Brahmany Kites, ospreys, megapodes, two species of pigeon, and many seabird species.

2.1.3 Socio-economic Situation

From the outset of the project, TNC and MFEC have emphasized the involvement of traditional resource owners and users in the planning, establishment, and management of the CMCA. Although the islands are officially owned by the government, identifying and recognizing traditional ownership and use rights to the resources of the Arnavon Islands was essential to the project's long-term success. We believe we have achieved this objective to the satisfaction of all parties, including the government which supports the project and now acknowledges the communities' traditional rights.

Under the early planning phase of the project, TNC and MFEC investigated traditional ownership and resource use by the Kia, Posarae, and Waghena communities and initiated community involvement in the establishment and management of the Community Marine Conservation Area. Through discussion with village leaders and government officials, including the Commissioner of Lands, we discovered that the main groups with traditional ownership rights are the Sinagi and Volaikana tribes, located in the villages of Kia (northwest Isabel) and Posarae (southwest Choiseul) respectively.

While these tribes have traditional ownership rights, the Gilbertese people of Waghena, one-and-a half hours by canoe to the north of the Arnavon Islands, are the main users of the marine resources. The Gilbertese were relocated from Kiribati to Waghena by the British in the early

1960's. As non-Solomon Islanders, the Gilbertese have rights only to limited land area on Waghena Island and have no traditional marine tenure. Because they are culturally people of the sea, they are much more reliant on the diminishing marine resources of the North Isabel/South Choiseul region for food and income than are the people of Kia and Posarae, who have access to large land areas for subsistence cultivation.

Questions of customary tenure are in a constant state of flux and are very difficult to resolve throughout the Solomon Islands. Given this situation we have learned that it is highly desirable that Solomon Islanders reach consensus on who has rights and which groups are resource stakeholders. This is an approach the project has taken to obtain community support and involvement.

Early discussions with all communities revealed a good understanding of the depleted state of the commercial resources of the islands and enthusiastic support for the project. Due to their critical dependence on these resources, the Gilbertese community in particular has expressed a real interest in marine conservation and management. Specifically, the Gilbertese are interested in marine farming as an alternative to resource exploitation, and this option will be explored in the implementation phase of the project.

2.1.4 Preliminary Surveys: Ecological and Household

A team of scientists and technicians from TNC, MFEC, and the local communities conducted a **Rapid Ecological Assessment** (REA) of the Arnavon Islands and surrounding marine areas in April 1993. Developed by TNC for Pacific Island locations, the REA methodology uses a multi-disciplinary approach designed to rapidly gather data and assess the biological diversity of a discrete geographical area. The Arnavon Islands REA was the first comprehensive ecological inventory of the marine and terrestrial resources of any area in the Solomon Islands.

The REA provided valuable data on the state of the islands' resources, anecdotal information on resource use, and recommendations for resource management. The REA concluded that: 1) the coral reef system of the Arnavon Islands was in excellent condition with an impressive diversity of corals, fish, and marine invertebrates; and, 2) populations of important commercial macro-invertebrates (e.g., Trochus, beche-de-mer, giant clams, and black and gold lip pearl oysters) were depleted, 3) the islands were an important habitat for an impressive variety of terrestrial fauna.

In September to October 1993, detailed village **household surveys** and consultative workshops were conducted by a team from TNC, MFEC, and local assistants to identify past and present resource use, household conditions, and future marine resource needs, and discuss the results of the REA. In the three communities, the surveys identified resource use patterns, socio-economic needs, the subsistence, cultural, and economic importance of marine resources to these communities and considered the impact of specific management prescriptions on them. In particular, the household surveys sought to identify the socio-economic pressures which have led to the over-exploitation of the resources. The household surveys provided valuable preliminary information as a basis for further investigation and evaluation as the project proceeds. They also provided an opportunity for the surveyors to discuss the project and marine resource management issues with the wider community.

The results of the Household Survey reports were presented to the communities and a series of participatory workshops will be held early in the implementation phase to identify sustainable

enterprise options drawing on the findings of the surveys. The baseline information as well as other participatory evaluation methods will be used to assess the impact of the CMCA and its management on these communities.

2.1.5 Achieving Community Consensus

The REA and the household surveys and consultative workshops mentioned above, served as a catalyst for continued project development and stimulated intense interest in conserving the marine resources of the Arnavon Islands. Each of the three communities reached a consensus to proceed with the establishment of the Arnavon Islands Community Marine Conservation Area. Based on the recommendations of the REA, they independently discussed strategies for the conservation and management of the resources and developed recommendations for a management structure and stricter rules for the conservation area than recommended in the REA.

In December 1993, representatives from the three communities, the provincial and national governments, and TNC met in Honiara (the capitol of the Solomon Islands) to decide on management rules for the CMCA. The three-day meeting marked the first occasion that these three communities engaged in formal dialogue with each other. Despite the high potential for dissent due, in part, to cultural differences and historic circumstances, the meeting was very successful. In fact, the Permanent Secretary of the Ministry of Forests Environment and Conservation, and a respected leader from Kia, stated that he would never have believed it possible to bring together these three communities in such constructive dialogue, especially over the management of marine resources. Due to the positive attitudes and support of the community and government participants, the Commissioner of Lands reaffirmed the government's approval to proceed with the project on government-owned land.

2.1.6 CMCA Management Plan and Management Committee

At the Dec. 1993 meeting all participants decided that the next step was to form a Management Committee with two representatives from each community, representatives from Isabel and Choiseul provinces, a representative from MFEC and one from TNC. The management committee holds primary responsibility for the management of the CMCA. Their principle role is to oversee the implementation of the management plan and management regulations for the CMCA. Other functions of the committee are:

- Periodic review of management rules, with a major review at least every three years.
- Decide on any changes in the management of the conservation area through an annual review of the management plan.
- To act as a channel of communication between the communities, provinces, and project coordinators.
- Advise national and provincial government on the Arnavon CMCA.
- Enforcement of management rules through supervision of CO's.
- Decide upon conservation and research activities to take place in the CMCA, and support the work of project related researchers.
- Screening and approval of external requests to conduct research.

Three committee meetings were held in 1994. At the first meeting in April the committee drew up a draft management plan and decided on hiring procedures and criteria for community selection of local Conservation Officers (CO). These were seen by the communities as necessary to ensure CMCA success and to build community understanding and capacity in resource management. The draft plan was taken to the communities for review and feedback, and

community selection committees were set up to screen applicants for CO positions.

The management plan was finalized and approved at the second committee meeting in August, and selection committee recommendations were reviewed and the CO's selected. The Isabel Province legal advisor suggested a strategy for the formal recognition of the conservation area and management plan by the province under its existing wildlife sanctuary legislation. The legal process was initiated and the necessary changes in the existing legislation were approved by the provincial assembly.

The December 1994 meeting focused on Conservation Officer training and the infrastructure needed at the Arnavon Islands to support the CO's work in maintaining surveillance and enforcing management regulations at the CMCA. The meeting also looked at logistics of the upcoming biological monitoring program that will be completed by the International Center for Living Aquatic Resource Management (ICLARM) and Great Barrier Reef Marine Park Authority (GBRMPA) during the first half of 1995. Previously, on the recommendation of ICLARM, the management committee agreed that an in-depth monitoring of the commercially valuable invertebrate marine species before the conservation area was opened, would be beneficial in determining the effectiveness of the CMCA management strategy.

2.2 Infrastructure

The Arnavon Community Marine Conservation Area is located in a remote uninhabited island group with no physical infrastructure. The closest areas with infrastructure development are the Gilbertese communities on Waghena Island, one and a half to two hours motorized canoe ride from the Arnavons, and Kia village two to two and a half hours away. Waghena has a primary school, clinic, and short wave radio communication, limited sanitation, no electricity, or roads, and water is collected by rain tank or wells containing brackish water. Kia village in Isabel Province has piped water supply, communal use toilets built over the water, primary school, radio communication, first aid station with a soon to be opened clinic, wharf with regular shipping provided through Isabel Development Company, and a commercial fisheries development project under construction. There is no sanitation, electricity, or roads. The third community involved in the project, Posarae in Choiseul Province, is about four hours canoe ride from the Arnavons, and has a primary school, health clinic, radio communication, fisheries station, and copra buying point, but is lacking water supply, sanitation, electricity and roads. Transportation to and from these communities to other areas in the Solomons is provided by irregular inter-island shipping services once or twice per month.

2.3 Relevant Institutions

The project partners work with a number of institutions. In Isabel province the project must coordinate management decisions with the provincial executive who has legally delegated the authority to manage the conservation area to the AMCA Management Committee under provincial Wildlife Sanctuary Ordinance. The project works directly with the provincial Fisheries Division which is represented on the Management Committee. Conservation Officers will liaise with the provinces Police Division for enforcement once the CA is officially opened. Choiseul Province Fisheries Division represents that province on the Management Committee.

Within each community the project must work both with the existing customary social structures and with other institutions of importance to community life.

The Kia community of Isabel has a matrilineal social organization. Membership in a lineage is determined through maternal ties as is land tenure, and provides the primary channel for social relationships and obligations. Kia is settled by a number of different lineage groups. Each lineage is represented by its leaders on the community's council of chiefs, which has a primary role in decision making on matters affecting the community. The entire Kia community are followers of the Church of Melanesia. The Church has a strong and vital role in the life of the community, with many of the village celebrations and special events are focused around it. Other major community organizations are also tied to the Church, including the Mother's Union and a Welfare/Charity organization.

In Waghena, the basic social and economic organizational unit is the household, followed by a residential unit comprised of several households. Residence, land tenure and social obligations are defined on the basis of a bilateral decent grouping called "ooi," which include all the descendants of a common founding ancestor. Life in the Waghena community centers around the meeting houses or "maneaba". At meetings held in the maneaba, the elder males of the community called the "unimane" are traditionally the only ones with speaking rights, although this has broadened to include some younger men. The maneaba assembly has the role of deciding on matters of law and order, village policy in extra-community affairs, and the treatment of outsiders. It also has a lead role in organizing festive occasions. Decisions in the maneaba are made by consensus. The churches are also a major focus of village life. Religious affiliation appears to be a strong factor influencing residence, and the people of Cooksin village follow the Catholic Church, while those of Aririki and Nukumaroro are members of the United Church. There are also youth and women's organizations in each of Waghena's villages as well as cooperative societies.

Social structure in Posarae as throughout most of Choiseul province is based on the "sinangge", a social unit consisting of everyone descended from a common founding ancestor. The founder was always male and unusually eight to twelve generations removed. The sinangge is the main determinant of residence, tenure arrangements, and the organization of social activities. Membership is most commonly through paternal ties, although maternal ties are not uncommon, and a person could have allegiance to several sinangge. Leaders were traditionally recognized on their ability to gather and distribute shell money, and to organize and lead people. The villages around Posarae are inhabited by people of the Volaikana sinangge. The people of these villages are all members of the Seventh Day Adventist Church, which impacts on their marine resource use in and around the conservation area, since they are forbidden from eating or handling shellfish and turtle. The Saturday Sabbath is strictly observed with a complete rest from work of any kind. Life revolves around the morning and evening "lotu" service, and the Sabbath rest day. Special occasions and celebrations center around the church, and it is also the base for other major community organizations, including youth, women's and welfare organizations.

2.4 Environment, conservation and land use policies and programs

The Solomon Islands National Environment Management Strategy mentioned the Arnavon Islands as one of the important areas to be included in a National Conservation Area system and also has a number of other elements relevant to the Arnavon Project.

One of the highest priority issues highlighted in the Strategy is the need for comprehensive environmental legislation. The Ministry of Forests, Environment and conservation is currently working on such legislation, which will include a section on conservation of national heritage

The strategy also gives broad support for the protection of the country's biological diversity

through the establishment of protected areas as well as improved management of the broader environment. MFEC is currently working towards a national approach for the establishment of a system of conservation areas in the country, bearing in mind the needs and circumstances of the Solomon Islands where much of the land is under customary tenure.

Presently the legislative support for the Arnavon project is under existing Isabel Province Wildlife Sanctuary legislation. In the long term, it is expected that the conservation project will also be covered by national legislation once this has been enacted. In addition to this, the national fisheries legislation will continue to provide a framework for regulating the use of marine resources on the area

PART 3 - RATIONALE AND PROJECT DESIGN

The Arnavon Islands Community Marine Conservation Area Management Project will establish a community-based and cooperatively managed conservation area as a tool for ensuring the protection and sustainable use of marine resources in the Arnavon Islands. Marine resources are among the country's principal sources of protein and cash income, and they are vital components of the rural semi-subsistence economy. Current levels of exploitation for some commercially valuable species are unsustainable. There is an urgent need to develop marine conservation and management strategies that are appropriate and acceptable to local communities, and can be applied to a broad range of community-controlled natural resources. Recognizing this need for action, the Isabel provincial government listed the establishment of the Arnavon Islands CMCA as one of its top ten provincial priorities in the Solomon Islands National Environmental Management Strategy (NEMS) of 1992.

3.1 Project Design

At the invitation of local communities and the Solomon Islands government, The Nature Conservancy in partnership with the Solomon Islands' Ministry of Forest Environment and Conservation proposes to work with local communities, provincial and national governments, and international collaborators to:

- conduct resource inventories and monitoring to quantitatively assess the biological diversity of the CMCA and track the recovery of key commercial species populations;

- obtain formal conservation status for the Arnavon Islands CMCA under Isabel provincial law;

- assist the previously established project Management Committee in developing and implementing a Management Plan for the CMCA, including rules governing commercial and subsistence harvesting;

- ensure active community involvement in all aspects of the project through the Management Committee, community workshops and meetings, and employment of local Community Conservation Officers;

- incorporate traditional knowledge and community attitudes toward marine resource use into sustainable management strategies for the CMCA;

- develop local technical skills and expertise in marine conservation, resource

management, and monitoring;

- capitalize on an unprecedented opportunity to test the impact of conservation areas on marine invertebrates and the rehabilitation of important subsistence resources through a comprehensive management plan and biological monitoring;

- evaluate the economic and ecological benefit of the CMCA to the communities, both in the Arnavon Islands and the surrounding fisheries;

- develop and demonstrate techniques for sustainable fisheries management within the CMCA and surrounding areas; and

- investigate a range of alternative sustainable income generation options, including marine farming, with the local communities.

The project will create a working model for CMCA's which could be replicated in the Solomon Islands and other South Pacific countries. After the project is completed in three years, long-term management of the Arnavon Islands CMCA will be fully assumed by the local communities with assistance from the Solomon Islands Government Ministry of Forests, Environment and Conservation (MFEC).

3.1.1 Aims and Objectives

The overall aim of this project is to establish a community managed Marine Conservation Area to protect and sustainably manage marine and terrestrial ecosystems in and around the Arnavon Islands, for the primary benefit of the local communities of Kia, Waghena and Posarae and for the the wider benefit of the Pacific region.

Conservation Objectives:

Objective 1: *To protect the islands' Hawksbill turtle nesting sites, and rehabilitate key commercial and subsistence fisheries stocks by establishing a community marine conservation area with management rules and sanctions based on traditional conservation practices where applicable.*

Output: The implementation of the management plan and regulations will result in the long term protection of turtle nesting sites, and the measurable recovery of key marine resources in the conservation area, and will potentially allow for the resumption of limited harvesting.

Objective 2: *To test the hypothesis that sustainably managed marine conservation areas will enhance the productivity of fisheries and maintain habitat quality both within and outside the conservation area.*

Output: A scientifically rigorous monitoring program will be designed and implemented to measure changes in population density and distribution for key commercial and subsistence species and the ecological quality of the conservation area. In addition a simplified ongoing monitoring program carried out by the conservation officers and communities will track changes in the overall health of the ecosystem and abundance of representative species.

Objective 3: *To demonstrate the economic and environmental benefits of CMCA management as an incentive for the conservation and sustainable use of marine resources in the broader region.*

Output: Local communities will understand the benefit of managing marine resources and will begin to develop and apply management strategies for other marine areas and resources under their control.

Objective 4: *To promote an understanding of resource needs and uses in the three local communities involved in the project, and to build cooperation between them through the development of consensus-based management policies and cooperative resolution of management issues.*

Output: A CMCA Management Committee composed of leaders from the three communities will meet at least three times a year to decide on management policy and strategies for the CA, and to encourage inter-community dialogue and consensus on resource management issues. The Management Committee and Community Conservation Officers will complete at least one training course in meeting facilitation, conflict resolution, and consensus-building.

Objective 5: *To promote similar approaches to marine resource management in the Solomon Islands and the South Pacific by using the conservation area for demonstration purposes.*

Output: Another community in the Solomon Islands or another country in the region chooses to adopt the community-managed marine conservation area concept and management strategy. The conservation area is visited by community leaders from at least one other Province in the Solomons and one other Pacific island country.

Biodiversity Objectives:

Objective 6: *To obtain data on marine species of commercial and subsistence importance as support for the development of conservation and sustainable use policies and practices.*

Output: Data from the Rapid Ecological Assessment, annual marine turtle population surveys and the project monitoring program will be collected, analyzed and recorded in suitable format and will be provided to the local communities, the scientific community, and key government officials to encourage and support sustainable resource management policy and legislation.

Objective 7: *To develop a better understanding of the marine ecosystems of the Solomon Islands through inventories and long-term monitoring.*

Output: All scientific data collection and research undertaken in the conservation area will be reported in a timely fashion and made available to local communities, government, and the scientific community in an appropriate format.

Objective 8: *To implement scientifically valid techniques and appropriate methodologies for conservation area monitoring and project evaluation.*

Output: A scientifically rigorous program for monitoring coral reef and tropical inshore fisheries will be established in partnership with scientists of the Great Barrier Reef Marine Park Authority and the International Center for Living Aquatic Resource Management (ICLARM). Data will be recorded and made available to local communities and the scientific community.

