Indicators of Success for the South Pacific Biodiversity Conservation Programme

VOLUME TWO—FIELD TRIALS

Trevor Ward, Geoff Dews, Art Whistler, Dion Ale

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Trevor Ward
Institute for Regional Development,
University of Western Australia,
Perth, Western Australia

Geoff Dews
Geoff Dews Consulting,
Maroochydore, Queensland

Art Whistler
Department of Botany
University of Hawaii,
Honolulu, Hawaii.

Dion Ale
Consulant,
Apia, Samoa

April 2000

Preface

This series of reports documents the findings of consultancy projects undertaken for the South Pacific Regional Environment Programme to develop and trial Success Indicators for the South Pacific Biodiversity Conservation Programme.

This report (Volume 2) documents the findings of field trials designed to assess the indicators that are identified in Volume 1 (the Technical Report), and particularly the feasibility and utility of the indicators for routine implementation to evaluate the success of the South Pacific Biodiversity Conservation Programme.

Companion reports in this series are:

Volume 1—Technical Report
Volume 3—Data Report (documents the findings of the community consultations)
Volume 4—Keeping Track of Changes in Uafato Conservation Area (non-technical)
Volume 5—Keeping Track of Changes in Vatthe Conservation Area (non-technical)
Volume 6—Keeping Track of Changes in Koroyanitu Conservation Area (non-technical)

Front Cover

The front cover is a photograph of the Uafato Village and Conservation Area, Samoa
(photo by Geoff Dews and Trevor Ward)

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(Appendices 2 to 7 inclusive are provided only with the CD version of this report)

Acknowledgements

We are pleased to acknowledge the enthusiastic support of the Uafato community, and we thank them for the opportunity to examine their Conservation Area in detail.

We particularly thank Ioane Etuale (Conservation Area Support Officer for Uafato), and Suiga Tuiavii (Conservation Officer) for their support and participation in the Indicators Project. The on-going support of O Le Siosiomaga (the Lead Agency for the Uafato Conservation Area) and its Director (Dr. W. Vermeulen) for this Project is also greatly appreciated.

Most, importantly, our work would not have been possible without the support of Joe Reti, Sam Sesega and Francois Martel of SPREP, and we thank them for their participation and advice throughout the Project.

Executive Summary

The Field Trials were designed to evaluate the procedures suggested in the Technical Report for measuring success in the SPBCP. This included trials of the community-based monitoring procedures, data collection and analysis, and synthesis of the data into a pro-forma report on the success of the SPBCP.

The trials showed that some customisation is likely to be required for each intended Core Indicator in each Conservation Area. This is because the emphasis on specific biodiversity issues varies between CAs, and the capacities of local communities to both accept the need for monitoring and to resource its implementation are also likely to be variable.

The trials developed appropriate procedures within the capacity of the Uafato community for monitoring of fish catch, ifilele harvest, and weed incursions. Procedures were also developed and implemented for a comprehensive annual survey of households in relation to the perceived state of the natural resources and aspects of the socio-economic conditions in the village.

The procedures include standard monitoring protocols for each indicator, data recording and management procedures, simple automated data analysis routines, and basic quality control. The Uafato CASO and CO were trained in the implementation of these procedures.

During the trials considerable new data was collected on various indicators for Uafato, and this has been documented for archiving purposes. For most indicators, this data establishes the benchmark, and will form the basis for performance evaluation in future assessments.

A pro-forma report on the success of the SPBCP has been designed. The reporting system is based on an evaluation of data on the Core Indicators identified in the Technical Report, with a synthesis and analysis using multivariate statistical tools that summarise and display the data in simple ways. The reporting of success uses the multivariate assessment of indicator data on the CAs, and a simple evaluation of the seven Programme-level indicators. The basis for evaluation is the extent to which numeric targets set for each indicator has been achieved. This is summarised for the CAs into two simple diagrams and a single number score, and for the Programme-level indicators into a small table of scores against each of the 7 indicators. These outputs have an explicit technical basis, but are suitable for reporting in a scorecard format, and in simple everyday language for administrators, managers and politicians, and could be readily translated into other languages for wider distribution.

This evaluation approach enables reporting on success to be given a quantitative and repeatable basis, with biases limited and identified. It also enables priorities for future investment and work programs to be established, and to be linked directly to future performance evaluations.

Based on the experience of these trials in Uafato, the implications for implementing the core indicators in other CAs are summarised as a set of recommendations. The key aspect will be the fine-scale customising of the indicators to the respective CAs, and training of CASOs in implementation and quality control. In order to maintain standards, it will be necessary to have the monitoring procedures, resulting data, and the synthesis and interpretation checked on a routine basis by independent experts.

1. Background

This document is the report of Phase 2 of the Indicators of Success Project—a set of trials designed to gather field data on 16 of the Core Indicators (see below) that were identified in Phase 1 of the Project (Ward et al., 1999). The field trials were designed to test out the feasibility of gathering and analysing data on indicators in the SPBCP Conservation Areas for the purposes of determining the success of the SPBCP in conserving biodiversity.

Phase 1 of this Project identified potential indicators to evaluate the success of the SPBCP; the indicators were designed as an integrated set based on data collected at the level of the Conservation Area and at the whole-system (SPBCP) level. The indicators evaluate the outcomes of the SPBCP activities in the CAs, and place the conservation of biodiversity in the context of sustainable use of natural resources and the continued development of dependant human populations.

The indicators of success identified in Phase 1 covered aspects of biodiversity, natural resources and socio-economic conditions of the CAs examined. Core Indicators were considered to be success indicators that should be applied in all CAs in a similar way. Programme-level indicators can be used to measure the success of system-level activities of the SPBCP. Taken together, the Core and Programme indicators can be used to evaluate the overall success of the SPBCP.

The approach adopted in this Project is to encourage the integration of indicators of success into the normal management systems used for the management of each CA. In this way, monitoring of key indicators can become 'institutionalised' into the usual operations of the CA, and provide vital information for resources management of each CA as well as data for performance assessment for the SPBCP system. This is the basis for a modern adaptive approach to the conservation and management of natural resources, and offers the CA communities the opportunity to apply 'best practice' approaches to CA management customised as necessary to meet their local traditional customs and requirements.

Many of the indicators of success are designed for initial implementation by the local communities, based on data collected by community-based monitoring procedures. In order to evaluate the utility of such data for reporting on the success of the SPBCP, this Phase of the Project (Phase 2—Field Trials) is to conduct a trial implementation of a selected set of the success indicators, and to report on the findings as the basis for refining monitoring designs, and expanding the success indicators to other CAs.

This consultancy for Phase 2—Field Trials is to conduct a trial implementation of 16 selected indicators in the Uafato Conservation Area, and to report on:

1. the procedures used in the field trials;
2. the data collected;
3. recommended standard methods for future monitoring of each indicator;
4. the capacity for, and acceptance of, implementation of indicator monitoring by local communities;
5. analysis of the data as a baseline for future monitoring and further designs;
6. recommendations for extending the indicators to other CAs;
7. a pro-forma report that synthesises available data to report on the success of the SPBCP.

The pro-forma report on the Success of the SPBCP has been developed based on the findings of the field trials. It uses the available data for indicators in the Conservation Areas and on indicators at the Programme level as the basis for an evaluation. The report is in pro-forma because at this stage of the SPBCP, the data required on most of the indicators has not yet been assembled. The pro-forma report is expected to provide a model for the project-end evaluation of the success of the SPBCP, and to provide the basis for a post-project reporting program on the CAs and the SPBCP.

The Terms of Reference for this consultancy (Phase 2) are attached in Appendix 1.

2. Indicators for the Trials

The Phase 1 of this Project identified a potential 26 Core Indicators for each Conservation Area. Resources were not available to enable a trial for all of these indicators, and so a subset was chosen for the field trials. The indicators to be trialed were chosen according to the following criteria:

1. Provided a mixture of the classes of indicators (biodiversity, natural resources and socio-economic)
2. Represented a range of levels of effort and commitment required from the community and lead agency
3. Represented at least one key biodiversity component
4. Represented a range of technical needs and levels of development of the monitoring protocols.

In order to focus our effort, and to maximise the outcomes from the field trials it was decided to restrict the trials to only one of the original Conservation Areas used in Phase 1— Uafato in Samoa. Uafato offers a number of advantages for the implementation of the field trial, including the ready availability of logistics support from facilities at SPREP headquarters in Apia.

The final set of indicators chosen for the trials is as follows (*the identity code for each indicator refers to the numbering system for all Indicators used in the Phase 1 report*).
A set of 11 indicators to be implemented by an annual household survey –
C7. Cash crop index
C8. Subsistence crop index
C9. Subsistence wild-harvest food index
C20. The number and type of toilets in the village
C23. Human population size and structure
C24. Participation rates in village activities
C25. Number of villagers with traditional skills
C26. House construction material and number of electrical appliances
R2. The number of carvers in the village
H13. Number of villagers trained for management positions
H22. Number of villagers with traditional tattoos

In addition to the household survey a further 5 indicators were selected for the trial:
C6. Catch of fish and shellfish
C13. Plan of management for natural resources
B2. Weed invasions in to the forest (see also C17 Weed invasions)
R3. Harvest of ifilele trees (see also C5 Harvest of key tree species)
B10. Condition of lagoon near village.

The procedures used for establishing the monitoring program for each of these indicators are described in detail in Section 3.