Sustainable Enterprise Development Objectives:

Objective 9: *To identify, evaluate, and implement a range of alternative sustainable income generation options for the three communities, including investigation of the feasibility of mariculture options.*

Output: A Marine Enterprise Development Consultant will assess enterprise potential, feasibility of options and outline a strategy for implementation for the best of these options. Three consultative workshops will then be held early in the implementation phase to help each community select appropriate enterprise options and design an action plan for implementation. A feasibility study of marine farming options will be conducted and discussed with the communities as part of this process. At least one enterprise option will be implemented by each community.

Socio-economic Objectives:

Objective 10: *To analyze socio-economic factors that have determined the patterns of resource exploitation in the conservation area, including identification of the main user groups and any special factors or pressures driving resource use.*

Output: Socio-economic factors will be identified and analyzed during the regular consultative meetings and workshops and the pre- and post-implementation phase household surveys. The information will be documented in the reports on these activities and will be used to help the communities develop a long-term management strategy for the conservation area and to support similar strategies for other resource use areas controlled by the three communities.

Objective 11: *Evaluate the impact of conservation area management on subsistence and commercial marine resource harvesting practices, adaptations and changes to these practices occurring due to management, and the effects both beneficial and negative resulting from these changes.*

Output: Past and current harvesting practices are being identified through the consultative workshops and household surveys conducted in the planning phase of the project and through ongoing community discussions. The impact of conservation area management on these practices and the effects of changes to these practices will be evaluated and used to adapt the CMCA management strategies to strengthen the beneficial effects and mitigate the negative effects.

Objective 12: *To record traditional knowledge of the marine resources and ecological*

processes of the Arnavon Islands and to use this information to help formulate management strategies for sustainable resource use and community education.

Output: A report on traditional knowledge of the marine resources of the area will be prepared based on interviews with fishermen and community elders and presented to the communities. This information and the data from the monitoring program will be analyzed and used to conduct the annual review of the Management Plan. Appropriate materials will be prepared based on this information to support community education activities.

Objective 13: *To ensure that there is fair access to resources and that the benefits of conservation and income generating activities and concomitant resource management obligations are distributed in an equitable manner.*

Output: Participatory techniques will be used to monitor and evaluate the decision-making process and mechanisms will be established to ensure that project benefits and obligations are shared in an equitable manner.

Capacity Building/Training Objectives:

Objective 14: *To involve the traditional resource owners and local communities in the establishment, management, and monitoring of the CMCA through participation in management, research activities, monitoring, information sharing, and active participation in all other aspects of the project.*

Output: The three communities will be involved through regular consultative meeting and workshops, the CMCA Management Committee with majority representation from the communities, and employing and training six Community Conservation Officers trained in conservation area management, and conservation extension and outreach skills.

Objective 15: *To build practical technical skills and expertise in sustainable marine resource management and biodiversity conservation in the Solomon Islands, including methodologies for inventory and community self-monitoring of marine resources, socio-economic survey and evaluation, traditional marine resource knowledge, and project planning and management.*

Output: A core group of Solomon Islands personnel from the three local communities, the Ministry of Forests, Environment and Conservation, the Fisheries Division, and local NGO's will be provided with opportunities to employ their experience or receive training in a wide range of conservation management skills.

3.2 Project Phasing

3.2.1 Summary of pre-Phase 1 Project Accomplishments: Preliminary Community Consultation and Project Concept Development

- In collaboration with provincial government authorities, identified all traditional resource and users, local communities, and other Solomon Island residents with a direct interest in the project (October 1992 to May 1993).

- Held a series of open community meetings in Kia, Posarae, and Waghena to forge an agreement in principle to establish the proposed CMCA (1989 to present).

- Conducted the REA of the Arnavon Islands to inventory and assess the area's biological resources and make recommendations for conservation and management (April 1993).

- Held workshops in Kia, Posarae, and Waghena to present REA and Household Survey findings and discuss the use, management, and protection of resources (September to October 1993).

- Performed Household Surveys to identify socio-economic needs and resource use patterns of local communities (September to October 1993).

- Met with community and government partners and decided to form a Management Committee, develop a Management Plan, and establish rules for the proposed CMCA (December 1993).

3.2.2 Summary of Phase 1 Project Accomplishments: Project Planning and Development

Establishment of Project Management Committee:

- Management Committee established with strong community representation
- Community committee members lead in all decision making, with the technical support of provincial and national government and TNC members.
- Consensus decision making process adopted for use on all key issues.
- Committee members are active proponents for the CMCA within their communities.
- Committee members consult with their communities regularly to inform them of the committee's activities and receive feedback on its work.

Adoption of a Management Plan for the Conservation Area:

- Management guidelines suggested through community consultation.
- Committee compiled management plan, with regulations drawn from suggested guidelines.
- Community feedback on draft plan, and community approval of the final draft.
- Management plan adopted by the Management Committee and approved by Isabel Provincial Executive.

Selection and Hiring of Conservation Officers:

- Management Committee established six Conservation Officer positions, determined selection procedures, and hiring criteria.
- Community organized selection committees screened applicants and made recommendations to the Management Committee.
- Management Committee accepted recommendations and hired two Conservation Officers from each community.
- Training program for CO's began in November 1994 with a workshop in PRA and certification training in scuba diving.

Scientific Monitoring Program Initiated

- ICLARM approached to assist with project monitoring of economically valuable marine species in and around the Core Conservation Area.
- Management Committee approved the monitoring plan.
- ICLARM with GBRMPA collaboration secured $79,000 AUD for 1995 to support monitoring on the Arnavon Islands from ACIAR. ACIAR approved the grant for three years.
- Design phase of the monitoring program completed in October 1994.

Legalization of Arnavon CMCA:

- Management committee made presentation and submission to the Isabel Provincial Executive, to be recognized and authorized to manage the CMCA.
- Isabel Provincial Assembly, on the recommendation of the Provincial Executive, approved the management plan as regulations governing the CMCA, under an existing Wildlife Sanctuary Ordinance, and gave the Management Committee the power to manage the Conservation Area for the Province.

Mariculture started in the Region:

- Management committee discussed potential for mariculture in the Arnavon area with ICLARM.
- ICLARM surveyed the area for Black Lip Pearl Oyster and set out Black Lip spat collectors, to trial the ranching of wild Black Lip spat for the jewelry market.

3.2.3 Project Implementation : Work plan and calendar of activities.

Year 1: January 1995 to December 1995 - recurrent activities mentioned only one time.

Project Planning and Management

1) Conduct three Management Committee meetings (one in Honiara and two in local communities (yearly in April, August, and December).
   Participants: TNC, MFEC, and Management Committee.
2) Conduct training course in financial management and project administration for the Management Committee (August/September 1995).
   Participants: TNC and Management Committee.
3) Hold periodic community consultations in all three communities to report on previous year's progress, identify concerns, assess development needs, and modify management strategy (yearly and ongoing).
   Participants: TNC, MFEC, and Management Committee.

Community Marine Conservation Area Development

1) Organize and provide CO training in conservation area management, enforcement, extension, and community development.(February/June 1995).
   Participants: TNC, MFEC, consultant from GBRMPA and USP.
2) Provide additional on the job follow-up training for CO's as needed throughout the year.(yearly).

Participants: TNC, MFEC, and CO's.

3) Construct physical infrastructure on the Arnavon Islands and purchase basic equipment necessary for conservation area management (January/April 1995).
Participants: TNC. MFEC, and Management Committee.

Resource Inventory and Monitoring

1) Conduct baseline monitoring inventories (January 1995, March 1995, and May 1995).
Participants: TNC, MFEC, ICLARM, ACIAR, and Management Committee.
2) Train CO's to conduct simple monitoring techniques and establish a simple ongoing CMCA monitoring program. (ongoing throughout project).
Participants: TNC, CO's, MFEC, ICLARM.
3) Co-ordinate management activities with on-going Hawksbill turtle population research (yearly June to September).
Participants: TNC, MFEC, Fisheries Division and SPREP.
4) Conduct census of Megapode population (September/October 1995).
Participants: TNC, MFEC, CO's and Management Committee.
5) Vegetation Mapping of the islands flora.(November 1995 to February 1996).
Participants: TNC, MFEC, CO's and Management Committee.

Enterprise Development

1) Enterprise consultant to assess economic potential and enterprise options for communities and design implementation strategies for the most promising options.(February/March 1995).
2) Conduct participatory workshops on enterprise development options (June to August 1995).
Participants: TNC, MFEC, and Management Committee.
3) Begin implementation of enterprise development component (September to December 1995).
4) Consultant to set up socio-economic program using participatory methods for community self monitoring. Monitoring program to be ongoing throughout the project (October to November 1995).
Participants: TNC, MFEC, and Management Committee

Year 2: January 1996 to December 1996

Community Marine Conservation Area Development

1) Assist Management Committee in annual evaluation of CMCA management rules and policies one year after introduction (April 1996).
Participants: TNC, MFEC, and Management Committee.
2) Maintain buildings and equipment (On-going throughout project).
Participants: TNC and Management Committee.
3) Explore opportunities to expand the concept of sustainable resource management to other areas and hold workshops with interested communities (On-going throughout the project).
Participants: TNC, MFEC, and Management Committee.
4) Conservation Officers' extension work in the communities to raise awareness of conservation and sustainable management issues. (Ongoing throughout the project)

Participants: TNC, MFEC, CO's.

Resource Inventory and Monitoring

1) Conduct end of year biological monitoring (yearly in April).
   Participants: TNC, MFEC, ICLARM, GBRMPA, and Management Committee.
2) Gather traditional knowledge on marine biology and ecology (July to August 1996).
   Participants: TNC, MFEC, CO's, and Management Committee.
3) Reef mapping of Arnavons and current mapping of Manning Straits (September to December 1996).
   Participants: TNC, MFEC, CO's and Management Committee.

Enterprise Development

1) Conduct resource recovery survey of economically valuable species (On-going).
   Participants: TNC, MFEC, and CO's.
2) Continue implementation of enterprise development options.(ongoing).
   Participants: TNC, MFEC, and Management Committee.
3) Conduct participatory workshops to strengthen community capabilities for operating small enterprises (July to August 1996).
   Participants: TNC, MFEC, and Management Committee.

Year 3: January 1997 to December 1997

Project Planning and Management

1) Assist Management Committee in developing a strategy for future management of the area after the first three years (on-going).
   Participants: TNC, MFEC, and Management Committee.

Community Marine Conservation Area Development

1) Conduct multi-community consultative meeting on the Management Plan and future of project (June 1997).
   Participants: TNC, MFEC, and Management Committee.

Resource Inventory and Monitoring

1) Continue research and follow-up on traditional knowledge of marine species and ecology for application to resource management policies (March 1997).
   Participants: TNC, MFEC, and Management Committee.

Enterprise Development

1) Conduct participatory workshops to evaluate enterprise development and determine future needs (September to December 1997).
   Participants: TNC, MFEC, ICLARM, and Management Committee.

Year 4: January 1998 to December 1998

Project Planning and Management

1) Review and revise Management Plan on basis of research findings and report results to three communities (August 1998).
   Participants: TNC, MFEC, and Management Committee.

Community Marine Conservation Area Development

1) Handing over of project responsibility to the Communities and Management Committee, with administrative and financial backstopping from MFEC. Phasing out of TNC's support (January to June 1998).

Resource Inventory and Monitoring

1) Conduct biological monitoring after three years of management. (January to May, 1998).
   Participants: TNC, MFEC, ICLARM and Management Committee.
2) Evaluate long-term monitoring and report results to the Management Committee with recommendations for changes, if any, in species harvesting restrictions and management policy (June/July 1998).
   Participants: TNC, MFEC, ICLARM, and Management Committee

Enterprise Development

1) Analyze fisheries and biological monitoring results to determine economic benefit of CMCA to surrounding fisheries and determine sustainable harvest potential. Present results and recommendations to the Management Committee and communities (July to August 1998).
2) Hold workshop on recommendations on sustainable harvest from within CMCA, link with multi-community consultative meeting on the future management in the region (September 1998).
   Participants: TNC, MFEC, ICLARM, and Management Committee.

3.3 Project Financing and Administration

The total project costs for 1995 are estimated $289,690 USD or $1,000,308 Solomon Island Dollars. Of this total $67,820 USD or $234,184 SBD are being requested through SPBCP, and an additional $20,000 SBD will be provided by SPREP's RMTCP. BCN is providing approximately $49,000 USD or $150,000 SBD through a Planning Grant, and additional funds will be requested from an Implementation Grant during 1995. ACIAR is providing $79,000 AUD or $207,320 SBD for Biological Monitoring of the conservation area. TNC will provide an additional $59,000 USD or $203,831 SBD and MFEC will contribute $37,000 SBD. See Annex 1 for the 1995 project budget. The budget is itemized in both SI Dollars (pgs 1-4) and US Dollars (pgs 5-8). The budget justification follows. Annex 2 contains estimated 5 year budget of funding needs from all sources.

3.3.1 Budget Justification

Personnel: Conservation Officers' Salaries:

Six Conservation Officers have been hired to manage the CMCA on a day to day basis . They will work on the islands in three man teams. Each team will spend two months on duty at the Arnavons, followed by two months off duty. During the two months off duty, the CO's may work up to ten days in their communities on environmental awareness and other project related extension activities. The CO's will be hired on a yearly contract, casual basis and be paid for their time on the basis of the work they perform. The CO's will be supervised by the management committee.

- Salary level - $420/month x 6 mths. + $56.50 x 6 mths. (tax & NPF) + $20/day x 10 days x 6 mths. + $26.00 x 6 mths. (tax & NPF) = $4215.00 X 6 CO's = $25,290.00

Following is the rational for hiring the Conservation Officers:

- The communities believe that the success of the Conservation Area depends on there being a permanent presence on the islands to enforce the agreed upon regulations.

- The CO's will be trained in scientific monitoring of resources, and work with consulting scientists in the initial monitoring survey team. They will thereafter have an important role in maintaining an ongoing monitoring of resource use and population size, map the terrestrial and marine environments, and collect important data needed for managing the CA and surrounding areas.

- The CO's will play an important role by providing environmental awareness, and extension activities within their communities, assist with socio-economic assessments and monitoring of project effects, and assist with enterprise development.

- The CO's will provide valuable information to their communities about resource management, which is essential to the long term prosperity of these communities who depend on their natural resources for subsistence and income.

- Because of the regions remoteness, there needs to be local project representatives to keep the communities informed about project activities, provide the project managers with community feedback, and to keep up the momentum and enthusiasm for the project.

- The communities see the hiring of local CO's as a sign of commitment to local control of the CA.

- The three communities decided that there needs to be a balance between them, thus six CO's provide two teams of three. One officer from each community gives equal representation which they feel will both discourage favoritism in the enforcement of the regulations and provide a check that the CA is being managed properly.

- Since SPBCP is not funding a CASO for this project, (MFEC is seconding personnel for the CASO position) it would be appropriate for SPBCP to support the CO positions.

- A long term strategy for covering the costs of the CO's salary will be decided during the first

two years of the implementation phase, when it becomes apparent what benefits the project is providing to the communities, and options for community generated funds for meeting the costs of the CO's. Possible options include user fees for harvesting in the CMCA once resources reopen for harvest, a percentage of the profits from the various enterprises associated with the project, and/or as community understanding and capabilities for resource management increase various members of the community could rotate short tours of duty to monitor the area.

Consultants:

Justification of consultants refer to appropriate budget categories.

Conservation Officers Training:

Training objective:

- To provide CO's with the skills necessary to manage, monitor and enforce regulations in the MCA.
- To provide an understanding of resource management and environmental issues.
- To enable them to transfer knowledge and skills to their communities about resource management, and to raise their level of conservation awareness

CO's will be trained in the following areas:

- Project background and CO's roles and responsibilities.
- Fisheries Regulation.
- Environment and Conservation Division related program activities.
- Police liaison and enforcement of management regulations.
- Participatory community project planning and management.
- Scuba Dive Certification and Survey Techniques - this is essential for them to assist with the Biological monitoring as part of the ACIAR funded ICLARM/GBRMPA monitoring team, will provide for long team sustainability and localization of monitoring, and the safe dive practices they learn can be transferred to the communities where 'hooka' style dive techniques often result in bends and permanent disability, occasionally being fatal.

The above activities were completed in November 1994. The following training will be conducted in March/April 1995.

- CMCA management techniques - an overseas consultant is needed for on site training in CA management, survey and mapping techniques, reporting and record keeping. This being the first CMCA in the Solomons it is important that on site management training of the CO's be comprehensive to ensure from the onset that the area is managed properly.

- Extension/community awareness and education training - to enable the CO's to work with their communities, and help them to understand the importance of the project, respect and adhere to the management guidelines, understand the importance of resource management, and be able to apply some of the management techniques to areas outside the CA. If possible it would be good to include the management committee members in this part of the training. It is anticipated that an external consultant would be needed for this training, possibly a specialist from USP in facilitation, communication, and/or extension skills.

- Enforcement of CMCA management regulations - with the Isabel Province police division in

Buala. On completion of this training the CO's will be deputized as Area Constables to enforce the MCA regulations which are incorporated into the Isabel Province Wildlife Sanctuary Ordinance, the enabling legislation for establishing this CA.

- Participatory Community Development Training Workshop - for 3 CO's - This SPREP organized national workshop will train participants in methods to achieve community participation in resource oriented sustainable development.

- Conservation Area Management Training Consultant - 21 days training x $300/day + $100/day per diem = $8,400 USD or $29,000 SBD.

- Community Extension Training Consultant - 14 days training x $300/day + $100/day per diem = $5,600 USD or $19,350 SBD.

AMCA Island Infrastructure:

- The Arnavon Islands are remote and uninhabited, making it necessary to provide basic living quarters and a work base from which the CO's can manage the CMCA.