3. Indicator Data Capture Procedures

This section of the report describes the methodologies and procedures used in the field trials Project. The recommended Standard Monitoring Protocols for each indicator based on the work of this Project are listed in Appendix 3.

3.1 Household Survey

For some of the indicators there are data already available (such as the population size), but for most of the indicators there is no previous data. The survey conducted for this consultancy therefore provides the first quantitative basis for capturing data on these indicators in Uafato. In this section the general procedures for the survey are described first followed by the specific procedures for each indicator in the household survey.

3.1.1 General Household Survey Procedures

The household survey was conducted by two people (generally), one to interview and talk, and a second to record the information on the data sheets. Data sheets were pre-printed, one for each household to be surveyed. The data sheet used is shown in full in Appendix 3. After some initial trials, the format shown in Appendix 3 was found to be most economical and effective, by combining the questionnaire and data sheets into one form that was filled in during the actual interview with each respondent.

All households were surveyed in the village over a period of about 3 weeks in late October 1999. Interviews were best conducted at times of the day when other more pressing duties did not distract respondents. Times found to be least attractive were early morning, when gardens were usually tended before the heat of the day, and in the late afternoon when the evening meal was being prepared. Each interview and subsequent data sheet checking took about 30 minutes per household, although only a limited number of households could be surveyed in a single day because of the limited availability of respondents.

October seemed to be generally acceptable to the Uafato villagers as a good time of year for the annual household survey to be conducted.

A complete Standard Monitoring Procedure (SMP) for each of the 11 indicators assessed in the household survey is shown in Appendix 3.

Figure 1. Conducting the household survey in Uafato in 1999

3.1.2 Natural Resource Indices

Three natural resource indicators use scores on an index of desirability, as perceived by each respondent in the household survey. These indicators are therefore measures of the villager's perceptions about their resources; these perception indicators do not keep track of the resources themselves—matters such as actual levels of harvest or productivity of specific areas—they document the *perceptions* of the people interviewed. Actual levels of harvest, for example, must be tracked using specific resource-based indicators, such as described below for ifilele, or for fish. The indices have been developed to keep track of changes in the *perceived* success of each of the natural resources because shifts in both actual and perceived success may have important consequences for the biodiversity of the CA.

3.2 Catch of Fish and Shellfish

To gather information on the fish catch and effort in Uafato a method was developed that is based on a form of creel census. Initially it was expected that each fisher would be provided with data sheets and trained in completing their own catch information in a log book format. This was altered after discussions with the Conservation Officer and some villagers. It was decided that the best approach would be for the Conservation Officer (at times with the CASO) to interview the fishers after they had returned from each fishing expedition and record their catch and effort. This

change was instigated to minimise training needs for the fishers, to ensure consistency and accurate data, and to involve the CO with the fishers in a non-intrusive way.

The basic procedure is for the CO to interview all the fishers each time they go fishing for a period of seven days (noting that no fishing takes place Sundays) for one week out of each two weeks. This means that data would be collected for two non-consecutive weeks in each month. During the initial phase of this monitoring it is expected that data will be collected for at least 12 months, and then the timing would be subject to a major review of the data, with recommendations for future monitoring frequency. The reason for a seven-day sampling period is to avoid 'data creep' caused by repetitive duties for the CO and to avoid over intrusive interviewing of the fishers. Although continuous sampling is possible, the week-on week-off timing will lead to more consistent application of the procedures and hence more accurate data.

Although it was initially considered that a community meeting would be held to explain the objectives and benefits that would accrue from this monitoring project, the village leaders were otherwise engaged, and it appeared that they may be suffering from over-consultation. It was therefore decided that the Conservation Officer (a resident of the village) would be able to adequately explain the need for the marine resource monitoring as he interviewed the fishers.

The CASO and Conservation Officer were provided with hands-on training in the village on the aims of the monitoring, the reason for the survey, the expected results and the analysis techniques. The training also incorporated initial field data collection and actual fisher interviews.

Follow up discussion were held with the CASO, the Conservation Officer and staff of the O le Siosiomaga Society in Apia. This was used to summarise the data collected and outline suggestions for follow-up on work involving the Siosiomaga Society, particularly data entry and analysis.

A set of data recording sheets were developed in consultation with the CO. The initial recording sheets were modified after the early trials in the village, and the final field data recording sheet is shown in Appendix 3. The categories of information recorded are shown in the Table below.

Figure 2. Documenting the fish catch and effort in Uafato village

Household Name:	This is identifying which family was involved as the principle fishers
Date of Fishing Trip:	This is day the fishing trip started. This information may be later used to relate catches to seasons or other external activities and special occasions
Interviewer:	The name of the CO who undertook the interview so that inconsistencies may be clarified in follow-up
Number of people fishing:	The total number of fishers involved in the trip
Male:	The total number of male fishers involved
Female:	Total number of female's fishers involved
Fishing Started: Morning; Afternoon; Night	This is to record when the fishing operation began. This information may be later used to relate catches to seasons, moon, and tidal phases.
Where did you fish: Shore; Lagoon; Behind the reef; Deepwater	This to find out what habitats are being fished, and to relate the type of fishing methods and target species with the zones of operation. This allows for the detection of effort changes and target habitats if fishers change their fishing strategy over time.
Which fishing grounds:	In cooperation with the CO and villagers the fishing areas were divided into specific areas based on traditional areas fished. These areas have traditional titles (see the map of fishing areas: Figure XXZZ). The fishers nominate the areas where they caught most of their catch. This information allows for the fishing effort in each area to be monitored, and to detect if there are changes over time in the main places being fished.
Total number of fish landed:	Total number of fish landed. For species of molluscs an estimated number is recorded.
Type of fishing gear:	The list of fishing gear is shown on the data sheet. The gear mostly used in the operation is highlighted for every fisher interviewed. This allows for the tracking of trends and effort over a period of time as fishers change their fishing strategy according to target species, local weather conditions, etc.
Comments:	The interviewer is to record if the fishing is for any special event, or if there is something unusual about the fish or the fishing trip, or any other observations of interest.
The name of species:	Most of the species taken from Uafato Bay are listed on the information sheet. The fish caught are identified by their local name. These are assigned a simple species code for ease of data entry to the data sheet. In due course, the species names, where possible, should be made consistent with the AusAID Samoa Fisheries Division project for consistency within Samoa, and each species should be assigned with the AusAID's project species code as well as its local Uafato name and number.
Number:	The number of fish of each recognised type that are returned to the village are recorded. The interviewer places a number against each species corresponding to the number landed. This allows for a record of catch changes over months, seasons and years as the data sets build up.
Size:	The AusAID Fisheries Project (see Figure 2) has developed a recognised system of measuring fish. Shellfish size is not recorded.
Fish for:	This allows for trends in catch usage to be monitored
Food:	The catch is used mainly for food source in the family
Gift:	the catch is mainly given away to other families, or outside the village
Sell:	The catch is mainly sold in the markets or in other villages.

3.3 Plan of Management for Natural Resources Management

The intent of this indicator is to track the development and effectiveness of the system that is used to manage the exploited natural resources in each CA. This includes the extent to which the management of the CA is able to monitor the use of each natural resource in relation to the available amount in the CA.

This indicator is implemented as a 'checklist'. The management plan for the natural resources of the CA is evaluated against a set of 16 criteria, each of which is assessed (pass, fail or a conditional pass) for the extent to which it is implemented in the plan to achieve the sustainable use and conservation of the resources. The criteria used for this assessment are shown in Appendix 3.

The indicator could not be evaluated in the trial, because of insufficient time for the interviews. The evaluation was to be conducted by interview with the Chairman of the CACC, the Director of the Lead Agency (O Le Siosiomaga) and the CASO for Uafato, and by assessment of the Uafato Conservation Area Resource Management Plan (Tu'u'u Ieti Taule'alo 1998). The data sheet for the scores and the SMP is included in Appendix 3.

3.4 Weed Invasions into the Forest

The intent of this indicator is to track the spread of weeds that may threaten the viability and conservation values of the forest ecosystems in the CA. A survey of 9 selected sites in the CA was undertaken, and the priority indicator weeds were identified for further monitoring. The report and the data from this survey are shown in the Appendix 5, and the proposed routine monitoring procedures are in Appendix 3.

The basic approach is to score the abundance of each of 9 high priority weeds at each of the 9 locations on a regular basis (twice each year). At each location the abundance of each priority species is estimated every 5 metres on a 100 metre permanently-marked transect line. The locations chosen for weed monitoring include two permanent sample plots that are also used for measuring the growth rates of ifilele. The data are entered into the O Le Siosiomaga computer system in Apia, and later the paper records will be filed in both the O Le Siosiomaga office in Apia and at the CA office in Uafato.

The variables to be measured in this indicator are the abundances of each of the 9 priority weed species. These are estimated along the transect at each location, and the data is summarised using a graph that compares abundances for each weed on each transect at the sequence of sampling times.

Figure 4.
Two priority weeds in Uafato CA:

Merremia (above)

Kosters Curse (left)

3.5 Harvest of Ifilele Trees

The intent of this indicator is to keep track of both the harvest of ifilele and all other tree species used for carving, and the effort expended in obtaining the trees. The indicator is based on voluntary data returns completed by each person or group that harvest trees in the CA. The responsibility for filling in the data sheets has been allocated to the owners of the chainsaws used to cut trees for carving. The data sheets are collected and assessed for completeness every second week by the Conservation Officer in the CA. The data are entered into the O Le Siosiomaga computer system in Apia, and later the paper records will be filed in both the O Le Siosiomaga office in Apia and at the CA office in Uafato.

The variables to be measured in this indicator are:

1. the number, size and growth form of all ifilele trees and all other trees cut for carving purposes from the CA;
2. the location in the CA where each tree was cut;
3. the pattern of cutting activity throughout the year by each group/carver.

The carver groups and each person likely to cut trees for carving have been issued with measuring tapes for measuring the circumference of each tree cut. The standard information sheet, the field data sheet (in English only) and the recommended SMP are included in Appendix 3.

Figure 5. Ifilele cut for carving purposes

3.6 Condition of Lagoon near Village.

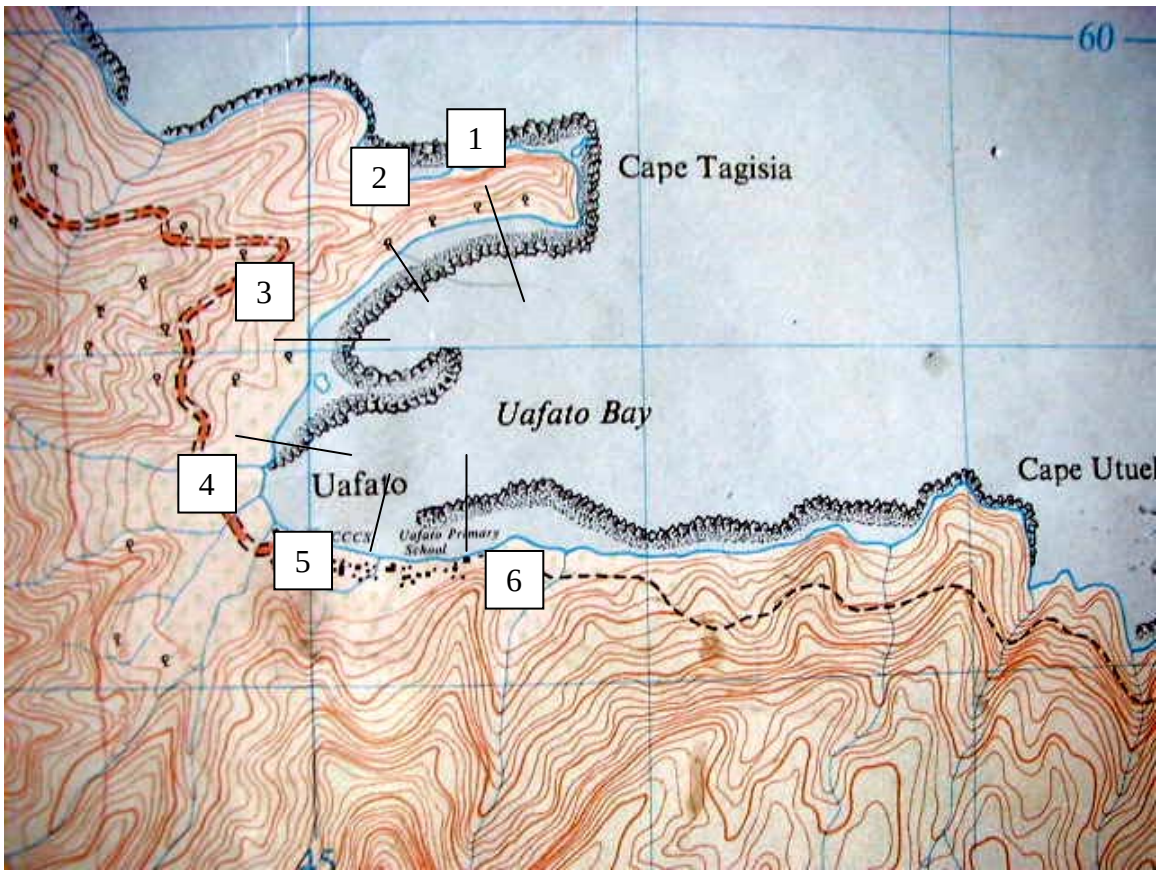
The intent of this indicator is keep track of the condition of the lagoon in Uafato Bay, and in particular the seagrasses and typical lagoon fauna, and the condition of the lagoon substrate. The Uafato lagoon has not previously been surveyed, and so an initial field survey was undertaken in order to be able to design a monitoring programme. The data reported here is from the survey. The procedures used for the survey were designed with the monitoring programme in mind, and used community-based approaches and readily available tools.

The survey involved six cross-lagoon transects, with a set of observation stations on each transect. At each station four replicate observations of the lagoon seabed were made using a quadrat (a square metal frame of 50 cm on each side —an area of 0.25 m^2—placed on the seabed). In each quadrat, all occurrences of all the plants and animals were recorded, with an estimate of their abundance. To make viewing of the seabed easy, a plexiglass viewing chamber was constructed, for use in shallow water. The survey was undertaken by the CASO and the CO, under the supervision of an experienced marine biologist. One person acted as the recorder, while the other was the assessor. These roles were reversed at each transect for training purposes. The design of the transect sampling and site selection was such that they could easily be replicated by the CASO or a trained village representative. This was in keeping with the aim of developing a sampling protocol that was very cost effective, requiring minimal skills and equipment.

The survey techniques is based on the technical literature (see Ward *et a*l. 1999, English *et al.* 1994, Dahl 1978, Crawford 1997) but with modifications for the unique location and ecology of the Uafato Village site (the tropical rain forest, freshwater streams, and foreshore interaction).

Three transects were established on the south side, and three on the north side of bay. The surveys were undertaken at low tides thus eliminating the need for snorkeling or swimming. Six randomly chosen start points were established along the foreshore as the commencement points for each transect (these points were recorded and located using hand-bearing compass). Each transect was started at the waters edge with the first sampling point 30 paces towards the reef (directly seaward across the lagoon). The start location and direction of transects was noted on the data sheet, and marked on a map of the bay. Fixed shoreline marks that are identifiable (such as the church tower) were selected as reference points (see the Plan of Transects below).

Figure 6. Transect lines in the Uafato Bay lagoon.



The aim of the survey was to get at least four observation stations per transect (each 30 paces apart) but only three stations could be sampled on Transect 3, because of the narrowness of the lagoon at this location. Coral reef crest cannot be sampled efficiently using these techniques, and so data was only gathered for the lagoon seabed.

At each sampling station (30 paces spacing between sampling stations) a set of four quadrat observations were taken (see Sampling Layout diagram below). The quadrat positions were randomly chosen; at each station two quadrat positions were placed forward to the left, and two samples forward and to the right of the observer. The placement of the quadrats were positioned to eliminate any human disturbance to the sampling areas—except of course for mobile animals such as crabs and fish, most of which would escape from the vicinity. These four replicate quadrat observations (samples) are taken to reduce sampling bias at each station. There was no opportunity to conduct a pilot survey, and 4 replicates was chosen as a minimum number that was consistent with theory and the available literature.

When each quadrat was set down a series of variables (see below) were recorded as viewed through the viewing chamber. To quantify these variables estimates were made of the percentage cover, and each estimate was assigned an abundance code (see below) and recorded on the field data sheet (see Appendix 3).

Figure 7. The CASO and CO using the clear-view chamber and quadrat to survey flora, fauna and substrate in the Uafato Bay lagoon.

Codes for recording percentage cover/abundance

Percentage Cover	Code
0%	0
1% - 5%	1
6% - 30%	2
31% - 50%	3
51% - 75%	4
76% - 100%	5

The percentage cover was recorded on the field sheets and later transformed into the code for analysis. In future field sampling, the code may be recorded directly into the field sheets as the field team becomes more experienced.

The variables recorded in each quadrat

LIVING	NON-LIVING
Seagrass: Halophila	Boulders (>5mm)
Seagrass: Syringodium	Coral rubble
Seagrass other	Gravel (1-5 mm)
Macro-algae	Sand
Beche-de-mer	Muddy-sand
Sea urchin	Mud
Starfish	Hard coral -dead
Shrimp	Worm casts
Crab	Mounds
Clam, mussel	Burrows
Live hard coral	
Fish	
Brittle star	

Other parameters were also recorded such as water clarity, wind conditions, water depth, time of day and tide phase.

In the areas that are predominately sand or mud sediment, rather than gravel, coral rubble or boulders, it was necessary to determine the predominant sediment structure in one quadrat at each station (after the other variables have been recorded). A sample of the surface sediment was taken using a half coconut shell and transferred into an empty jam jar. The jar was then carefully filled with clear water from the lagoon. The jar was then shake vigorously for a few seconds. If the water in the jar become clear within 20 seconds, then this sediment sample was recorded as sand. If the water remains very cloudy for up to 1 minute, the sample was determined to be muddy sand. If very little of the sediment settles out after 1 minute, then the sample is recorded as mud.

The results of each variable in each quadrat and sediment composition determination was entered for each individual replicate quadrat (not station combined) into a spreadsheet database along with other relevant data (see Appendix 3).