- The communities see the building of island infrastructure as an important project benchmark. It represents to them a sign of the long term commitment of outside partners (TNC, MFEC, and SPBCP) to this project.

- The 4 room house will provide office space and one room living quarters for each of the CO's on duty. @$3,000 construction and local materials + $5500 manufactured materials.

- The leaf rest house will provide accommodation and work space for Management Committee meetings on the islands, visiting scientists. project monitoring team, and other visitors. @2,500 construction and local materials + $1000 timber.

- An equipment shed is necessary to protect and secure petrol supplies, OBM and other equipment. Toilet block and kitchen. @$2,000 construction and local materials + $2,500 timber and manufactured materials.

- Iron roofs and two water catchment tanks will provide fresh water for drinking as there is no potable water on the islands. Water tanks @2 x $1,000.

- Well improvements will upgrade the existing shallow well for use for bathing.

- Radios and solar panels to charge the radio batteries are essential for communication in case of emergency and for day to day work needs between the CO's on duty, their communities, and the project managers in Honiara.

  1 radio at the Arnavons (SPBCP) + 1 radio for each community + 1 radio at MFEC or TNC office. 5 radios and solar set up @$11,000/ea. = $55,000.

- Canoes and Outboard Motors - 1 canoe and OBM for use by CO's at the CMCA, and for use during the monitoring surveys, which will remain at the islands at all times. (ACIAR funding of the monitoring program supplied this canoe and OBM, Oct. '94). Second canoe for use of the management committee. extension/awareness activities, enterprise

development activities, and other project related uses.

- Furniture and equipment - The basic furnishings and adequate equipment needed for living and working on the islands will be provided for the CO's.

AMCA Management Committee:

The committee is comprised of two representatives from each of the three participating communities, Isabel and Choiseul Provinces' Senior Fisheries Officers, and a representative of both MFEC and TNC.

- The management committee holds three meetings per year to discuss issues and concerns of the communities relating to the project, and for decision making required for project management and implementation. One meeting a year is held in Honiara, and 8 committee members travel air to Honiara from the project area. @$308/person x 8 = $2,464. When island infrastructure is completed, 2 meetings per year will be held on the islands, with 4 persons traveling by air to the Arnavons for each one. @$308/person x 4 = $1,232 x 2 = $2,464.

- Accommodation and other meeting expenses include rest house in Honiara @ $35/night x 5 nights x 8 persons = $1,400, rental of a meeting venue @ approximately $200 and refreshments $200. The meeting costs on the island are estimated at $800/meeting x 2/yr. = $1,000.

- Subsistence allowance will be offered for the committee members' substantial time and effort dedicated to meetings and other project responsibilities. This allowance will be at a rate of $20/day x 6 days x 8 = $960 x2 meetings = $1,920 for meetings outside of Honiara and $45/day x 5 days x 8 = $1,800 & 4 days travel @$20/day x 8 = $680 in Honiara. The rational for this allowance is;

  - Compensation for time lost from subsistence and income earning activities in their communities, i.e. gardening, fishing, shop keeping.

  - The communities understand that while they may benefit from the project in the long run, committee members devote a significant amount of time and effort, exceeding what is generally accepted as time donated to community projects, and therefore deserve to receive an allowance.

  - Committee members feel that they make an important contribution to the project. They see this small allowance as a recognition and appreciation of their input, which serves to strengthen their commitment to the project.

- Management training will include meeting facilitation skills, conflict resolution, project management, accounting, and financial management. It will serve to strengthen the committee members capabilities and help to insure long term sustainability of the project beyond this funding cycle. Training will also give the committee members skills that they can apply in other community projects.

Community Awareness, Education, and Participation:

These activities will include community workshops, consultative meetings and CO's extension duties. The focus will be on informing the communities about project related activities and receiving feedback, broad resource management issues, understanding management rules and fisheries regulations, effects of destructive and unsustainable resource harvesting, and PRA activities.

- Resource material - teaching aids for the above activities.
- Workshops and consultative meetings - food, accommodation, and other expenses needed to run a workshop or community meeting.
- Air Travel - travel to and from the project area by consultants , project staff and resource persons. @$308/person x 5 persons x 3 trips = $4,620.

Sustainable Enterprise Development:

A major component of this project is to develop feasible economic enterprises, and strengthen existing enterprises so that they become sustainable environmentally and economically. These must be dependent for their success on the biodiversity and overall health of the areas environment to ensure the long term success of the CMCA concept and related resource management in the broader project area.

- Enterprise Development Consultant, and preliminary enterprise survey and workshops - there has never been planned economic or enterprise development in this region, which has resulted in a patchwork of opportunistic enterprises that are unsustainable and quickly depleting the regions resources particularly in the marine sector. The project believes that this does not need to be the case. A qualified enterprise development consultant is needed who can assess the present economic environment, suggest viable options for sustainable enterprise development which are dependent on the regions biodiversity for success, fit into the area's cultural framework, and design a strategy for implementing these options. An enterprise consultant is being funded under a BCN planning grant.

- Enterprise Training - training for community members participating in enterprise development activities. The nature of the training will depend on the outcome of the consultant's work and the options selected by the communities for implementation. Training will build capabilities to pursue selected options, and will likely include financial management, business management skills, marketing, training in mariculture techniques, and other appropriate areas.

- Enterprise Development Fund - the amount needed in this fund will be dependent on the start up costs of the options selected, and if the project will establish a credit scheme for enterprise development. The figures shown are an estimate and need to be reassessed after the consultant's report has been completed.

- Air Travel - internal travel to the project site for consultant team and for training and implementation of the enterprise options.

Monitoring and Evaluation:

In order to determine the effects of the project, both positive and negative, ongoing

monitoring and evaluation is necessary. Biological monitoring of marine invertebrate species of economic importance will be carried out by ICLARM and GBRMPA together with project partners. This monitoring is being funded by ACIAR @ $79,000 AUD for 1994/95. Marine turtle monitoring is being supported through SPREP's RMTP @$20,000/yr. In addition to this, participatory monitoring and evaluation procedures need to be designed that can be used by CO's, the management committee, and the communities to assess the biological and socio-economic aspects of the project.

- CO Biological Monitoring Program - a simple monitoring program will be designed for implementation by the CO's as a part of their normal duties that will look at;
  - water quality
  - 2 - 3 key marine species that indicate the overall health of the marine environment
  - land species
  - mapping of reef, vegetation, and currents
  - indicators the communities recognize that reflect the health of the local environment.

- Socio-economic Monitoring Program - An external consultant will design and set up the socio-economic monitoring program. This program should consist of a yearly monitoring survey, with mid-term and final review. It will assess the changes in community attitudes toward resource use, social and economic impacts of the project on the communities, distribution of project benefits, and changes in communities attitudes, perception, interactions with each other. Consultant @$300/day + $100/day per diem x 21 days = $8,400 USD = $29,000 SBD.

Operating Costs:

- Fuel - For general management needs of CMCA - 2-3 daily patrols around the CA, a fortnightly trip for food and other supplies, change of CO teams every two months. @ 5 drums petrol/month x 12 months x $430/drum = $25,800/yr.

  - For community awareness, education, and participation - canoe travel for two workshops in each of three communities per year, and for extension work by CO's. 8 drums petrol x $430/drum = $3,440.

  - For Management Committee Meetings - canoe transport to and from three committee meetings. 6 drums petrol x $430 =$2,580.

  - For enterprise development - transport for enterprise consultant team survey and assessment, and for implementation of the enterprise development component. 8 drums petrol x $430 = $3,440.

- Paper, office supplies - CO's need materials for record keeping, work logs, monitoring data, and report writing.

- Kerosene, rice, tea and sugar ration - due to the remote location, basic food supplies will be provided for the CO's along with kerosene for lights and cooking.

- Maintenance and servicing of OBM and equipment - to ensure the dependable operation of all equipment.

- Telecommunication and postage - TNC and MFEC will provide these costs.

Air Travel:

- International airfares for CMCA management training and community extension training consultants - Australia or New Zealand to Honiara return @ $2,139 x 2 = $4,278.
- International airfare for enterprise development consultant - U.S. Honiara return @ $2,500 USD or $8,650 SBD.
- International airfare for socio-economic monitoring consultant - Australia or New Zealand to Honiara return @ $2,139.

For justification of internal travel expenses refer to appropriate budget categories.

3.4 Organization and Management

Success of the project is dependent on the involvement of community leaders throughout the process. Through active community participation, we hope to build a lasting commitment to the sustainable management of both marine and terrestrial resources while working to rehabilitate economically valuable marine resources. We believe changes in the perceptions of local resource users are already taking place as evidenced by the strong interest and participation of community leaders in the Management Committee and the support the project has received at the local level.

Short Term - In the initial phases of project activities, TNC and MFEC as the principle collaborators have been and will continue to provide direction and initiate activities for the project, along with coordinating most project inputs, logistics, and communication and interaction with outside organizations. TNC, because of its years of international experience in conservation, will also act as principle advisor for the project. During this phase, MFEC will strengthen its capabilities to design and establish conservation areas with landowners and provincial governments, and to coordinate and administer a conservation area system at the national level.

The AMCA Management Committee was created and is being developed to take the principal role in managing the conservation area. The committee members are selected by each participating community to represent their ideas and concerns regarding conservation and resource management. Community representation ensures a high level of community participation in all project activities, and the committee is the principal liaison between TNC, MFEC, and the three communities. Decision making comes from a consensus of the community representatives with advice from the government and NGO representatives on the committee, i.e. TNC, MFEC, Provincial Fisheries officers. During the initial phase a major focus will be building the committee's capabilities in project planning and management, for it is expected that they will hold the central role in the project's management.

CO's will be responsible for the day to day management of the CMCA. Their duties will also include environmental awareness and extension activities in their communities. The six CO's are hired by and responsible to the management committee. Two CO's were selected by each community from young men within the community who met the management committees hiring criteria. During the initial phase the CO's will receive training in practical CA management skills, biological monitoring, data collection, record keeping, and extension skills.

To facilitate community involvement on a wider scale, feedback loops between the communities and their committee members and between community and project coordinators

should be well established, understood, and used for maintaining a project focus that is relevant to community needs. During the initial phases these feedback loops will be established through consultative meetings, workshops, and dialogue with community members. Another essential element of the project is to assist the communities to develop appropriate enterprises that utilize the regions resources sustainably and equitably. Project partners will help communities identify enterprise options, learn the necessary skills, and develop implementation plans. Finally, the CO's will work with the communities to transfer CA management skills they have learned, for use in sustainable resource management in other areas under community control.

ICLARM is associated with the project to help design and implement the biological monitoring program for economically valuable marine invertebrate species. They will work with the GBRMPA and the Fisheries Division of the Ministry of Agriculture and Fisheries on the monitoring and will train the CO's to assist. ICLARM will also advise the communities on mariculture potential and implementation, and help design a simple monitoring program that the CO's can implement.

AMCA is on Government land and is established under a 1980 Isabel Province Ordinance as a Wildlife Sanctuary. The Isabel Provincial Assembly has agreed to transfer management of the CA to the to the Management Committee and incorporate the management regulations detailed in the Management Plan into the existing legislation. The province is represented by the Senior Fisheries Officer who advises the committee on provincial policies and fisheries issues.

Long Term - Toward the end of the third year of the implementation phase the Management Committee will assume the lead role in Conservation Area Management including supervising CO's, coordination of all CMCA activities, long term planning, and financial management for the CMCA. They will also have a role in coordinating the sustainable enterprise development component of the project. CO's will assist the Management Committee with day to day management of the CA. They will focus more on extension activities and the transfer of sustainable resource management techniques to the communities. The MFEC will take an advisory role providing administrative and financial backstopping. As these groups gain expertise and confidence, TNC's role will gradually be phased out. The communities will have developed a strong commitment to sustainable resource management, give enthusiastic support to the work of the committee, and be actively pursuing selected enterprise options and opportunities to expand sustainable management methods to other areas under their control.

3.5 Project Coordination

The Nature Conservancy is the lead organization and the Solomon Islands Ministry of Forestry, Environment and Conservation, Environment and Conservation Division is the principal collaborator for this project. TNC and MFEC, will be responsible for overall coordination and project management, and will work closely with the AMCA Management Committee and a number of other partners. Each is described briefly below with contact information for key individuals provided.

Lead Organization

The Nature Conservancy is an international conservation organization with programs throughout the South Pacific including Palau, Federated States of Micronesia, Solomon Islands, and Papua New Guinea. TNC staff have years of experience in marine resource management and biodiversity conservation in tropical South Pacific countries.

Mr. Peter Thomas
Director of South Pacific Program
TNC
17 Gulf View Rd.
Auckland New Zealand
Tel: (649) 479 2417
fax: (649) 479 1944

Mr. Edward Mayer
Solomon Island Field Representative
TNC
PO box 556
Honiara, Solomon Islands
Tel: (677) 20940
fax: (677) 21339

Principal Collaborator

The Ministry of Forest, Environment and Conservation, Division of Environment and Conservation is responsible for implementing the country's National Environment Management Strategy, enforcing wildlife and environment policy and legislation, and the establishment of conservation and protected areas throughout the country.

1. The Permanent Secretary
Ministry of Forestry, Environment
and Conservation
P.O. Box G24
Honiara, Solomon Islands
Tel. (677) 21 521
Fax (677) 21 245

Mr. Moses Biliki
Chief Environment Officer
Ministry of Forestry, Environment
and Conservation

Management Committee

Kia Village, Isabel — Nelson Bako and Leslie Miki
Posarae Village, Choiseul — Rence Zama and Elijah Pita
Waghena Community, Choiseul — John Rabaua and Bua Tebaubau
Isabel Province — Simon Alekera
Choiseul Province — Arthur Nego

Community Collaborators

1. Chief Steven Taki
Voliakana Tribe
Posarae Village
Choiseul Province
Solomon Islands

Chief John Lepita
Voliakana Tribe
Posarae Village
Choiseul Province
Solomon Islands

As the Chiefs of the Voliakana Tribe, Chiefs Taki and Lepita are the key point of liaison with the traditional landowners and are strong advocates of the project.

2. Chief Leslie Miki
Chairman
Kia Council of Chiefs
Kia, Isabel Province
Solomon Islands

The Kia Council of Chiefs represents the interests of the north Isabel communities including the Sinagi Tribe.

3. Honorable Ueveti Tebitara
Choiseul Provincial Assembly Member
Waghena Island
Cookson, Waghena
Choiseul Province, Solomon Islands

The Waghena Assembly Member, with the elders of the Waghena community represent the interests of the Gilbertese people of Waghena Island.

Provincial Government Collaborators

1. Mr. Ruben Dotho
Provincial Secretary
Isabel Province
Buala, Isabel
Solomon Islands

Mr. Simon Alekera
Senior Fisheries Officer
Isabel Province

The Isabel Provincial Government has jurisdiction over the Arnavon Islands and represents the interests of the landowners and communities involved. The provincial government has included the establishment of the Arnavon CMCA as one of its ten National Environmental Management Strategy priorities.

2 The Provincial Secretary,
Choiseul Provincial Government
Taro Island
Choiseul Province

Arthur Nego
Acting Senior Fisheries Officer
Choiseul Province

The Choiseul Provincial Government is supportive of the project. The project area lies outside the Province, however, two of the participating communities, Posarae and Waghena are located within the province.

Regional Collaborators

1. Dr. Vili Fuavao
Director
South Pacific Regional Environment Programme
P.O. Box 240
Apia, Western Samoa
Tel: (685) 21 929
Fax: (685) 20 231

The South Pacific Regional Environment Programme (SPREP) has supported the Arnavon Islands turtle monitoring work over the past five years and has a strong interest in seeing the Arnavon Islands habitat and the Hawksbill turtles protected. It is anticipated that SPREP will continue to support turtle monitoring activities in the project area under the RMTCP.

2. Dr. Johann Bell
Senior Scientist
International Center for Living Aquatic Resources Management (ICLARM)
Coastal Aquaculture Center
P. O. Box 438
Honiara, Solomon Islands
Tel: (677) 29255
Fax: (677) 29130

ICLARM is an international organization based in the Philippines, with extensive experience and expertise in inshore fisheries and sustainable marine farming projects in developing Asian and Pacific countries. ICLARM will assist with the fisheries management aspect of the project and will provide valuable assistance with the monitoring and enterprise aspects of the project.

3.6 Monitoring and Evaluation

3.6.1 Biological Research and Monitoring Component

We will conduct **baseline inventories and monitoring** to quantitatively assess the biological diversity of the Arnavon Islands CMCA and evaluate the effectiveness of a managed conservation area for the rehabilitation of depleted marine resources. While the REA provided the initial information needed to evaluate the biological value and conservation potential of the area and to develop the Management Plan, more detailed inventories and a scientifically rigorous program will be required for long-term monitoring.

Determining the Effects of a Conservation Area

The establishment of the CMCA represents a unique and virtually unprecedented opportunity to determine the effects of closing an area to fishing on depleted populations of commercially valuable beche-de-mer, Trochus, giant clam, and pearl oysters both within and outside the area. Although some data now exists for vertebrate fisheries in temperate zones, to our knowledge, no data exists on the impacts of conservation areas on tropical marine invertebrates. Quantitative monitoring of important organisms within the CMCA and in similar habitats outside the conservation area will be conducted. This information will be used to develop a management strategy for the sustainable use of subsistence and commercial resources and to evaluate the effects of the CMCA.

Measuring the Number and Size of Key Species

The notion that conservation areas allow populations of adult tropical marine invertebrates to increase in number and size has yet to be demonstrated unequivocally and this project provides an ideal opportunity to test this hypothesis.