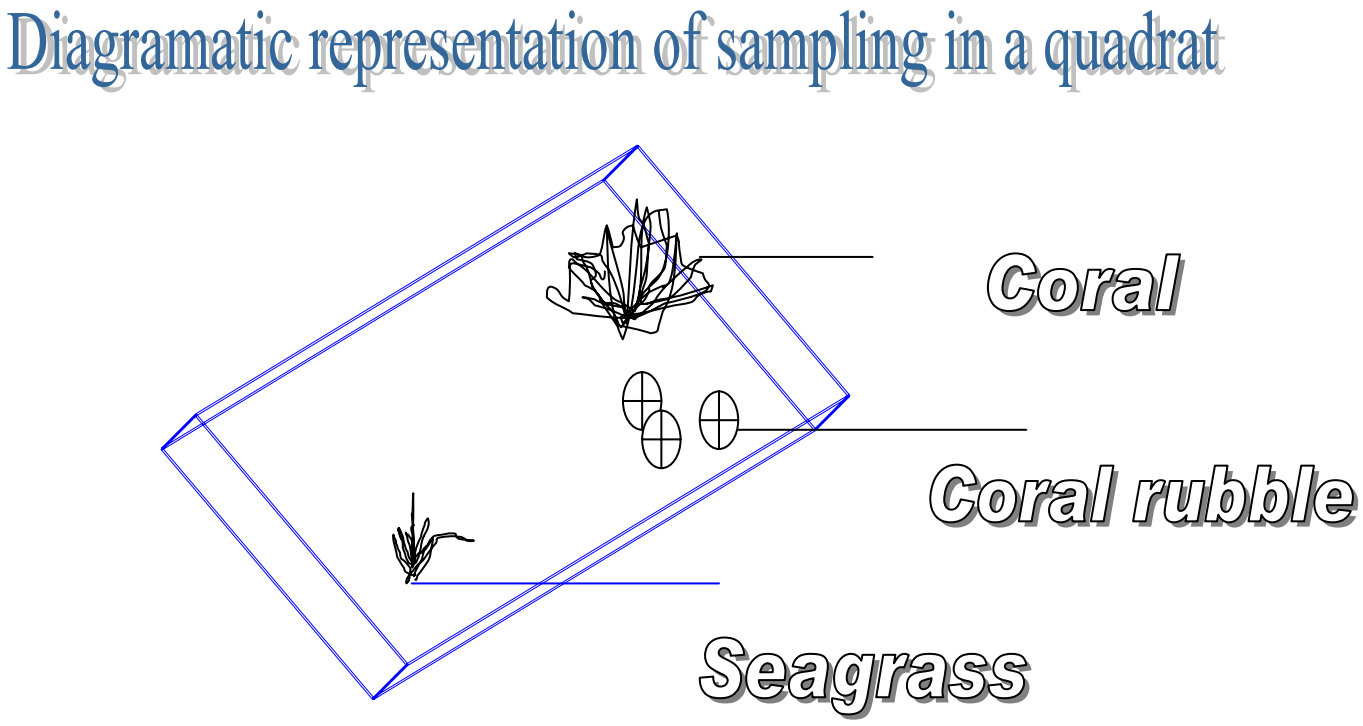


Figure 8. Plan of Transects: Coordinates of the transects established in the initial survey/sampling program. Bearings were taken with a hand compass.

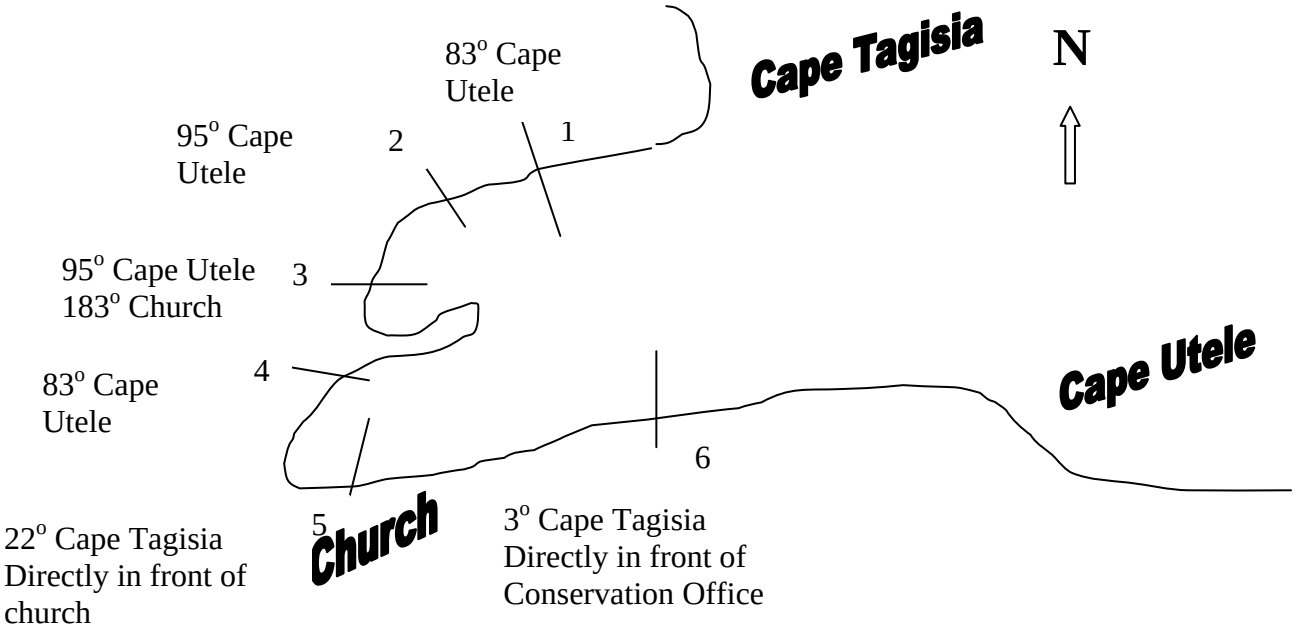
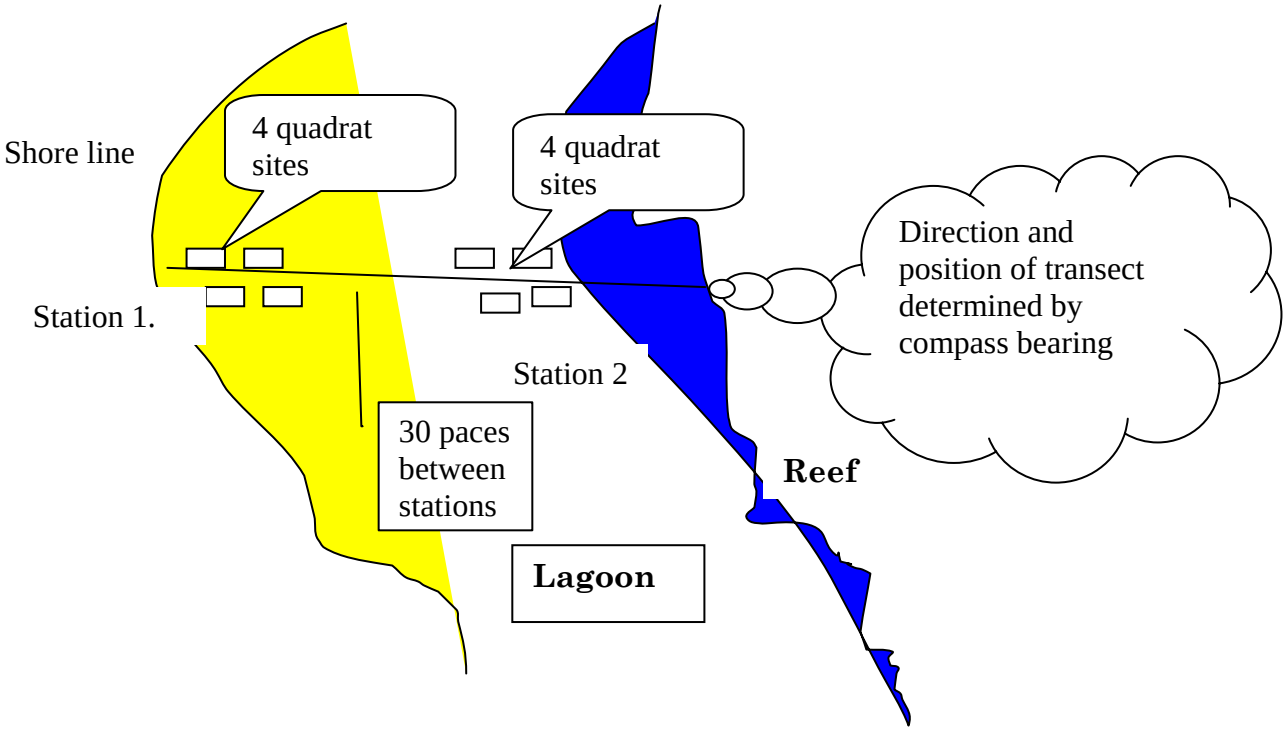


Figure 9. Sampling Layout
Sampling layout showing the concept of four replicate sampling quadrats per station



4. Analysis of Indicator Data

In this section we provide a description of how the data captured on each indicator is used to compare to the baseline, or to a previous set of measurements, to determine the nature and extent of change.

4.1 Household Questionnaire Data

The data on the indicators captured using the annual household survey is best assessed by comparing the numbers in any specific category in one year with those of any previous year. For example, the number of septic toilets in the village in one year can be simply compared to those in any previous year to assess a change. Statistical measures of dispersion or error are not needed, because the household survey is a complete census, not a sample. The most convenient way to examine such data is using a simple bar graph to compare between years.

This graphical method of display and assessment applies to the following indicators with data captured during the household survey:
C20. The number and type of toilets in the village
C23. Human population size and structure
C24. Participation rates in village activities
C25. Number of villagers with traditional skills
C26. House construction material and number of electrical appliances
R2. The number of carvers in the village
H13. Number of villagers trained for management positions
H22. Number of villagers with traditional tattoos.

The household survey forms used in this Project can be adopted as the standard field form and data sheet for the future annual household surveys (see Appendix 3).

4.1.1 Natural Resource Indices

For each index, respondents are asked to evaluate, for the past year, the performance of each resource in each of three categories. Respondents are advised to answer in one of the 5 possible categories. The rank scores on each of the 3 elements of the index (each ranging from 1 to 5, where 1 represents the most highly desirable condition) are multiplied together to yield a index score that has a maximum range of 1 to 125. An index score of 1 is the best possible outcome, in terms of the villagers, while a score of 125 is the worst possible outcome. The data for each of the 3 indices was gathered during the household survey, and the household survey form in Appendix 3 shows how the questions were put to the respondents in the survey. The survey forms used in this Project can be adopted as the basis for the Standard Monitoring Procedures (SMP) for these three index indicators. A complete SMP for each indicator is shown in Appendix 3.

The data for each of these indicators is converted from the raw index score (as calculated above) into a percentage of the perceived most desirable score by taking the reciprocal after range standardisation. The data for each indicator is presented in Appendix 4 as the mean % response across all responses, together with its standard deviation, as a percentage of the most preferred condition. The mean and standard deviation of the percentage values can be directly compared between two surveys for any specific resource, and will form the basis for tracking changes over time in the villager's perceived condition of a resource compared to their preferred condition.

Determining trends over time will be most easily carried out using a graph that shows the mean and standard deviation across all % responses for a specific resource for two or more consecutive household surveys.

The questionnaire specifically asks respondents to evaluate the current year against the previous year. This means that the score on these indices cannot be used to compare with, say, a survey 5 years previous, unless a specific question on this is also asked in the household survey. The correct way to interpret the data captured in these 3 indicators is to sequentially assess the trends in a continuous time-series of data to evaluate change over time. Comparisons with earlier years can only be made if there is a continuous and uninterrupted data sequence for each intervening year.

4.2 Catch of Fish and Shellfish

The catch and effort data is summarised at two levels for monitoring and reporting purposes.

The Weekly Report: during the pilot phase (2 weeks of data each month for one year), each week of data is entered into the computer database, one week per file, and a simple overview summary is produced for each week of data collection. The weekly report will be used by the CO, the CASO and the CACC to ensure that monitoring procedures are in place and working effectively. The weekly reports are to be printed on paper, and archived in the offices of Siosiomaga Society in Apia. The computer files for each week of data are archived and backup files are copied and, together with the disc copies of the weekly report, are provided to SPREP.

A summary of the data for the Weekly Report is generated automatically by the Excel database after entry of each week's data. Appendix 3 contains the details of the information to be provided in the Weekly Report, and the standard data analysis files for the automatic generation of the graphs. The graphs summarise the catch of fish and shellfish in terms of numbers (abundance) and the species composition. The data is standardised by the number of fishing trips as a crude measure of fishing effort.

The Six-Monthly Report: the 6-monthly report is more complex and detailed than the weekly report. The 6-monthly report is an analysis for the CACC to assess fishing catch and effort, and will provide the basis for assessment of the impact of any changes to management arrangements in the CA or in Uafato Bay (such as the closure of an area to boost fish stocks). The development of each 6-monthly report will require assistance from a marine biologist or fisheries expert to analyse the weekly data, until a Microsoft Access database is developed. From Access the 6-monthly reports can be formatted for routine output, without the need for specialist support. The effectiveness and operations of this database would be reviewed on an annual basis, at each time the overall monitoring programme for the CA is reviewed.

In the 6-monthly reports, the key trends to be examined that will signal important changes in the marine ecosystems are:

- Progressive shift in fishing grounds
- Progressive shift in species composition in individual fishing grounds
- Change in size of catch from individual fishing grounds
- Change in gear types used in each fishing ground
- Change in number of fishing trips.

If any of these are detected, at levels that are not considered to be within the usual bounds of variability, the CACC will need to consider in more detail why these changes are happening, and

what measures may be developed to counter any detrimental impacts that may follow, in order to maintain the long-term productivity of the Uafato marine ecosystems.

4.3 Plan of Management for Natural Resources Management

This indicator is implemented as a 'checklist', together with a set of comments in explanation of the yes/no evaluation of each criterion. The annual assessment should simply compare incremental improvements with the previous year, or any previous period chosen for comparison. The checklist of questions is shown in Appendix 3.

4.4 Weed Invasions into the Forest

The changes in weed abundances will be determined using a set of graphs that display the abundance of each weed on each transect (location) at each sampling time. The graphs (Appendix 3) are used to visually compare the changes in weed abundance on a transect between sampling times. If any specific weed is considered to be increasing at any location, more complex statistical evaluations, based on the data, can be undertaken by external consultants to determine if the trend is statistically robust. If statistically significant increases in weed abundance are detected, it may be necessary to implement further sampling for this weed to evaluate its distribution in the CA, and subsequently to consider remedial measures.

4.5 Harvest of Ifilele Trees

The intent of this indicator is to keep track of both the harvest of ifilele and the effort expended in obtaining that harvest. The indicator is based on voluntary data returns completed by each person or group who harvests timber in the CA for the purposes of carving. The data sheets are collected and assessed for completeness every second week by the Conservation Officer in the CA. The data are entered into the O Le Siosiomaga computer system in Apia, and later the paper records will be filed in both the O Le Siosiomaga office in Apia and at the CA office in Uafato.

The variables to be measured in this indicator are:

- the number, size and growth form of all ifilele trees and any other tree species cut for carving purposes from the CA;
- the location in the CA where each tree was cut;
- the pattern of cutting activity throughout the year by each group/carver

The standard data sheet and the recommended SMP are included in Appendix 3.

4.6 Condition of Lagoon near Village.

The data on abundance of flora and fauna, and the substrate material, in the lagoon are summarised as the mean and standard deviation of the 4 replicate samples at each station. For each transect this information is displayed as graphs of the mean values of the living and non-living attributes of each transect. The standard deviation is converted to the coefficient of variation (CV: the ratio of the standard deviation to the mean, expressed as a percentage) to summarise the small-scale spatial variability at each location. The CV is used as a measure of

natural spatial variability so that in the future, after repeat sampling is conducted, differences between the mean values of the attributes of any transect can be evaluated in the context of the spatial variability as shown by the magnitude of the CV. When the CV is great (such as more than 50) the spatial variability is substantial, and care must be exercised in interpreting apparent changes of attributes over time to be real changes rather than sampling variability caused by small-scale spatial variability in the lagoon.

The standard field sheets and database are included in Appendix 3. The standard Excel database in Appendix 3 automatically calculates the data summaries and prepares the graphs for routine inspection.

For the purposes of reporting at the system level on the SPBCP, the abundance of algae is used as the key reporting variable.

5. Indicator Baseline Data

In this section, we provide a summary of the data that has been gathered in the 1999-2000 surveys—the baseline data. The raw data is shown in Appendix 2, and the data analysis is shown in Appendices 3 and 4.

For most indicators the data collected in this project will be the baseline data, because data like this has not been previously collected in this way in Uafato. However, where previous data does exist, the comparisons are shown in this section in order to demonstrate how in the future monitoring will be used to detect changes that occur in Uafato.

5.1 Indicators in the Household Survey

5.1.1 Cash Crop Index

The main cash crops (on the basis of number of households involved) are Pandanus, Kava, coconut leaves (for weaving), and fish. The survey showed that most of the currently harvested resources were considered to be in good condition, each exceeding 70% of their most desirable condition. Overall, the index scored 77.6% of the most desirable condition.

	pandanus	coconut leaves	kava	fish	overall
Mean % of desired condition	77.8	82.4	74.1	74.4	77.6
Standard deviation	14.7	10.0	10.8	12.0	

5.1.2 Subsistence Crop Index

The main subsistence crops are shown in the table. All of these resources are considered by the villagers to be in good condition, all exceeding 70% of their most desired condition, and most above 80%. The plantation crops were considered to be in worst condition, relative to the preferred condition, but the score was greatly influenced by one household that considered the plantations as extremely poor in 1999 compared to 1998. This accounted for the high standard deviation (the standard deviation for plantations is 34% of the mean). Overall, the index scored 83% of the most desirable condition.

	giant taro	taro	banana	yam	breadfruit	lemon/ citrus	coconuts	plantation	overall
Mean % of desired condition	81.8	87.8	81.7	88.6	81.9	95.8	81.3	74.6	83.0
Standard deviation	10.6	10.0	9.2	9.0	9.4	2.7	7.5	28.2	

5.1.3 Subsistence Wild-harvest Food Index

The main subsistence wild-harvest resources, shown in the table, are all considered to be in excellent condition in Uafato. All the resources were considered to be more than 90% of their most desirable condition, and overall the index scored 96% of the most desired condition. The scores showed only a small range, and a very small standard deviation in the responses, indicating a strong measure of agreement throughout the village on the excellent condition of the subsistence resources in the CA.