Measuring Recruitment Within and Outside the Area

The advantage of closing an area to fishing is that the remaining individuals will increase in size and newly recruited individuals will be able to attain large adult size. In most marine animals, egg production increases exponentially with size. Thus, there will be a strong likelihood that increased egg production will mean more juveniles available to recruit to the CMCA and to

surrounding areas still open to fishing.

Since the islands are uninhabited and land-based impacts on the marine environment, such as soil runoff, have been minimal, the marine environment is essentially undisturbed. As a result, we will be able to monitor natural changes without the interference of local anthropogenic impacts. Monitoring of terrestrial habitat, particularly shoreline dynamics, and the Megapode population will also be conducted.

Methodologies for Addressing Biological Monitoring Questions

To adequately test this hypothesis, we will select a number of sites within and outside the CMCA for detailed, quantitative inventories and **long-term monitoring**. Sites will be selected based on their similarity to the reefs inside the conservation area and their position relative to the prevailing current pattern. The abundance of species of interest and the quality of habitat at selected sites will be inventoried on three occasions prior to initiating protective status and monitored yearly and on three occasions after the protection has been in place for three years. This monitoring plan will help us to accurately identify the cause of any increase in a species following closure and will increase confidence that the patterns of increasing abundance we expect over the monitoring period are due to the protective status of the CMCA. Based on an evaluation of the long-term monitoring results, we will determine the economic and ecological benefit within the CMCA and in the surrounding areas. Results will guide the Management Committee in planning effective management for the CMCA, and also help to determine sustainable harvest levels of commercially important species in the region.

A monitoring program using visual census along transect lines has been designed by ICLARM and GBRMPA. The initial monitoring is currently in process. The CO's are being trained to assist in conducting this monitoring. In parallel with this rigorous scientific monitoring program, CO's will be trained in simple resource monitoring techniques they incorporate into their work plan. These skills will be passed on through CO extension activities so other community members can monitor resources outside the CMCA.

Using our monitoring data on the abundance of key marine resources, we will try to determine the value of the CMCA in supporting surrounding fish and invertebrate populations. If the harvesting prohibitions are respected, there should be an increase in the abundance and size of key marine species in the CMCA. If the CMCA is contributing to populations in adjacent areas through the export of larvae, juveniles or adult fish, monitoring should reveal an increase in the abundance of these species outside the CMCA as well.

Monitoring of sessile benthic communities (e.g. corals, algae, sediment) will follow procedures developed by the Australian Institute of Marine Science (AIMS), as adapted to the IOC/UNEP global coral reef monitoring program. Monitoring of reef fish will be by visual census along transects, again following the techniques used by AIMS and the GBRMPA throughout tropical Australia and Southeast Asia. In Year 1 of the project, we will conduct a census of the Megapode population and the CO's will carry out monthly surveys of the Megapode population to evaluate the effectiveness of the six-month closed season specified in the Management Plan. We will also coordinate CMCA management activities with the on-going Hawksbill turtle population research.

We intend to monitor the fishing catch and harvesting of key species and fishing effort in areas surrounding the CMCA. We will perform fishing catch and effort surveys using standard

fishery methods (e.g. creel surveys and interviews with fishermen) as part of the annual monitoring plan.

If the CMCA is contributing to the abundance of subsistence species to the surrounding area, the monitoring should reveal an increase in the abundance and, perhaps, size of the species harvested, as well as a potential decrease in the harvesting effort required. By analyzing these data on harvesting catch and effort, we will determine the effects of the CMCA on temporal and spatial patterns of harvesting and the potential, long-term economic benefit of the CMCA to subsistence and commercial fisheries.

3.6.2 Socio-Economic Research and Monitoring Component

Understanding Resource Use

We will continue to research resource use and management practices in the project area. The household surveys performed in the planning phase of the project will be repeated in Year 3 of the project to evaluate **changing community attitudes toward marine resource use and the CMCA.**

Defining Community Resources, Needs, and Priorities

We will work with the communities to identify their skills, human resources, needs and priorities. The process of defining these resources and needs is critical to the successful development of sustainable enterprises in these communities. The information will help us to understand their skill base, encourage local confidence in enterprise development, and determine which enterprise options and participants would be most appropriate for implementation.

Understanding Traditional Knowledge

Local resource users have a wealth of **traditional knowledge** about the biological resources and ecological processes of the Arnavon Islands which will strengthen the management of the conservation area. This information is vital to develop appropriate sustainable management policies for the CMCA and for marine resources in general.

Socio-economic Effects on the Communities

We will attempt to gauge changes in status, living conditions, and resource needs within the communities. A combination of participatory methods and surveys will be used to assess any beneficial or adverse changes being felt in the community related to the project. Some areas to be considered in this monitoring process include:

- Indicators identified by the communities that measure the socio-economic effects of the project.
- Indicators to measure the effects of resource management, i.e. time needed to collect subsistence resources, distance traveled, and trends of income earning.
- Changes in how the communities view resource management.
- Community satisfaction with the project, and with the decision making process. (Who is

making decisions?)

- Distribution of project benefits. Is it equitable in the community and between communities?

- Baseline and ongoing study of distribution of wealth, through wealth ranking and income flows (to the communities, individuals, how and where income is spent).

- Changes in the use of the environment.

- Changes in the rural economy - subsistence/cash economy balance, through sampling a few key households representing various income levels.

- Changes in frequency of conflicts and the conflict resolution process due to effects of management, and/or changes in resource abundance.

- General views and attitude of the communities about the project, both good and bad.

- Community needs/desires satisfaction. What do they want to get out of the project?

Methodologies for Answering Monitoring Questions

Participatory community workshops and informal meetings will be held to increase community awareness of resource management issues and the role of the CMCA. As the project progresses, we will adjust the number and type of workshops or meetings to meet the needs and interests of the communities. Together with the Management Committee, TNC will select the topics for workshops. The workshops will be conducted by members of the Management Committee, the CO's, TNC, and our collaborators. Outside expertise will be used where specific technical expertise is needed.

Workshop topics will include: 1) understanding socio-economic factors influencing resource exploitation and social change in local communities; 2) planning and resource management options to provide for a sustainable future for the communities; and 3) simple evaluation and monitoring methods that the communities can use to assess the effects of the project.: and 4) collecting and documenting traditional biological and ecological knowledge and assessing how this knowledge can be incorporated into sustainable resource management systems.

3.7 Training - Summary of training needs for this project identified in earlier sections

Training Needs	Target Group	Timing	Approx. No.
Project Design/CA establishment	MFEC, CASO	Year 1 and 2	5
Project Planning and Management	MFEC, CASO & Mgt. Committee	Year 1 and 2	9
Conflict Resolution	Mgt. Committee & CO's	Year 1 and 2	16
Facilitation Skills	Mgt. Committee	Year 1 and 2	10

CA Management	CO's	Year 1	6
Environmental Awareness Extension	CO's & Mgt. Committee	Year 1 and 2	16
Biological Monitoring	CO's & CASO	Year 1	7
Scuba Diving	CO's & CASO	Year 1	7
Enterprise Management/Business Skills	Community	Year 2	10 - 20
Sustainable Res. Mgt.	Community & CO's	Year 2 and 3	10 - 20
PRA	CASO, CO's	Year 1 and 2	17

PART 4 - PROJECT IMPACT

A project of this scope can be expected to have significant impacts both environmental and socio-economic. The project design and methodologies are being employed for the first time in the Solomon Islands and therefore we can only estimate what will be the likely impacts

4.1 Environmental Impacts:

It is expected that the community management of the Arnavon CMCA will have considerable and beneficial effects on the marine and other resources of the area.

- There should be significant improvement in the biological resources both with the CMCA and hopefully in the surrounding areas. These improvements should be measured by the monitoring process set in place at this time.

- The infrastructural development and regular presence of the CO's on the islands could have some negative impacts due to clearing of land for building, garbage disposal, and fire wood collecting. The management plan attempts to mitigate these impacts through strict control on refuse disposal, introduced plants and animals, fuelwood collection, in addition to the regulations governing use of the resources. It should also be noted that the islands have been regularly visited during fishing and resource harvesting trips, and are suffering from unrestricted damage to the vegetation from bush clearing for camping and firewood collecting used for drying bech-de-mer. Conservation area management will discourage this and the presence by the CO's will be offset by an improvement of coastal vegetation and shoreline stability.

- The participating communities view the project as an experiment to see if a reasonable level of sustainable resource use can be achieved through effective management. The communities recognize that if present unregulated extraction trends continue, the resources will be irreversibly depleted, and they are therefore willing to try the management option at the Arnavons. Assuming success at the CMCA, it can be expected that resource management techniques will spread to other areas under community control with a subsequent improvement in the biological resources.

4.2 Socio-economic Impacts:

The socio-economic impacts of this project will be determined by both CMCA management at the Arnavons and by the enterprise development component. Likely impacts could include the following:

- An increase in the communities understanding of their environment, and capacity for undertaking sustainable resource management through participation in the management committee and other project activities, hiring of CO's, and training provided to CO's, management committee and the communities.

- Heightened awareness of the need for sustainable management of natural resources may lead to the long term sustainability of harvesting and the continued availability of subsistence and commercial marine resources.

- The project may lead to the communities better understanding their needs and aspirations, and improve their ability to address these needs.

- The project is building communication links between these three communities which have never before existed, through the management committee and regular consultative meetings. At this point it appears that this process is clearing previous misunderstandings between the communities and shows signs of improving the climate for settlement of long standing land disputes. At the same time, it must be recognized that disagreement between the communities over project related issues could allow these misunderstandings and disputes to resurface and cause problems that impact on the project. However, this will be offset by establishing conflict resolution mechanisms in the project framework, and through training in conflict resolution and negotiating skills for committee members and CO's

- At this point it appears that the Management Committee is adequately representing their communities, it is possible that as the project evolves, individuals or groups in the communities may feel that they are not being well represented, or that they are being excluded from project participation. Regular community consultations and open meetings that allow for feedback from all interested parties in the community will mitigate this.

- It is anticipated that the project will provide increased income to individuals and the communities through enterprise development activities, project employment, training, building of infrastructure, and canoe hire and purchase of supplies from community merchants.

- There may be some short to medium term loss of income for individuals who have been regularly fishing and harvesting the waters and reefs of the Arnavons. This should be offset by enterprise development, employment and other project benefits.

4.3 Potential Risks to Project Achieving its Objectives:

- The project partners (TNC, MFEC, and others) not being able to meet their commitments and obligations with the project losing impetus and credibility.

- That destructive and unsustainable fishing and resource harvesting methods continue, despite

the efforts of the project to provide alternatives, and an understanding of the effects of these methods through awareness raising and sustainable enterprise development. This is one of the major problems that the project needs to address, because there are forces both outside and within the communities which benefit from these destructive methods and will resist change.

- Personal rivalry and dissension within the Management Committee leading to community dissatisfaction.

- The lack of perceived benefits to the communities.

- Inequitable distribution of the benefits between and within the communities.

- Insufficient incentives and penalties to persuade fishermen and resource users to respect the protected status of the CMCA.

- In the long term, the lack of resources or commitment within Government and the communities to maintain the project into the future.

LIST OF ACRONYMS

ACIAR	Australian Center for International Agriculture Research
AMCA	Arnavon Marine Conservation Area = CMCA
AUD	Australian Dollars
BCN	Biodiversity Conservation Network
CA	Conservation Area
CCA	Core Conservation Area
CMCA	Community Marine Conservation Area = AMCA
CO	Conservation Officer = CCO
GBRMPA	Great Barrier Reef Marine Park Authority
ICLARM	International Center for Living Aquatic Resource Management
MFEC	Solomon Islands Ministry of Forest Environment and Conservation
NEMS	National Environment Management Strategy
REA	Rapid Ecological Assessment
RMTCP	Regional Marine Turtle Conservation Program
SI	Solomon Islands
SBD	Solomon Island Dollars
SPBCP	South Pacific Biodiversity Conservation Programme
SPREP	South Pacific Regional Environment Programme
TNC	The Nature Conservancy
USD	United States Dollars

BUDGET CATAGORY	SPBCP	BCN *	TNC	MFEC	ACIAR	SPREP/RMTP	TOTAL
		all values in Solomon Island Dollars					
Personnel							
TNC Solomon Island Field Rep. - 1/2 time		43,831	43,831				87662
TNC South Pacific Program Dir. - 21 days			20,000				20000
TNC Marine Biologist - 30 days			15,000				15000
CO salary x 6 CO's	25,190						25190
MFEC Principal Cons. Officer - 1/4 time				7,000			7000
MFEC officer as CASO				10,000			10000
SUBTOTAL	25,190	43,831	78,831	17,000	0	0	164,852
Consultants							
MCA management / extension and community education training	48,343						48343
Enterprise specialist		51,796					51796
Socio-economic monitoring	29,006						29006
SUBTOTAL	77,349	51,796	0	0	0	0	129,145
Conservation Officer Training							
Scuba Dive certification		4,500					4500
Training expenses - food, accommodation,allowances	12,000	3,000					15000
SUBTOTAL	12,000	7,500	0	0	0	0	19,500
AMACA INFRASTRUCTURE							
Four room leaf house with iron roof			8,500				8500
Two room leaf guesthouse			3,500				3500
Equipment shed - timber with iron roof			3,500				3500
Two water catchment tanks			2,000				2000
Custom kitchen and toilet			1,500				1500
Well improvement			500				500
Five radios and solar panels	22,000	33,000					55000

BUDGET CATAGORY	SPBCP	BCN *	TNC	MFEC	ACIAR	SPREP/RMTP	TOTAL
Two canoes and outboard motors		30,000			30,000		60000
Furniture/equipment - lamps, beds, stove, utensils, bush knives, shovels			3,500				3500
SUBTOTAL	22,000	63,000	23,000	0	30,000	0	138000
Management Committee							
Accommodation and meeting expenses	2,000	1,400					3400
Subsistence allowance for work on project	3,360	1,000					4360
Training in management	5,000						5000
SUBTOTAL	10,360	2,400	0	0	0	0	12,760
Community Awareness Education and Participation							
Resource materials & graphic artwork	8,000						8000
Workshop and meeting expenses	10,000	5,000					15000
SUBTOTAL	18,000	5,000	0	0	0	0	23,000
Enterprise Development							
Workshops/ survey		6,000					6000
Training	8,000						8000
Enterprise development fund		60,000					60000
SUBTOTAL	8,000	66,000	0	0	0	0	74,000
Monitoring and Evaluation							
Biological							
Invertebrate resources -ICLARM					177,320		177320
Turtle survey						20,000	20000
Ongoing monitoring program -CO's	2,500	2,000					4500
Socio-economic monitoring survey	3,000	3,000					6000
SUBTOTAL	5,500	5,000	0	0	177,320	20,000	207,820

BUDGET CATAGORY	SPBCP	BCN *	TNC	MFEC	ACIAR	SPREP/RMTP	TOTAL
Operating Costs							
Fuel - general management of MCA	25,800						25800
-community awareness activities	3,440						3440
-management committee meetings	2,580						2580
-enterprise development		3,440					3440
*		2,580					2580
Paper & office supplies	2,000	1,000					3000
CO's rations/rice, tea, kerosene,	1,500						1500
Equipment & OBM maintenance	2,000	1,000					3000
Communication - phone & fax			6,000				6000
SUBTOTAL	37,320	8,020	6,000	0	0	0	51,340
Air Travel							
Consultants / International Airfares							
MCA Management/Extension, Comm. Ed. - NZ (Aust)/Hon/NZ (Aust) X 2	4,278						4278
Enterprise Dev. - US/Hon/US		8,650					8650
Socio-eco. monitoring set up - Aus/Hon/Aus	2,139						2139
Internal Airfares							
Training of CO's	1,000	2,000					3000
Management Committee	4,928						4928
Commun ity awareness/participation	4,620						4620
Enterprise Development							
consultant team to project		1,848					1848
training and implementation		4,928					4928
Monitoring	1,500						1500
SUBTOTAL	18,465	17,426	0	0	0	0	35,891

BUDGET CATAGORY	SPBCP	BCI *	TNC	MFEC	ACIAR	SPREP/RMTP	TOTAL	
Indirect Costs								
Organizational Overhead		28,000	96,000	20,000			144000	
TOTALS	**234,184**	**297,973**	**203,831**	**37,000**	**207,320**	**20,000**	**1,000,308**	
	* Number in bold are BCN Planning Grant, all other numbers are estimates of BCN implementation grant request							

ANNEX 2

AMCA 5 YEAR BUDGET

BUDGET CATAGORY	SPBCP	BCN *	TNC	MFEC	ACIAR	SPREP/RMTP	TOTAL	
		all values in US Dollars						
Personnel								
							25,386	
TNC Solomon Island Field Rep. - 1/2 time		12,693	12,693				5,792	
TNC South Pacific Program Dir. - 21 days			5,792				4,344	
TNC Manne Biologist - 30 days			4,344				7,295	
CO salary x 6 CO's	7,295						2,027	
MFEC Principal Cons. Officer - 1/4 time				2,027			2,896	
MFEC officer as CASO				2,896			47,740	
SUBTOTAL	7,295	12,693	22,829	4,923	0	0		
Consultants								
							0	
MCA management / extension and community education training							9,000	
Enterprise specialist		9,000					8,400	
Socio-economic monitoring	8,400						17,400	
SUBTOTAL	8,400	9,000	0	0	0	0		
Conservation Officer Training								
							0	
Scuba Dive certification							2,000	
Training expenses - food, accommodation,allowances	1,000	1,000					2,000	
SUBTOTAL	1,000	1,000	0	0	0	0		
AMACA INFRASTRUCTURE								
							4,000	
Maintenance & Repairs	2,000	2,000					1,014	
Furniture/equipment - lamps, beds, stove, utensils, bush knives, shovels			1,014				5,014	
SUBTOTAL	2,000	2,000	1,014	0	0	0		
Management Committee								
							984	
Accommodation and meeting expenses	579	405					1,263	
Subsistence allowance for work on project	973	290					1,448	
Training in management	1,448						3,695	
SUBTOTAL	3,000	695	0	0	0	0		

Community Awareness Education and Participation								
Resource materials & graphic artwork	2,317						2,317	
Workshop and meeting expenses	1,500	1,500					3,000	
SUBTOTAL	3,817	1,500	0	0	0	0	5,317	
Enterprise Development								
Workshops/ survey		1,738					1,738	
Training	1,000						1,000	
Enterprise development fund		70,000					70,000	
SUBTOTAL	1,000	71,738	0	0	0	0	72,738	
Monitoring and Evaluation								
Biological								
Invertebrate resources -ICLARM					12,500		12,500	
Turtle survey						5,792	5,792	
Ongoing monitoring program -CO's	724	579					1,303	
Socio-economic monitoring survey	869	869					1,738	
SUBTOTAL	1,593	1,448	0	0	12,500	5,792	21,333	
Operating Costs								
Fuel - general management of MCA	7,472						7,472	
-community awareness activities	996						996	
-management committee meetings	747						747	
-enterprise development		996					996	
		747					747	
Paper & office supplies	579	290					869	
CO's rations/rice, tea, kerosene,	434						434	
Equipment & OBM maintenance	578	290					868	
Communication - phone & fax			1,738				1,738	
SUBTOTAL	10,806	2,323	1,738	0	0	0	14,867	
Air Travel								
Consultants / International Airfares								

BUDGET CATAGORY	SPBCP	BCN *	TNC	MFEC	ACIAR	SPREP/RMTP	TOTAL
			All values in U.S. dollars				
Personnel							
TNC Solomon Island Field Rep. - 1/2 time		10,500	10,500				21,000
TNC South Pacific Program Dir. - 21 days			4,500				4,500
TNC Marine Biologist - 30 days			4,344				4,344
CO salary x 6 CO's	7,295						7,295
MFEC Principal Cons. Officer - 1/4 time				2,027			2,027
MFEC officer as CASO				2,896			2,896
SUBTOTAL	7,295	10,500	19,344	4,923	0	0	42,062
Consultants							
MCA management / extension and community education training	0						0
Enterprise specialist		8,400					8,400
Socio-economic monitoring	8,400						8,400
SUBTOTAL	8,400	8,400	0	0	0	0	16,800
Conservation Officer Training							
Scuba Dive certification		0					0
Training expenses - food, accommodation,allowances	1,000	1,000					2,000
SUBTOTAL	1,000	1,000	0	0	0	0	2,000
AMACA INFRASTRUCTURE							
Maintenance + Repairs	5,000	5,000	0				10,000
Furniture/equipment - lamps, beds, stove, utensils, bush knives, shovels		1,000					1,000
SUBTOTAL	5,000	6,000	0	0	0	0	11,000
Management Committee							
Accommodation and meeting expenses	579	405					984
Subsistence allowance for work on project	973	290					1,263
Training in management	1,448						1,448
SUBTOTAL	3,000	695	0	0	0	0	3,695

MCA Management/Extension, Comm. Ed. - NZ (Aust)/Hon/NZ (Aust) X 2	619						619	
Enterprise Dev. - US/Hon/US		1,239					1,239	
Socio-eco. monitoring set up - Aus/Hon/Aus	619						619	
Internal Airfares								
Training of CO's	290	579					869	
Management Committee	1,427						1,427	
Commun ity awareness/participation	1,338						1,338	
Enterprise Development								
consultant team to project		535					535	
training and implementation		1,427					1,427	
Monitoring	434						434	
SUBTOTAL	4,727	3,780	0	0	0	0	8,507	
Indirect Costs								
Organizational Overhead		43,530	17,900	5,792			67,222	
TOTALS	43,638	149,707	43,481	10,715	12,500	5,792	265,833	

Community Awareness Education and Participation							
Resource materials & graphic artwork	1,500						1,500
Workshop and meeting expenses	1,500	1,500					3,000
SUBTOTAL	3,000	1,500	0	0	0	0	4,500
Enterprise Development							
Workshops/ survey		1,738					1,738
Training	1,000						1,000
Enterprise development fund		50,000					50,000
SUBTOTAL	1,000	51,738	0	0	0	0	52,738
Monitoring and Evaluation							
Biological							
Invertebrate resources -ICLARM					12,500		12,500
Turtle survey						5,792	5,792
Ongoing monitoring program -CO's	724	579					1,303
Socio-economic monitoring survey	869	869					1,738
SUBTOTAL	1,593	1,448	0	0	12,500	5,792	21,333
Operating Costs							
Fuel - general management of MCA	7,472						7,472
-community awareness activities	996						996
-management committee meetings	747						747
-enterprise development		996					996
"		747					747
Paper & office supplies	579	290					869
CO's rations/rice, tea, kerosene,	434						434
Equipment & OBM maintenance	578	290					868
Communication - phone & fax			1,738				1,738
SUBTOTAL	10,806	2,323	1,738	0	0	0	14,867
Air Travel							
Consultants / International Airfares							0

budget yr 3

MCA Management/Extension, Comm. Ed. - NZ (Aust)/Hon/NZ (Aust) X 2							0
Enterprise Dev. - US/Hon/US		1,239					1,239
Socio-eco. monitoring set up - Aus/Hon/Aus	619						619
							0
Internal Airfares							0
Training of CO's	290	579					869
Management Committee	1,427						1,427
Commun ity awareness/participation	1,338						1,338
Enterprise Development							
consultant team to project		535					535
training and implementation		1,427					1,427
Monitoring	434						434
SUBTOTAL	4,108	3,780					7,888
Indirect Costs							
Organizational Overhead		36,730	18,550	5,792			61,072
TOTALS	45,202	124,114	39,632	10,715	12,500	5,792	237,955

BUDGET CATAGORY	SPBCP	BCN *	TNC	MFEC	ACIAR	SPREP/RMTP	TOTAL	
		all values in US Dollars						
Personnel								
TNC Solomon Island Field Rep. - 1/2 time		8,000	8,000				16,000	
TNC South Pacific Program Dir. - 21 days			3,000				3,000	
TNC Marine Biologist - 30 days			4,344				4,344	
CO salary x 6 CO's	7,295						7,295	
MFEC Principal Cons. Officer - 1/4 time				2,027			2,027	
MFEC officer as CASO				2,896			2,896	
SUBTOTAL	7,295	8,000	15,344	4,923	0	0	35,562	
Consultants								
MCA management / extension and community education training							0	
Enterprise specialist							0	
Socio-economic monitoring	8,400						8,400	
SUBTOTAL	8,400	0	0	0	0	0	8,400	
Conservation Officer Training								
Scuba Dive certification							0	
Training expenses - food, accommodation,allowances	1,000	1,000					2,000	
SUBTOTAL	1,000	1,000	0	0	0	0	2,000	
AMACA INFRASTRUCTURE								
Maintenance and repairs	3,000	3,000					6,000	
Furniture/equipment - lamps, beds, stove, utensils, bush knives, shovels		1,000					1,000	
SUBTOTAL	3,000	4,000	0	0	0	0	7,000	
Management Committee								
Accommodation and meeting expenses	579	405					984	
Subsistence allowance for work on project	973	290					1,263	
Training in management	600						600	
SUBTOTAL	2,152	695	0	0	0	0	2,847	

Community Awareness Education and Participation								
Resource materials & graphic artwork	1,500						1,500	
Workshop and meeting expenses	1,500	1,500					3,000	
SUBTOTAL	3,000	1,500	0	0	0	0	4,500	
Enterprise Development								
Workshops/ survey		2					2	
Training	1,000	1,000					2,000	
Enterprise development fund		25,000					25,000	
SUBTOTAL	1,000	26,002	0	0	0	0	27,002	
Monitoring and Evaluation								
Biological								
Invertebrate resources -ICLARM					51,352		51,352	
Turtle survey						5,792	5,792	
Ongoing monitoring program -CO's	724	579					1,303	
Socio-economic monitoring survey	869	869					1,738	
SUBTOTAL	1,593	1,448	0	0	51,352	5,792	60,185	
Operating Costs								
Fuel - general management of MCA	5,000						5,000	
-community awareness activities	996						996	
-management committee meetings	747						747	
-enterprise development		996					996	
"		747					747	
Paper & office supplies	579	290					869	
CO's rations/rice, tea, kerosene,	434						434	
Equipment & OBM maintenance	579	290					869	
Communication - phone & fax			1,738				1,738	
SUBTOTAL	8,335	2,323	1,738	0	0	0	12,396	

Air Travel								
Consultants / International Airfares								
MCA Management/Extension, Comm. Ed. - NZ (Aust)/Hon/NZ (Aust) X 2							0	
Enterprise Dev. - US/Hon/US							0	
Socio-eco. monitoring set up - Aus/Hon/Aus	619						619	
Internal Airfares								
Training of CO's	290	579					869	
Management Committee	1,427						1,427	
Commun ity awareness/participation	1,338						1,338	
Enterprise Development								
consultant team to project							0	
training and implementation		1,000					1,000	
Monitoring	434						434	
SUBTOTAL	4,108	1,579	0	0	0	0	5,687	
Indirect Costs								
Organizational Overhead		19,100	16,350	5,792			41,242	
TOTALS	39,883	65,647	33,432	10,715	51,352	5,792	206,821	
	All figures using current costs and salary levels.							
	Values may change due to inflation, currency fluctuation, changes in costs, and salary structure.							

BUDGET CATAGORY	SPBCP	BCN *	TNC	MFEC	ACIAR	SPREP/RMTP	TOTAL
			All values in U.S. dollars				
Personnel							
TNC Solomon Island Field Rep. - 1/2 time		6,000	6,000				12,000
TNC South Pacific Program Dir. - 21 days							0
TNC Marine Biologist - 30 days			3,000				3,000
CO salary x 6 CO's	7,295						7,295
MFEC Principal Cons. Officer - 1/4 time				2,027			2,027
MFEC officer as CASO				2,896			2,896
SUBTOTAL	7,295	6,000	9,000	4,923	0	0	27,218
Consultants							
MCA management / extension and community education training							0
Enterprise specialist							0
Socio-economic monitoring	8,400						8,400
SUBTOTAL	8,400	0	0	0	0	0	8,400
Conservation Officer Training							
Scuba Dive certification							0
Training expenses - food, accommodation,allowances	1,000	1,000					2,000
SUBTOTAL	1,000	1,000	0	0	0	0	2,000
AMACA INFRASTRUCTURE							
Maintenance + Repair	5,000	5,000					10,000
Furniture/equipment - lamps, beds, stove, utensils, bush knives, shovels	1,000						1,000
SUBTOTAL	6,000	5,000	0	0	0	0	11,000
Management Committee							
Accommodation and meeting expenses	579	405					984
Subsistence allowance for work on project	973	290					1,263
Training in management	600						600
SUBTOTAL	2,152	695	0	0	0	0	2,847

Community Awareness Education and Participation							
Resource materials & graphic artwork	1,000						1,000
Workshop and meeting expenses	1,000	1,000					2,000
SUBTOTAL	2,000	1,000	0	0	0	0	3,000
Enterprise Development							
Workshops/ survey		1,200					1,200
Training		1,000					1,000
Enterprise development fund		12,000					12,000
SUBTOTAL	0	14,200	0	0	0	0	14,200
Monitoring and Evaluation							
Biological							
Invertebrate resources -ICLARM							0
Turtle survey						5,792	5,792
Ongoing monitoring program -CO's	724	579					1,303
Socio-economic monitoring survey	869	869					1,738
SUBTOTAL	1,593	1,448	0	0	0	5,792	8,833
Operating Costs							
Fuel - general management of MCA	5,000						5,000
-community awareness activities	996						996
-management committee meetings	747						747
-enterprise development		996					996
"		747					747
Paper & office supplies	579	290					869
CO's rations/rice, tea, kerosene,	434						434
Equipment & OBM maintenance	579	290					869
Communication - phone & fax			1,738				1,738
SUBTOTAL	8,335	2,323	1,738	0	0	0	12,396

Air Travel							
Consultants / International Airfares							
MCA Management/Extension, Comm. Ed. - NZ (Aust)/Hon/NZ (Aust) X 2							0
Enterprise Dev. - US/Hon/US							0
Socio-eco. monitoring set up - Aus/Hon/Aus	619						619
							0
Internal Airfares							0
Training of CO's	290	579					869
Management Committee	1,427						1,427
Commun ity awareness/participation	1,338						1,338
Enterprise Development							
consultant team to project							0
training and implementation		1,000					1,000
Monitoring	434						434
SUBTOTAL	4,108	1,579	0	0	0	0	5,887
Indirect Costs							
Organizational Overhead		13,630	16,760	5,792			36,182
TOTALS	40,883	46,875	27,498	10,715	0	5,792	131,763
	All figures using current costs and salary levels.						
	Values may change due to inflation, currency fluctuation, changes in costs, and salary structure.						

ANNEX 3

Maps of Arnavon Islands and Project Area

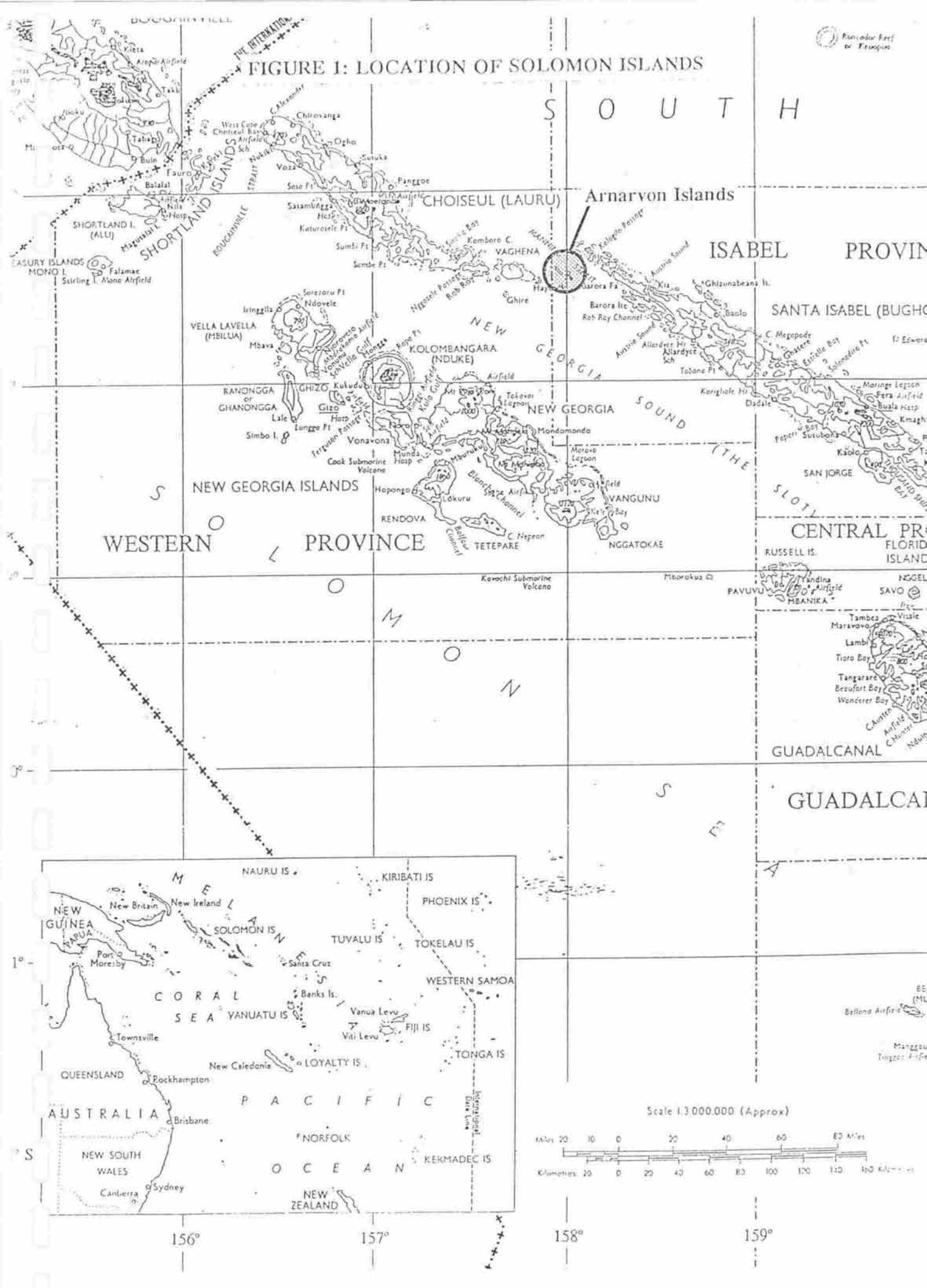


FIGURE 1: LOCATION OF SOLOMON ISLANDS
SOUTH
Arnarvon Islands
CHOISEUL (LAURU)
ISABEL
PROVIN
SHORTLAND ISLANDS
SHORTLAND I. (ALU)
BOUGAINVILLE
STRAIT
VELLA LAVELLA (MBILUA)
KOLOMBANGARA (NDUKE)
NEW GEORGIA
GEORGIA SOUND (THE SLOT)
RANONGGA or GHANONGGA
GIZO
NEW GEORGIA ISLANDS
WESTERN PROVINCE
SOLOMON
VANGUNU
RENDOVA
TETEPARE
NGGATOKAE
SANTA ISABEL (BUGHO
SAN JORGE
CENTRAL PR
FLORID ISLAND
RUSSELL IS.
PAVUVU
MBANIKA
SAVO
GUADALCANAL
GUADALCA
SEA
NAURU IS
KIRIBATI IS
PHOENIX IS
NEW GUINEA
PAPUA
New Britain
New Ireland
SOLOMON IS
TUVALU IS
TOKELAU IS
Port Moresby
Santa Cruz
WESTERN SAMOA
CORAL SEA
VANUATU IS
Banks Is.
Vanua Levu
FIJI IS
Viti Levu
Townsville
TONGA IS
New Caledonia
LOYALTY IS
QUEENSLAND
Rockhampton
PACIFIC OCEAN
AUSTRALIA
Brisbane
NORFOLK
NEW SOUTH WALES
KERMADEC IS
Canberra
Sydney
NEW ZEALAND
Scale 1:3,000,000 (Approx)
156°
157°
158°
159°
1°
5°