	Birds	Shellfish	Fruits	Trees shelter	overall
Mean % of desired condition	97.0	95.0	95.7	96.4	96
Standard deviation	1.1	2.8	2.9	1.5	

5.1.4 Toilets in the Village

This indicator records the number and type of toilets in the village. The full baseline data set is shown in Appendix 2.

Open Pit	Pour Flush	Septic	Total Number
0	22	13	35

5.1.5 Human Population Size and Structure

The resident population of the village is 263 people. This number is uncertain because of the difficulty of classifying some people who are temporarily away from the village, and some who are away for a long period, but may one day return.

This population compares to a resident population of 234 recorded in 1994, in the Project Preparation Document for the Uafato CA. This represents a population increase of about 12% in the past 5-year period, and is consistent with verbal opinions of the villagers that the population is quickly increasing.

Male	Female	People Age >15	Currently Attend School	Attend Pre- Schl	People Age >55	Temp Away	Permanent away	New arrivals
140	123	?	?	?	?	?	?	?

5.1.6 Participation Rates in Village Activities

The household survey has shown that the population strongly participates in a range of village activities. Although 24 people were nominated as being members of the Village Council, only two were recognised as members of the CACC, despite the fact that the membership is almost identical. This indicates perhaps a weaker perception amongst the villagers of the existence and separate role of the CACC in comparison to the Fono (Village Council). The overall incidence of participation in the village (sum of numbers of people participating in any activity) is 397.

Number of Participants

Village Council	Untitled Men	Unmarrried Women	Youth group	Womens Committee	CJCLDS Youth Club	Kava growers club	Carvers	CACC	Uafato Congregn. Church	Overall (sum)
24	50	32	57	62	12	34	22	2	102	397

5.1.7 Number of Villagers with Traditional Skills

The village has a strong representation of traditional skills in the village; the table documents the extent of those skills in the village. The total incidence of traditional skills (sum of numbers of people with any traditional skill) is 233.

Weaving Fine mats	Tapa Making	Canoe Building	Sinnet making	Building Houses	Traditional Healing	Tattooist	other	Overall (sum)
61	11	7	121	11	19	0	3	233

5.1.8 House Construction Material and Number of Electrical Appliances

Almost half of the Uafato houses have some areas of concrete floor, and many have sawn timber and iron for roof construction. All houses have mains electricity supplied from the Samoa grid,

most have a range of small electrical appliances, and some have larger appliances such as an oven or microwave for cooking, and a fridge or freezer.

House Construction Materials

	Floor materials		Roof/Top materials				Sides materials		
	Unconsolidated materials (rock, pebble gravel, sand,..)	Concrete	Iron	Wood	Sawn Timber	Thatch	Wood	Sawn Timber	Open
Number of houses	13	9	14	9	14	4	2	7	8

Electrical Appliances: number of houses with appliance

	Oven	Micro-wave	stereo	TV	video	Portable stereo/ radio	fridge	freezer	iron	kettle /jug	other	Overall (sum)
Number of houses	3	3	17	10	10	6	7	5	12	5	4	82

For the purposes of system level reporting, the house construction and electrical appliances measures were formed into two separate indicators. The house construction data was assembled into an index of construction, based on a house construction model using concrete floor, tin roof and sawn timber walls. Other models could be defined for use, subject to the definition of an exact target by each CACC. For this index, the number of houses with concrete floor, tin roof and sawn timber walls is summed; for the present survey the Construction Index for Uafato is 30. For the electrical appliances, the sum of number of houses that have each appliance is used to report as a single measure; for this survey the total number is 82.

5.1.9 The number of carvers in the village

Carving of Ifilele is the major income-generating activity in the village, and is reflected in the number of carvers, both older carvers and youths being trained.

Older carvers	Youth	Total
34	19	53

5.1.10 Number of villagers trained for management positions

Only one person resident in the Village considered they had been trained in a business, technical or administration position in relation to management of the CA.

5.1.11 Number of villagers with traditional tattoos

Seven villagers were recorded as having traditional tattoos.

5.2 Catch of Fish and Shellfish

The Conservation Officer in Uafato undertook the duties of systematically recording all catches of fish and shellfish catches for a pilot survey. This survey commenced in October 199, and is expected to run for a full year of sampling: 2 weeks in every month.

In the preliminary survey conducted in October 1999, the total number of independent fishing trips recorded over a seven-day period was 36. The seven days included a Sunday, but due to

village rules no fishing takes place on a Sunday, so the average number of fishing trips is 6 per day.

There appears to be 100% coverage of fishing activities by the recorder and a total of 1647 individual fish were caught and landed at the village. The size of fish was mainly between 20-40 cm in length (forearm measurement). The catches were identified into 50 separate species (not including shellfish).

The major part of the catch was for subsistence use although a small but important component was sold. A small section of the catch was consigned as gifts within the village. This is not indicated in the attached data sheet.

The four major species groups recorded were soldierfish (family *Holocebtridae*), surgeonfish (family *Acanthuridae*), mullet (suborder *Mugiloidei*) and groper (family *Serranidae*).

Using length estimates devised by King (1992) (wrist, forearm and elbow) and the weight rations (King and Zann 1992) it is estimated that the weight of catch from the four main groups, (soldierfish, surgeonfish, mullet and groper) during the sampling period was approximately 775kg. This does not include the minor species or the shellfish, which were recorded separately.

The fishing techniques recorded over the seven-day period were: cast netting, hook and line from a canoe, dive and spear, dive and spear with a torch and drag netting.

For the purposes of the overall system-wide analysis, the average number of fish caught/trip is used as the key variable for reporting on this indicator. For all the data gathered and entered into the database by March 2000 (four sets of weekly data) an average of nearly 21 fish were caught per fishing trip.

5.3 Weed Invasions into the Forest

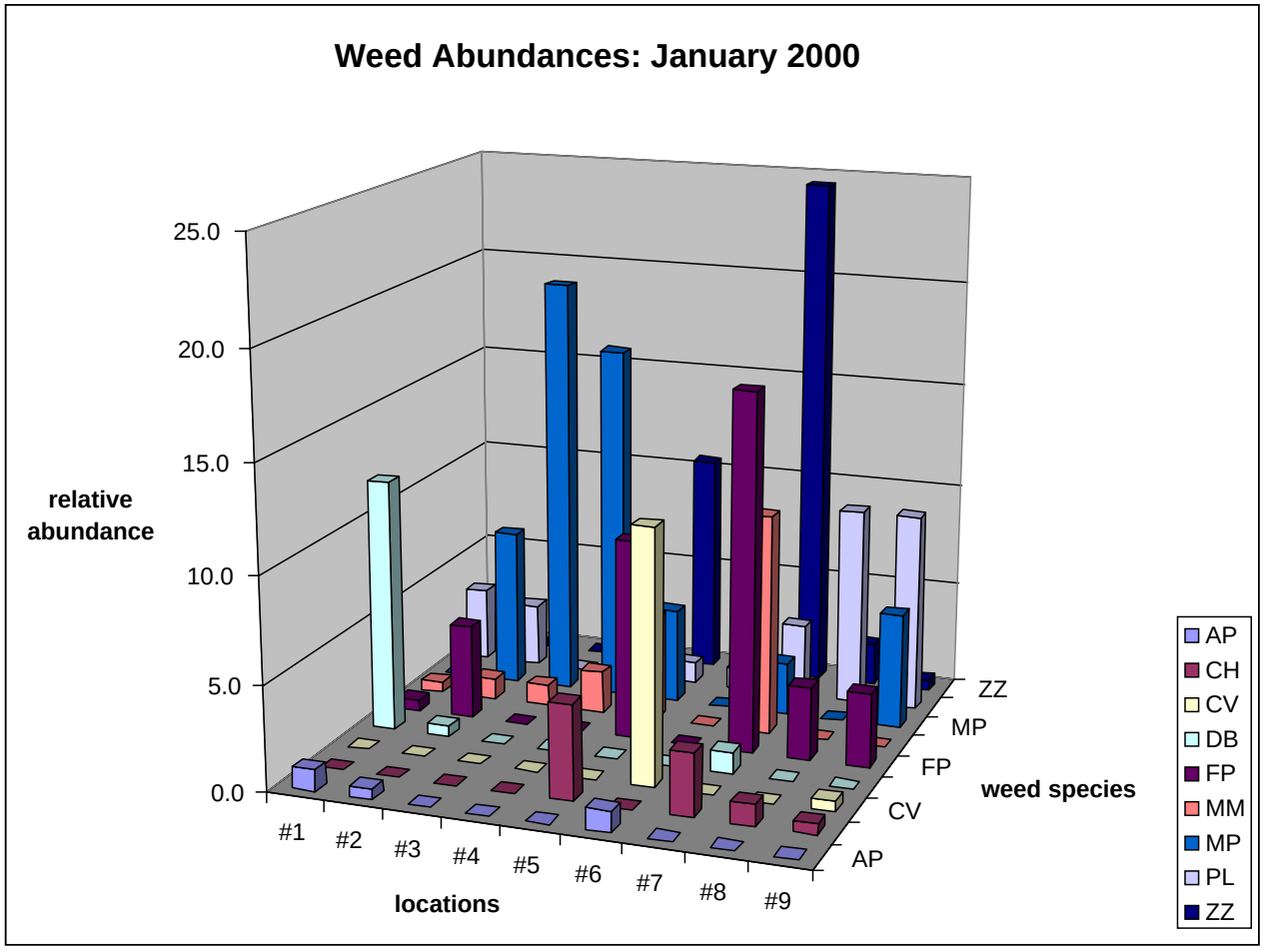
The vascular flora of Samoa Archipelago is estimated to be about 765 species. A total of 378 plant species have been recorded in the Uafato CA—294 flowering plants, 80 ferns, and 4 fern allies. Of these, 77% are native (290, 12 of which were added during the present survey), i.e., indigenous and endemic, and 23% are alien species (Polynesian and modern introductions). This number represents about 38% of the native flora of the Samoan archipelago. This is quite a high number of native species for such a small area (only 1—2% of the area of Samoa). Thus the CA has a relatively large flora, probably much more than any of the other protected sites (with the probable exception of Ole Pupu-Pu'e National Park) in Samoa.