FIGURE 2: LOCATION OF ARNARVON ISLANDS

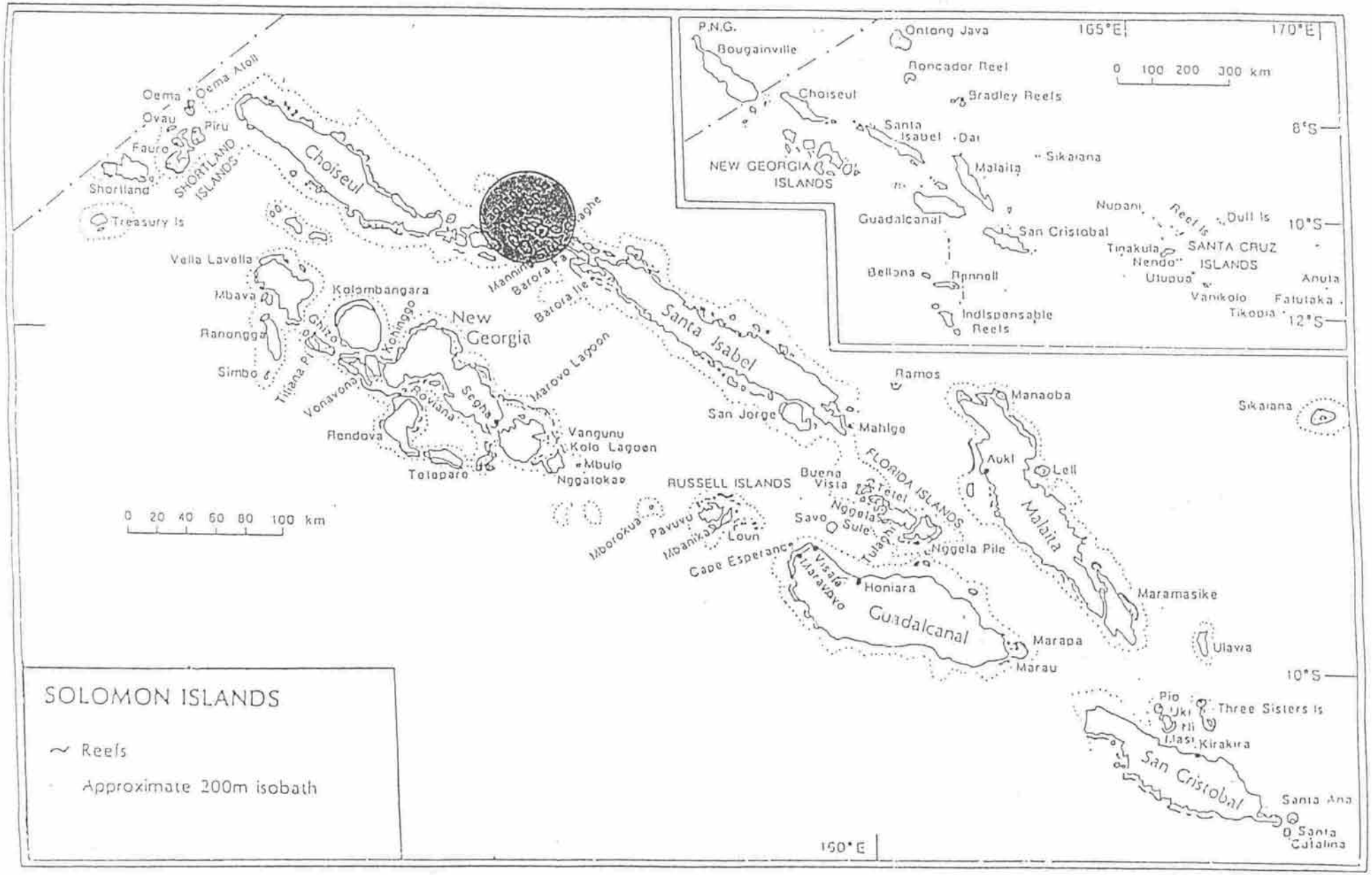
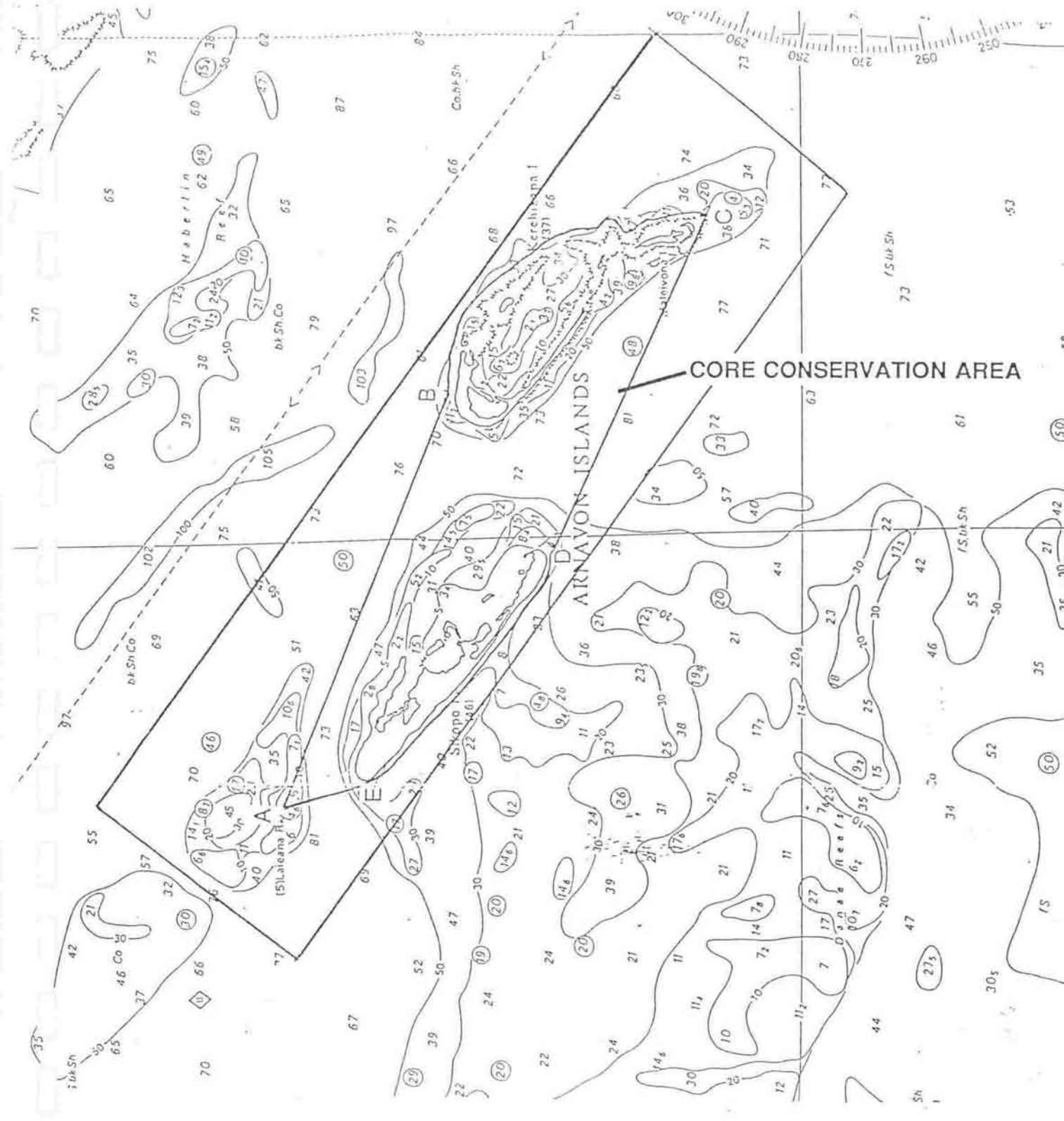


FIGURE 3: PROPOSED MARINE CONSERVATION AREA BOUNDARIES



ANNEX 4

AMCA Management Plan

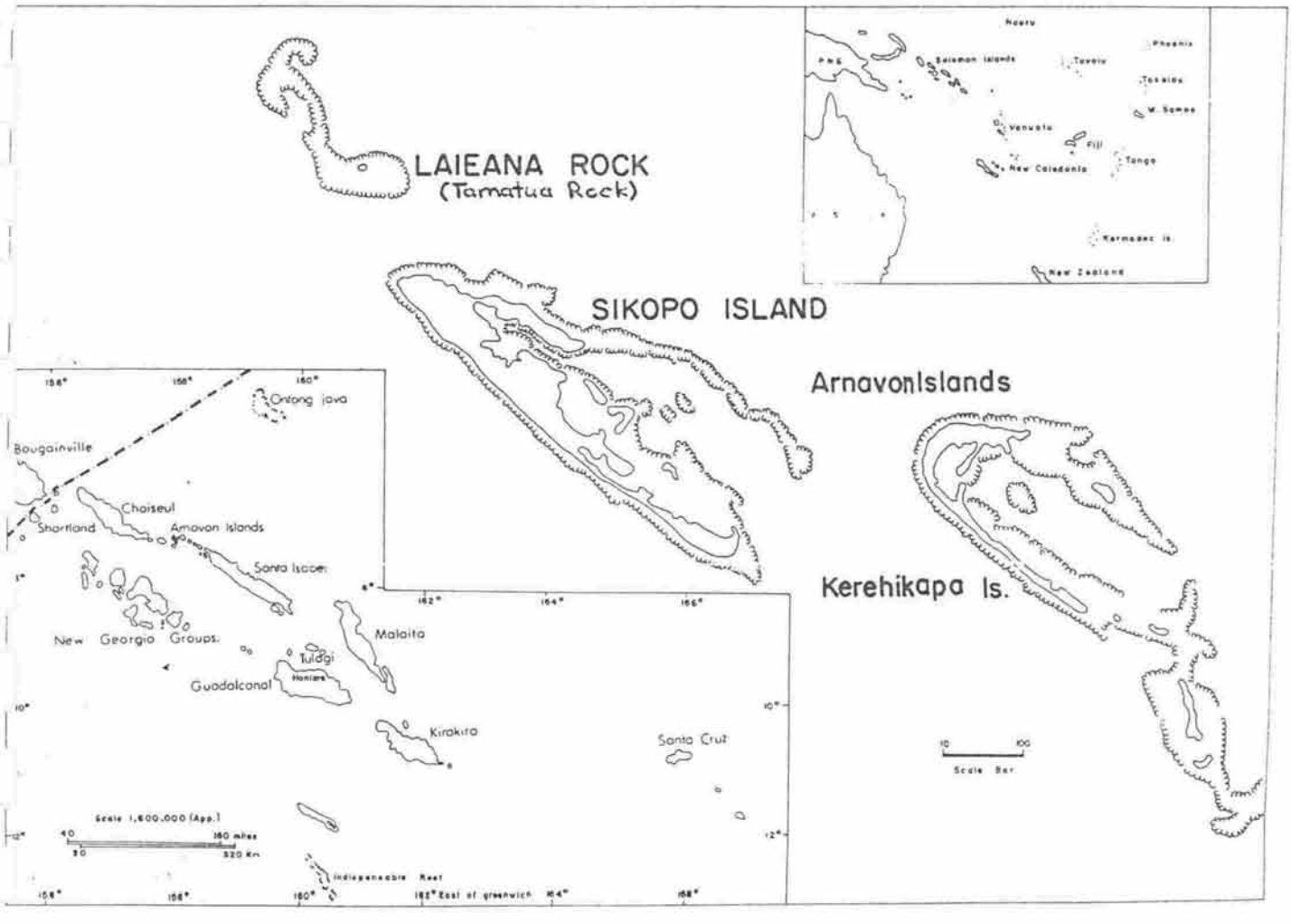
ARNARVON MARINE CONSERVATION AREA

MANAGEMENT PLAN

A: BACKGROUND

1) LOCATION

The Arnarvon Island Group consists of three islands and an area of reef: Kerehikapa, Sikopo, and Maleivona Islands and the Laieana Reef. The group is located in the Manning Straits midway between the islands of Choiseul and Isabel. The total land area is approximately 2.88 sq. km.



2) DESCRIPTION

There is a diverse mix of shoreline and coral reef habitats in the low island context of the Arnarvon Islands. The coral reef communities include a moderately diverse mix of coral, soft coral, algae, and macro invertebrate components. The density of coral cover is high in only a few locations, with coral cover ranging from 0% to 70%. A total of 43 genera of hard corals were recorded from the island group during a Rapid Ecological Survey in April 1993. There was not a abundance of marine invertebrates of other resources

of commercial interest found around the Arnarvon Islands, although there is extensive suitable habitat for many of these species.

Two main vegetation communities cover the island group. These are: Beach (Coastal Strand) Forest and Mangrove Swamp Forest. There are also scattered patches of Pandanus Swamp Forest and a patch of Lowland Rainforest on Sikopo Island. The vegetation has been damaged by turtle hunters and fishermen collecting fuelwood for bech-de-mer dryers. This includes damage to littoral trees that help stabilize the shoreline. There is evidence of shoreline erosion over large sections of the coast, however, the main turtle nesting beach at Kerehikapa Island, along the northern ocean side of the island appears to be building up following a major erosion episode in the recent past.

The island group is the most important rookery for the hawksbill turtle in the Solomon Islands and the Pacific, with a maximum estimate of 679 nests being laid in 1992. This represents 235 nesting female hawksbills, and smaller numbers of green turtles. There is much evidence of heavy hunting pressure on these turtles around Arnarvon. Approximately 56% of the turtle shell exported in 1990, for which the area of capture was reported came from the vicinity of the Arnarvon Group, and the sea between Kia and Waghena. This represents approximately 1300 turtles killed in the area during that year. A decline in the hawksbill nesting population has been reported, and continued exploitation will most likely result in the loss of this globally important rookery.

The Arnarvon Group has a highly diverse terrestrial fauna for such small islands, with 41 species of bird, 6 species of flying fox and bat, and at least 7 species of terrestrial reptiles recorded. The group is also a significant habitat for migratory birds, sea birds, waders and shorebirds. Megapodes lay eggs throughout the island group, with a concentration in a 20m by 30m nesting ground on Sikopo Island. The harvest of megapode eggs and reef fishing is culturally important in the subsistence economy of the adjacent communities.

Trochus, Blacklip and Goldlip Pearl Oyster Shell were found in very low densities, Greensnail was not found at all. Fifteen species of Bech-de-mer or sea cucumber are found, but most of the commercially valuable species were found in densities significantly lower than recorded in other areas of comparable habitat. The low densities and small size of both commercially valuable shells and bech-de-mer indicates that these resources have been subject to heavy exploitation and are seriously depleted. This has been verified through the workshops and community household surveys in Posarae, Kia, and Waghena. It is believed that the fishery is in danger of collapse unless immediate controls are placed over the harvesting of these resources.

The relatively unaltered and pristine condition of the coral reef and lagoon habitat, and the apparent lack of fishing pressure have contributed to a relatively diverse and abundant population of reef and near shore fishes. A few dense patches of seagrass ranging to 10m in diameter are found on the near shore sand flats adjacent to the shoreline of the inner lagoon of Kerehikapa Island. Less dense patches occur elsewhere, with three species of seagrass being recorded.

3) PURPOSE OF CONSERVATION AREA.

The primary purpose of the conservation area is for the protection of the hawksbill turtle nesting ground found in the Arnavon Islands. Other important reasons for the establishment of a conservation area are the sustainable management of the marine and terrestrial resources of the island group, particularly the marine invertebrate resources which are currently being heavily exploited and showing a critical decline in abundance. It is the purpose of this plan to establish management guidelines for protecting the Hawksbill Turtle and its rookery in the Arnarvon area and to sustainably manage the other marine and terrestrial resources including those which have a cultural, subsistence and economic importance to the surrounding communities.

A function of the management plan is to achieve the active participation of the surrounding communities in the sustainable management of the Arnavon Group. Through this involvement the communities will gain an understanding of the importance of resource management which they will then be able to apply to community resources outside the conservation area.

4) STATUS OF THE ARNARVON ISLANDS AND PARTICIPANT'S MANAGEMENT ROLES

The Arnavon Islands are government land, administered by the Division of Lands, but have a cultural and economic importance to the three adjacent communities of Kia, Waghena, and Posarae. Because of this, the management of the Arnavon Marine Conservation Area will be undertaken jointly by the Environment and Conservation Division of the Ministry of Forestry, Conservation and Environment (MFCE), The Nature Conservancy (TNC), the three adjacent communities, and Choiseul and Isabel Province. Representatives from each of these parties will form the Arnavon Island Marine Conservation Area Management Committee which will be responsible for overseeing the management of the conservation area and implementing this plan.

5) THE PLANNING PROCESS

The Environment and Conservation Division of the Solomon Islands Ministry of Natural Resources, working in partnership with the Nature Conservancy, formulated a proposal for the establishment of the Arnarvon Marine Conservation Area in 1991. They have been working closely with the adjacent communities since that time to reach consensus on both the need for a conservation area, and its management.

The process of consultation with local communities began in 1989, when the Ministry collaborating with The South Pacific Regional Environment Program initiated a survey of turtle populations and nesting beaches. During the course of the survey local communities, traditional resource owners, and government officials expressed concern over the serious depletion of the hawksbill turtle populations because of the export trade in their shells (bekko). They were also concerned with the depletion of the other commercially important marine resources, and saw the need for establishing some form of conservation status over the Arnarvon area. A previous attempt to establish a wildlife sanctuary there in 1981, failed because the local

resource users had not been consulted. The importance of working together with local communities was recognized, and is an integral part of this program.

A rapid ecological survey of the islands was conducted between the 9th and 26th of April 1993. A multi-disciplinary team of scientists surveyed the terrestrial and marine resources in order to obtain more information on the ecological values of the area and the present status of the resources.

A series of consultative meetings were held between 21 Sept. and 26 Oct. 1993 in each of the communities, to present the findings of the REA for feedback from the communities, to understand local perceptions of what had been happening to resources over time, and to discuss management options for the area. Household surveys were also conducted in each village at the same time to gain a better understanding of the significance of the Arnarvons in relation to each community's needs and resource use patterns, so they could be taken into account in the management plan. These meetings will lay the foundations for the continued involvement of the communities at each successive stage of the project.

In the community workshops and consultations there was consensus on the need to develop a conservation area in the Arnarvons, but management recommendations varied between communities. On 8 &9 Dec. 1993, representatives of the three communities and all the other involved parties met in Honiara in order to reach final consensus on a set of management recommendations for the Arnarvon Marine Conservation Area (AMCA), and decided on the structure and composition of the management committee. **This management plan is the result of the outcome of that meeting, the REA, and all previous community consultative meetings. It incorporates the thinking and wishes of the adjacent communities, is based on the current scientific knowledge of the area and the resources it contains, and is flexible enough to change to meet future needs and wishes of the involved parties as well as to incorporate improved scientific information as it becomes available.**

B) OBJECTIVES OF MANAGEMENT

The Arnarvon Marine Conservation Area is being established to achieve the following management objectives.

1) To protect the nesting ground and rookery of the Hawksbill and other turtles in the Arnarvon Islands.

2) To provide for the management and sustainable use of the other resources, marine and terrestrial, for both subsistence and small scale economic uses.

3) To monitor and evaluate the status of resources and the effects of the management program on those resources, which could then be useful in the broader context of marine and island resource management.

4) To involve the local communities in the planning, establishment, management, and monitoring process for the Conservation Area.

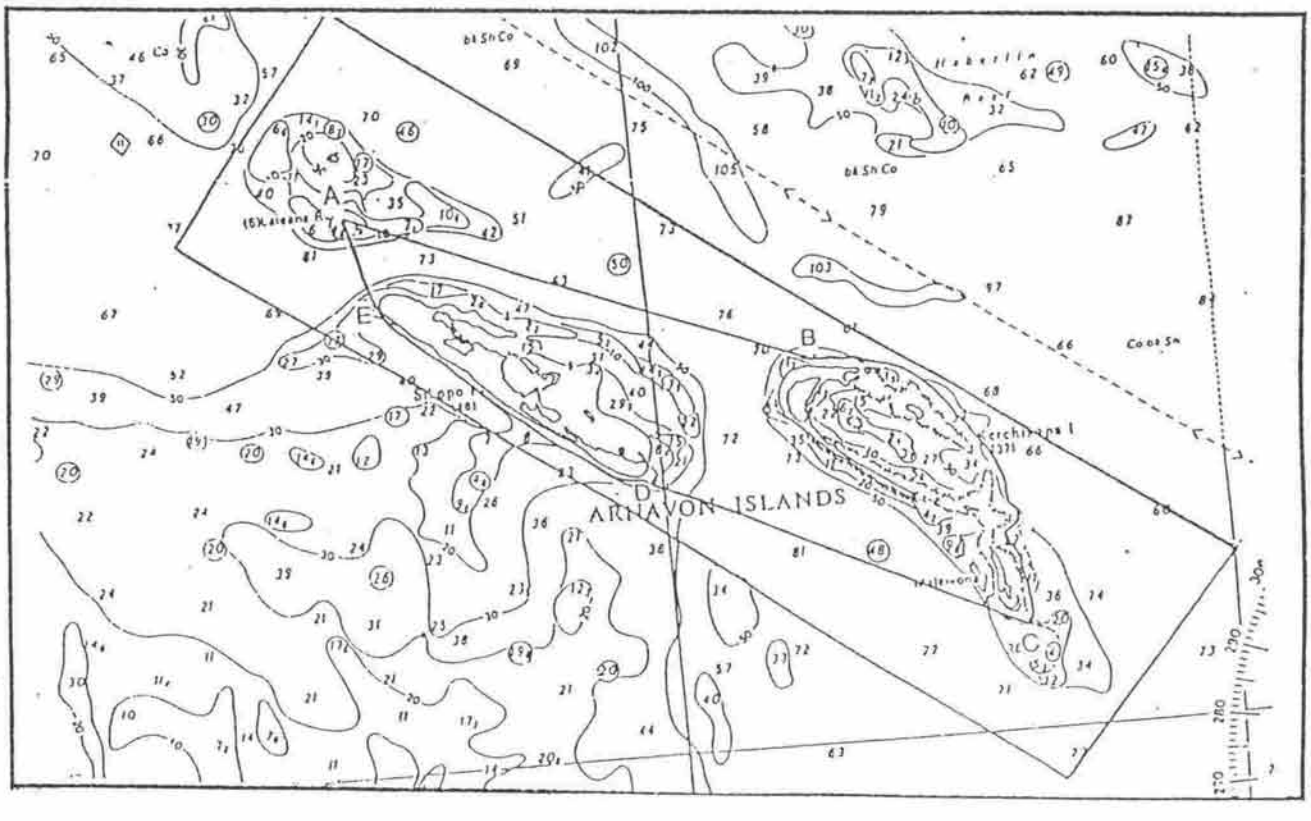
C) CONSERVATION AREA OPERATION

1) ADMINISTRATION

This management plan is to be submitted to the Isabel Provincial Assembly to establish the legal status of the Arnarvon Marine Conservation Area (AMCA) for the purpose of its enforcement and implementation. Choiseul Province will also be asked to support the establishment of AMCA and the enforcement of its regulations. A management committee has been established as an outcome of the Dec. 1993 meeting to reach final consensus on management recommendations, with representation of all interested parties. This committee holds primary responsibility for the management of the AMCA, and the implementation of management guidelines and the enforcement of regulations contained in this plan as recognized under Isabel Province ordinance and/or by laws. The terms of reference for the management committee are attached as Annex 1.

2) CONSERVATION AREA BOUNDARY:

The official boundary of the Arnarvon Marine Conservation Area is the rectangular area shown on the following map, which encloses all of the shallow marine habitat of the Arnarvon Islands, including Laieana Reef. the area mapped encloses approximately 82.7 sq km.



A core conservation area for practical day to day management, which includes the most critical shallow marine habitats and the islands themselves, will be identified by visual sighting on the limited geographic features of the area. The core conservation area boundary would:

- start at Laieana Rock (map point A), and encompass an area of 100 meter radius around the rock.
- extend from there to a point 100m off the north shore of Kerehikapa Island (map point B)
- follow the contour of the island 100m from the outer edge of the shallow reef platform, across the lagoon pass and along the east side of Kerehikapa Island Group to a point 100m out from the southern end of the island group (map point C)
- extend from there to a point 100m out from the southern end of Sikopo Island (map point D)
- follow the contour of the island 100m offshore to a point 100m out from the east end of Sikopo Island (map point E)
- continue back to the starting point at Laieana Rock to close the core area (map point A)

The enclosed core conservation area encompasses 31.4 sq km.

3) MANAGEMENT RULES

The following management rules have been reached through the consensus of representatives from the three adjacent communities, the provinces of Isabel and Choiseul, The Division of Environment and Conservation, and The Nature Conservancy.

3.1. TURTLES: A complete ban on the commercial and subsistence harvest of both turtles and turtle eggs from the core conservation area. This is a permanent ban on these resources.

3.2. BLACKLIP AND GOLDLIP PEARL SHELL: A complete ban on the commercial and subsistence harvest of these resources from the core conservation area. This ban will be reviewed after each three year period to assess the status of the resources and to determine if limited commercial harvest will be allowed. Changes will be based on an evaluation of the monitoring program concerning numbers and size of the population.

3.3. TROCHUS AND BECH-DE-MER: A complete ban on the commercial and subsistence harvest of these resources from the core conservation area. This ban will be reviewed after each three year period to assess the status of the resources and to determine if limited commercial harvest will be allowed. Changes will be based on an evaluation of the monitoring program concerning numbers and size of the population.

3.4. GIANT CLAMS: A complete ban on the commercial and subsistence harvest of these resources from the core conservation area. This ban will be reviewed after each three year period to assess the status of the resources and to determine if limited commercial and subsistence harvest will be allowed. Changes will be based on an evaluation of the monitoring program concerning numbers and size of the population.

3.5. GREENSNAIL: A complete ban on the commercial and subsistence harvest of these resources from the core conservation area. This ban will be reviewed after each three year period to assess the status of the resources

and to determine if limited commercial and subsistence harvest will be allowed. Changes will be based on an evaluation of the monitoring program concerning numbers and size of the population.

3.6. REEF FISH: Line fishing is allowable only for subsistence use. All commercial fishing, spear fishing, net fishing, and any other methods are banned for the harvest of these resources throughout the conservation area.

3.7. MILK FISH, 'VULU', 'BANEAWA': The harvesting of this fish from the lagoon areas of the core conservation area is prohibited as it has become rare.

3.8. SHARK: Limited fishing is allowed with a 2 shark limit per canoe visiting the conservation area.

3.9. SCUBA AND HOOKAH GEAR: The use of this type of equipment for the harvest of any marine resources is permanently banned in the core conservation area . Scuba gear will be allowed for the purpose of monitoring the resources of the area for management reasons and in scientific investigation.

3.10. MEGAPODE BIRDS AND EGGS: The megapode population of the Arnarvons is protected. A complete ban on killing these birds for subsistence and commercial uses. The collection of megapode eggs is subject to a six month closed season from January to June. Collection of eggs is allowed for permit holders only during the open season from July to December. Permits to collect eggs will be issued by the wardens to individuals and groups, but cannot be used for commercial purposes. The open season is subject to periodic review at least every three years, and dependent on monitoring of the megapode population and maintenance of a substantial breeding population in the conservation area.

3.11. PIDGEON: A complete ban on the hunting and killing of these birds for any purpose in the conservation area.

3.12. VEGETATION: A ban on the cutting of live vegetation from the conservation area. The taking of dead timber for use as firewood on the islands is allowed only for subsistence use while on the islands. Use of any firewood for the drying of bech-de mer is prohibited.

3.13. ALL OTHER RESOURCES: Subsistence uses while on the islands only are allowed for all other resources. Resources are not allowed to be taken away. A ban on commercial uses of all resources throughout the entire conservation area, unless specified in these management rules.

4) SITE MANAGEMENT

a) Exotic Species Control - It is prohibited for visitors and staff to bring, plant, or disperse any seeds, plants, or animals to the AMCA. This includes household pets and garden vegetables.

The presence of a female cat and her offspring as well as Polynesian rats are of concern, because of their potential negative impact on native fauna and flora. Therefore a rat trapping program should be set up, and the female cat and any offspring should be destroyed or removed from the island.

b) Garbage and Sewage Disposal - The Arnarvon Islands should be kept free of garbage and waste, particularly tin cans, plastics, glass, and styrofoam. It is the responsibility of the Wardens to ensure that garbage is disposed of properly and that the reserve is kept free of garbage and waste materials.
   1. A suitable site for a disposal pit needs to be selected, one which would not lead to contamination of or leeching into the ground water. Since the island is small, if a suitable site cannot be found, garbage will have to be removed from the area to a suitable dump site. This is applicable to tin cans, metal, glass, plastic, and styrofoam.
   2. All paper, exotic seeds, and vegetation which could become established on the island should be burned.
   3. All other vegetable waste should be composted in a suitable area so as not to attract flies and mosquitoes.
   4. All visitors should remove their rubbish or dispose of it according to these guidelines.
   5. In order to maintain a healthy environment for the Wardens, their families, and any visitors, the toilet facilities that are provided must be used by everyone. The beach and bush are prohibited for use as toilets.

c) Erosion Control - In order to control coastal erosion, which is aggravated by the cutting and destruction of beachside vegetation, it is prohibited to cut or destroy any live vegetation on the islands. Replanting of native vegetation will be undertaken by Wardens to stabilize the shoreline where erosion has occurred due to destruction of beach vegetation

d) Tambu Sites - Tambu sites within the AMCA need to be identified by the adjacent communities, and the management committee advised of any special considerations or restrictions that are needed for these areas.

5) FINES AND PENALTIES

Breaking of any of the rules and regulations contained in this management plan will be subject to a fine of an amount decided on by the management committee. The Wardens are authorized to issue citations to anyone in violation of these management rules, in accordance with Isabel Province by laws and ordinances, and with the support of Choiseul Province. Any fines collected will be returned to the management committee to help support the work at AMCA. Copies of the AMCA management plan and regulations, with a map identifying the core conservation area will be made available on the Arnarvon Islands, in all the adjacent communities, and at fuel depots in the area

6) ACCESS TO THE CONSERVATION AREA

All visitors upon arrival to the Arnarvon Marine Conservation Area, are to notify the warden on duty of their presence, sign the guest register stating address, the duration of stay and the purpose of the visit, and are required to abide by the management rules and regulations. The use of resources within the conservation area for any purpose, subsistence or commercial, is reserved for the adjacent communities of Kia, Waghena, and Posarae , and use is governed by the management rules. The subsistence use of resources while on the islands is

allowed for official government and AMCA parties. Other visitors will need to obtain permission from the management committee for the use of resources while on the islands. A copy of the rules and regulations will be available for visitors to read at the wardens' residence. Visitors are allowed to camp at the camp site on Kerehikapa Island only. Camping in any other location is prohibited.

Any research activities, except those organized as part of the AMCA project to monitor the conservation area, must be authorized by the management committee, and all reports and findings of research must be made available to the committee for the purpose of informing management decisions and helping local communities better understand their resources. Section 10 of this plan outlines the application procedures for authorization of research activities in the AMCA

7) STAFF

It was agreed through the consultation process that there should be 6 wardens employed to patrol the Arnarvon Marine Conservation Area, 2 wardens from each of the three communities, Kia, Posarae and Waghena. Three wardens are to be posted on the island at any time. Two teams of wardens will rotate 2 months on the island followed by 2 months off the island. Each team will have one officer from each community.

Wardens may be married or single, but at present due to conditions on the islands and their isolation it is recommended by the committee that the wardens immediate families not be encouraged to live on the island.

The job description for the wardens positions is includes as Annex 2 of this plan.

8) STAFF TRAINING AND DEVELOPMENT

A training program will be developed to train the wardens in conservation area management, methods to enforcement the management rules, and extension education.

It is recommended that the Ministry of Forestry, Environment and Conservation request that the South Pacific Regional Environment Program (SPREP) implement their memorandum of understanding with Australia, to request a training officer from Great Barrier Reef Marine Park be made available to train the wardens in conservation area management on the AMCA site. It is also recommended that the Wardens be seconded to the Isabel Police Division for training in enforcement. Finally, wardens should be trained in extension education, negotiation and conflict resolution techniques for dealing with visitors to the AMCA.

In service training will be provided to further strengthen the wardens capabilities, provide training in research methods, data collection, equipment maintenance, basic first aid and life saving, and to address management needs as they arise.

9) WARDENS RESIDENCE

A residence and administrative base will be constructed at the AMCA. It will be located on the site of the old wardens residence on Kerehikapa Island. The residence will include one leaf house suitable to house 3 wardens, with an iron roof and 1000 gal rain tank for water catchment. The dimensions of the house should be approximately 6 fathoms in length and consisting of four rooms, one for each of the three wardens on duty, an office space, and a common living verandah. A small permanent fuel and equipment shed with an auxiliary 500 gal. water tank, and a leaf rest house of one large room and verandah to accommodate visiting government officers and/or scientists will also be constructed. The rain tanks will be fiberglass or aluminum. A small house will be built at a suitable site on the ocean side of the island over the water to be used for toilet facilities.

As much as is possible, timber and poles for residence and other buildings should be brought in from other islands, with a minimum of forest clearing for the housing and base area.

The wardens' residence will be equipped with a table and chairs, office desk and file, 2 food safes, 3 beds with mattress and mosquito nets, kerosene tilly lamp, kerosene stove, and kitchen supplies. Additional equipment will include stationary, radio, binoculars, fiberglass canoe with 30 hp engine, small dugout canoe, 3 life jackets, tools for outboard maintenance, 3 torches with batteries, and first aid kit. It is the responsibility of the Wardens to keep all equipment in good working order, and at the completion of each work rotation a check list of equipment and its condition needs to be completed by both the outgoing and incoming teams.

10) RESEARCH AND MONITORING

It is recommended that a research program, which would improve our understanding of the natural processes within the AMCA, should be implemented. It should include research and monitoring of the islands' terrestrial flora and fauna, the turtle populations, and sedentary marine resources, corals and fish. The program should also include documenting of the traditional knowledge of the islands and their resources.

a) Support will be given by the management committee and Wardens to the Ministry of Forest Conservation and Environment in its yearly turtle monitoring and tagging program.

b) A monitoring program of the marine invertebrates and other commercial resources should be initiated immediately. The populations of target species should be surveyed for both size and abundance. It should be carried out at a minimum of 2 sites adjacent to each of the Arnarvon Islands, and 2 other unprotected reef sites in the area. A minimum of 4 transects should be surveyed at each site. This survey needs to be carried out at least 2 times prior to closing of the AMCA to commercial fishing, and repeated every 3 years, with the results to be used by the management committee to decide on any revisions of the management rules. (see Annex 3)

c) Vegetation and shoreline maps of the islands should be drawn up and used to monitor changes over time in the islands' vegetation.

d) Traditional knowledge of island resources should be collected and documented.