Several plant species have become invasive in Samoan ecosystems, especially in disturbed areas (which includes much of the country due to the recent cyclones). The Uafato Conservation Area is, however, relatively free of these invasive species. Only 21 vascular plant species found in the CA can be considered to be invasive in forests. Of these, only a few were seen to invade closed forest to any appreciable degree, and these are described as the forest weed indicator species.

The most abundant of the alien forest weeds in the CA are *Mikania micrantha* (**fue saina**, mile-a-minute vine), *Passiflora laurifolia* (**pasio**, passionfruit), and *Clidemia hirta* (Koster's curse), and the native invasive species *Merremia peltata* (**fue lautetele**) and *Faradaya amicorum* (*mamalupe*). The CA is missing most of the other serious forest weeds, which probably makes it

the most pristine forest in Samoa. In a effort to keep it that way, the CA should be periodically monitored for new arrivals, and the nine plots established during the present survey should be periodically re-sampled to see if the species already present are becoming a problem. They probably are not, but the monitoring can assess that for certain. There appear to be no weeds in the forest that are currently in need of remedial measures.

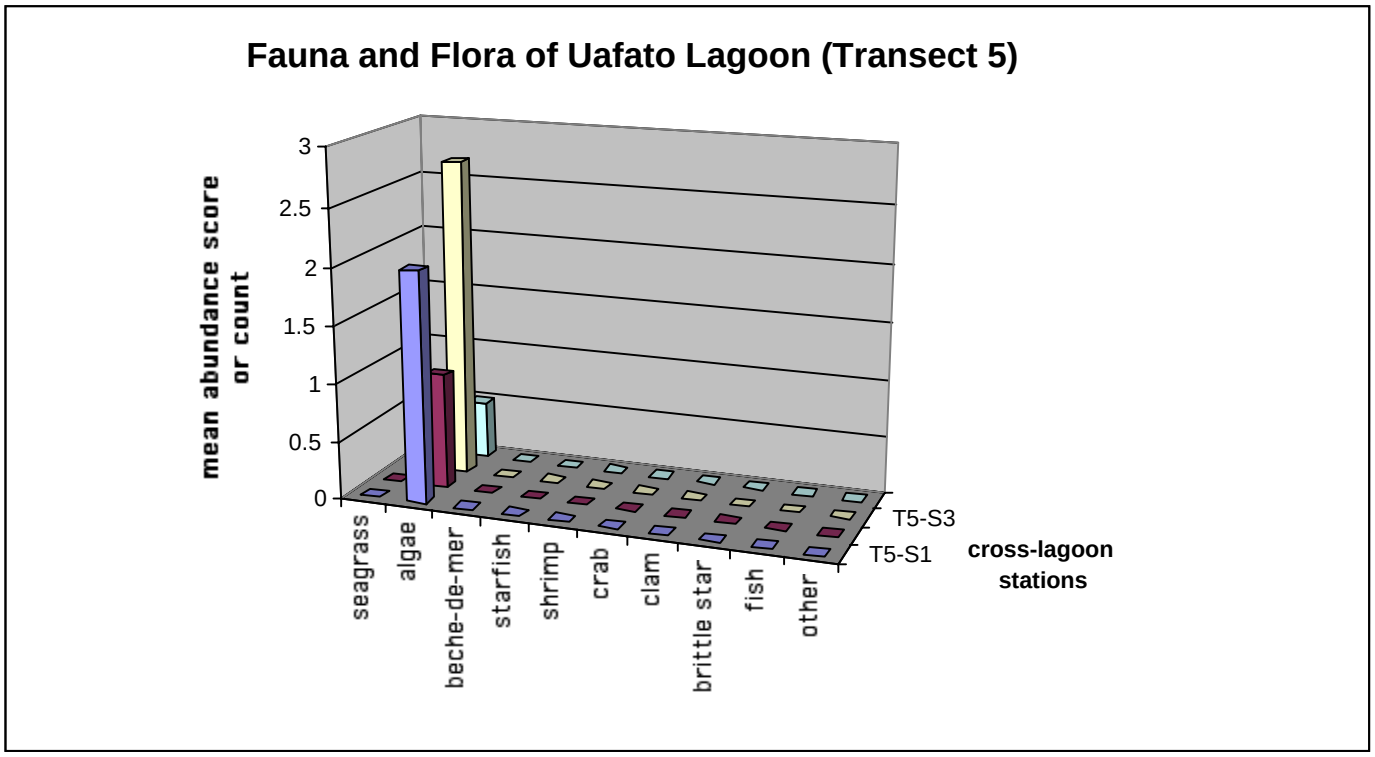
The existing (January 2000) distribution and relative abundance of the 9 priority weeds chosen as indicators are shown below. The relative abundance of each weed species is scored on each of 9 transects chosen as permanent monitoring locations.

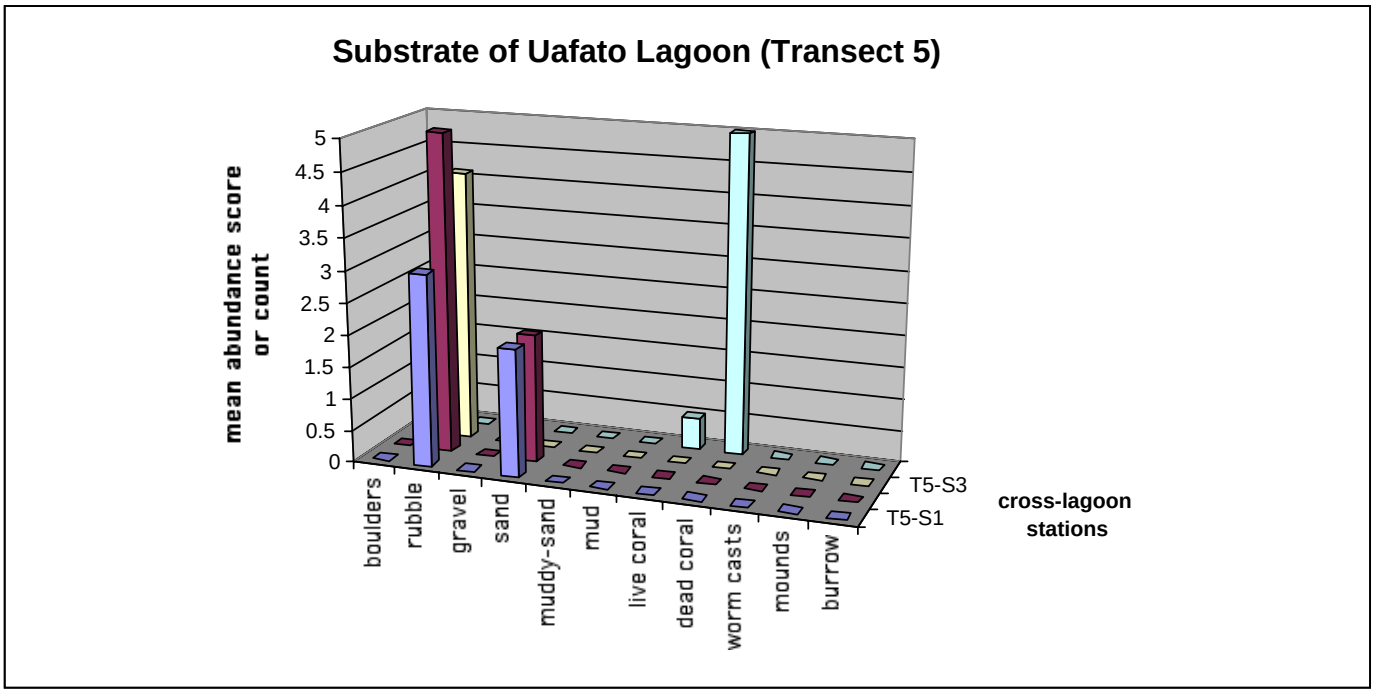


For the purposes of reporting at the system level, the abundances of all of the 9 weeds in all plots is calculated and reported as the Weed Index. It is calculated as the sum of the raw scores of weed abundances in all plots. For the survey reported above the Weed Index is 221.5.

5.4 Condition of Lagoon near Village.

The survey of the lagoon shows that, as expected, the inshore areas comprise mainly coral rubble and gravel, with the slightly deeper offshore areas sometimes having live and dead hard coral pieces. Some parts of the lagoon have algae and seagrasses, but mainly in the inshore parts only. The patterns of distribution of these variables are shown below for Transect 5, a location near the village church.





For the purposes of system level reporting, the data for algae abundance has been selected as the key variable for reporting purposes. The increases of algal abundances in lagoons can signal a change in nutrient and hyrdological regimes, and generally, the increases of algae may be considered as an early warning of environmental problems in lagoon systems. The macroalgae data is reported as a Macroalgae Index: the sum of all the scores for macroalgae for all quadrats. For the current survey the Macroalgae Index is 40.