Isabel Provincial authorities will be kept informed of all research activities in AMCA, and they should also be coordinated through the management committee members in the adjacent communities. Whenever possible the communities should assist in these research activities.

Researchers not associated with the AMCA, TNC, or MFEC are expected to obtain the permission of the management committee to conduct research activities in the AMCA. The procedure for the screening of research activities, and to obtain permission to conduct research is as follows:

An application for research needs to be filed with the AMCA management committee. This application should be on the official letterhead of the sponsoring organization, and include the purpose of the proposed research, reasons why it is important, how it will benefit the AMCA and its surrounding communities, a work plan, and schedule of activities. Upon its receipt, the application will be considered at the next regular committee meeting, and if approved must then be submitted to the appropriate government and provincial authorities for their approval. If the researcher wishes he may call a special meeting of the committee to consider the application, but all expenses for such a meeting will be paid for by the researcher. The committee can at its discretion charge a fee for private research not associated with the AMCA to be used to support the work at the Arnarvon Islands.

A report on the results of the research and copies of any publications, papers, and dissertations which are the outcome of research must be submitted to the committee as soon as they are available. Any traditional knowledge obtained during research must be appropriately acknowledged, and remains the property of the people and communities of the area. Any profit derived from the use of this knowledge must be returned to the communities.

11) COMMUNITY INVOLVEMENT, TRAINING, AND DEVELOPMENT

As participants of the AMCA project, the three adjacent communities of Kia, Waghena, and Posarae will be included in the decision making process through their representation on the management committee. These committee members should hold a meeting in their community before each regular committee meeting. Any issues or concerns that individuals or communities have concerning the AMCA should be brought to the attention of their representatives on the management committee at this time. The results of any research, monitoring, or other activities will also be provided to the communities. Whenever possible, community members will be included as participants in these activities.

A regular program of consultative meetings will be instituted by the management committee to keep the communities informed and involved in the resource management of the conservation area. To broaden the understanding of conservation and resource management issues of community members, these meetings will include associated activities to build conservation awareness, develop a basket of options of sustainable economic activities utilizing both marine and other resources, and promote the transfer of resource management techniques that can be applied by the communities to other areas under their control.

It is recommended that the wardens be available to talk to schools, church groups, and villages about conservation, the AMCA, and their work, during their two months off duty. Each warden will compensated up to ten days salary equivalent for these extension activities. Requests for extension services and talks by the Wardens should be coordinated through the committee members in each community.

12) LIAISON BETWEEN AMCA AND EXTERNAL PARTIES

The management committee together with TNC and MFEC will be responsible for liaison with external parties and organizations. There should be cooperation with all parties interested in furthering the aims of the AMCA, in particular; national and provincial governments, Fisheries Division of Ministry of Agriculture and Fisheries, local Non Government Organizations, SPREP, International Center for Living Aquatic Resource Management (ICLARM), and other regional organizations. There should also be an equal sharing and exchange of information, training, and participation in program activities that will bring mutual benefit to both the AMCA committee and staff, and to the above mentioned organizations. The Provincial Governments of Choiseul and Isabel province should be informed through their Senior Fisheries Officer of all planned activities.

13) SCHEDULE OF WORK TO BE COMPLETED FOR AMCA

April 11 & 12 - Management Committee Meeting, to present draft management plan, get committee feedback, and finalize the plan

May 19 - June 30 - Present management plan to the three communities for approval.

June - Begin the process of formalizing the AMCA through provincial ordinance and bylaws, and gazette the reserve.

July - August - Recruitment of wardens

August - October - Management plan to Isabel and Choiseul Legal Advisors. Isabel Province to draft new ordinance or ammend existing one to make AMCA a legal entity

August, end - Management Committee Meeting, selection of Wardens and adoption of Management Plan.

October. - Start construction of Wardens residence

October. - February. - Warden's training

October - November - Workshops in Kia, Wagena, and Posarae

October - November - Organize monitoring program, start initial monitoring survey

November - December - AMCA ordinance to Isabel Provincial Assembly

February - March - Complete initial monitoring survey

March - Gazzette AMCA

March - Official closing of commercial resources in AMCA

An annual work program for the wardens will be prepared by the management committee together with the wardens. The Wardens will be responsible to complete a report for the management committee at the completion of each two month rotation.

This management plan will be in effect for a period of three years, with an annual review by the management committee.

ANNEX 1

Arnavon Islands Marine Conservation Area Management Committee

Terms of Reference

1- Role of the Management Committee.

The primary role of the committee is to oversee the implementation of the management plans and management rules for the Arnavon Marine Conservation Area (AMCA). Other functions of the committee are:

- Periodic review of management rules, with a major review at least every three years and periodic reviews if there is the need.
- Decide on any changes in the management of the conservation area through an annual review of the management plan.
- To act as a channel of communication between the communities, provinces, and project coordinators.
- Advise national and provincial government on the Arnavon Area.
- Enforcement of management rules through supervision of wardens activities.
- Decide upon conservation and research activities to take place in the AMCA, and support the work of project related researchers.
- Screening and approval of external requests to conduct research.
- Supervise the AMCA wildlife wardens.

2- Committee Membership.

The management committee will be composed of 10 members:

-2 representing Posarae community
-2 representing Waghena community
-2 representing Kia community
-1 representing Isabel Province
-1 representing Choiseul Province
-1 representing the Ministry of Forest Environment and Conservation
-1 representing The Nature Conservancy

The three participating communities will have one substitute each in the event that one of the community's representative is unable to attend a meeting or perform his duties.

3- Committee Meetings.

The management committee will meet three times each year, every 4th month. The first meeting should be held in April 1994. Meetings will be held in the Arnavon Islands once the warden's residence is built, with one meeting each year held in Honiara. Until that time meetings will be held in Honiara. Provisions will be made for extraordinary meetings when needed.

4- Election of Committee Members and Terms of Office.

It was recommended by both Choiseul and Isabel Province that their Senior Fisheries Officer represent their respective province. The Ministry will be represented by the Director of the Environment and Conservation Division, and The Nature Conservancy will be represented by their Solomon Island Field Representative. The committee members representing each community are:

Elisha Pita	Posarae
Rence Zama	Posarae
John Rabaua	Waghena
Bua Tebaubau	Waghena
Leslie Miki	Kia
Nelson Bako	Kia

The term of office for the above committee members will be three years. Each community will be responsible for nominating and electing new committee members and a substitute by traditional/customary methods or by democratic vote at the discretion of each community. Should a community representative resign from the management committee before the end of his/her term, the substitute from that community will take the vacant position on the committee.

5-Decision Making

It is recommended that decisions on management policy, changes in rules, and other issues considered by the committee be determined by a consensus of all members. At the discretion of the committee majority vote can be substituted for consensus on minor issues of management or regarding the wardens, but for major issues of concern to the communities the committee must consult with and involve the communities in the decision making process.

6- Conflict Resolution

It will be the responsibility of the Management Committee to resolve any disputes or conflicts arising among the three adjacent communities or other parties concerning the Arnavon Marine Conservation Area. It is important for the committee to negotiate a resolution to any dispute that is acceptable to all three communities, therefore training will be provided in conflict resolution and negotiation techniques.

7- Approval of Management Plan.

The draft management plan will be presented to the committee for their comments. Upon approval by the committee the management plan will be referred to each community for their comments, with a recommendation for approval. Final adoption of the plan will be by the management committee after community approval is received.

8- Compensation and Privileges of Committee Members.

The following compensation will be provided to committee members for attending regular committee meetings and other official duties:

- All reasonable expenses for travel, food, and accommodation when attending committee meetings. This includes air and canoe hire expenses, accomodation, and food/expenses allowance of $25/day. In Honiara, accommodation at suitable rest house, and $45/day food/expenses allowance will be provided provided. While on the Arnarvon Islands or other locations meals, accomodations and $20/ day for expenses will be provided. In lieu of rest house accommodation, $15 per day will be provided for committee members who stay with wantoks in Honiara to cover expenses. Because of the high cost of fuel and canoe rental, travel arrangements should be coordinated with other committee members whenever possible.
- Costs of extended stays in Honiara, and additional canoe hire for return travel will be the responsibility of the committee member.
- Training in management, chairing and running effective meetings, financial planning and management of programs, and other topics will be provided.

ANNEX 2

POSITIONS AVAILABLE
with
ARNARVON MARINE CONSERVATION AREA

JOB DESCRIPTION

Six wardens will be hired to live and work at the Arnarvon Marine Conservation Area, Isabel Province. Each warden will work 2 months on the island, followed by 2 months off duty, and will work with two partners. The role of the wardens are to uphold the management objectives of the AMCA as put forward in the management plan, and to protect the islands and resources of the area from exploitation. The wardens are responsible to the management committee. Applications will be taken only from residents of Posarae, Kia, and Waghena. Warden are hired on yearly renewable contract and is open to men or women.

Duties:

- To enforce the management rules set out in the management plan.
- Patrol the conservation area.
- Assist with all research programs.
- Responsible for site management; to include garbage disposal, removal/destruction of exotic species, rat control program, and other duties as needed.
- Assist visitors to the islands and ensure they are aware of and follow management rules.
- Issue citations (fines) to individuals or groups who break management rules.
- Complete work report at the end of each 2 month work rotation.
- Responsible for maintaining equipment and facilities in good order, requisition of supplies and accounting for petty cash.
- Assist with community conservation awareness and education activites.
- Other duties as required.

Qualifications:

- Form 3 leaver, with reading and writting skills.
- Mature and responsible, at least 18 years old or over.
- General knowledge of resources of the Arnarvon area.
- Interest in conservation and resource management.
- Ability and desire to learn and understand conservation management and research methods
- Knowledge of mechanics suitable to maintain and repair outboard motor.

Benefits:

- Housing is provided during rotation on the island.
- Salary level is $420 per month when on duty at the Arnavons.
- Provision of rice, sugar, tea, and kerosine ration while on the island.
- Use of canoe once each fortnight to buy fresh food and supplies at the nearest village.

ANNEX 3

MARINE ENVIRONMENT MONITORING OF THE ARNARVON ISLANDS

Rationale

The establishment of a Marine Protected Area (MPA) in the waters of the uninhabited Arnarvon Islands represents a unique opportunity to monitor the marine environment of this area for several reasons:

The closure of the area to fishing and other resource harvesting activities provides an opportunity to determine: 1) the effects of establishing an MPA on the abundance and distribution of marine resources within the protected area and 2) the role of the protected area in contributing to the abundance of marine resources in adjacent unprotected areas.

The absence of human habitation and only limited human activities on the islands mean that human effects are minimal, providing an undisturbed marine environment for monitoring of natural changes and effects of global climate change without the interference of local anthropogenic effects.

There is minimal terrestrial runoff from the Arnarvon Islands due to the low elevation, reef sediment nature of the islands, further limiting the effects which influence marine environmental quality and biological communities and providing an undisturbed marine environment for monitoring.

An opportunity for controlled, secure long term monitoring of a natural marine environment in the Solomon Islands and Melanesia is provided by the Arnarvon Islands as a function of: 1) the long term protected area status to be obtained for the area; 2) their status as the first and only MPA in the Solomon Islands; and 3) their status as one of the few locations in Melanesia (if not the only) presently being pursued as a long term marine environment monitoring site.

The presence of ICLARM, a major international marine resource management organization, in the Solomon Islands provides the potential for access to and support from the international marine science community and the potential for linking the Arnarvon Islands monitoring program to the global coral reef database (REEFBASE) being developed by ICLARM.

A secure MPA at the Arnarvon Islands which is not subject to anthropogenic and terrestrial impacts provide the opportunity for participation in the IOC/UNEP global program for monitoring the effects of climate change on coral reefs.

Methods

A series of sites will be selected within and outside the MPA which allow representative marine habitats and important marine organisms to be monitored over time. The monitoring will focus on coral reefs which are the dominant marine habitat of the Arnarvon Islands and are import for their subsistence and commercial resources in the surrounding area.

The Rapid Ecological Assessment (REA) of the Arnarvon Islands (The Nature Conservancy, 1993) provides sufficient information on the shallow nearshore marine environment of the area to allow a set of representative monitoring sites to be selected. Selecting an adequate number of representative sites from the area surrounding the MPA will require some level of reconnaissance investigations. If low altitude color air photos are available, preliminary site selection can be made based on the photos. For sites both within and outside the MPA, exact site selection will require some quick evaluation at the proposed locations.

The monitoring of the Arnarvon Islands area must use methods which are easily repeatable, using inexpensive, accessible equipment. The monitoring of sessile benthic communities (e.g. corals, algae, sediment) will follow the procedures developed by the Australian Institute of Marine Science (AIMS), as adapted to the IOC/UNEP global coral reef monitoring program (UNEP, 1993). These methods are line intercept methods which require the establishment of permanent transects locations. Basic environmental parameters (e.g. temperature, turbidity) will also be determined using the methods outlined for the global coral reef monitoring program (UNEP, 1993). Fish and other mobile living resources (e.g. sea cucumbers, urchins, giant clams) can be monitored along the same transects using visual census techniques which have been used through Southeast Asia by AIMS (Dartnall and Jones, 1986).

If there is interest, additional, less quantitative, monitoring of coral reef benthic, fish and invertebrate communities can be conducted by local villagers or fisheries extension officers using the simplified methods developed by Dahl (1984). In addition, the lack of information on water currents in the Arnarvon Islands area will require developing a project to assemble a minimum level of physical oceanographic information on this using simple, inexpensive methods (e.g. drift cards).

Workplan

Year 1

Obtain low altitude, color air photos of the area

Select permanent transect sites within and outside MPA

Select final monitoring parameters and methodology

Determine and develop data assemblage, analysis, storage and transfer procedures

Assemble monitoring team consisting of local and international scientists

Obtain equipment and supplies

Train local participants

Conduct baseline inventories at permanent transect sites 3 times during Year 1

Year 2

Compile, analyze and publish results of baseline inventories

Determine appropriate season and frequency of monitoring

Conduct Year 2 monitoring

Year 3

Arrange for IOC/UNEP program to conduct major training in coral reef monitoring

Conduct Year 3 monitoring

Year 4

Conduct Year 4 monitoring

Compile, analyze and publish results of initial monitoring

processes, e.g. variability in recruitment of larvae from place to place, spatial differences in predation rates etc.

The Arnavon Islands offer a unique opportunity to test this model. There are two main islands to be protected and abundances of commercial invertebrates found there could be compared with at least two areas of comparable size and habitat on Isabel and Waghina. Since the reserve is yet to be declared. It would be possible to make estimates of abundance at these places of two occasions before declaring the MPA. Alternatively, if it will take sometime to organise these two surveys, declaration of the MPA could be postponed until they are done.

As the communities have agreed that closure should be for three years, and that re-opening the Islands for exploitation should be dependent on a substantial increase in the population levels of exploited species, it will be necessary to survey the populations again on two occasions at the end of the 3rd year after closure.

The exact methods for doing visual censuses of the invertebrates have been developed for trochus and pearl oysters, and should be straight-forward for sea cucumbers. However, it would be prudent to have $\geq$ 4 replicate transects at each of at least two sites for each of the two Arnarvon Islands and the two unprotected reefs.

Sampling Strategy for the Monitoring of Invertebrate Fisheries at the Arnarvon Islands Marine Protected Area

The establishment of a Marine Protected Area at the Arnarvon Islands offers a virtually unprecedented opportunity to assess the effects of closing an area to fishing on depleted populations of beche-de-mer, trochus and pearl oysters.

The advantage of closing an area to fishing is that the remaining individuals will increase in size, and newly recruited individuals will be able to attain a large adult size. The benefit actually arises because, in most marine animals, there is an exponential increase in egg production with increase in body size. The increased egg population should improve the likelihood that there will be more juveniles available to recruit to the reserve, and to surrounding areas still open to fishing. Note that recruitment to the site of the parent population (the reserve) is not guaranteed because many of the animals (e.g. pearl oysters and beche-de-mer) have a long-lived ($>$ 1 month), pelagic larval stage and so there is much scope for dispersal away from the spawning areas. A large supply of eggs is also no guarantee of a large year class of juveniles. There are many hazards to larval life, and there is often a poor correlation between egg abundance and the number of juveniles. It is logical, however, that without large numbers of eggs to start with, there is little scope for a strong year class of juvenile recruits.

The notion that marine protected areas allow populations of adult tropical marine invertebrates to increase in number and mean size has yet to be demonstrated unequivocally. To test this hypothesis adequately, the following criteria area needed:

1. There must be monitoring of at least two protected areas, and at least two unprotected areas,

2. Abundances of the species of interest must be monitored on several ($\geq$ 2) occasions prior to the introduction of protection, and again on several occasion after protection has been in place for several years.

More than one protected, and one unprotected area, need to be monitored to avoid misjudging the cause of any increase in abundance of a given species in the MPA following closure to fishing. If only one protected and unprotected area are used, and abundance of a species increased in the protected area but not the unprotected one, the increase could have been due to the lack of fishing, or to other reasons, e.g. the chance recruitment of juveniles only to the protected area.

To avoid the very real chance of this type of confounding, and to increase confidence that the patterns of abundance observed between protected and unprotected areas several years after protection are actually due to the protection, it is necessary to sample several protected and unprotected areas before and after the protection is introduced. Then if the same pattern is observed between all protected and unprotected areas one can be confident that the reserves are functioning as intended. If the expected patterns do not rise, then we learn something about the effect of protection compared to other common