6. Key Lessons and Recommendations

As we proceeded through these field trials, the following key points emerged as lessons for future implementation of indicators and monitoring programmes.

Institutionalisation of monitoring

In order for local people to be convinced that they should volunteer the effort required for monitoring, they need to be convinced that they will see a 'return' for their efforts in the future. In order to achieve this, the idea of monitoring and its role in modern concepts of natural resource management needs to be developed within the CA communities. This effectively means that the CAs need to be committed to the active management of the resources of their CA, and when this happens, they will easily be convinced that monitoring of indicators is important for the continued well-being of the CA. Hence monitoring is a key element of the management of the CAs, and the effort put into monitoring is a commitment to good management. Also, without a commitment to management, penalties for over-harvesting, or breaking of community rules, are not likely to have any effective impact in protecting the biodiversity of the CAs from overexploitation. The central element that will underpin progress in this area is the existence of an effective plan of management for the natural resources of the CA. Putting these in place in each CA, following the model used in Uafato, and consistent with the criteria identified in this report, is probably the highest priority task for all the SPBCP CAs.

Site customisation

Each CA has a slightly different (some are very different) conditions, and this means that each Core Indicator will need to be locally refined for implementation to be fully effective. For many this will not mean a big change to the standard protocols, but key aspects like site/transect selection are important to get right. This means that most CAs will need a fine-scale customisation of the standard monitoring procedures to best fit their local circumstances.

Participatory training

Since the idea of quantitative monitoring in a systematic way is relatively new to most local communities, the procedures for monitoring will need to be introduced slowly and progressively. Each new indicator intended for implementation should be specifically introduced to each CA following a schedule of implementation, The schedule can be derived by the CACC in conjunction with the SPBCP and the lead Agency. For each CA, the training for implementation and customisation of the generic indicator SMPs will be required, and this will need to be done in a highly participatory and consultative manner.

Quality control

Given the innovative nature of some of the indicators, and the weak institutionalisation of indicators and monitoring in most Pacific areas, there will be an ongoing need for detailed assessment of data collection, analysis and interpretation procedures for each indicator implemented in each CA. This is probably needed for the first few years, and will have to be provided by external consultants until lead agency staff have been sufficiently trained to be able to implement a quality control programme in an unsupervised mode. The key issues to be

addressed will be maintenance of systematic observation and sampling regimes, data security and management, and interpretation issues. Without regular external audit, all routine monitoring programmes risk 'data-creep', or incremental procedural shifts.

Community feedback

We consider that the CA indicator programme has a high profile in the local communities, and it will be imperative to provide strong data feedback procedures. Without this, there will appear to be little return for effort, and the local volunteers may loose motivation to continue with accurate reporting.

Data currency

As part of the feedback issue above, it is crucial that all data be quickly entered into the databases with little delay. This reduces the risk of corrupt data becoming entrenched into the monitoring database, and enables any questions about specific pieces of data to be resolved in a timely manner. This also means that external audit can be carried out on current data.

Taxonomic support

Given the taxonomic complexity of some of the tasks being required of local volunteers, it is unlikely that quality monitoring data can be expected from CAs unless the CASO and/or CO are given adequate training in flora and fauna identification. This should be very focused, and have in mind the precise requirements of the indicators. After this knowledge is entrenched in the local community, it can be passed on to trainee COs (see below).

Succession planning and skills transfer

It is clear that the monitoring procedures and other work in the CA will not be able to be continued with an active program of succession planning. The present hierarchy (CASO, CO) is effectively an apprenticeship system, with the CASO training the CO to ultimately take the position of CASO. This will be maintained while there is the present system responsibilities and cash rewards (salary) linked to this hierarchy. This should be further extended in each CA, so that there is at least on trainee CO (voluntary) who is likely to become the CO in due course, and can be formally recognised within the CA hierarchy. The trainee CO(s) can also become an important conduit for knowledge to become transferred to the community, and they would greatly assist with the institutionalisation of the concepts of natural resource management and the role of monitoring. This process should also be extended so that the volunteers become identified as important custodians of the procedures of biodiversity management, and be routinely involved with external consultants, lead agency, or other government agency personnel as opportunities arise.

Technically robust monitoring

The SMPs identified in this report are based on the most modern and appropriate approaches to indicator selection and monitoring. But the limitations in available resources for their implementation are very major. This means that the design and initial implementation is based on established practice elsewhere, but not on pilot survey data from the CAs in question. This means that, generally speaking, the effectiveness of the monitoring (in the sense of being able to detect important levels of change) is highly uncertain. In this sense the monitoring is not highly

technically robust. In order to enable the design and procedures to be improved in due course, all the SMPs have ‘upgrade paths’ identified in broad terms. These upgrades are provided so that, in the future, as community capacity increases, so the nature of the monitoring may also be improved. The upgrades are probably best implemented with the assistance of external consultants to ensure that the intended outcomes are achieved. Key areas to be addressed include the capacity of the monitoring to detect changes considered to be ecologically important.

Independent audit for Programme-level evaluation of success

The evaluation of the programme-level success of the SPBCP should be conducted by independent auditors. The data to be used should be assembled and made available for audit by the CACCs, Lead Agencies and SPREP, but the synthesis, evaluation and a report on the outcomes should be prepared by an independent authority. The data needed for the evaluation may need to assembled by a specific task team under SPREP guidance, or as part of a specific project dedicated to this purpose, whose role is to liaise with the respective CACCs and Lead Agencies to advise on the data needs.

7. System-wide Evaluation of Success

In this section of the report, the available data is used to prepare a pro-forma report on the success of the SPBCP at the system level. The report is based on the indicators identified in Phase 1, and on some additional programme-level indicators subsequently identified in consultations with SPREP staff and members of TMAG.

The pro-forma report on the success of the SPBCP is divided into two parts: first, an evaluation of success at the level of each CA using the Core Indicators; and second, an evaluation of success using the Programme Level indicators. The full system-wide evaluation uses both sets of indicators.

The data gathered for this report on each of the programme-level indicators are shown in Appendix 6 (Baseline Data on Programme Level Indicators).

This section of the report describes the evaluation process, lists the data formats, and provides a standard set of analyses for application to the available data. The pro-forma report itself is shown at Appendix 7.

7.1 Conservation Area Success

Evaluation of the success of the Conservation Areas uses the data on the Core Indicators for each CA. Two options have been considered for reporting purposes. First, the numeric observation data on all indicators from the CAs are converted into frequencies of increases or decreases to standardise across all CAs. Frequencies of both increases and decreases are reported by summing across each indicator for all CAs. Second, for each Core Indicator, one key aspect is derived (often as an index that combines various other aspects) and this single measure is reported for each Core Indicator. This process looses information, but adequately summarises much of the most valuable information in each Core Indicator for system-level reporting. For the purposes of this report, the second of these two options has been chosen in developing the pro-forma report.

As described in the Technical Report, the basis for measuring and reporting on success at the CA level is the measurement of data on the Core Indicators and comparison with projected requirements (targets) for each indicator. The procedures for making this comparison are described in the Technical Report and in Appendix 7 of this report

7.2 Programme-level Success

The Indicators used in evaluation of the success of the SPBCP at the system-level are shown in the table below.

P1. Number of Conservation Areas
P2. Number of other Conservation Areas using the SPBCP model
P3. Number of collaborating partners
P4. Number of CASO group workshops
P5. Number of Core Indicators implemented
P6. Rate of income generation ($ income)
P7. Staff self-employed within income-generating projects

A description of each indicator, and, where it exists, the data for each indicator, are shown at Appendix 6. The data for each indicator were assembled by reference to Programme Officers of the SPBCP, and records/reports held by SPREP in Apia. In a real evaluation of the SPBCP, these data would be more gathered in a more comprehensive manner, by consultation with the CASOs, the lead agencies and the local communities themselves.

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Appendix 1: Terms of Reference for Phase 2 of this Project

Phase 2 of the Indicators for Success Project will:

- consult communities in detail about the proposed Success Indicators;
- get feedback using PRA tools to refine the indicators;
- prepare field sampling designs and protocols in conjunction with communities;
- conduct the field sampling exercise, to provide a set of data points;
- analyse and summarise the data, and prepare summary reports;
- finalise standard monitoring protocols in conjunction with resource management plans and agencies;
- prepare a trial SPBCP system-wide report using the Success Indicators.

Expected outputs from this Phase of the consultancy are

- a report of the Trials detailing the process, the methodologies, data collected, analysis of the data, findings and recommendations;
- a trial SPBCP system-wide report using the Success Indicators.

Reports of progress on this consultancy are scheduled for presentation to the SPBCP Technical Management Advisory Group meeting (October 1999) and the Fourth Round Table on Nature Conservation in the Pacific meeting (November 1999).

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APPENDICES 2 TO 7

Appendices 2 to 7 inclusive are attached as separate files on the CD version of this report.

Appendix 2: Baseline Data Collected in Uafato Conservation Area

Appendix 3: Recommended Standard Monitoring Procedures

Appendix 4: Analysis and Synthesis of Resource Use Indices

Appendix 5: Weed Survey of the Uafato Conservation Area

Appendix 6: Baseline Data for Programme Level Indicators

Appendix 7: The Success of the SPBCP: A Proforma Report